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Development of a composite collar drafting system

(For all principal collar types and their variations)

A thesis submitted in fulfilment of the requirements for the degree of

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Abstract 2005

Although collars represent only a small area of the pattern-making experience, they form a natural focal point when combined with the main parts of the garment. They are therefore an important design element that needs a considerable amount of thought. Presently, collar pattern-making follows a number of developmental paths that diverge considerably in their outcomes. Each collar style has a different collar drafting method to obtain the required collar silhouette and within each method there are many variations. Generally, drafts cannot be transported between styles, even changing the stand and fall measurements may not be possible without resorting to trials and drafting instruction alterations. Because of this individualistic approach there is a lack of standardisation and predictability to collar drafting in general and not all collar drafting methods are equal, some are better than others. Determining the more useful and advanced drafting techniques from, sometimes, conflicting methods is a matter of trial and error which, in itself, acknowledges and enlarges these unpredictable methods.

Through an empirical knowledge of current collar drafting methods, coupled with an overview of the body of collar drafting methods derived from the literature, this thesis evaluated a number of selected collar drafting methods to identify their common elements, their underlying strengths and weaknesses and reasons for the scarcity of predictability of final collar forms. From the results of three-dimensional fabrications, a series of questions concerning their performances are developed to evaluate the drafting outcomes.

A conceptual analysis, in which the mannequin was divided vertically in to a number of discrete 'sections' showed the importance of the relationships between all of the collar styles, their front opening positions and individual body neck-lines, giving a better understanding of how collars actually work. Conceptually dividing the mannequin in to a finite number of sections formed the foundations of the 'composite' collar drafting system.

A composite collar drafting system, with a single set of instructions was developed that could enable designers and pattern-makers to create collar styles and their numerous variations, with the assurance that the envisaged two-dimensional collar will also be the final three-dimensional silhouette. The composite collar drafting system instils

confidence in the entire process leading to a reduction in the number of toiles required to confirm a design. Novices should find the single composite collar drafting system easy to remember and apply, thus reducing the required learning period needed to master collar drafting. From the very beginning the whole design and pattern making procedure is obvious in methods, layouts and conclusions, making collar drafting a predictable cost-effective endeavour

The composite collar drafting system, which may be capable of computerisation (something that is not, at present, available to the practitioner), positions itself outside of the current main-stream two-dimensional manual and computer methods and the small number of computerised three-dimensional versions of manual collar drafting, which only describe single collar types. There is no system that accounts and includes multiple collar styles and alternative designs, except the composite collar drafting system.

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List of collar names

| | |
|--|---|
| Convertible (or two way collar) | Styled with lapel and close to the neck |
| D.B. Tailored jacket with peaked lapel | Fully structured |
| D.B. Ulster overcoat | Fully structured |
| Eton | High fastening |
| Peter-Pan | Sits flat on and around the shoulders |
| Prussian | High fastening overcoat |
| Regency (or Highwayman) | Fully structured with separate break lines for collar and lapel |
| Roll | Stands up close to the neck all round |
| Sailor | Sits fat on and around the shoulders |
| S.B. Chesterfield overcoat | Fully structured |
| S.B. Clover-leaf | Rounded at the corners on both collar and lapel |
| S.B. Tailored jacket with lapel | Fully structured |
| Semi-Roll | Stands up close to the neck at the back/ lies flat at the front |
| Shawl | (under collar is attached to the front pattern) |
| Shirt | (Close fitting to the neck) |
| Stand | (Chinese, Mandarin.) Stands up close to the neck |

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List of abbreviations

| | |
|--------------|---|
| CAD | Computer Aided Design |
| C.B., C/B | Centre back line of the neck or garment |
| C.F., C/F | Centre front line of the collar or garment neck |
| D. B. | Double breasted |
| F. edge, F/E | Front edge |
| GGT | Gerber Garment Technology |
| No. | Number |
| p. s. i. | pounds per square inch |
| S. B. | Single breasted |
| T. C., T/C | Top collar |
| U. C., U/C | Under collar |

List of definitions

| | |
|---------------------|--|
| Back | The back section of upper body of the garment from shoulder to hem. |
| Balance | <i>'A general description, as the word suggests, for a lack of distortion.'</i> Taylor and Shoben, 1990; p26. |
| Block fuse | The process of fusing a fabric in a blocked shape, larger than required, to pre-shrink the fabric piece prior to accurate cutting. |
| Break line | <i>'A crease edge of the collar is the line or edge where the collar stand becomes the fall by being creased over to run with the crease line of the lapel.'</i> Morris, 1947; p 235. (see crease line). |
| Break point | <i>'Where the rever turns back to form a lapel.'</i> Aldrich, 1985; p 114. |
| Buttonhole distance | A measurement from the buttonhole to the front edge of a garment. |
| Button distance | The distance from the front edge to the button. |
| Button wrap | An allowance measured from the button to the front edge of a coat or jacket. |
| Centre Back (C/B) | Centre of the back line of the neck. |
| Centre Front (C/F) | Centre of the front line of the neck. |
| Collar | <i>'A collar is the part of a garment that encircles the neck and frames the face.'</i> Joseph-Armstrong, 1987; 254. |
| Clicker knife | A thin steel knife outline for the cutting, and retention of standardised shapes during manufacture. |
| Crease line | The line that separates the stand from the fall and the lapel from the forepart (see break line). |
| Digitiser | <i>'A work table and a free-floating cursor which are used to convert pattern shapes into a format understood by the computer system.'</i> Cooklin, 1990; p 362. |
| Double Breasted | Two rows of buttons, one each side of the centre front line. |
| Draft | Collar instructions/diagrams (blueprint). |

| | |
|-----------------------------|---|
| Ease | An amount of seam line longer than that required; It is used to manipulate another shorter seam line or to impart shape. |
| Fall | <i>'The fall of the collar is that part which falls over or turns back from the edge of the stand down over the shoulders.'</i> Morris, 1947; p 235 |
| Forepart | Front section of upper garment from shoulder to hem (see front). |
| Front design line | The front shaping of a collar. |
| Front | The front section of an upper garment from shoulder to hem (see forepart). |
| Fusible | Inside fabric sandwiched, glued and fused between the top collar and the under collar to give extra body and enhance appearance. |
| Fusing Press | Used to press the fusible to either the top collar and/or under collar by heat and pressure; helps to give shape and body. |
| Gorge | Front neckline shape. |
| Grade rule data | Data that defines the movement of a grade point for one size. Cooklin, 1990; p 364 |
| Grade rule table or library | <i>'A grade rule library can be compiled of numbered grade rules used at the grade points of the block or basic pattern.'</i> (CAD). Aldrich, 1984; p 160. |
| Grading | Making patterns larger or smaller than the original, whilst retaining the same proportions and styling. |
| Inner or neck edge | <i>'The edge of a collar that is stitched to the neckline of the garment.'</i> Joseph-Armstrong, 1987; 254. |
| Lapel | <i>'Revers (or lapels) are the front edges of a bodice, blouse, jacket or coat which, in their upper part, fold back over a line known as a crease line.'</i> Bray, 1985; p 90. |
| Leaf edge | The outer edge of a collar that sits around the shoulders. <i>'Fall edge or leaf edge.'</i> Shoben and Ward, 1990; p 128 |
| Mannequin | A model of a human body representing a specific size. |

| | |
|------------------------------------|---|
| Marker | The arrangement of patterns on paper or fabric to reduce fabric wastage. |
| Master size | The first pattern to be produced. Usually one of the middle sizes (size 12 for women or 100cm chest for men). |
| Melton | Milled woollen cloth used for under collars. |
| Mirror | Copied area formed on a folded line (mirrored line). |
| Mirrored line | Fold line used for duplication. |
| Modelling | The process of shaping fabric on the dress form. |
| Neck Line | <i>'The portion of the collar which will be attached to the garment.'</i> Pepin, 1942; p 145. |
| Neck Points | The joining points of the neck line and shoulder seam of the front and back body sections. |
| Nest | The superimposing of one size (pattern) on another so that the progression of increase is clearly visible. Taylor and Shoben, 1990; p 26. |
| Notches | Cuts in pattern pieces or garment parts with which to align other cut pieces. |
| One-piece collar | Stand and fall cut in one piece. |
| Pattern engineering/ Engineered | A method of pattern cutting that dictates the garment shape, rather than by traditional tailored methods of stretching and shrinking with the iron. |
| Piping | An added amount of fabric that turns under to hide a seam line. |
| Plot/Plotter/Plotting | <i>'Draws full- or small-scale patterns, nested grades and markers on to paper.'</i> Taylor and Shoben, 1990; p 71 |
| Plotter | Computerised machine for drawing pattern pieces and markers. |
| Ready-to-wear | A garment made from standard or average body measurements. |
| Round gorge | Curved section of the front neck. |
| Profile former | Tool to duplicate 3 D forms, in a straight line. |
| Seam allowance | An allowance for joining separate garment sections together. |
| Self fabric | Fabric used for the outside of a garment. |

| | |
|------------------------------|--|
| Set of collar | <i>'The way it lies and fits at the neck.'</i> Bray, 1985; p 78. |
| Shrinkage | Amount a material will contract under the influence of heat and pressure. |
| Single Breasted | One row of buttons on the centre front line. |
| Split collar | Separate stand and fall patterns (see two-piece collar). |
| Spring | An angling procedure for the insertion of extra leaf edge length. |
| Square gorge | Straightened corner section of the front neck. |
| Stand | <i>'The stand of the collar is that which fills up the neck of the coat to the desired height.'</i> Morris, 1947; p235. |
| Step collar | <i>'So-called because the distance the collar-end is from the end of the lapel forms a "step".'</i> Morris, 1947; p 235. |
| Stock garment | A garment that is 'ready-to-wear'. |
| Superimposition | Two or more lines occupying the same position (overlaid lines). |
| Tailored | An outer garment structured with an underlay of padding (canvas or fusibles). M.T.M. or stock garments. |
| Tailored collar | A canvassed or fused top collar sewn to a self fabric or melton under collar. |
| Toile | <i>'The toile contains the basic shape of the dress (or other garment) and must fit perfectly.'</i> Silberberg and Shoben, 1993; p 3 |
| Top collar | Outside or façade of a collar (self fabric). Sometimes fused to give structure. |
| Top plate | Wooden reinforcing disc placed in the neck of the mannequin. |
| Trimmings | Fusibles, thread, buttons etc. |
| True length | Actual length of a line (not in perspective). |
| Two dimensional (2D) | A flat object with only length and breadth measurements (no height). |
| Two dimensional Grading (2D) | <i>'When the pattern changes only in girth and height and not in shape.'</i> Taylor and Shoben, 1990; p26. |
| Three dimensional (3D) | An object having three measurements, length, breadth and height. |
| Three dimensional | <i>'grading techniques which change suppression as well as</i> |

| | |
|------------------|--|
| Grading (3D) | <i>girth and height grades.</i> Taylor and Shoben, 1990; p26. |
| Two-piece collar | <i>'A (coat) collar with a separate stand, i.e. a seam between the stand and the fall.'</i> Bray, 1997; p 132. (see split collar). |
| Under Collar | Under side of a collar, either self fabric or melton. |
| Wedge-in | Increasing the length of a seam line by a specified amount. |
| Wedge-out | Decreasing the length of a seam line by a specified amount. |
| X Coordinate | The horizontal axis of a pattern piece. 'X' to the right and '-X' to the left. |
| Y Coordinate | The vertical axis of a pattern piece. 'Y' as the upper point and '-Y' to the lower point. |

Line colour key for collar drafts

Under collars: Figures 7.1-7.43 (pages: 174-228)

| | | |
|-----------|---|---|
| Stage 1a |  | Collar stand section (sector) lines |
| |  | Body section (sector) lines |
| Stage 2 |  | Collar stand section lines |
| |  | Collar fall section lines |
| |  | Body section lines |
| Stage 3a |  | Collar stand section lines |
| |  | Collar fall section lines |
| Stage 3b |  | Alternate colour stand and fall section lines |
| Stage 3c |  | Alternate colour stand and fall section lines |
| |  | Transferred neck edge line |
| Stage 4 a |  | Opened section lines |
| |  | Smoothed leaf edge line |
| Stage 5a |  | Alternate colour stand and fall section lines |
| Stage 5b |  | Opened section lines |
| |  | Smoothed leaf edge |

Top collars: Figures 7.44-7.45 (One piece collars) (pages: 231-233)

| | | |
|----------|---|---|
| Stage 1a |  | Alternate colour stand and fall section lines |
| |  | Transferred neck edge line |
| Stage 1b |  | Alternate colour stand and fall section lines |
| |  | Transferred neck line |
| |  | Break line ease allowance |
| |  | Original gorge line |
| Stage 2a |  | Opened section lines |
| |  | Transferred neck line |
| |  | Leaf edge piping |

Top collars: Figures 7.46-7.49 (Two piece collars) (pages: 234-239)

| | | |
|----------|---|---|
| Stage 1a |  | Alternate colour stand and fall section lines |
| |  | Transferred neck edge line |
| Stage 1b |  | Alternate colour stand and fall section lines |
| |  | Transferred neck edge line |
| |  | Break line ease allowance |
| |  | Original gorge line |

Stage 2a

Stage 2b



Stand and fall separation line and notches



Alternate colour stand section lines



Opened section lines



Transferred neck line



Break line



Leaf edge piping

Chapter 1

Introduction

1.0 Overview of the drafting process

The process of creating garments frequently starts with an abstract design imagined by the designer; a style that is translated into a drawing capable of being effectively communicated to personnel throughout a clothing manufacturing organisation until it finally emerges as a physical reality.

To advance the design from concept to actuality requires a series of practises by the designer or pattern maker that begin with the creation of one or a number of individual patterns which make up the whole garment style. The role of a pattern, in the initial trialling phase (and later in full production), is as a guide, or template, that is placed on the fabric, traced around and cut out ready for assembly.

Patterns, including collar patterns, are produced from 'blueprints' called drafts. Drafting is a two dimensional, technical-drawing method of obtaining a pattern which involves the use of pre-determined drafting instructions and either one or more diagrams as visual aids (e.g. Bray, 1985; Kunick, 1967; Shoben and Ward, 1990). Unlike three dimensional modelling on the mannequin, drafting usually gives only an approximation of what is required in the end result. Alterations frequently need to be made by the practitioner, firstly to the toile, then the pattern and later to the draft for future designs in order to develop the design to the ideal shape.

Collars and lapels are available in a considerable number and variation of shapes, sizes and styles with names that have become 'standard' in the literature; such as convertible, Prussian, shirt, tailored and Ulster (Figure 1.1). From a drafting point of view, different collar types look dissimilar and have evolved different methodologies to attain their silhouettes and variations. Each type of collar requires a different approach to the technique of pattern drafting, with most drafting techniques not transferable between styles. Although there are very few design elements common to all collar types, these are open to interpretation. Thus, variations of position, shape and size can be made to most elements in each given collar type producing an almost infinite range

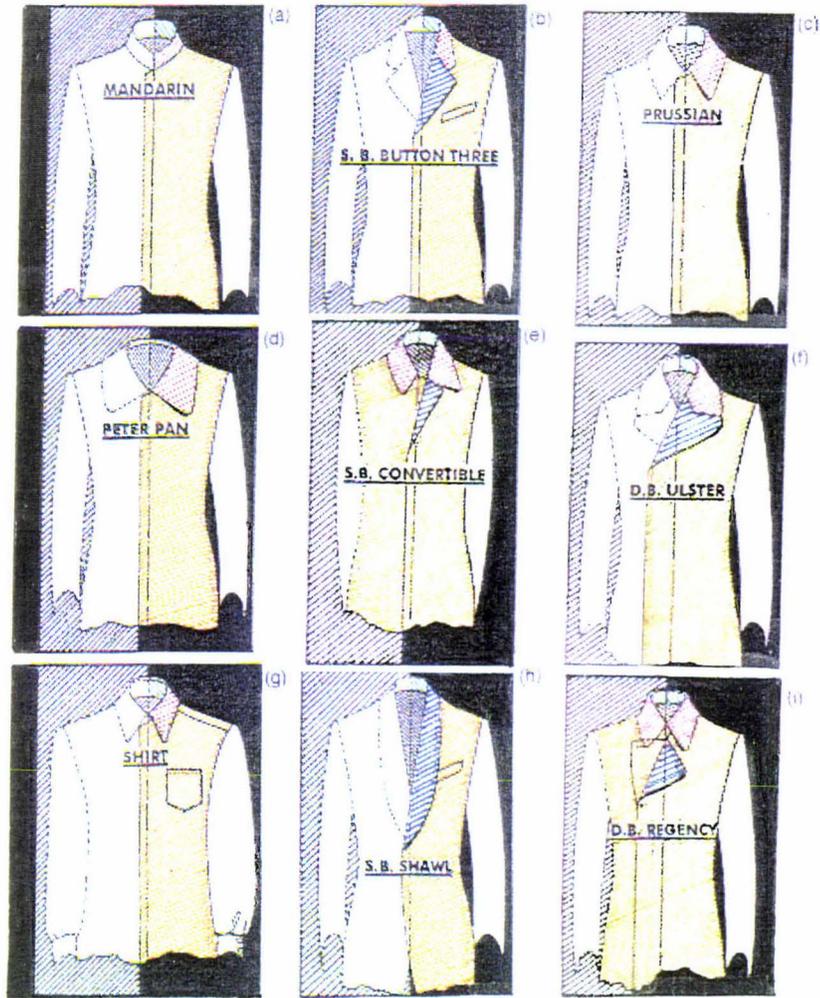


Figure 1.1 Standard collar types used in the composite collar drafting system.
 (a) Mandarin (b) S. B. Button three (c) Prussian (d) Peter Pan
 (e) Convertible (f) D. B. Ulster (g) Shirt (h) S. B. Shawl
 (i) D. B. Regency
 (Drawing source: © M. Campbell).

of styles within each standard collar. The vast array of possible variations of collar design, and the difficulties associated with them, causes problems for the pattern-maker and student alike.

Students and practitioners gain knowledge and experience of developing these 'standard' collar styles by copying collar drafts then trialling them to ascertain the result. As there are many variations of design elements available to the pattern maker, there are many problems that have to be solved before a collar pattern is finalised. For the novice designer, collar problem solving happens on a frequent basis until a satisfactory level of accomplishment has been attained. At the end of this time period, very possibly years, new drafts will have been developed by competent practitioners to succeed those deemed to be ineffective. Every designer will undertake this continuous, lengthy and expensive pursuit of trial and error until better methods of collar drafting are found. This is wasteful from all perspectives; whether it is in the number of individuals involved, fabric usage or manufacturing trials. The circle never closes on these seemingly persistent investigations by designers and pattern makers into the creation of better collar drafting and collar pattern making techniques. Individualistic, physical procedures of modelling or drafting are still the norm for the pattern-making of collars. Computer techniques for collar pattern-making often still depend on manual drafting, the practitioner relying on a good knowledge of drafting processes for the manipulation of previously digitised patterns.

'A computer cannot replace a good pattern-cutter: it is simply a tool to help them do a job even better' Aldrich (1992; p. 17).

1.1 Collar drafting terminology

Contemporary collars and lapels have their own terminology, being distinct from other sections of pattern making. Many authors (e.g. Cutler (No date), Erwin, 1969; Pepin, 1942; Aldrich, 1985; Bray, 1985; Shoben and Ward, 2000; Morris, 1947) agree on most commonly used terms in pattern drafting (Figure 1.2) and these are the terms that will be used in this thesis. Some common terms are interchangeable (for instance the leaf edge has other familiar terms, such as outer edge and design edge or design line). However, some North American publications use different terms such as 'sloper' for block; 'overfold' instead of fall; and 'rink' (Gough, 1956, p.73) in place of convertible

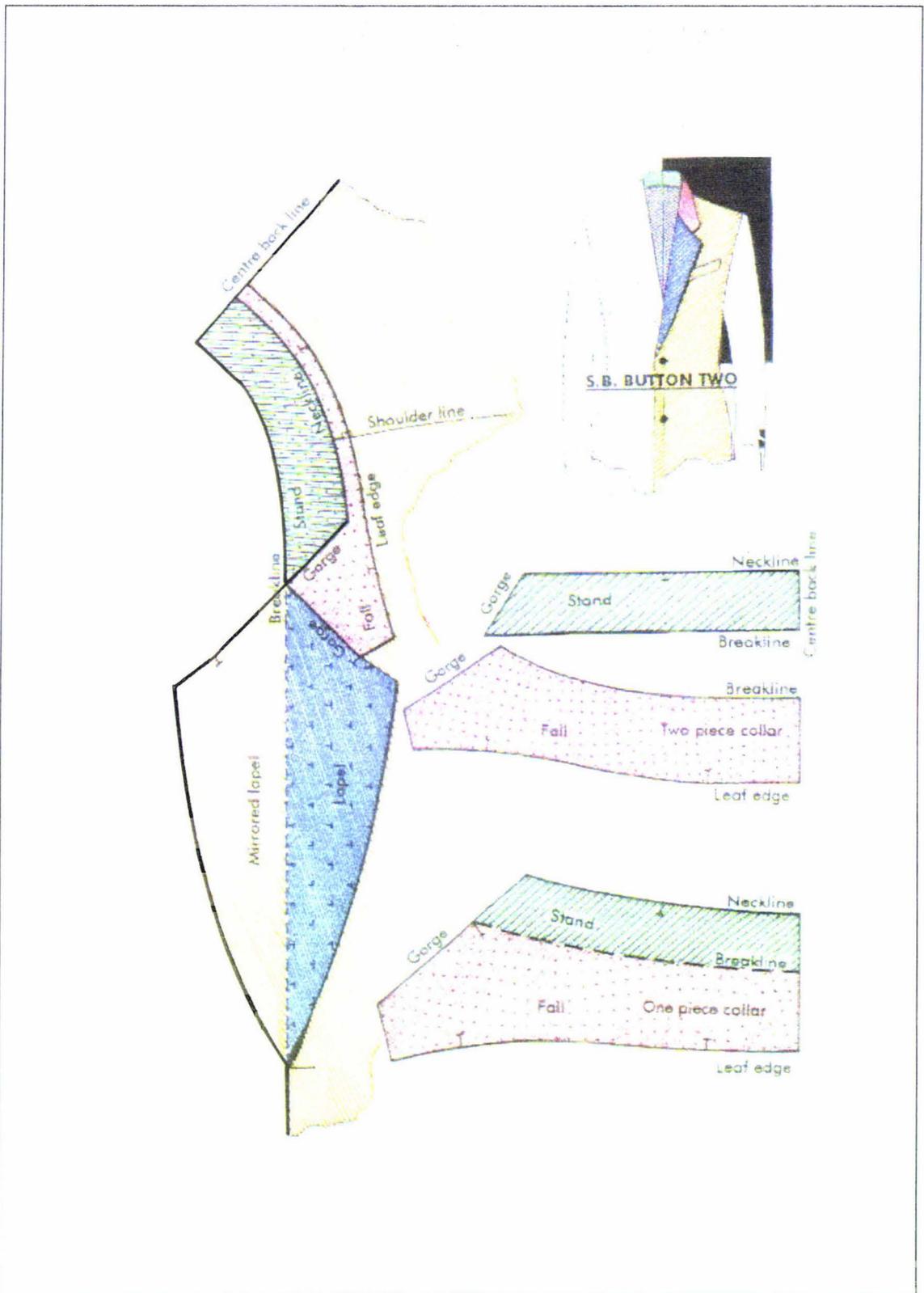


Figure 1.2 Collar and lapel terminology: Design elements used in this thesis.
 (Drawing source: © M. Campbell).

collar. There is also, from Chiricota (2003), 'base' for the collar stand and 'lapel' for the collar fall.

1.2 Rationale

It is my experience over thirty years, in both the clothing industry and in tertiary teaching through making observations of the diverse approaches taken by practitioners and many students, that inexperienced pattern makers seemed to spend considerable time, energy and materials perfecting a variety of ways of creating collars; yet all the while manipulating the same few essential elements or features on each occasion. These observations have led me to investigate why there appears to be a lack of cohesion between the various approaches to collar drafting and why there are so many different methods that arrive at, more or less, the same conclusion and give the impression of success to some degree or other. How can all the variations in methods produce the same, or nearly the same, results? Perhaps because of these separate methodologies they do not. Are the results really entirely satisfactory? Do they give what the designer or pattern-cutter has envisaged or wants? The only way that drafting methods may appear to be correct is if they give different, individual results in each case which may disguise the fact that they do not perform as needed. Unfortunately the true performance of a collar draft is not usually apparent until the end of the trialling period.

At present, collar making takes place in a circular, indirect approach; first is the draft followed by the pattern and toile. Alterations are then made to the toile, translated back to the pattern and draft, then another toile is constructed; and so on. The composite collar drafting system developed in this thesis attempts a more direct route. The rationale therefore, is to reduce the ambiguities seen in contemporary drafting processes and to enable better predictions of collar performances at the design conception stage, prior to drafting, pattern-making and the final collar fabrication.

1.3 Aims

The aim of this thesis is to produce a single 'composite' collar designing and drafting system that contains enough information to produce a majority of the 'standard' collar types, styles and their variations. The 'composite collar drafting system' is a method of obtaining a 'first' collar pattern (both one and two-piece under collars and top collars) for a particular design from which a set of graded collar patterns could be produced.

The composite collar drafting system will enable the practitioner to verify the collar design at the drafting stage thus reducing the number of toiles. This system could help less experienced pattern makers with the collar pattern making component of apparel design.

Although the present research does not venture into the realms of collar computer programming, the new composite collar drafting system might contribute to, and/or enhance the opportunities for the future development of a fully automated computer aided design programme for collars. The composite collar drafting approach is designed with computerisation in mind, using the same single set of processes for all the collar types. The composite system diagrams will, therefore, be prepared and arranged accordingly.

1.4 Objectives

Preliminary examination of a range of existing published collar drafting techniques has shown that there are design elements and features common to almost all collars investigated; although variations to these fundamentals are possible, and necessary.

The objectives of this research are:

1. To review the available published literature pertaining to historical and contemporary collar drafting and modelling techniques.
2. To evaluate the effectiveness of a selection of different published and personal collar drafting methods in order to determine whether these could be of use in the formation of a new composite collar drafting system. Common drafting qualities and interrelationships among design elements that link the separate and distinct parts of collar, neck and the upper body regions will be identified.
3. To amalgamate and develop the essential collar and body elements in order to develop a 'composite collar drafting system' that encompasses most traditional types of collar and their resultant three-dimensional forms from a two-dimensional base. This single, manual pattern-drafting system has the potential to provide increased quality, fit and 'set', for a variation of collar designs whilst decreasing the number of toiles.

1.5 Scope

The scope of this thesis is confined to an analysis of historical and contemporary drafting techniques for a selected range of collar design types that incorporate examples from flat-only collar styles, through stand and fall types, to the stand-only variety. Because of their characteristics concerning the positions and distortions of the break line and the necessity of a front gorge dart to negate excessive amounts of fabric under the collar, grown-on collars will not be included in this thesis.

An investigation into the history and development of collars and their drafting techniques would not be complete without mentioning collar modelling. It is important to include this aspect of collar making in the research to evaluate what makes a collar style or type; their qualities, problems and difficulties, and the dexterous manipulations that are performed both on the flat (2D) and on the mannequin (3D) to complete the design.

Conveying the organised layout of a particular drafting method by means of written descriptions alone is not possible. A diagram must be added to give a framework to its structure. It is the same with comparisons between one set of blueprints and another, there has to be visual representations to indicate their disparities as well as their analogous sections. Collar modelling methods, with a selection of contemporary drafting systems, are analysed diagrammatically in order to contrast and compare their instructions and approaches with those of the composite collar system. Once the new composite collar drafting system has been determined and developed into a single collar design and pattern-making process, examples of a comprehensive number of collar designs will be drafted to verify their performances.

1.6 Overview of thesis

Chapter 2 reviews the published literature available pertaining to collar drafting. There are also descriptions of modelling methods through collar classifications to the formation of drafts and grading. Consideration is also given to various aspects of contemporary pattern-making processes such as 2D and 3D collar computerisation.

Chapter 3 evaluates a series of contemporary collar drafting techniques showing the spread of methodologies required for the various shape diversities and size differentials

that exist within published drafting and modelling procedures; and identifies the knowledge required for the desired collar silhouette. Questions related to the collar drafting processes and their imperfections (including the break line position) are articulated to inform the reader of their ambiguous nature.

Chapter 4 describes the methods and materials used to produce the drafts and toiles.

Chapter 5 analyses the structure of the various sections that make-up the three-dimensional mannequin. This analysis explains the sectioned body and neck elements and their associations which are essential for their introduction to the composite collar drafting system.

Chapter 6 develops the composite collar drafting system. Experiments to analyse the effects of various leaf edge 'length insertions' and determine how they influence a collar's shape are illustrated. The 'stand-band' (stand collar section) and superimposition of elements are introduced as are explanations of the elements that influence the body neck line position, its 'tracking' and the theory of the neck line's formation.

Chapter 7 describes the stages in the 'composite' collar system and the process itself. Drafting instructions for stand, flat and stand and fall collar styles and examples of the variations in the front collar design area for a number of different collar types are presented and evaluated. Top collars and shawl collars are represented in one and two piece formats. Composite collar grading is described followed by the manual 'quick reference' composite collar system.

Chapter 8 discusses conflicting manual contemporary drafting methods and the contradictions between collar design types. The underlying principles of the processes within the composite collar drafting system and the mannequin as an important ingredient of the whole development are also expressed.

Chapter 9 presents conclusions and suggestions for further research.

Chapter 2

Literature review: Historical and contemporary collars

2.0 Early collar styles

Collars of one style or another have been with us almost as long as civilisation itself. Throughout history collars have adorned garments either for practical purposes or for decoration, changing in size, shape and design according to their placement in history. For example, Laver (1972, p.16) describes Tutankhamen's Queen, (1350-1340BC) as wearing an embroidered collar of gold and enamel. Queen Elizabeth I (1533-1603) popularised a collar style that became '*conventional attire*' (Pepin, 1942; p.148) in which the collar stood up at the back falling flatter at the front.

The fashionable evening dress of 1825 was described as follows: '*a collar of velvet, and ascends very high on the neck, and the crease rolls over, something like a horse collar*' (Shep, 1991; p.12a). Illustrations of a polonaise and a bodice from 1888 (Arnold, 1982; p.10), show both to have a stand collar, one of which is shaped at the front. Further interesting examples of clothing with, or without, collars dating back many hundreds of years may be found in various collections throughout the world (e.g. Victoria and Albert Museum, London; Museum of costume, Bath; Metropolitan Museum, New York). Pattern drafting methods have developed and evolved through history, they encompass those collar styles that are the subject of this thesis.

2.1 Drafting history

There has been a vast amount of literature written on the history of costume and clothing in general, the whole field covering a very wide subject area of thousands of years from cave dwellers to the present. Nevertheless, the cutting and drafting of clothing patterns, especially collars, using documented methods is not nearly as ancient, and is of a much rarer nature than descriptions of costume in general. The scarcity of early published drafting techniques in Europe and North America illustrate the scant detailing of collar pattern-making until late in the eighteenth century.

'There is very little detailed information on the subject of patterns and dressmaking until the end of the eighteenth century' Arnold (1964, p.3).

The earliest European texts can be traced back to the late sixteenth century. One such text entitled '*Libro de Geometrica Practica quell al trada de toccanto officio de sastre, por Juan de Alcega.*' (John Alcega, Madrid; 1589. cited in Shep, 1987; p.74); contains a method describing the cutting of fabric, to the correct measurements, for a coat.

'In the first quarter of the nineteenth century there was quite a concourse of authors and inventors of systems'.....'this awakening of our trade ushered in a new era of progress' Shep (1987, p.90).

'The Art of Cutting and History of English Costume' by Edward B. Giles, 1887 and 1896; re-published by R. L. Shep (1987), contains a vast amount of information on the sources and methods of cutting and drafting systems, as well as their authors and dates of publication (when available). There is also a critical description of the merits, or otherwise, of each of the many systems reviewed. However, few of the methods of cutting and drafting describe collars or collar patterns to any great length.

The coat drafts illustrated (Figure 2.1), and attributed to a Mr. Hearn in the year 1818 (Giles, 1896, p.92), give only a cursory introduction to the collar (shown by the dotted lines); nor do the instructions mention collars to any length or detail. To compensate for this absence of descriptive accounts of collars, and to assist in determining the position of the neck line, Mr. Hearn does give a method to ascertain the amount of height of a neck for any figure, an important aspect for the better fitting collar for differing body types and sizes. Bray (1985) presents a more contemporary observation on figure attitudes:

'The shape of a person's neck also affects the fit of a collar. For a stooping figure with a 'long' neck a collar, which is more close fitting at the back is necessary. A thick-set figure with a short, straight neck generally needs a looser-fitting collar'. Bray (1985, p.79).

Wampen (1863), published one of the most complete and elaborate of cutting systems (Figure 2.2) using a proportional height and width of 'geometric' measurements of various parts of the body. Nevertheless, there is no disclosure as to the method of collar drafting, although there is a clear indication of the shape of the front gorge line with the neck point forward of the deepest part of the neck line arc.

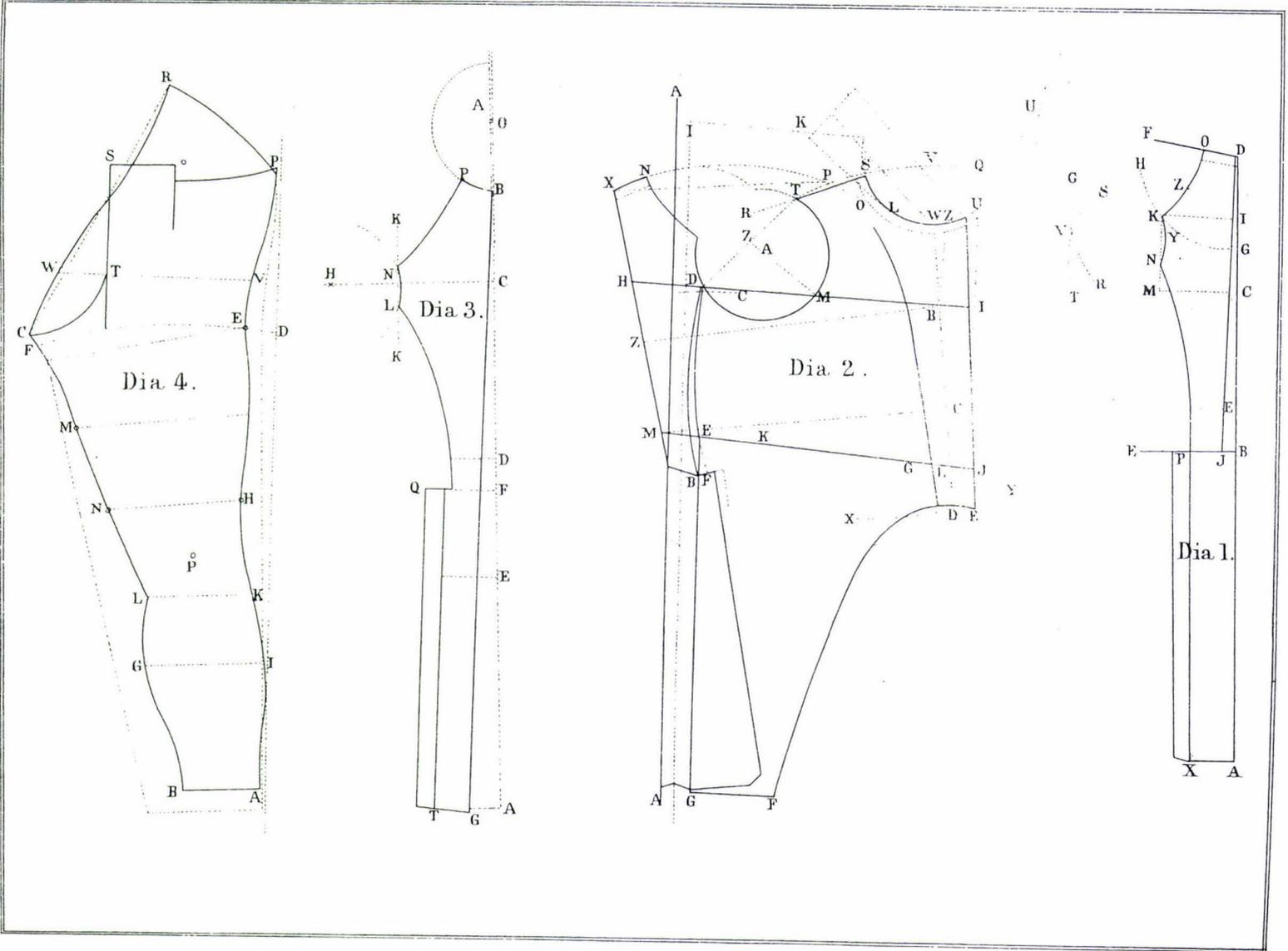


Figure 2.1 Drafting: Coat and trousers draft attributed to Hearn (1818).
(Source: Shep, 1987).

Using the same principles as Wampen, the 'West-End system' (Figure 2.3) of drafting came into being in 1871 and was described by Giles as 'simple and easily drafted', (Shep, 1896; p.172). Here again there is a neglect of the collar.

2.1.1 Drafted patterns

Prior to the 'scientific' or geometric systems of drafting, tailors relied on simple patterns (Shep, 1987; p88), and as a consequence these usually had to be altered to fit the client. To duplicate garment cutting results, and perhaps standardise processes, the easiest method is to make a pattern from which copies can be made and altered, with a tried system, in an easy manner. The experience and effort needed to establish good pattern-work led to the jealous guarding of the results among practitioners. This mindset has been handed down from one practitioner through the generations to the next and is still a part of the repertoire of some good pattern-makers. However, there are those who have voluntarily shared their experience and expertise, readily handing-out copies of their pattern work to those of need. There are still others who have taken the middle approach; that of placing their drafting systems and pattern cutting methods for sale (Shep, 1987; p.91).

'The earliest advertisement I have found for paper patterns, which were sold to professional rather than home dressmakers, is in "The World of Fashion", October 1836.' Arnold (1964, p.3).

Advertisements of this kind became more frequent after 1880. In America, Ebenezer Butterick began his paper pattern service in 1863, closely followed by McCall's Pattern Company in 1870; pattern production keeping pace with sales of the sewing machine (Arnold, p.4) which was a boon to both professional and amateur alike.

'Between 1860 and 1910, the women's ready to wear trade multiplied by fifty times'. (Aldrich, 2002; p.18).

The call for ready made garments placed a great strain on the ability of manufacturers to keep up with the demand for tailored clothing. To simplify the process of modelling then copying onto card, and to help practitioners to complete garments more quickly and easily, a system of pattern-drafting evolved. To keep up with production new

Plate 2.

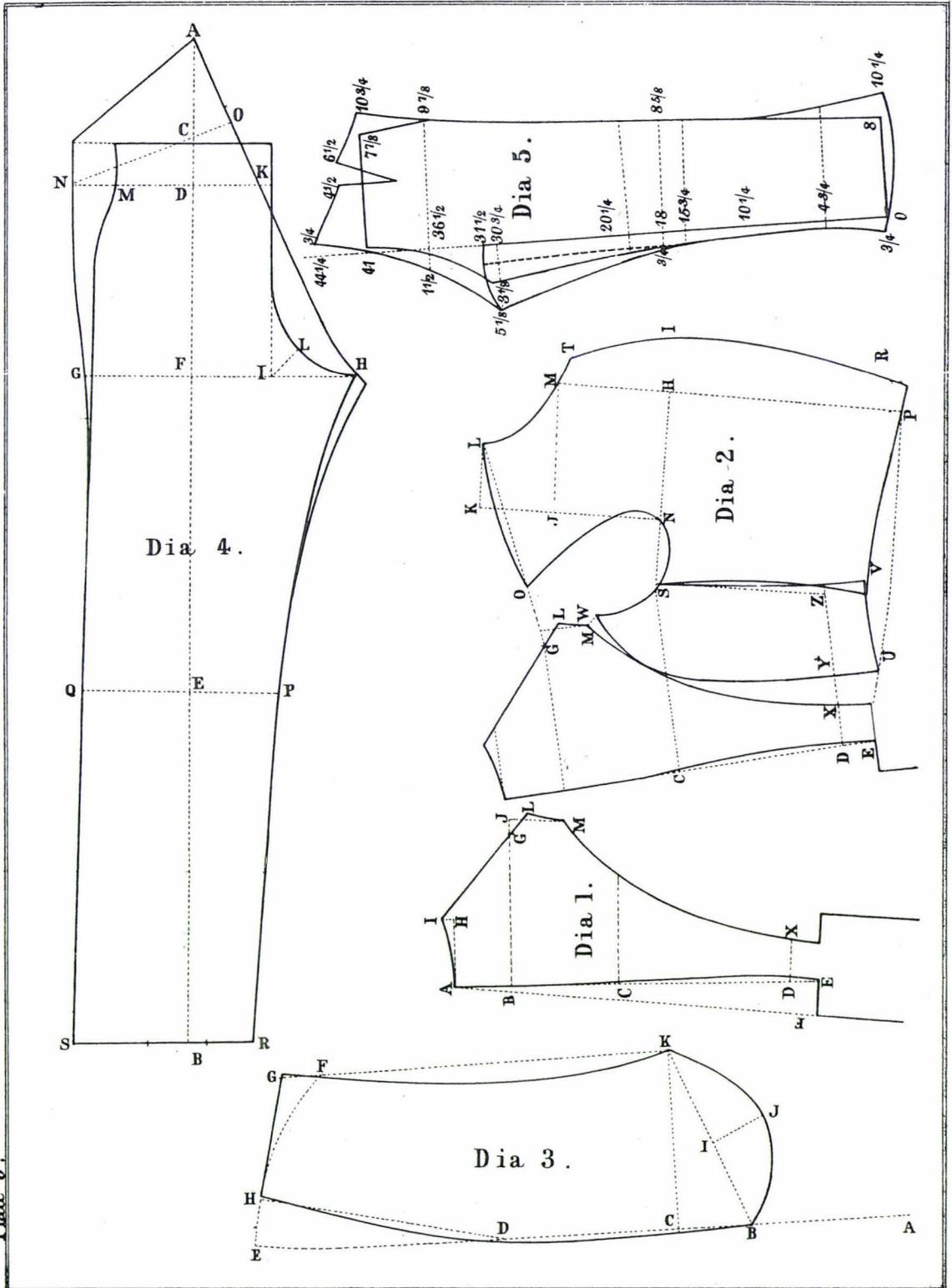


Figure 2.3 Drafting: Coat and trousers draft attributed to West End (1871)
(Source: Shep, 1987).

grading and drafting techniques were developed to enable quicker replication of designs, written instructions being kept to a minimum to simplify procedures.

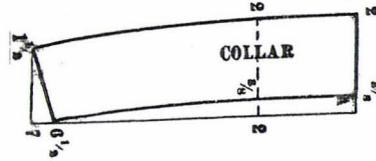
A publication of pattern-cutting instructions from the year 1889, entitled '*Garment Patterns 1889 with Instructions*', (Kliot, Jules and Kaethe, 1996), contains numerous examples of diagrammatical collar drafts for a large number of everyday garments. Figure 2.4a, b, c, d show examples of collars for men, women and children. It is evident that the styling shapes of collars has not changed greatly from the late 1800's to the present period. Apart from an exclusion of text (measurements only), these methods of drafting collars show only minor differences to current procedures except, perhaps, in the gentlemen's overcoat collar which is drafted separately from the body sections (Figure 2.4d).

2.2 Collar classifications

An examination of the literature reveals that there are countless collar style variations covering a wide array of sizes, shapes and configurations. Uniting collars under a single drafting system requires the amalgamation of all collar styles and their variations. This requires that collars are easily identified for grouping.

Organising collars under their names may be ineffective as interspersed within these collar terms are other standard or traditional variations which are not specifically identified by name, just an approximate description of their final shape. One scheme is to classify collars under their respective collar types. However, when collars do not have names, trying to decide which collar group they should be added to is problematical; the collar type classification system then becomes indistinct (e.g. Pepin, 1942; Aldrich, 1985; Mee and Purdy 1987). As drafting systems vary between each author and between each collar type, one author may give a classification list of six collar types whilst another cites only two. Controlled, ordered assemblages of collars grouped under such headings as silhouette, function, type or category may help to reduce the number of collar categories and simplify the problem of making a standardised collar drafting system. However, as shown in Table 2.1, authors differ in their classifications.

LADIES' HOUSE DRESS.



LADIES' NIGHT GOWN.

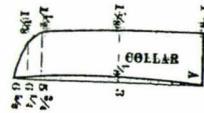
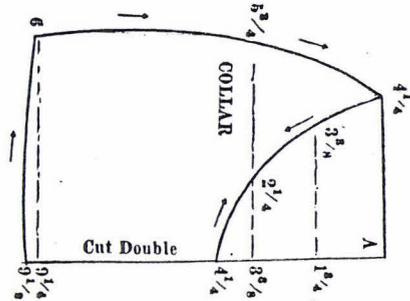


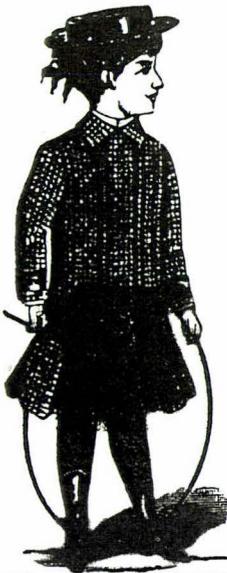
Figure 2.4 Drafting: (a) Ladies house dress and night gown collars (c. 1889).
(Source: Kliot, Jules and Kaethe, 1996).

LAWN TENNIS COSTUME.



66

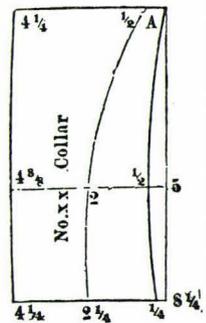
CHILD'S COSTUME.



This is a beautiful costume, suitable for either boy or girl. It is drafted by bust measure, and is in six pieces: Front, Back, Belt, Collar and two Sleeve portions.

There are three single box plaits in front and back, extending to the shoulders, and three under the arm, as shown in draft.

The plaits at top of back are marked on 2 measure line, or fourth line drawn from top, for convenience; and the plaits are marked on front on $3\frac{1}{2}$ measure line, for the same reason.



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Figure 2.4 Drafting (continued): (b) Lawn tennis costume and child's costume collars (c. 1889).

(Source: Kliot, Jules and Kaethe, 1996).

BOYS' SUIT.



Use scale corresponding with the chest measure.
Is in eight pieces: Front, Back, Collar, Belt and two Sleeve portions, and the two portions for the Knee Pants.

Is drafted on the general plan of work.

Each plait is marked on the draft.

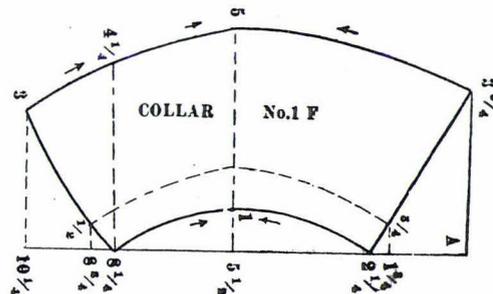
Follow the arrows closely.



THE PANTS

Are drafted by the scale corresponding with the waist measure.

Regulate the length by the use of the tape measure.



BOYS' OVERCOAT.



Use scale corresponding with the chest measure over the coat.

Is in six pieces: Front, Back, Side Back, Collar, Pocket, Lap and two Sleeve portions.

This garment is drafted upon the general plan of work.

Regulate the length by the tape line.

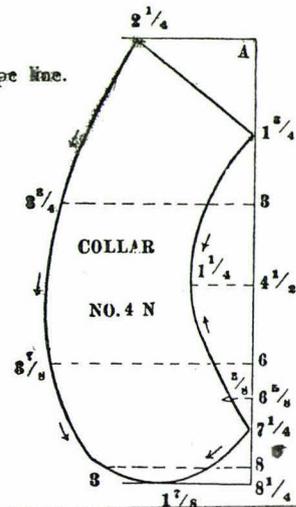
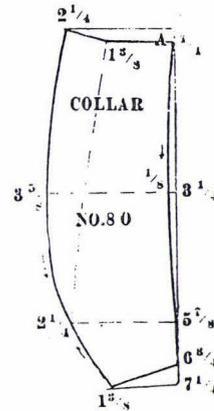


Figure 2.4 Drafting (continued): (c) Boy's suit, boy's overcoat collars (c. 1889).
(Source: Kliot, Jules and Kaethe, 1996).

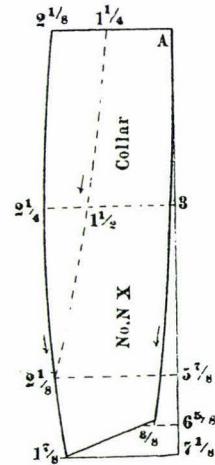
GENTLEMEN'S OVERCOAT.



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BOYS' OVERCOAT.



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Figure 2.4 Drafting (continued): (d) Gentlemen's overcoat and boy's overcoat collars (c. 1889).

(Source: Kliot, Jules and Kaethe, 1996).

Pepin (1942) classifies collars by their 'set', such as flat, low roll, high roll, stand and fall and stand; with many degrees of 'set' in between. Referring to the principle of 'cut', (i.e. what defines a collar, rather than their function) Pepin (1942), describing the 'attached' collar classification, is being a little unclear as apart from grown-on collars, all collars, including stand-collars or flat-collars, are attached. Tailored collars as a category is not helpful, as a Prussian style of collar may be 'tailored', or not, as the situation demands.

Table 2.1 Summary of selected published collar classification systems

| Author | Year and page no. | No. of collar Types | Collar types |
|-----------------------|-------------------|---------------------|---|
| Pepin | 1942 p.146 | 3 | Attached collars Convertible collars Tailored collars |
| Tuit | 1974 p. 72 | 3 | Flat collars Rolled collars Stand collars |
| Aldrich | 1985 p. 114 | 4 | Flat collars Stand collars Collars cut in one with garment Collars with revers |
| Mee and Purdy | 1987 p. 115 | 6 | Flat collars Fluted collars Collars with a roll Stand collars Rever collars Collars all-in-one with Bodice |
| Joseph-Armstrong | 1987 p. 255 | 2 | Convertible collars Non convertible collars |
| Brown | 1992 p. 196 | 3 | Flat collars Standing collars Rolled collars |
| Silberberg and Shoben | 1993 p. 88 | 2 | Standing up collars Lying down collars |

Aldrich (1985), as well as Mee and Purdy (1987) describe collars with revers (lapels) as a separate category (a convertible collar may have revers, or not, as the style warrants). Joseph-Armstrong (1987) includes two types of collars, those types of collar that closely follow the concave neck line of the garment so will lie flat or relatively flat (non-convertible) and those that are convertible, having straighter or slightly convex neck lines. There seems to be no category for the insertion of the stand-only collar unless it is classified with the nonconvertible collars, those that are only worn closed; except that stand-only collars also have the similar convex shaped neck lines of the convertible collar. The systems and numbers of collar types or classifications seem to increase or decrease through the years, adding to the confusion. Collar classifications

seem to have reached their peak when Mee and Purdy (1987, p115) described six categories while Silberberg and Shoben (1993, p.88), state:

'Collars come in two basic shapes, the standing up variety and the laying (sic) down variety'.

These two types of collar (standing up and lying down) are at the ends of the collar shape spectrum. However, stand and fall collars, as their name suggests, have both of these collar type elements (a stand and a fall) included in their make-up. There is the extra crease, or break line element as well as the division of stand and fall sections delineated by this line. The need to take into consideration the break line, as well as the stand width and the partial change in direction of the lower section of the fall when pattern making, means that this type of collar must be treated as a separate category in its own right.

Tuit (1974, p.72) states; *'In spite of the many variations in shape, height of stand, etc, most collar shapes belong to one of three groups'.*

Brown (1992) tends to agree, albeit with a change in name for the stand and fall types. These three collar groupings (Tuit, 1974; Brown, 1992) appear to give enough categories to allow for the flexibility needed to correctly place all of the collars, named or otherwise, under investigation in this research, without needing any further diversification. Conversely, if possible, a reduction in the number of collar categories would be an advantage. Joseph-Armstrong (1987) appears to omit the stand collar

2.2.1 Three basic collar types/groups

Through investigations during the literature review process for the present research, it was found that when names and style detailing were omitted and substituted with basic collar silhouettes, collars could be categorised and sub-divided into the three basic types described as 'flat', 'stand' and 'stand and fall' (Figure 2.5). All collars reviewed in this research fall within these three collar types. In the development stages of the new composite collar system, collar types will be categorised under these three main collar headings, consistent with those described by Tuit (1974). (The fact that a collar may, or may not be joined to the front pattern section does not detract from these three basic types of collar).

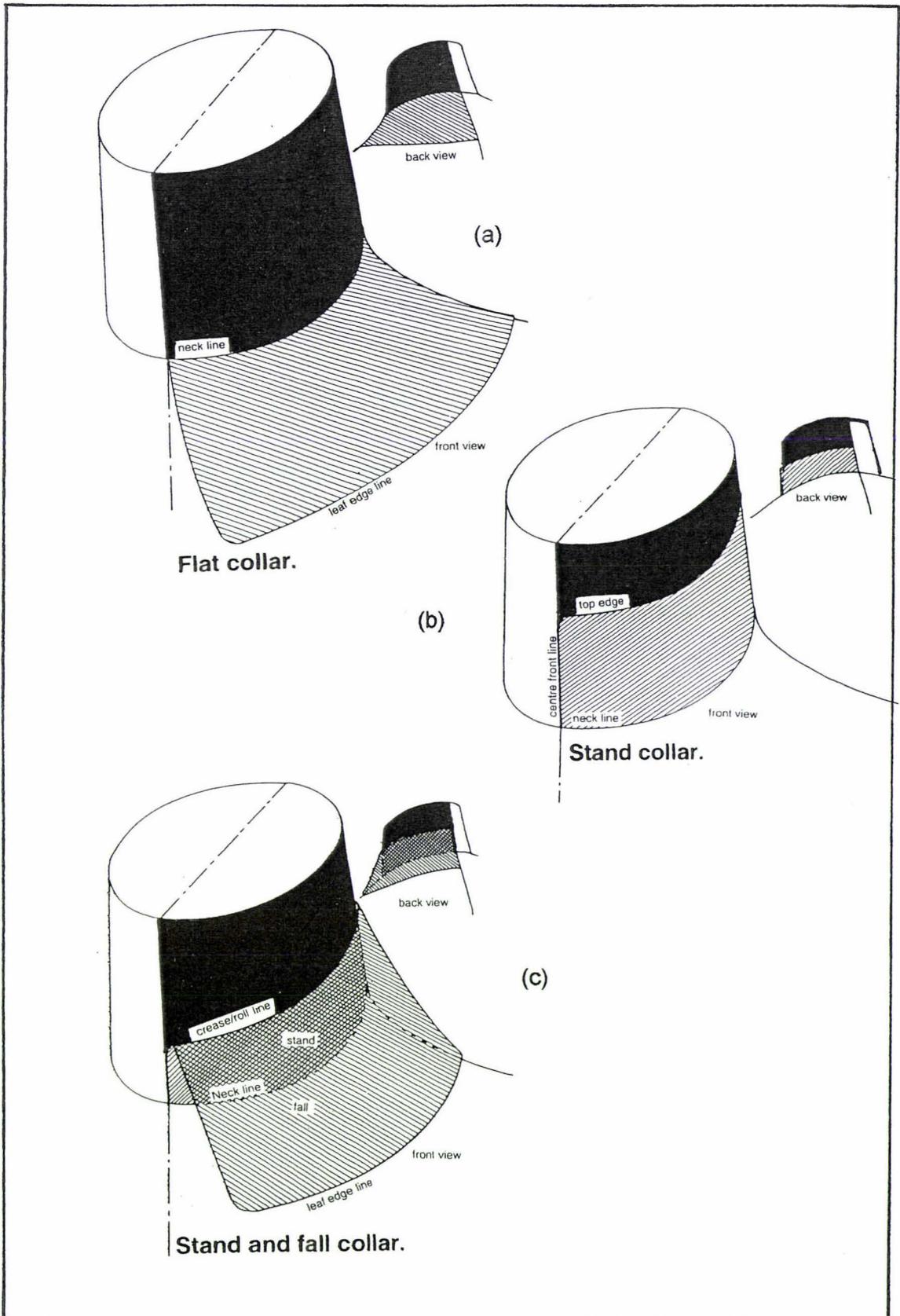


Figure 2.5 Three basic collar types/groups used in this thesis:
 (a) Flat collar. (b) Stand collar. (c) Stand and fall collar.
 (Drawing source: © M. Campbell).

Table 2.2 shows three lists of collar names assembled under their respective groups of 'Flat' 'Stand' and 'Stand and Fall'.

Table 2.2 Collar classifications

| Flat collar group. | Stand collar group. | Stand and fall collar group. |
|-----------------------------------|---|---|
| Bertha (round/square Peter Pan | Band Chinese Ring Clerical Stand Wing tipped | Clover-leaf Convertible D.B. Tailored D.B. Ulster Eton Prussian Puritan Regency/Highwayman Sailor S.B. Chesterfield S.B. Tailored Shawl Shirt |

Flat collar group

The flat or 'Peter Pan' type of collar has no stand, no top edge and no break line, but it does have a neck line at the inner edge and a leaf edge line at the opposite extreme edge (Figure 2.5a). This collar sits around and follows the body and shoulder area contours terminating at the neckline. It is totally flat around the body and shoulder areas and can be designed to any width and shape. If a 'flat' collar has to have a stand, of whatever dimensions, it cannot be described as flat. Only if it is absolutely flat on the shoulders can it be termed flat, otherwise it must be part of the stand and fall category no matter how small the stand.

However, Aldrich (1980, p62) states: *'many flat collars have the appearance of roll collars'*.

Authors seem to be in general agreement that the majority of flat collars are not absolutely flat (Tuit, 1974, p.72; Erwin, 1969, pp.104-105). Aldrich (1985, p.114) and Bray (1985, p.80) describes the flat collar as a 'Peter Pan' (except that as the shoulder seams of the pattern are shown to be overlapped, causing a shortness of leaf edge length, there will be at the very least, a slight roll). Perhaps it is because collars with shallow stands and wide falls are so near to flat collar types that they are regarded as flat. Pepin (1942, p.152) expresses a Peter Pan collar as having an all-round roll.

As the 'flat' collar is described by different writers as having various degrees and shapes of stand as well as fall, there is a quandary as to what actually constitutes a truly 'flat' collar. For this dissertation the truly flat collar will have a stand value of zero millimetres. Partly because of on-going debate as to what constitutes a flat collar, there are very few names listed in this flat collar style table (Table 2.2).

Stand collar group

The stand group of collars (Table 2.2) consist solely of that section above the neckline. The stand collar has no fall, no leaf edge and no break line; but has both a neck line at the lower edge and a top edge line at the upper edge (Figure 2.5b). Stand collars may be expressed as basic rectangular shapes, or can be manipulated to have curved edges to fit closer to the neck. The stand collar is the antithesis of the flat collar. Instead of lying prone around the shoulder area, it stands around the neck column inside the neck line of the garment. Stand collars sit either upright, to allow for ease between the collar and the neck, or are angled inward to more closely hug the neck.

Some drafting systems, such as Aldrich (1985, pp.116-117), use identical overlaps to reduce the length of the top edge of the stand to make the collar angle inwards towards the neck, suggesting that the neck column is of uniform tapering proportions. Most texts do not give reasons for such manipulations. Erwin (1954, p.100) gives the following explanation for the degree of overlapping of the top edge of a Mandarin collar:

'The overlaps in the pattern should be greater where the neck itself slopes the most, which varies with the individual'.

It is unclear whether this statement refers to the inward inclination of the angles of the neck as they taper towards the head, or whether it is referring to the neck line plane from a high at the centre back to a low at the centre front. Most probably the former as the text does not mention anything about a neck line plane. However, both play their respective parts in forming the collar shape.

Stand and fall collar group

The stand and fall category of collars represents collars that are an amalgamation of both the stand and the fall collar types (Figure 2.5c). They have no top edge although they do have all of the other attributes of the other two collar styles; namely a neck line,

a stand width, break line, fall width and a leaf edge line. There is no uniformity to the structure of stand and fall collars as they range from low stand and wide fall to high stand and narrow fall, and include all the computations in between (refer to Figure 1.1). Not only are the dimensions variable, the design shaping lines are open to individual interpretations, giving a considerable array of possible permutations of designs within this grouping.

2.3 Collar modelling

Throughout history there have been, and still are, only two major methods of producing the correct collar silhouette; either by modelling or by pattern-drafting. Previous to drafting becoming the prevalent method of making garments and collars for mass production, the usual process employed was that of modelling. Drafting and modelling are two opposing techniques used to secure a three dimensional collar, the first is a technical, two-dimensional drawing method whilst the other is a more artistic three-dimensional manipulative sequence of development.

'The traditional way of producing a garment would be to model directly on to the client...' Silberberg and Shoben (1993, p.3).

Modelling is described by Mee and Purdy (1987, p.113) as *'...by far the quickest method of producing a collar.'* This is possibly because the collar fabric is already in a three-dimensional mode around the neck of the mannequin and can be appraised progressively during manipulations (for bespoke garments); whereas a pattern has to be drafted, traced off and cut out, all on the 'flat', before being trialled on the three-dimensional model. Naturally, modelling can also be a time consuming and expensive method, especially for more 'structured' pattern developments and is not usually applied to mass production. Nevertheless, to be certain that all approaches to collar development have been considered, it is appropriate to describe the methodologies behind collar-modelling as well as those of collar-drafting. Any differences between the two systems, such as the process of three-dimensional modelling, opposed to the practises of flat drawing, and similarities, for instance, those procedures that rely on trial and error as well as final manipulative processes in the 'round', will be documented and taken into account.

Modelling, like any other art form, has to be learned by assiduous application as well as by trial and error (Bray, 1997; p. 1). It is a lengthy process that must be repeated each time a new collar is required, unless a copy of the collar shape, in the form of a pattern, is made as a template for subsequent styles of a similar nature. Modelling procedures still progress in essentially the same traditional manner (Silberberg and Shoben, 1993; p. xi) of fabric manipulations on the mannequin needing a degree of artistic application, knowledge of the procedures involved and a clear impression of the goals to be realised. Preparatory delineation of boundary lines such as the neck line, the centre back and the centre front lines are followed by a dexterous process of subtle placement of the fabric by pinning, cutting, moulding and shaping on and around the neck of a mannequin to achieve the desired collar silhouette and collar 'set'. The final result is entirely reliant on the proficiencies of the practitioner with the process finished when the designer considers that there is no more that can be done to improve the product. There are, of course, variations to the modelling procedure such as those described in Mee and Purdy (1987, p.122), where the Eton collar is folded for extra length on the outer edge, whilst the fabric is held above the neck line; or in Bray (1997, p.61) where the lower edge of the fabric has a series of cuts, up towards the neck line, each progressively deeper than the last to enable the fabric to mould to the stand.

Flat collar modelling

Modelling of the flat collar (Figure 2.6) is a replication of the front and back body pattern areas joined at the neck points and along the shoulder line. The neck line of the collar is a direct replication of the body neck line. The collar is given a width and front design shaping, although it is easier to cut a flat collar pattern straight from the united front and back pattern pieces than to follow the subsequent modelling steps (Source: Bray, 1987; p.60).

The flat collar modelling process (Source: M. Campbell) is as follows:

1. Cut a 35cm square section of fabric.
2. Measure and mark on the grain line edge the collar width plus 3-4cm from the bottom edge.
3. Place the fabric on the model with the mark on the centre back neck line and pin it down the centre back line (Figure 2.6a).

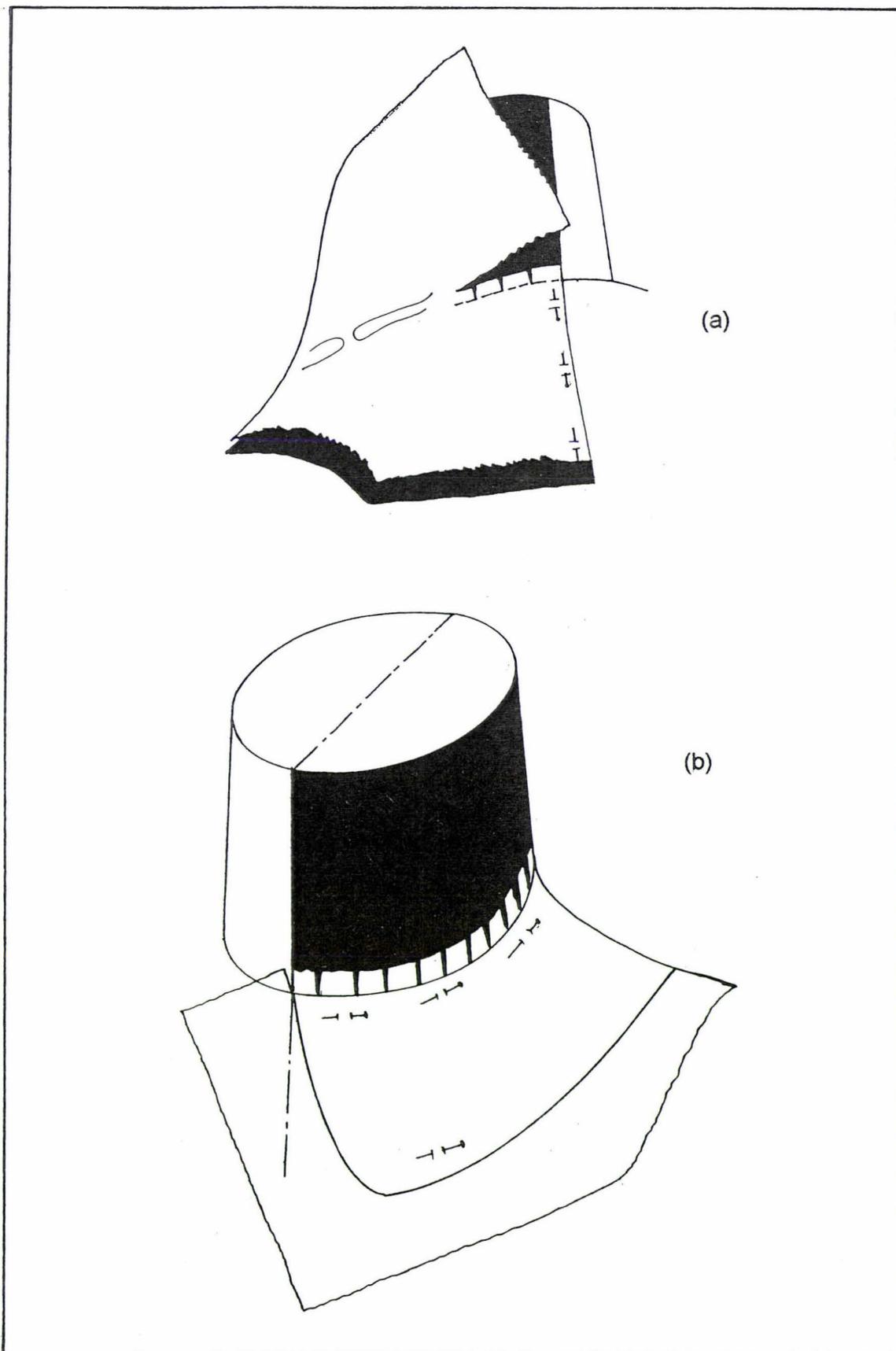


Figure 2.6 Flat collar modelling: (a) Back view (b) Front view.
(Drawing source: © M. Campbell).

4. Smooth the collar in a horizontal direction, around the back area for a small distance and away from the centre back.
5. Cut into the fabric for approximately 3 or 4cm, in a horizontal manner, at a distance of approximately 1cm above the neck line.
6. Cut down to the neck to relieve any tightness.
7. Pin into position below the neck line.
8. Follow this procedure, of cutting and pinning, around to the front (Figure 2.6b).
9. Draw the required front design shape.
10. Take the collar off the model then trace around its outline on paper to produce a pattern.

There is very little that cannot succeed with modelling this style of collar providing the collar below the neck line and the area around the shoulders is kept flat, in total contact with the mannequin. The neck line, outer edge and front design line may be shaped as appropriate for the occasion.

Stand collar modelling

The human neck column is not a perfect cylinder, being of an irregular cross section tapering in width towards the head. Because of this irregularity, the top edge of the collar has to be manipulated to gain a close fit to the neck, and has to be shorter in overall length when compared to the lower neck edge. How it is to be reduced depends partly on the neck column configuration and partly on the shape of the neck line contours to which it is to be attached. A stand or Mandarin collar (Figure 2.7) is joined to and situated above the neck line; it has no fall section to consider and therefore no leaf edge.

The stand collar modelling process (Source: M. Campbell) is as follows:

1. Place a sewn toile of the front and back body sections on the mannequin.
2. Cut out a fabric rectangle representing the stand collar width plus 10cm, and a length corresponding to the neck line plus 10cm.

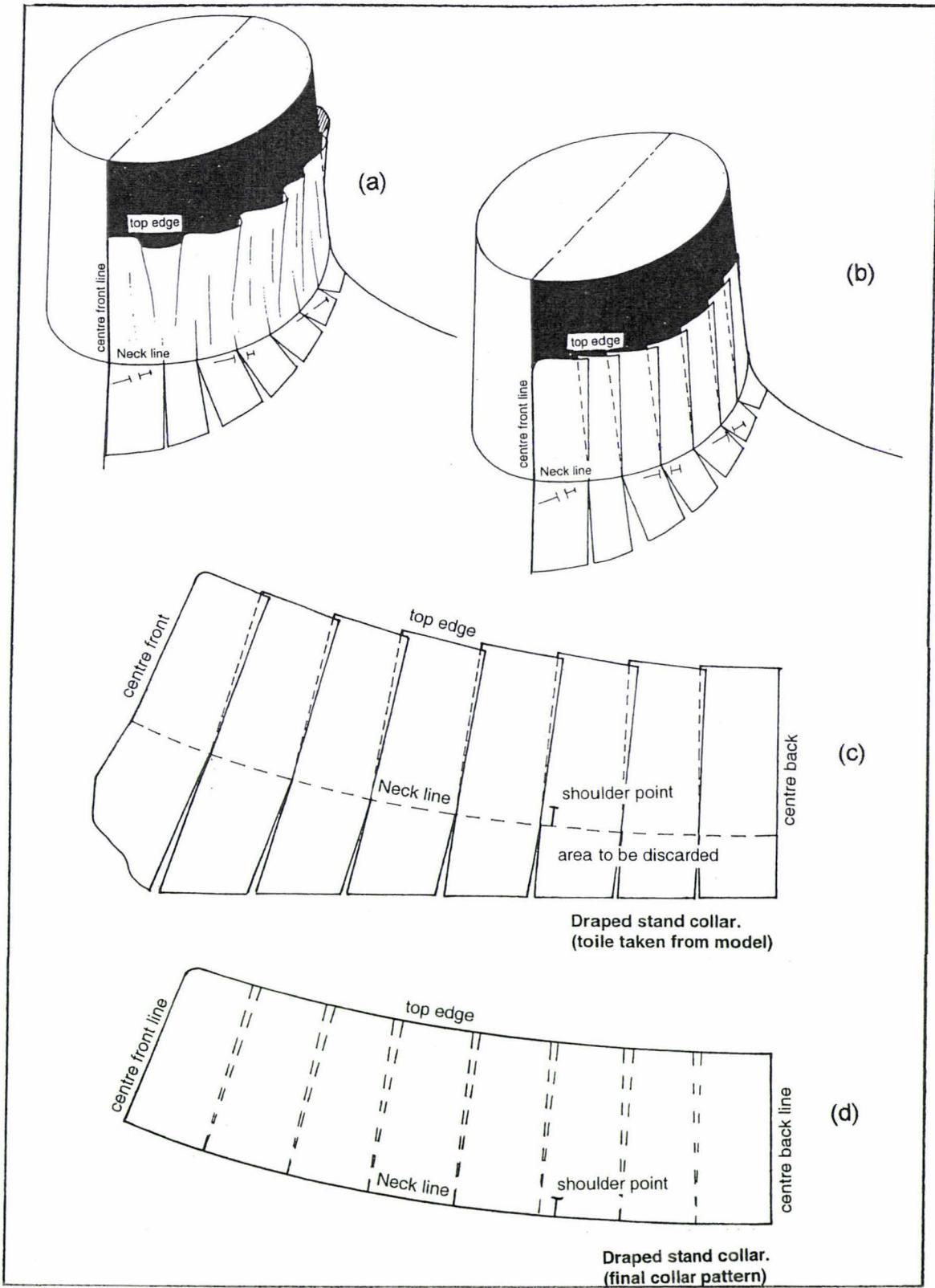


Figure 2.7 Stand collar modelling: (a) Fabric placed to the neck. (b) Fabric cut to fit the neck. (c) Fabric laid flat. (d) Pattern taken from fabric.
 (Drawing source: © M. Campbell).

3. Mark a straight line 1cm above the bottom edge to represent the neck line (rather than an undulating cut line).
4. Place the line of the rectangle directly on the neck line of the body sections at the junction of the back neck line and centre back line (Figure 2.7a).
5. Pin into position.
6. Smooth the fabric, progressively, around the neck cutting upwards to the neck line every few centimetres and pinning into place around to the centre front. At this point it becomes apparent that the upper or top edge (break line) does not lie flat to the neck column of the model, at certain points along its length, as there is too much fabric circumference compared to that of the neck of the model (Figure 2.7a).
7. Cut down the collar width from the top edge to the neck seam line, at each of the distortions, and allow the cut edges to overlap to reduce the length of the upper edge (Figure 2.7b).
8. Use adhesive tape or pin each of the sections to its neighbour to form a single unit.
9. Design the shape of the front top edge or leave as an angle.
10. Take the collar from the stand and place onto paper (Figure 2.7c). It is noticeable that the collar is no longer straight, it has a distinct curve along its top edge, the neck line is also curved between the first and last cut lines. The curved edges, at this stage, are really the top and bottom edges of a series of squares or rectangles that need the corners smoothed through to give the two edges a better flowing line.
11. From the neck line progressively measure and mark the collar width from centre back to centre front.
12. Cut out the stand collar (Figure 2.7d). The collar will now fit the neck column as well as the neck line from the centre back to the centre front.

Points to note are: The collar is perfectly aligned along the neck line with the top edge overlapped, reducing the edge by amounts that correspond (and therefore vary in width) to the inclination of the neck column. The top edge and neck line are curved in a manner that delineates and echoes the neck column. The whole process is controlled from beginning to end by the modeller with each step clear in its results to each point. For the experienced practitioner there is no vagueness, almost no pause or backward steps for corrections, and the result is usually as expected. As a method of

progression, the process is quite easy in its manipulations. When the neck shape or the neck line is altered, the same principle sequence of events must be repeated from beginning to end.

Stand and fall collar modelling

There are numerous stand and fall collar shapes and an assortment of avenues of advancement depending on personal preferences of method. Without testing each structure progressively, there is little to show the precise dimensions and form the collar will take in the end. Whichever method is used, there needs to be an exact amount, not including ease, of length of outer edge to fit the shoulder region, allowances for the stand and the fall measurements and the roll allowance, to permit the collar to lie smoothly around the shoulders.

One method of modelling a stand and fall collar which follows the method laid out in Bray (1997; p.61) commences with a copy of the draped flat collar toile that usually occupies the area below the neck line (Figure 2.8).

The stand and fall collar modelling process (Source: M. Campbell) is as follows:

1. The flat collar toile is taken from the mannequin and repositioned both above, and on the neck line at the centre back.
2. Work the toile around the neck from the back to the front, placing, pinning and cutting progressively. Each cut, at the base of the fabric, is incrementally increased in length around the neck to the front. The longer the cut the higher the stand will be. (for clarity refer to Figure 2.8a)
3. Invert the fabric, pulling it down to match the centre back line and the outer edge corresponding to the dress form. This can only be achieved if the collar is pushed upwards on the model neck to form a stand and fall section. (refer to stand and fall diagram in Figure 2.8b)
4. Indicate the collar shape and size from the front design area to the centre back.

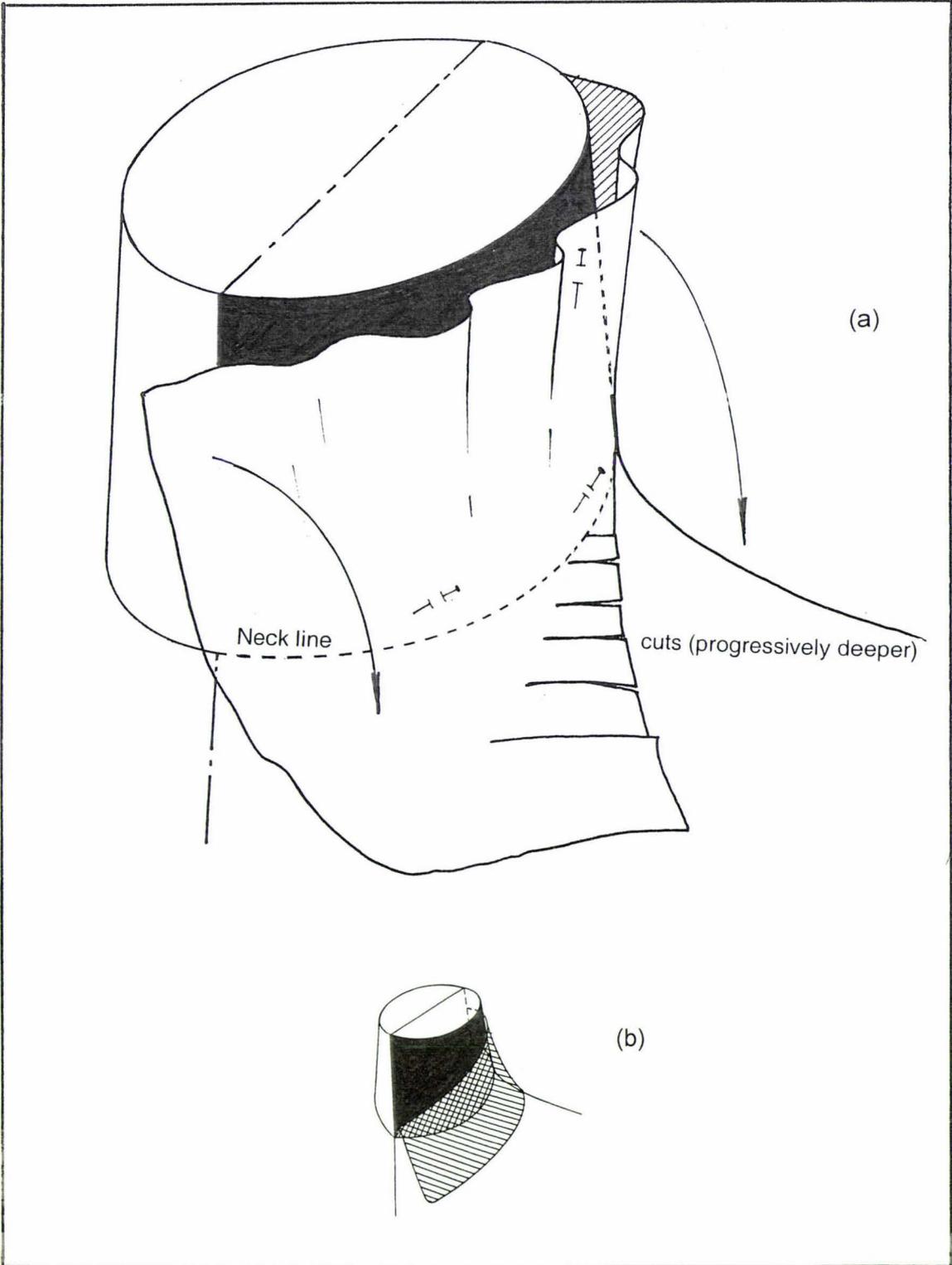


Figure 2.8 Stand and fall collar modelling.
(Drawing source: © M. Campbell).

Modelling a flat collar or a stand collar is fairly straight forward in comparison to a stand and fall modelling method. Some interesting observations come to light: Both the collar shape and collar styling changes with the cutting depth, although the first attempt will probably not give a satisfactory or required result, (e.g. the ratio of stand to fall may not be as required, the roll, or crease line may not be suitably positioned, or may have distinct distortions). The process needs dexterous skill and experience. There may be other, not so obvious factors that effect the collar 'set', for example, the collar neck line may not be an appropriate shape.

All of the treatments for modelling the stand and fall collar have indefinite conclusions, there is a realisation that each divergent design and stand-to-fall ratio presents a different set of parameters to confuse the inexperienced practitioner. Although there are set plans of action, they, in themselves, are not a panacea for every kind of collar represented in this category. There are too many variables for each collar temperament or personality (e.g. such as differences in width, length, shape, position and style) to be taken into account and documented in a constructive convincing manner when using today's conventional modelling and drafting processes.

2.4 Contemporary collar drafting

To save time and materials, in the manufacture of future collar styles, the modelled collar toile was, and still is, translated or drafted onto a more permanent material, usually card of some description. This way a number of differently shaped basic patterns, or templates, can be built up to produce a 'library' of designs from which to extract patterns when needed. Drafting, in relation to modelling, saves time although losing a pattern could have a detrimental effect on the efficiencies of the design process, and therefore, more time would be needed to process customers' needs.

Pepin (1942, p. vii) states: *'The modern block system is a development of recent years. It first made its appearance in the industry at about the time of the first world war when mass production was just getting under way'*.

To enable designers to duplicate their card patterns quickly if they were lost or damaged, without the need for modelling, instructions along with diagrams were written down for each collar as permanent records to be later produced in book form. As with the drafting of the body sections, the actual method of producing the collar pattern has

not changed significantly throughout the twentieth century and now in to the twenty first century. Drafts and accompanying instructions are usually kept to a manageable size. They are stated briefly and to the point with correct terminology for clarity simplicity and conciseness.

2.4.1 Contemporary collar drafting differences

Although standardised collar terms are used by the majority of practitioners, there is no regimentation of drafting techniques. A vast number of different drafting methods have evolved throughout the twentieth century, accompanied by instructions from which to produce the basic shapes for the contrasting types of collars, with each one giving a slightly individual approach (Appendix A). When each designer uses a variation on a drafting theme there are literally hundreds, if not thousands of different drafts from which to choose.

Traditional texts tend to produce separate drafting techniques, including diagrams and instructions, for each collar. To show this diversity, 28 examples of the range of drafted collar styles are presented in Appendix A (diagrams 1-28) with personal illustrations, excluding instructions for brevity, which the reader may refer to as needed. The drafting examples include rectangular and shaped stands, various stand and fall collars with different fitting capabilities, a mixture of shirt collars and a method of shortening an under collar break line. There are also two methods of making stand and fall collars manipulated from the front and back section patterns and more complex one and two-piece designs for jackets and overcoats (e.g. Morris, 1947; Aldrich, 1980; Joseph-Armstrong, 1995; Shoben and Ward, 1990).

With present day collar drafting, a simple collar style requires a simple procedure and a more intricate collar might require more advanced methods. However, to date there is no single published drafting method that embraces the majority of traditional collar styles. Drafting instructions should compliment and unite the collar with the neck line; however, when the collar shape is altered to accommodate a new design (even within the same collar style), all of the elements, including the neckline, break line and collar dimensions will alter to some extent; making the original drafting method along with its measurements and manipulations mismatched and no longer applicable to the new neckline. Therefore, new instructions must be made quoting the new differences whilst discarding, or placing aside, the former directions and information.

'The shape of the neckline affects considerably the set of the collar' Bray (1985, p.79).

Most authors of drafting methods have followed the system of testing the results of each draft, evaluation and pattern adjustment, through fabric making-up until a satisfactory conclusion has been established. Older texts, because of their depth of considerations, such as Morris (1947), and White (1950) are regarded by many experienced practitioners as 'bibles' in their field. Manuals from the 1940s (e.g. Pepin, 1942; Morris, 1947), 1950s (e.g. White, 1950) and 1970's (e.g. Kawashima, 1977) have some of the more traditional methodologies and contribute significantly with their depth of understanding of their subject, and extensive lists of valuable terminologies. Others, such as Kunick (1967) and Shoben and Ward (1990) may use slightly different, more modern, approaches in their drafting techniques, with later terms such as 'pattern-engineering' Aldrich (2002). Pattern-engineering is described as the practise of pattern simplification using harmonious seam runs and pre-shaped forms for tailored collars and other areas. It can have the advantage of simplifying procedures and guiding garments through the manufacturing processes thereby removing the more skilled construction methods of imparting form and shape to a garment by stretching and shrinking with the iron (Cabrera and Flaherty Meyers, pp. 142-145).

The date of publication of a text seems to be a significant factor related to the amount of knowledge communicated in the examples of pattern drafting methods and their applications. Over the years the published drafting methods have gradually become simplified and the amount of information surrounding each of the drafting techniques has at the same time diminished. Perhaps publishing costs are now prohibitive for the production of large editions, maybe it is modern manufacturing methods or possibly because the 'experts' have not been readily replaced. Traditional drafting procedures are only a means to an end, with the most likely method to be used by industry being the quickest (less trialling), easiest and most cost effective, which results in a quality product.

2.4.2 Contemporary collar drafting trials

When designing new collars, from existing drafting methods, each draft must usually be trialled to ascertain which is the most appropriate for any given task. However, the over-all finish of a standard draft is rarely as envisaged or needed, so generally, designs have to be altered to suit each new style. Often there is no mention of potential

problems that might arise, so changes are regularly made to appropriate areas at later stages throughout the process. Sytner (1955, pp.70-94) describes alterations that may have to be made to collars after cutting, but does not specifically mention collar drafting. If all the required information is not available in a collar-draft, an alternative draft must be researched, trialled and evaluated for each new design. This is a costly and time consuming process particularly with more advanced and intricate collar designs. The investigative process has to be repeated with each type of collar and with each variation in size and shape (it is impossible for all variations of all collars to be fully documented ready for use).

With practice, experimentation, experience and time, methods evolve to a satisfactory conclusion and collars can be made in a consistent manner with an acceptable number of trials. This then becomes 'the' method for 'that' particular collar, and so on until all of the other collar styles have been established. Of course, experimental methods will vary among individual pattern makers and designers.

'Wholesale manufacturing designers always have their "pet" collar patterns' Pepin (1942, p.145).

Having expended a good deal of time experimenting to create and perfect a method (or several routines) to draft collars it's hardly surprising that as time passes, designers and pattern-cutters become 'locked' into using a personal system that their results confirm, and are reluctant to dismantle a good collar-making process to begin anew. Some designers are also secretive and reluctant to give away their own proprietary research.

2.4.3 Contemporary collar drafting results

Subtle, and not so subtle, causes of variations in the finished collar results exist between each method and style of collar drafting which are not often discussed in drafting manuals. Variations in results of particular drafts may take place for a variety of reasons (such as the collar instructions, the fabrics used, the practitioner and the collar type), when this happens the original procedures no longer apply. The drafting instructions must be changed to comply with the new results.

Differences could be because of any one, or a combination of the following:

- Expertise and/or experience of individual designers;
- Designers have their own personal and individual aesthetics and standards
- Differences in the number of drafting steps taken and the differences in the actual drafting techniques taken;
- Drafting the same instructions but with different size sections and line lengths
- Unbalanced pattern blocks used (front not horizontally aligned with the back section);
- Differences in time expended on drafting and the number of trials required;
- Differing manufacturing methods, aesthetics and quality standards;
- Fabrics used and the diversities in weave, weight etc. which need variations in production allowances.

There seems to be a general problem when using previously untested drafts, of a divergence of intentions between that of the author of the draft and the person evaluating the drafting technique. When using drafting books, it is unfortunate that the testing and the evaluation of collar drafts and what quality aspects to look for are not usually discussed. Nor is there mention of any difficulties that may occur when adapting collar drafts from a book with 'personal' body block-patterns which have differently shaped necklines. If using collar-drafts and block-patterns from the same source is doubtful in its outcome, matching blocks to collars from varying sources will, in all probability, be more prone to uncertainty.

'Every collar must be cut for its own neck line, and it is useless to try to fit a collar cut for one neck line into another of a different size and shape.' Bray (1985, p.79).

When the final collar does not achieve its role of being comfortable and pleasing in form and with quality and costs within acceptable boundaries, it has not performed as it should. The collar-draft, accompanied with wasted time and industry expense, has failed and can be considered redundant.

2.4.4 Contemporary collar drafting evaluation and documentation

The relative merits of one drafting method opposed to another can be difficult to gauge, especially when all the finished design parameters of collar width, length, shape and position are not specified. The instilled quality of the collar pattern cannot generally be assessed until after the toile has been constructed, when all the work has been finalised. Collar pattern testing can itself be a significant cost to industry.

Most contemporary drafting methods use step-by-step instructions (some easier to follow than others) and processes that end in a certain result. That result may or may not be obvious at the beginning. Faults that may arise in the product, as a result of the drafting, are not addressed so, of course, neither are their remedies. Faith in published drafting methods and their underlying qualities has to be exercised from beginning to end, this is why some authors such as Kunick (1967) come to be respected because their published drafting methods and distinctive approaches provide a greater depth of knowledge of how and why various drafting procedures work.

To be of use to practitioners, and to students in particular, collar-drafting methods should be transparent in their reasoning as well as being of value in their outcomes. To be effective and instructional, any drafting system should show, with each step, why those steps are necessary, and also the relationships between the body sections and the collar. The eventual design, shape and size of the collar should be predictable before cutting and manipulation of the production fabric begins. The decision to proceed, or not, is then simplified and resources could, therefore, be utilised more effectively.

Within a collar drafting system there should be proportionately, almost, as much information in a simple collar design as in the most complex collar, e.g. both a stand collar and a stand and fall collar have two ends as well as a top and bottom edge, and they both have shape, the only line missing from the stand collar is the break line. Whether the supplied information is obvious and comes into use or not depends on the

sophistication of the drafting system. The end result of the collar shape, its 'look' and its fit should be as predictable as is possible from the outset.

Methods that are ambiguous in their procedures or fail to give the desired results they were designed to produce are of limited merit. So too are drafting methods that give descriptions of the final outcome, such as 'roll all round', but do not indicate the amount or dimensions of the roll, the stand height, or the fall width. There is little point to producing a collar pattern from a draft if it does not live up to expectations and has to be further developed to be of use.

'If a point be fixed, or part located for a sound reason, that reason can and should be given....' (Kunick, 1967; p.81, quoted from 'The practise of garment patternmaking', W. H. Hume, no date given).

For a collar of any particular design that has to fit around a certain neck and its surrounding shoulder areas, there can be only one correct pattern shape and neck line position; so there needs to be a sure, convincing method with which to realise the ideal (or as near to), result. Since no two manuals agree on the most appropriate method for any of the collar designs, a universal, standard collar drafting system would appear to have only a small chance of success, unless a different approach were proposed.

As drafting techniques generally differ for each individual collar design, flexibility and adaptability to needs are not addressed in the literature. Using or copying existing shapes and altering them for new designs become the norm as speed of execution to cut costs and save time is to the fore at the design stage.

Since collars have their own characteristics, the instructions for a stand collar-draft do not contain sufficient information to be adapted for a stand and fall design. By trialling, a flat collar draft could be altered to bring about various changes in collar design and silhouette. However, these methods of collar manipulation are doubtful since there are too many ambiguous areas, such as the amounts and positions of leaf edge reduction.

Procedures for the assessment of the quality of published collar drafting techniques, if undertaken by designers, are not usually documented for public dissemination. They are usually for personal use only, and therefore, do not find their way into the public domain. As a result there are no published comparative investigations available

concerning drafting and collar pattern-making approaches, their defects and their remedies or merits. The processes of assessment and evaluation of collar making in general is left up to the individual to document, or not, using personal approaches and methodology. The usual approach is by trial and error until a modified draft emerges. When a designer or pattern-maker eventually decides to write a book or document their drafting procedures, it is an accumulation of experimental work built up over the years.

2.5 Top collars

The foundation for the top collar is the under collar. In most texts under collars are dealt with in some depth but this detailing is not carried through to the top collar (e.g. Pepin, 1942; Kawashima, 1976; Mee and Purdy, 1987). Many pattern drafting books, (e.g. Chaudhry, 1970; Bray, 1997; Sytner, 1955; Shoben and Ward, 1990; Aldrich, 2002) deal with a number of under collar styles and mention the top collar in only a brief manner. Unfortunately the top collar (fall) is usually the only part of the collar that is open to view for consideration or criticism.

There are certain fabric allowances such as edge piping and break line roll that need to be added to the top collar pattern to hide seam lines and to allow for the break line to crease without placing stress across the width of the fall section. The 'roll' allowance is almost always omitted from the list of instructions (e.g. Armstrong, 1995; Aldrich, 1980; Bray, 1985; Chaudrey, 1970; Erwin, 1954; Mee and Purdy, 1987), whereas the leaf edge piping allowance is sometimes given only a certain percentage of its requirements. For instance, Aldrich (1985, pp. 114-115) adds 0.25cm to the outer edge (presumably for the piping allowance; 0.125cm above and below the edge) and 0.25cm to the inner edge for the roll; heavy weight or thicker fabric has 0.5cm added.

2.6 Grading

The grading process is not within the scope of the 'initial' composite collar development in this thesis. Still, to show the progression from a single master pattern to a full size-range, a brief review of contemporary grading is included. The grading process could also be a point from which to show the possible differences when compared to composite collar grading.

'Grading is the process by which a range of larger and smaller sizes are produced from the sample pattern using a proportional system of measurement'. (Bray, 1997, p.196).

'Grading is a standard method of applying increases and decreases at points of a pattern to make the pattern larger or smaller.' (Schofield, N. A. and LaBat, K. L. 2005).

Grading is the enlargement or reduction of the original size pattern pieces, by agreed amounts, to produce the full range of sizes from smallest to largest, without changing the style and overall proportions. Grading allowances may or may not be unique to an individual manufacturer, and may or may not be regular throughout the size-range depending on the size-charts used and individual designer and manufacturing preferences. The front, back and collar patterns for each size have to be graded within the grading rules that give the correct fit, size and shape. Each manufacturer, or designer, follows their own distinct grading rules within the parameters of the size-chart.

Grading is based on the differences in the body measurements between one size and the next, whether smaller or larger than the median size. Grading has to exactly reflect the measurements in the size chart and requires a methodical, mechanical and precise process which requires total concentration if it is to fit to a high standard (Doblin, no date; p. 286).

2.6.1 Grading proportions

Generally, the aim of pattern grading is to produce a range of sizes, normally based on the bust girth for an upper-body garment, that are separated by an amount that will fit the widest range of persons (Cooklin, 1990; p. 18). The measurements that make up the various sizes are assembled in a size chart. A 10cm difference between sizes would result in fewer (Taylor and Shoben, 1990; p. 57) sized patterns and looser-fitting shirt-type clothing; whilst a 5cm difference between sizes in a given size-range may be used for jackets and overcoats which are more fitted-to-the-body. Cooklin (1990, p. 42) advises that a logical size-interval would be 4cm. The size-chart consists of as many sizes as is required to encompass the selected number of figures in the range (Hard's Yearbook, 1972, pp.109-170). As well as girth measurements, height also needs to be taken into account and divided in to appropriate groups.

The sizes in a chart might be designated with size-numbers such as 8, 10, 12, 14, 16, 18; or 77cm, 82cm, 87cm, 92cm, 97cm 102cm (for ease of recognition), with the appropriate measurements arranged under each size. Patterns for each of the sizes can be graded to standardise fit, shape and style (Bray, 1997; p. 196). Patrick and

Shoben (1990, pp.27-37) use a height grade between sizes of 24mm which equates to a nape to waist grade of 6mm and a neck grade of 10mm (2mm on the half back neck and 3mm on the half front neck grades). The neck grade is normally based on a proportion of the bust size for women's garments or chest size for men's garments.

'The neck width is graded according to a scale based on the bust measurement....' (Bray, 1985; p18).

Some authors (e.g. Cooklin, 1990, pp.20-28, 32-34, 37-39) give reasons for grading increments such as those based on a proportion of the bust girth (Cooklin, 1990; p.20), whilst others (such as Aldrich, 2002, p.62; Erwin, 1969, pp.4-5) give only grading measurements. Personal experience of grading shows that there are two general methods of grading patterns with variations of application within each. The first group of methods is completely, or almost completely manual, the other is computerised (but relies on operator programming).

2.6.2 Manual grading

'Stacked' grading consists of the master-size drawn onto paper with each of the other sizes in the range superimposed around the master-size and spaced by the grading measurements for each grade-point on the master-pattern. Manual grading can be a laborious process as each grade-site, or grade-point (Figure 2.9) has to be aligned and measured in turn to produce a 'master nest', or stacked-grade of pattern sizes; this process gives a hard-copy in the form of a paper 'blueprint' that can be re-used to generate pattern copies if the originals are lost or damaged.

'Stacked' grading is a more exacting method of grading than some (e.g. manually moving the pattern) and, as always with grading methods it is open to human error, especially when measuring. Grading, through the expansion or contraction in size by physically moving the pattern by the prescribed amounts (Cooklin, 1990; Taylor and Shoben, 1990; Handford, 1980) at points around the perimeter, is also prone to some of the same errors. There is also the added difficulty of trying to maintain the correct alignment of the pattern in its true X" (horizontal) and Y" (vertical) balance lines. This process must rank as the most inaccurate of the manual grading systems for the above reasons.

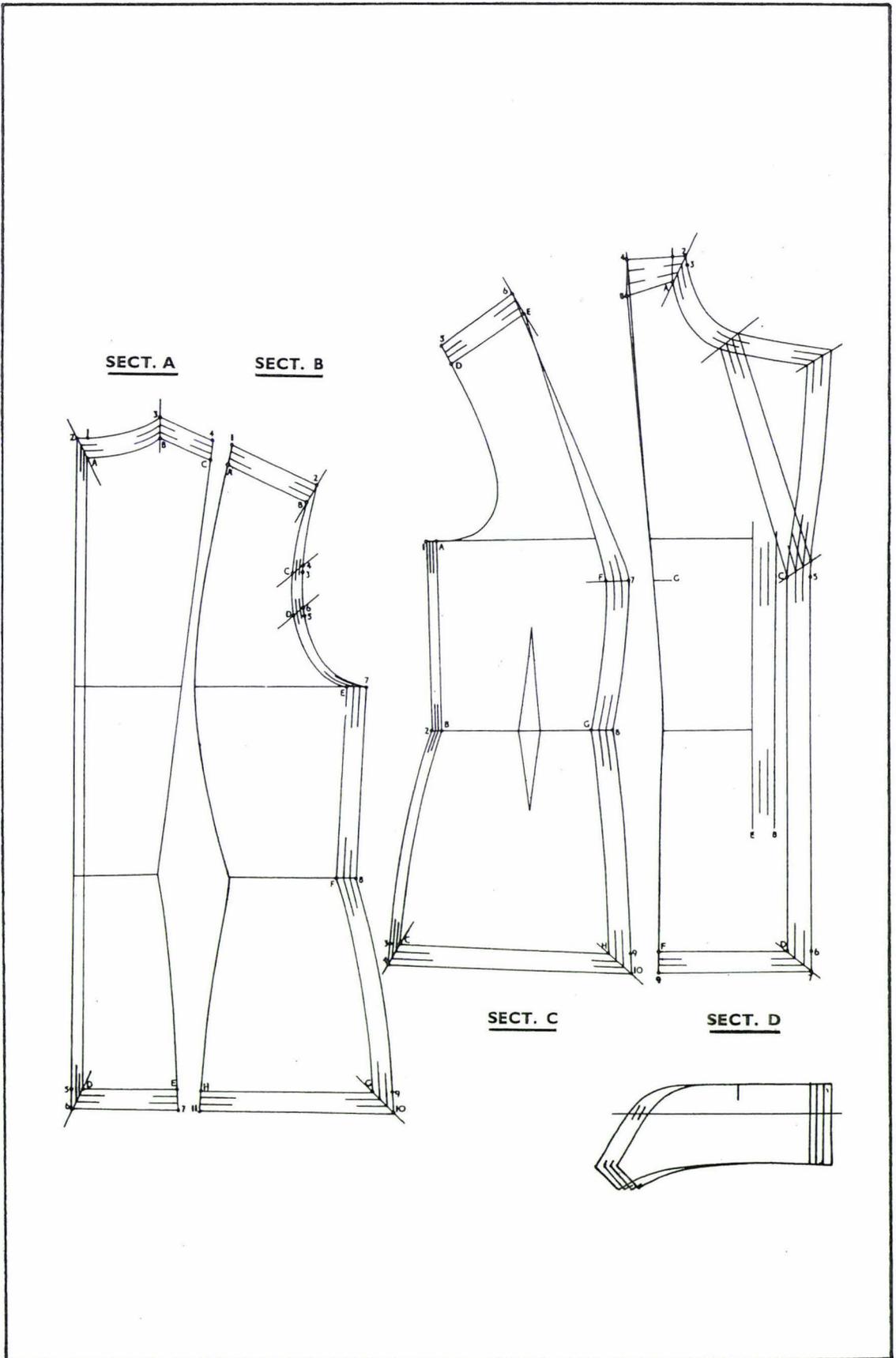


Figure 2.9 Manual grading: 'Stacked' grading with 'inserted' collar diagram.
 (Source: Fuller, E.F. and Clart, S. (No date).)

'...it pays to invest time in accurate preparation. Unfortunately, there are no short cuts to quality' Cooklin (1990, p51).

Manual grading (with acetate)

To relieve the tedious action of measuring every grade point in every pattern to be graded, the grade points, including their 'X' and 'Y' alignments, might be compiled into a permanent record on sheets of transparent acetate sheets, as in the 'Alexander' (no reference and no date) method (Fig. 2.10a). The master size pattern is delineated on paper and the grade points on the transparent acetate sheet placed over, matched and aligned with their counterpoint on the master pattern. The grade is then traced through on to the paper using a brad-awl as described in Taylor and Shoben, 1990; p. 58. Each pattern point is similarly treated until all of the points have been traced. The appropriate points are then joined using the contours of the master-pattern. As well as being more accurate on all aspects over the previous mentioned methods, there is also the bonus of quickness of execution and less likelihood of measurement errors. Because of its accuracy, this method would suit grading composite collars.

Manual grading (with machine)

A manually operated grading machine (Figure 2.10b, Cooklin, 1990; pp46-48) is another practise that is quicker than the strictly manual-measurement method. However, there is no permanent record of the graded pattern for archival purposes. The pattern is inserted into the machine and using the correct grading amounts, via the turning of knobs, the pattern is moved accordingly, either laterally or up and down the paper ('X' or 'Y'). Still, the method necessitates further manual manipulation for the drawing of curves and it is open to inaccuracies due to operator quality standards.

2.6.3 Computer grading (2D)

Computer grading (Figure 2.11) (Gerber Garment Technology, GGT, [online], 2002; Investronica, [online], 2002; Lectra, [online], 2003) can be more accurate than its manual counterpart, but it still relies on manual programming to establish accurate 'X' and 'Y' grading rules that the computer can follow (Cooklin, 1990; pp. 364-369). 'X' and 'Y' co-ordinates are alignment indicators of grade lines and their grading measurements, used by both the user and the computer for correct pattern alignment and pattern generation processes. Computerised grading software, in principle, uses the same method as utilised in the manual acetate, or stacked-grade system, except it

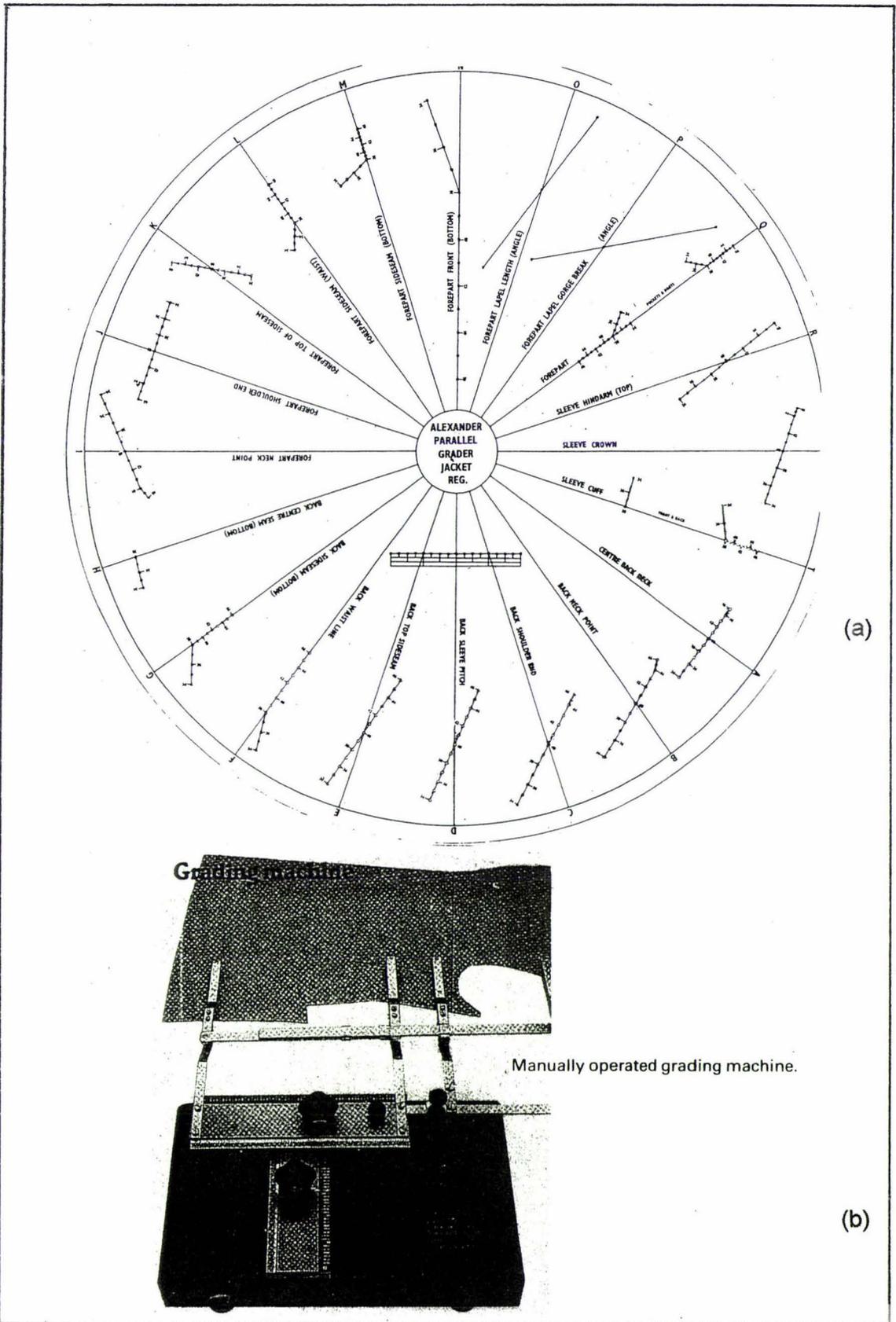


Figure 2.10 Manual grading with acetate and machine:
 (a) Acetate method (b) Manually operated grading machine.
 (Source, b) Cooklin, 1990)

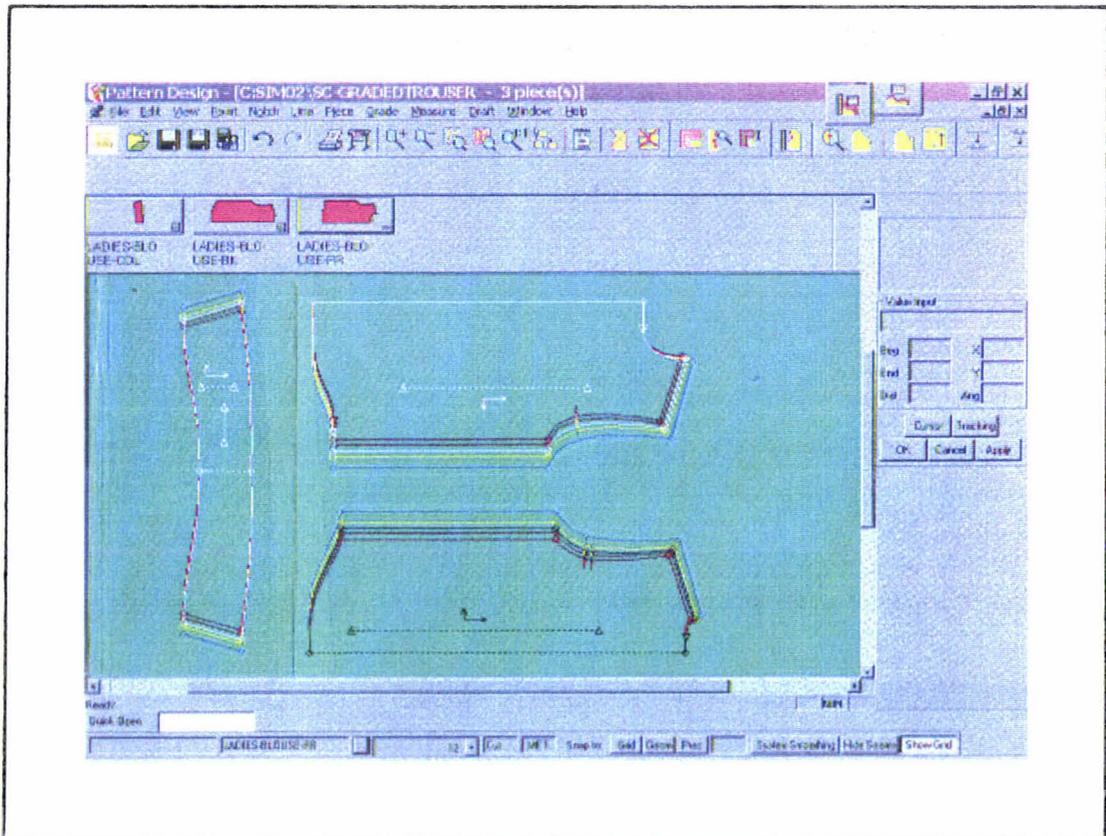


Figure 2.11 Computer grading:(2D).
 (Source: Massey University, (GGT); 2004)

is faster and more accurate in its execution, depending on the accuracy of the manually processed grade rule information. Manual grading is prone to human errors of measurements, angles and accuracy factors and is more costly in the time taken to produce the pattern range, whilst a computer is faster, more accurate and will carry out assigned tasks automatically once the correct information (a 'library' of 'X' and 'Y' grade rules) has been programmed, linked and properly accessed.

The computer will follow exactly the grade rule tables given to it by the technician, whether those rules are correct or incorrect and no matter how good or bad the information. The plotter, the machine that draws the patterns, has to be accurately aligned in its 'X' and 'Y' axes otherwise the patterns and markers produced will also be drawn incorrectly. Whether the problems are manual or computerised they are relatively insignificant and are not too difficult to overcome if care is taken, although more checking is required (because of the addition of digitised files etc.) than in the traditional methods.

2.6.4 Grading of collar patterns

There are various grading methods for collars from which to choose and a number of combinations of measurements possible within each method, accuracy being aimed for at all times with the most accurate method being computer grading. Two methods of collar grading are reviewed below to show the differences in approach. The first method develops a collar for every body size in the style range, each fitting only that particular size and no other. The second method is used primarily for tailored collar and lapel designs where one collar size may cover, or be a substitute for, all of the sizes in the size-range, the differences being in the manipulation of the front body-pattern neck line. This method of 'grading' collars is included to demonstrate that not all legitimate grading (and pattern-making) methods are translated into print, but exist nonetheless. It also shows that typical prescribed grading rules might not be the most favourable for the new composite collar drafting system.

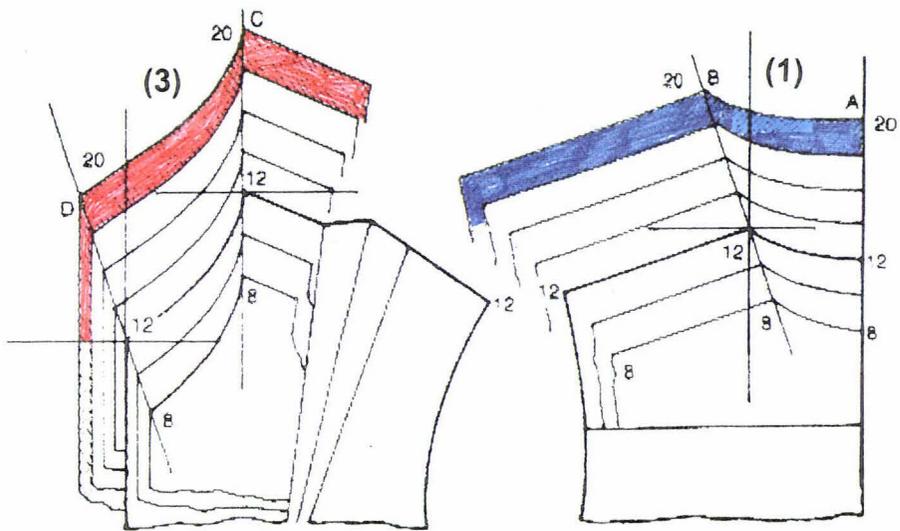
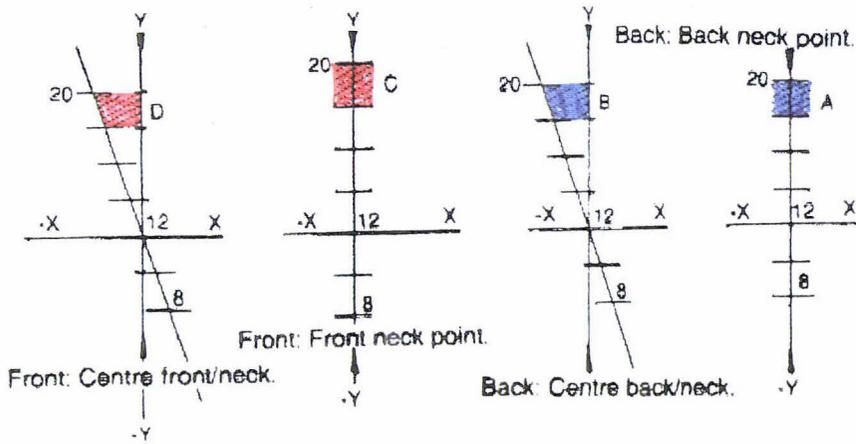
There are no references found in grading instruction manuals, periodicals or the internet pertaining to the non-graded type of collar. It can only be assumed that a relatively small number of designers practise or surrender the principles (taught to me by Colin Leighton, 1969; John Barran Ltd.) behind the technique; or have not deemed it necessary to follow the method through into publication.

Grading (graded collar for each neckline)

In Table 2.3, the size 12 is the median, sometimes called the master-size or basic-block (Fuller and Clart, (no date); p.38), the size from which all the other sizes in the range are made. For convenience, Table 2.3 reflects personal grade allowances proportioned at their respective grade points. All measurements (mm) are added to or subtracted from the size 12 (only those grade points pertaining to the neck area are shown). In New Zealand, the size 12 is a commonly used standard size used for the production of women's clothing.

Pattern grading increases or decreases progressively in both larger and smaller size directions on both the front neck line and on the back neck line (Figure 2.12) from the master size. The collar advances by the specified amounts to remain compatible with the back neck length and the front neck length of the body patterns. The back neck grade of the back pattern (1) is applied to the centre back line of the collar (2) and the front neck grade of the forepart (3) is placed at the gorge of the collar (4). This ensures

FRONT and BACK NECK GRADING



COLLAR GRADING

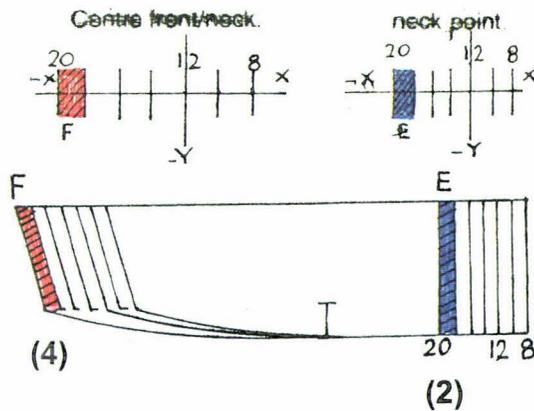


Figure 2.12 Grading: Graded collar for each neckline.
(Drawing source: © M. Campbell).

Table 2.3 Neck and collar grading (Source: M. Campbell)

| | | | | | | | |
|--|-----|----|----|----|----|----|----|
| Back grading: Centre back neck (A). | | | | | | | |
| Size designation: | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| (A) Direction: X (girth). | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (A) Direction: Y (height). | -12 | -6 | 0 | 6 | 12 | 18 | 24 |
| Back grading: Back neck point (B). | | | | | | | |
| Size designation: | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| (B) Direction: X (girth). | 4 | 2 | 0 | -2 | -4 | -6 | -8 |
| (B) Direction: Y (height). | -12 | -6 | 0 | 6 | 12 | 18 | 24 |
| Front grading: Front neck point (C). | | | | | | | |
| Size designation: | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| C Direction: X (girth). | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C Direction: Y (height). | -14 | -7 | 0 | 7 | 14 | 21 | 28 |
| Front grading: Centre front neck (D). | | | | | | | |
| Size designation: | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| (D) Direction: X (girth). | 4 | 2 | 0 | -2 | -4 | -6 | -8 |
| (D) Direction: Y (height). | -12 | -6 | 0 | 6 | 12 | 18 | 20 |
| Collar: neck point (E). | | | | | | | |
| Size designation: | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| (E) Direction: X (girth). | 4 | 2 | 0 | -2 | -4 | -6 | -8 |
| (E) Direction: Y (height). | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Collar: Front edge (F). | | | | | | | |
| Size designation: | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| (F) Direction: X (girth). | 4 | 2 | 0 | -2 | -4 | -6 | -8 |
| (F) Direction: Y (height). | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

that each size of collar fits its respective neck line, a standard practise found in many texts related to grading (e.g. Handford, 1980; Cooklin, 1990).

Front collar design contouring and stand and fall widths may not change (men's grading has a tendency to standardisation) unless the smallest size in the range is too modest in proportion for the regular collar size. The reverse could be apparent with a normal size collar appearing too small for the very large sizes. Whichever grading dimensions are used, all of the collars have to fit their respective neck lines in exactly the same manner as the master-size.

Grading (non-graded collar with graded lapel)

Grading a new collar for each neck line can be expensive when 'clicker knives', used for quality and manufacturing purposes, are involved as each collar requires a different under and top collar knife. To reduce costs, an alternative grading method is to use a single collar size for all the sizes in the full size range; a non-graded collar with a graded front gorge and lapel. The usual method of grading neck lines and allocating a collar to each size of neck does not apply with this system (Figure 2.13). Graded front and back patterns need not have collars graded for each size. With a single collar size

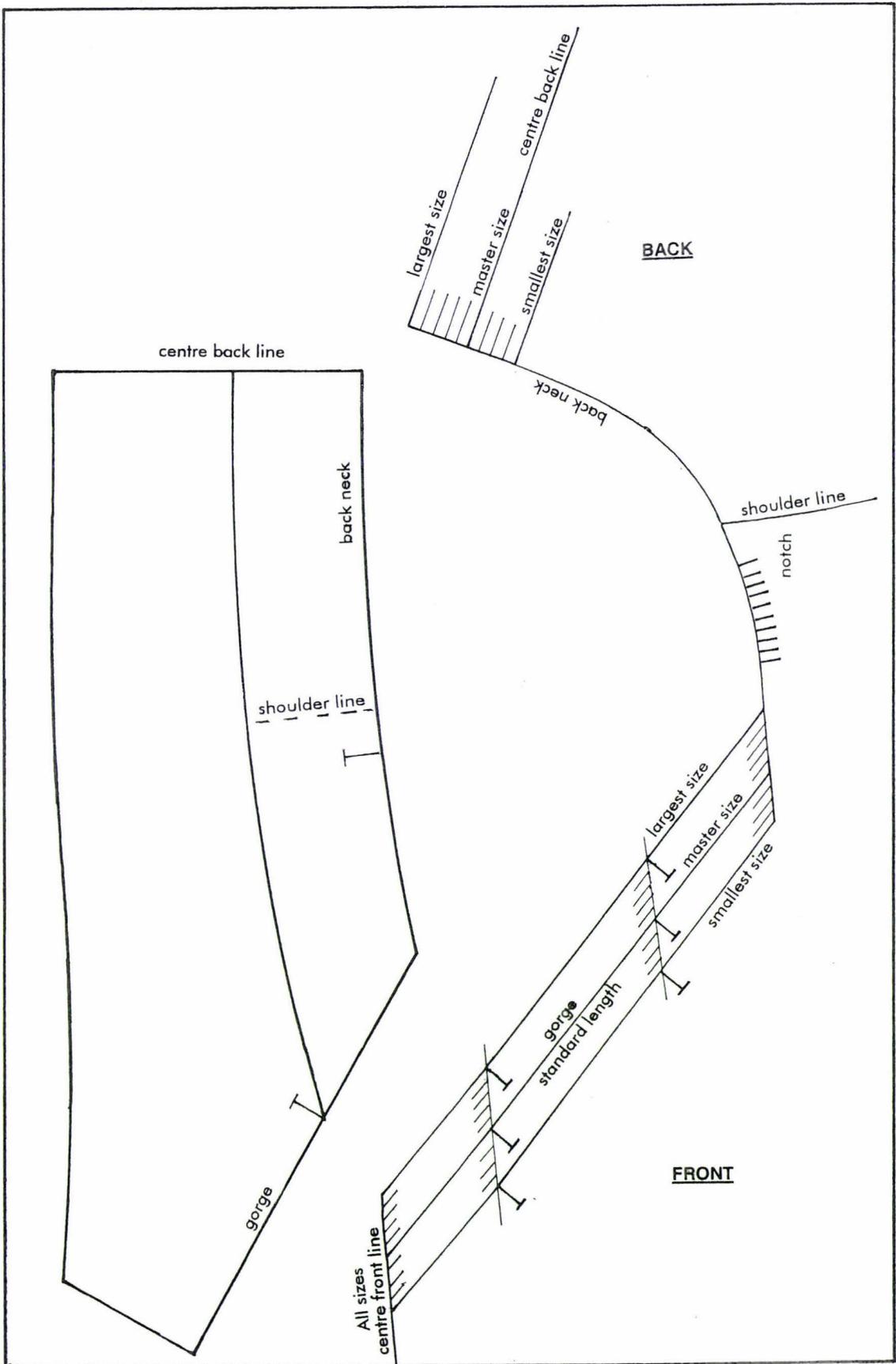


Figure 2.13 Grading: One collar (non-graded) for each neckline.
 (Drawing source: © M. Campbell).

grade, there is only one collar pattern to fit all sizes. There will, of course, have to be a modification of the neck line lengths to deal with the standardised collar neck length.

All of the neck lines will remain the same length as the master size for all sizes designated. Back neck grading is carried out in the usual manner, lengthening or shortening to the appropriate grade rules, which means that a grade modification will have to be applied to the front gorge line; this being the reverse of normal grading procedures. The front gorge of the smaller sizes will lengthen by the same ratio as the back neck is shortened, and the front gorge of the larger sizes will shorten by the same dimensions as the back neck is lengthened (Figure 2.13) to compensate for the changes in the length of the normal back neck grading measurements to retain the same neck line length for all sizes.

There would normally be a notch placed in the collar, as a sewing guide, to correspond to the shoulder line position. This collar shoulder notch can no longer remain at the junction of the shoulder lines as the centre back to shoulder line is still a graded area and so is prone to a change in length. It will have to move to a more convenient standardised (all sizes) position, possibly at a short distance in front of the shoulder line at a uniform distance from the square gorge corner, or at a standard distance from the centre back seam line. A corresponding matching notch will be introduced to the front or back patterns.

2.7 Computer Aided Design (2D)

To produce 'Designer' labels, as well as normal production runs, clothing companies invest large amounts of capital in the most up-to-date technology as top brands demand the highest quality of merchandise. Manufacturers have a responsibility to ensure that these high quality levels are met and adhered to in the production process.

Sophisticated computer aided design (CAD) technology helps to meet the required quality criteria and streamline production, to improve manufacturing work flows associated with intricate design, pattern-making and sampling (Gerber™, [online], 2002; Poly-Nest™, [online], 2003; Pad system™, [online], 2003) (Figure 2.14). With modern mass production techniques, especially with the advancement of CAD/CAM systems and their use in pattern-making and grading, quality in certain areas can be maintained, or enhanced, whilst containing and reducing manufacturing costs, this in

AccuMark Pattern Des

AccuMark Pattern Design helps the patternmaker and grader improve quality, create and grade more patterns in less time.

AccuMark Pattern Design includes functions that enable basic to complex pattern making tasks. The powerful grading tools speed up time consuming tasks associated with creating graded sizes.

The wide range of patternmaking and grading tools means flexibility for the user.



GERBERmarker

Gerber Technology has developed systems that assist rather than restrict the creative process. In addition, these systems perform repetitive and time-consuming tasks, freeing designers to focus on the creative development process.

This approach is unique and much more productive than techniques used in traditional systems and the increased speed dramatically shortens the product development cycle, which in turn, increases profitability.

AccuMark Silhouette pattern development systems combine the power of software with the skill of the patternmaker.

The patternmaker works with an electronic pattern table where all their manual input is automatically entered into the computer with the sketch of a stylus.

These systems ease the transition between manual and computerized pattern making allowing the user to combine the best of both environments.



AccuMark Silhouette



Figure 2.14 Computer aided design: (2D).
 (Source: Gerber Technology 2002)

Made-to-Measure meets the complex needs of the tailored clothing industry. It is the only software solution that provides true automation from pattern modification through advanced rule based specifications and order creation.

Quick and easy data entry, customizable knowledge base, and immediate processing of information are the essence of Gerber's Made-to-Measure system.

When combined with AccuMark Batch processing and NESTERserver, one button press is all you need to create customized cut parts.

AccuMark V-Stitcher is a powerful 3D garment design and visualization software solution. It provides true-to-life garment design, fitting and merchandising.

2D patterns can be viewed on realistic 3D human forms for detailed drape and fit sessions. Producing a large number of samples is no longer necessary-view different textures, patterns, fabrics and sizes real-time on your 3D avatar.

Gerber Technology has developed the unique cradle system for spreading machines.

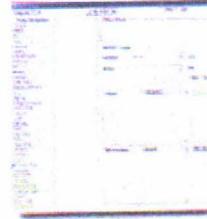
Using this method you avoid the disadvantages of the traditional spreading machines with labor-intensive and physical work.

The simplicity of these systems ensure easy and fast operator training and high reliability.

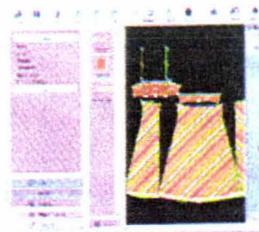
As the concept of made-to-measure and mass customization takes hold in the industry, the need for single- or low-ply cutting has increased.

Driven by agile manufacturing methods and tied to the latest technology, more and more manufacturers are responding to demands for smaller order quantities, quicker response, increased flexibility, and greater customization.

AccuMark
Made to Measure



AccuMark V-Stitcher



GERBERspreader



GERBERcutter



Figure 2.14 Computer aided design (continued): (2D).
(Source: Gerber Technology 2002)

turn can reduce costs to the consumer.

However, two-dimensional CAD designing (ClassiCAD™ [online] 2002) is still, normally, an extension of existing manual processes, there being three means of achieving a collar pattern. The first is through traditional manual pattern-making after which the pattern is digitised into the computer. The second is to change the dimensions of the previously digitised pattern in the computer to affect a new design; and the third is to create the collar entirely within the computer using manual methods. It is evident that all three methods of collar production rely on the acquired knowledge of the practitioner.

A CAD system that expands on the present set of programmes for pattern generation with new techniques would be an asset to both individual practitioners and industry as there are many small businesses that still use manual processes, three-dimensional designing and pattern generation of collars is still, as yet, an expensive option.

2.7.1 Computer Aided Design (3D)

Although none of the major CAD companies, such as Gerber Garment Technology™ (GGT™), Investronica™, Pad system™ or Lectra™, mention collar making as anything more than a continuation of their usual pattern drafting routines there are others who have, partially, succeeded in producing three-dimensional collar-modelling and pattern-making using computers .

Chiricota (2003) (Figure 2.15) introduces a 3D geometrical collar-modelling algorithm based on the mapping of 2D objects. It concerns the development of a shirt collar from the flat-pattern to 3D. This method relies on the fact that the main part of the bodice model is already constructed, around which the collar is created. It is not clear how the original collar was drafted, whether from a preceding neck line or not. No other collars are described. The approach is oriented towards the automation of the process of 3D garment modelling from the flat pattern; with minimal user intervention.

'It is substantially easier for most pattern makers to work in a 2D environment instead of using 3D tools.' Chiricota (2003, p.347).

Three-dimensional garment modelling using attribute mapping

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Keywords Modelling, Clothing

Abstract We propose a three-dimensional (3D) geometrical modelling algorithm based on the mapping of 2D objects on a 3D model. Our methodology can be applied to the automatic modelling of many "secondary" garment parts like collars, waist bands, pockets, etc. The results obtained are accurate in relation to the original flat patterns. Our approach is oriented towards the automation of the process of 3D garment modelling from flat patterns. An underlying constraint behind our approach consists in minimizing user intervention in the modelling process. Our method leads to an intuitive interface for novice users.



Collar modelling

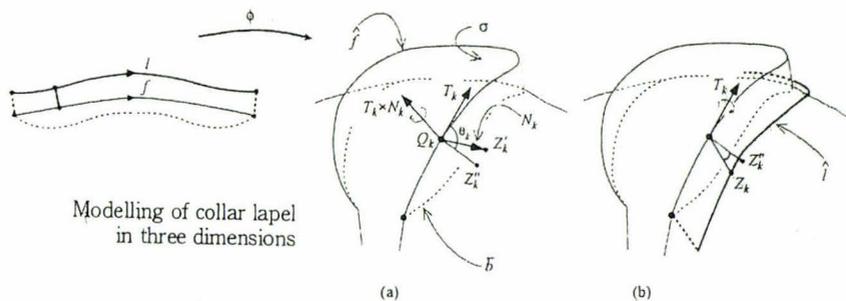
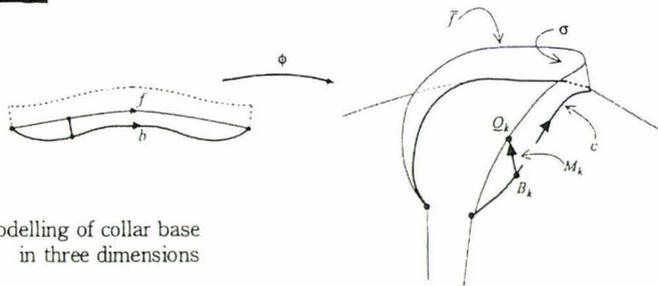
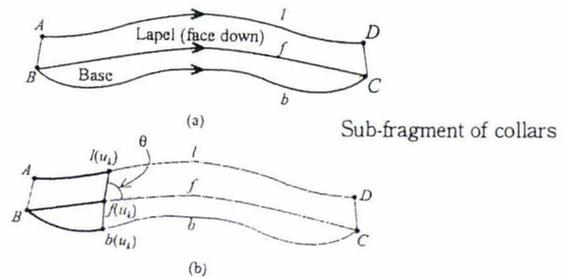


Figure 2.15 Computer Aided Design: (3D).
(Source: Chiricota, 2003)

The Chiricota (2003) quoted viewpoint is motivated by the observed difficulties of pattern-makers using 3D tools to manipulate garments in CAD systems. However, a contrasting opinion is given by Fang (2003) (Figure 2.16) who claims that compared to conventional two-dimensional drawings, costly design processes become much easier in three-dimensions. Fang's process is specifically aimed at collars and the development of automatic garment design tools which would elevate traditional industry practises. To achieve this aim, two representative basal collars are used as templates for further study. The two collar types are the convertible collar and the shirt collar (classified as stand and fall collars). It appears as though the neck line on the model is delineated prior to the generation of subsequent collar designs.

'Collar girth and associated basal collars design are focused at those collar girths near neck girth, such as convertible and shirt collars. Beyond that, the collar girth that (are) draped on the shoulder or chest are not considered in this preliminary work' Fang (2003, p.96).

The scope of this research is unclear; does it mean that only those collars that conform to, or can be modified from the two basic shapes are under investigation; and collars such as tailored, Prussian, Ulster or Chinese are not part of this programme at this stage? What is clear is that the above methods do not integrate all of the standard collar types including several designs that are under investigation in this thesis; the whole system appears to rely extensively on someone other than the researcher/engineer to initiate the collar pattern-making process (Fang, 2003).

Prior to the researcher producing algorithms for the computer-programme the collar patterns have to be made, by a pattern-maker, in two-dimensions, trialled in three-dimensions and altered to hone the design. Only then could the engineer become active to ensure that the two-dimensional collar patterns could be translated into three-dimensional images. Alterations to the images can then be made, on line, to effect a change in the design of the front area of the collar. Of course, with pattern-making experience a good designer would probably find it just as easy to design in two-dimensions 'on screen', providing the 'set' of the collars are correct in the first instance. There appears to be little point, and no real advantage to these manual or semi-automatic methods, which only entail a slight design alteration to either a single, or two basic collars, with no indication as to how other, more complex styles are developed.

3D collar design creation

Jing-Jing Fang

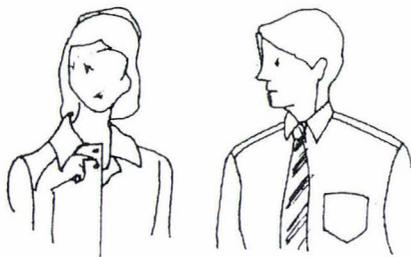
Department of Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan.

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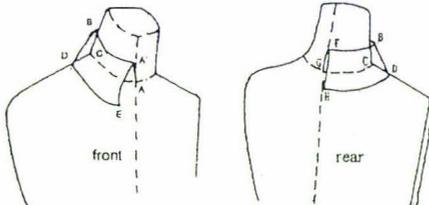
Received October 2002
Accepted January 2003

Keywords Clothing, Design, Object-oriented computing, Computer aided design

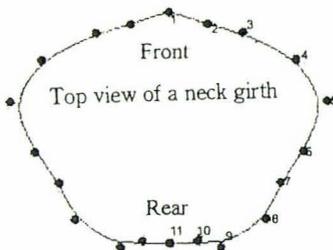
Abstract This preliminary research revolute the conventional clothing design process by true designs from three-dimensional (3D) rather than two-dimensional. The aim of the research is to develop a handy 3D clothing design software tool for general garment designers. Work carried out in this paper is the preliminary result of the 3D software infrastructure. In addition, 3D collar design based on a mathematical formula is accomplished as a template for other garment portions. Object-oriented technology is invoked as a tool for software developing. The system is divided into two major modulus, the user interface and the kernel. The user interface is used to collect messages from the users, and then send it to the kernel for further computations. Moreover, it exhibits real-time pictures received from the kernel. The major work of the kernel is to handle the operations that are called by the user interface. In this paper two basal collars, convertible collar and shirt collar, are illustrated as diversified figurations.



Convertible collar (left) and shirt collar (right)



Source: Hong (1997)



(a) Top View

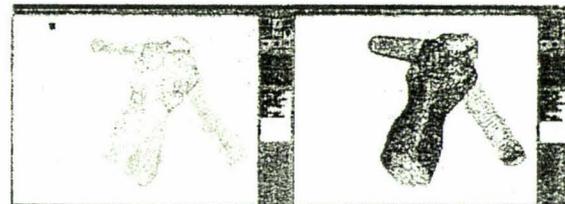
(b) Front View



(c) Right Side View

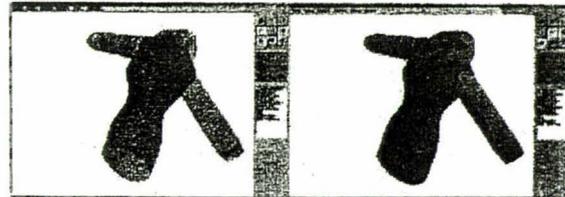
(d) Stored View

Display modes



(a) Point

(b) Line

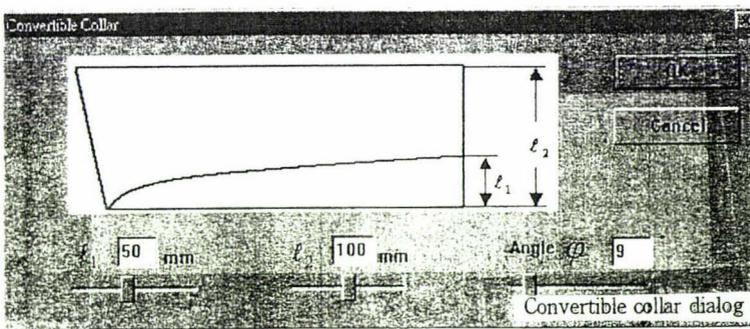
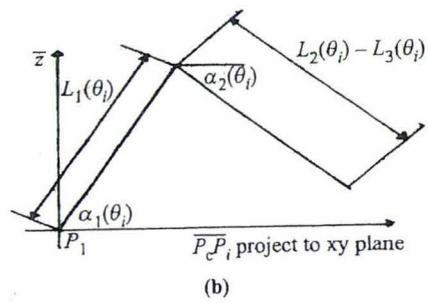
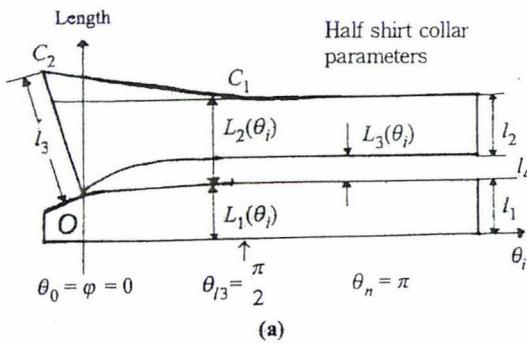
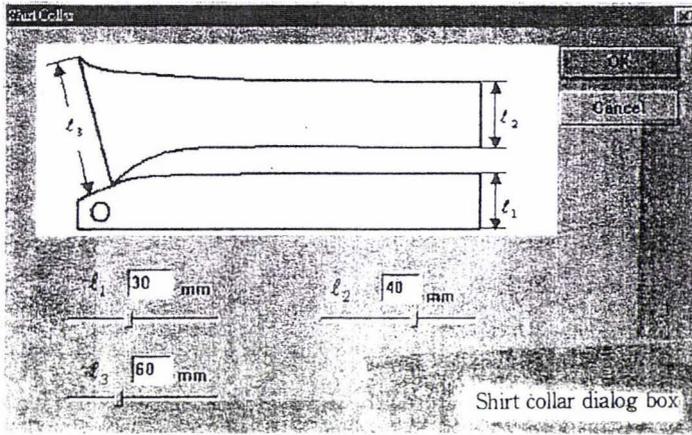


(c) Latjice

(d) Surface

Views

Figure 2.16 Computer Aided Design: (3D).
(Source: Fang 2003)



convertible collar

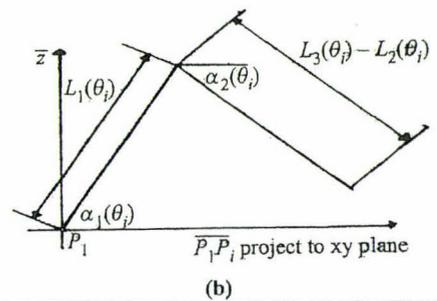
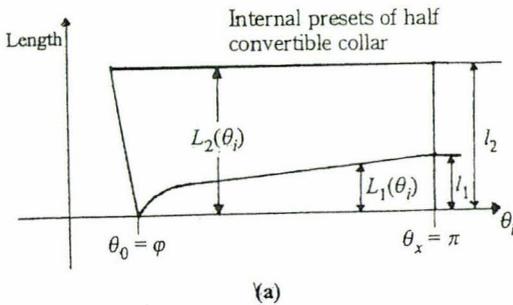


Figure 2.16 Computer Aided Design (continued): (3D).
(Source: Fang 2003)

Nevertheless, three-dimensional collar pattern design and development must be the method of the future.

2.7.2 Computer Aided Design (automatic 3D body scanning)

One tool that could have the capabilities of supporting all of the complexities of a composite collar drafting system is a 'body scanner' (Figure 2.17). The body scanner and its associated software can include a computerised system of producing patterns directly from measurement data supplied from an individually scanned human body (Kang and Kim, 2000). It is a process that allows for 'custom made' garments without the manual (and sometimes intrusive) use of the tape measure to take the necessary body measurements.

Istook and Hwang (2001) reviewed the body measuring systems currently available to determine the underlying principles behind the functioning of these systems, whilst World Textiles (2001) has also published comparisons of 3D body scanners with at least six different products under review. Xu, B. Huang, Y.; Yu, W. and Chen, T. (2002) observe that an automatic body measuring system is essential for apparel mass production.

Most scanning systems utilise the multi-line triangulation technique to rapidly acquire the surface data of a body which provides accurate body measurements that are not measurable by conventional methods. The body form can then be used as a digital model for the design of garments.

The TC² Corporation™ web site ([online], 2001) has a significant amount of information (as does Human Solutions [online, 2004]), with a short video clip of the scanning booth in action. There is mention of creating a totally digital product from fabric and yarn formation, to colour and print designs through silhouette specification and pattern development. Products can be created, often without the need to make a physical sample.

'The longer that outputs of the product development process can remain 'digital' the more flexible each part of the process becomes. This increased flexibility can be translated into reductions in cost, risk and time when compared to the traditional product development process.' ([TC2]™, [online], 2001).

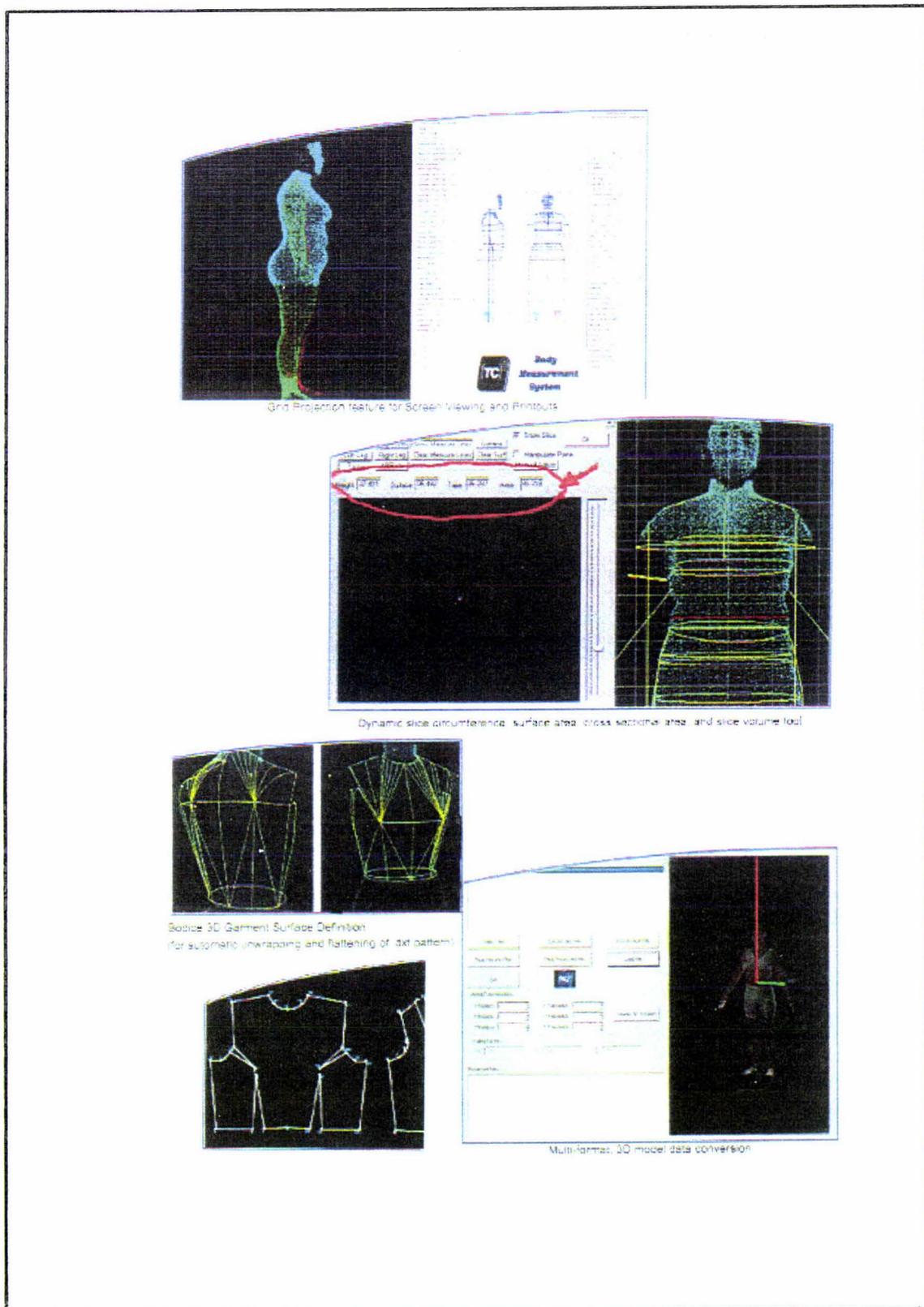


Figure 2.17 Automatic body scanning: (3D).
 (Source: Textile Clothing Technology Corporation, 2002)

E-Tailor™ ([online], 2001) also gives an integration of 3D body scanning with sizing information as well as virtual retailing for made to measure (MTM) garments. Two of E-Tailor's aims are to:

'develop tools that will contribute to the solution of the sizing problem....' 'in the form of a European Sizing Information Infrastructure (ESII)', and to develop a customised clothing infrastructure (CCI), consisting of: intelligent design systems'. E-Tailor™ ([online], 2001)

When computers working in two-dimensions were first introduced to the apparel manufacturing industry they were expensive options to the manual processes. Now three-dimensional scanning programmes are closer to being another necessary, almost indispensable, tool for medium to large businesses.

2.8 Economic considerations/Industrial perspective

Centres of tertiary education and learning in New Zealand and overseas seem to concentrate on the 'design' aspects of apparel rather than the more practical facets of clothing manufacture and many countries have discontinued the apprentice system, reduced import tariffs and resorted to imported goods. These trends have an effect on garment manufacturing companies, sometimes leading to plant closures, resulting in the loss of essential skills in pattern-making to the detriment of the clothing sector as a whole. Large and medium sized clothing manufacturers are not the only companies that are affected. Smaller 'cottage' units that do not have access to high levels of expertise through various reasons such as their geographic location, cost or accessible personnel still have a great need to stay up-to-date in design and pattern-making skills to stay in business.

High costs are incurred in workmanship, experience and design ability. Fabric is expensive and time so short between the end of one season and before the beginning of the next, that it becomes apparent that not all of the essentials can be given the same amount of attention in the design process. Some area has to become subservient to the others. Quite often it is the quality of the finished product that suffers. This quality may be the critical evaluation of styling and the 'point of difference' between rival manufacturers.

Within the normal manufacturing and sampling seasons, opportunities to re-design or alter the original concept are usually minimal and might only be achieved if the design has been successfully attempted previously. New designs at these periods are sometimes pared to a minimum to reduce wastage and to meet production constraints as re-working through problem areas is labour intensive, time consuming and expensive; especially if the pattern-maker is relatively inexperienced.

High costs can be incurred through the following processes:

- Producing collar trials/samples and alternative remakes;
- Fabric, sewing thread and fusibles used in trials;
- Training of personnel (both designers and trainees);
- Producing sub standard patterns and samples made by inexperienced personnel;
- Lost production due to inexperience or unsound pattern-making systems.

Design room personnel perform a number of intricate and important tasks, all of which are time consuming to some degree. The head designer has to manage and coordinate tasks, staff and time. Two aspects of pattern-making that reduce the available time for other tasks are the performing of experimental trials of full or partial areas of garments such as collars and the testing collar drafting methods. The costs of such trials become expensive if an efficient system of pattern making cannot be found or created. Many of these costs may be unknown within a given company, and may vary with the type of operation and production unit. Any reductions in the time taken in the production and trialling cycle of pattern design and making would be of enormous advantage.

Information gleaned from the review of published literature and computer programmed collar drafting techniques, suggests no evidence of any known research data to date of drafting techniques similar to that envisioned for a composite collar drafting system, or any duplication of this proposal. A composite collar drafting system could address some of the issues discussed in this section, issues such as simplifying the drafting process for a variety of collar styles and reducing the training needs of design room personnel. There may also be a reduction in the costs associated with developing and making collar patterns and toiles leading to a reduction in production costs.

Chapter 3

Review of contemporary collar drafting techniques

3.0 Introduction

This chapter evaluates a number of traditional and conventional, as well as unconventional, collar drafting methods that incorporate the three different collar styles of flat, stand and stand and fall types. It is necessary to review these drafts in order to later analyse and question each of the elements that make up the collar and body sections. A total of nineteen collar drafts are reviewed providing an overview of the broad spread of techniques available to the practitioner.

Collar types reviewed including both published and personal drafts are:

- Flat (2 methods)
- Stand (1 method)
- Stand and fall (7 methods)
- Shirt (2 methods)
- Convertible (1 method)
- Tailored (1 method)
- Shawl (1 method)
- Overcoat (3 methods)
- Regency (1 method)

Each collar style may be drafted using a variety of methods that include overlapped shoulder lines, overlapped leaf and top edges, wedged-open outer edges, 'spring', rectangles and two piece collars. From this analysis I have extracted a comprehensive list of questions, not usually mentioned in the literature, pertaining to the evaluation and quality of drafting, pattern-making and their outcomes. These questions have then been used to form a basis for the evaluation of the composite collar drafting system.

3.1 Contemporary collar drafting methods

The published and personal drafts are compiled both diagrammatically and textually in a standardised format to promote continuity. They are used as comparisons for the composite collar system. The drafting methods, derived from primary and secondary sources include; libraries, journals, data bases and personal information and

experience, were identified and selected based on the amounts of information and range of collar styles, the clarity of the text and illustrations, the date of publication and the reputation and innovative techniques of the authors. My personal drafts are included not because they are any better or worse than published drafts, but to give a more balanced view and to indicate that almost all drafting methods are defective in some way, whether it is in the amount of information, in the instructions or in the final 3D collar.

It is expected that experienced practitioners would, perhaps, prefer to rely on the drafting diagrams for a general idea of method, rather than studying the drafting instructions in minute detail.

The following drafting techniques develop in a regular manner commensurate with standard practises; however, as there is considerable scope within the dimensions and shapes of the depicted collar types for practitioners to develop their own approaches to the subject, they may represent only an approximation to personal tastes. Traditionally, the under collar draft forms the basis from which the top collar is constructed. The analyses detailed below refer only to the under collar.

The collar is normally constructed for only one half, or one side of the body (in this case the left side), and mirrored to give the full collar; therefore, when describing the methods and results, reference is made only to the left half of the final full collar length. To maintain the fit and relationship between the body sections and the collar as near as possible to that depicted in the diagrams and instructions, the matching block pattern (back, forepart and/or side body) to which the full collar is attached is also constructed.

3.1.1 Conventional flat collar drafting (two methods)

The two drafting methods described below (Figure 3.1) are basic in their application, echoing the body patterns directly underneath. The (half) collar silhouette is partially defined by the body neck line and its centre back line. The flat type of collar (Peter Pan) is positioned directly below the body neck line which forms the collar's upper boundary line for its entire length; the centre back of the half collar is also a duplication of the underlying body line. The collar width and front design are not constrained in any way by other factors such as the neck, they are arbitrary delineations purely based on the preferences of fashion trend interpretations by the designer.

Conventional flat collar drafting (straight shoulder lines)

The first method of drafting a flat collar (Figure 3.1a) includes drafting from the body sections with straight shoulder lines.

The drafting instructions (Source: M. Campbell) for the flat (one piece) collar (straight shoulder line) are as follows:

1. Draw around the front pattern (Figure 3.1a).
2. Place the back pattern to the front pattern matching the neck points.
3. Bring together the shoulder lines.
4. The front gorge is dropped approximately 5mm, pivoting from the neck point. This is to shorten the leaf edge which in the process makes the collar roll in this area.
5. Re-draw the front neck line shape in the new position.
6. Measure 7cm from the neck line to define the flat collar width from the centre back line around the shoulder area to the front. (Collar width is optional).
7. Design and shape the front collar area.
8. Trace the draft on a folded piece of pattern paper, add seam allowances and balance notches. Unfold the pattern.

Conventional flat collar drafting (contoured shoulder lines)

The second method of drafting a flat collar (Figure 3.1b) concerns body patterns with contoured shoulder lines to match the shape of the natural shape of the human shoulder area.

The drafting instructions (Source: M. Campbell) for the flat (one piece) collar (contoured shoulder lines) are as follows:

1. Draw around the front pattern (Figure 3.1b).
2. Decide on the collar width, measure and mark this amount down the shoulder line.
3. Place the back pattern to the front pattern matching the neck points.
4. Pivoting from the back neck point bring the shoulder lines together to match at the collar width mark allowing the shoulder ends to overlap (Morris, 1947; p. 238).

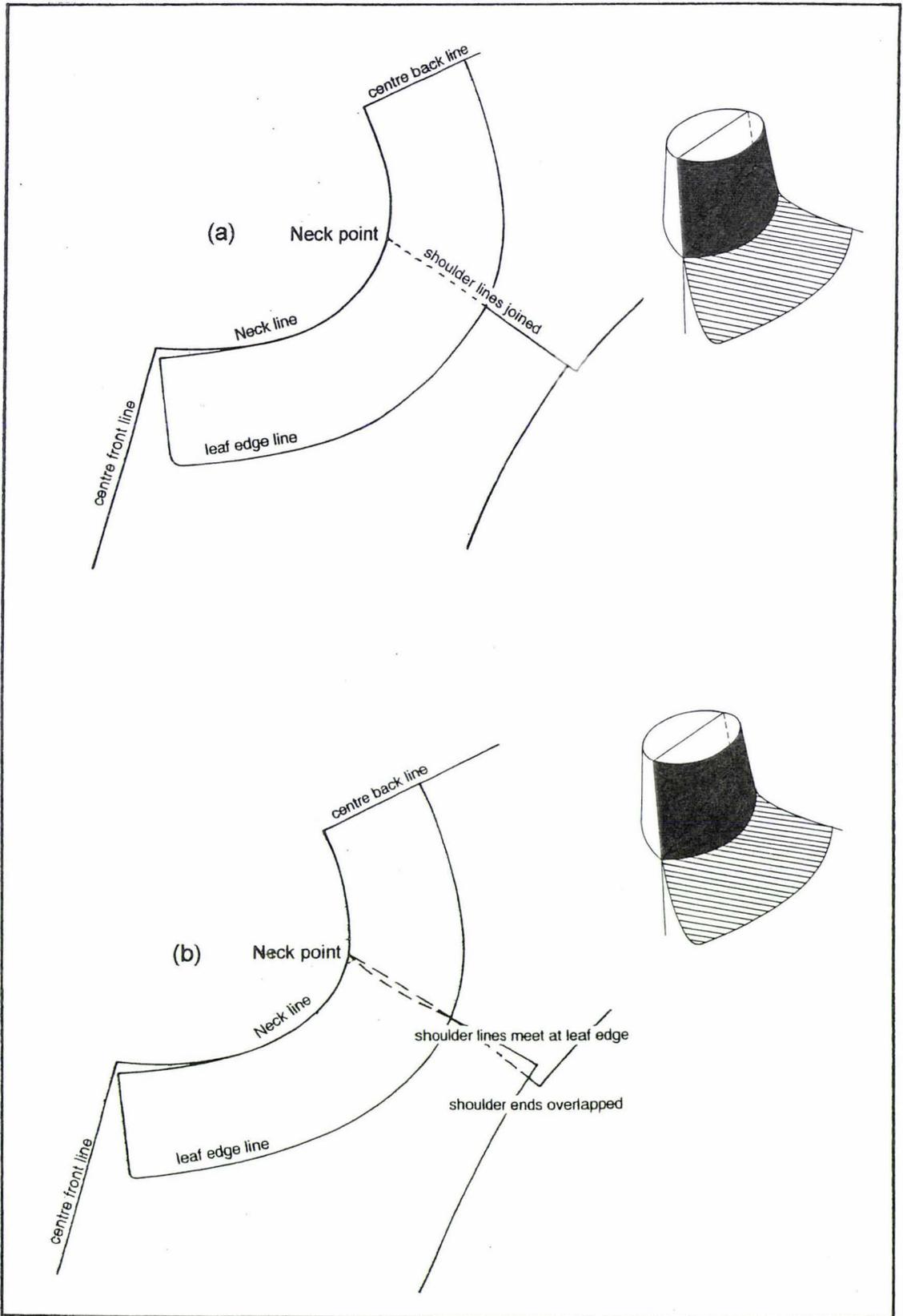


Figure 3.1 Conventional flat collar drafting: Shoulder lines.
 (a) Straight shoulder lines. (b) Contoured shoulder lines.
 (Drawing source: © M. Campbell).

5. The front gorge is dropped approximately 5mm, pivoting from the neck point. This is to shorten the leaf edge which in the process makes the collar roll in this area.
6. Re-draw the front neck line shape in the new position.
7. Measure 7cm from the neck line to define the flat collar width from the centre back line around the shoulder area to the front.
8. Design and shape the front collar area.
9. Trace the draft on a folded piece of pattern paper, add seam allowances and balance notches. Unfold the pattern.

Truly flat collars are exact reflections of the body, hugging the area around the shoulders, with a width restriction and front design profile; they can be quite easily developed straight from the front and back body pattern sections which are joined at the neck point and along the shoulder seam lines.

The two flat drafting techniques described do not provide for an absolutely flat collar. To hide the neck seam line, the front collar neck line is dropped (Bray, 1974; p. 82. Gough, 1956; p. 71); in reality this is the same as a 'shortening wedge' taken from the leaf edge, which compels the collar to ride up the shoulders to cover the neck line, developing a very slight width of front stand and in the process tending towards a stand and fall collar. Although the front collar neck line position has been altered by only a minor amount, the elements contained within the whole, though small, are still vague. In reality the finished result of the whole front collar is questionable.

3.1.2 Conventional stand collar drafting (one method)

Modelling fabric directly to the neck will give a good fit which can then be made into a pattern. However, the pattern is only good enough for that particular neck and neck line shape and size. For future reference, it is easier and quicker to develop stand collar drafting instructions than to repeat the collar draping exercise. A typical stand collar draft could be taken from the draped silhouette with instructions added to affect replication. The instructions for the stand collar draft use comparatively standard practises for the layout, except that individual measurements change with each author (e.g. Kawashima, 1977, p.169; or Joseph-Armstrong, 1987; pp.268-269).

The drafting instructions (Source: M. Campbell) for the stand (one piece) collar are as follows:

1. Draw a horizontal line to represent the $\frac{1}{2}$ neck line length (A to B) (Figure 3.2).
2. Project a line, at a right angle to A to B, for the stand width and centre back line (fold edge A to C).
3. Project a right angled line, 15mm long from B to D.
4. Curve the neck line (D to A), and add the shoulder notch (E).
5. Form a centre front right angle from the neck line (D to F) the same length as the centre back.
6. Curve the top edge line parallel to the neck line (F to C).
7. Trace the draft on a folded piece of pattern paper. Add seam allowances and balance notches. Unfold the pattern.

Stand collars are either rectangular in form or are curved to better replicate the neck contours. There are problems with both of these pattern forms. Firstly, the straight collar shape can only be used if the body neck line is designed for, and is compatible with that particular collar outline; an unknown quantity until on the model. Secondly, to obtain the curved stand collar it is usual practice to cut down the collar width at various intervals and overlap the top edge. Comparing a number of sources would show each giving non-standard variations for these cuts and of overlap amounts and placements, thus producing dissimilar arcing to the collar pattern and therefore different fitting and aesthetic capabilities.

There are numerous interpretations that make up drafting procedures for this type of collar (Gough, 1956; p. 73. Tuit, 1974; p.88. Aldrich, 1985; p.117), not one of which gives an in-depth description of the neck column. The shape and size of the body neck line and the neck itself, dictate a great deal to the collar form, when these change so should the drafting instructions. Normally, the draft has to be taken at face value, the proof is only apparent at the toile stage, yet, different drafts for stand collars give definite dimensions in their instructions, none of which are precisely the same. This leads to uncertainty of the final collar shape and whether it will be compatible with the wearer's neck as well as the garment neck line. The next part of the process, as usual,

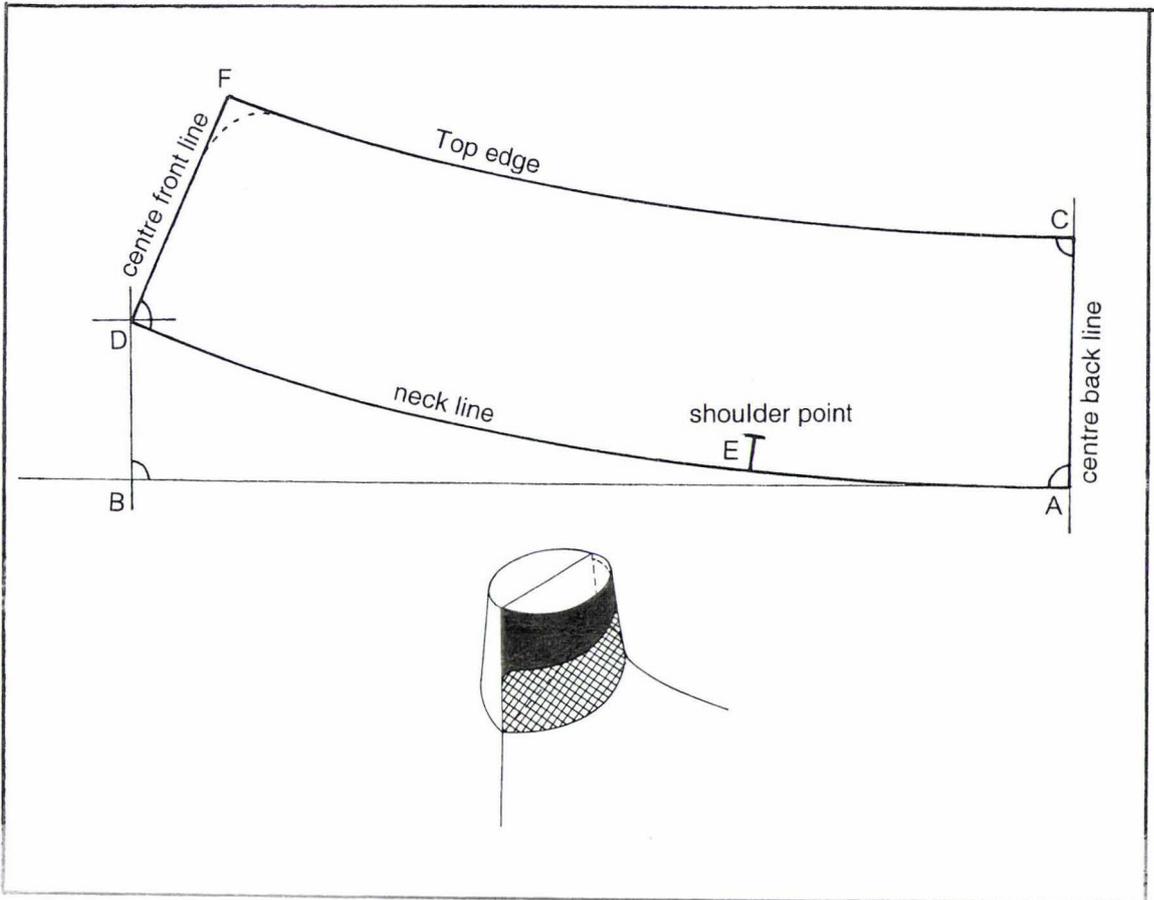


Figure 3.2 Conventional stand collar drafting.
 (Drawing source: © M. Campbell).

is the trialling process in which alterations for personal design requirements can be made.

3.1.3 Conventional stand and fall drafting (four methods)

Folding a stand collar to give a narrow fall section will have relatively no effect on the 'standing set' of the collar. It is a different matter when the fall is wider, or deeper, than the stand and extending into the body area, as this area of the fall will be on a different, more horizontal plane to that of the neck section. The leaf edge of the collar fall has to navigate through a longer line on the body than does the stand's neck line, therefore the leaf edge has to be longer than any of the lines on the stand.

Methods of drafting stand and fall collars include overlapping the shoulder lines to reduce the leaf edge length, and/or to take out wedges of leaf edge length. Both methods seem contradictions to a need for a long leaf edge. There is also a drafting

method which has a rectangle as its starting point, with a length to represent the neck line and width to equal the collective stand and fall requirements.

Conventional stand and fall collar drafting (overlapped shoulder lines)

A standard procedure (Figure 3.3) used to produce a number of different types of stand and fall collar (e.g. Prussian) starts with the flat-collar (Bray, 1985). The process consists of shortening the leaf edge to induce the collar to ride up the neck and eventually (if enough length is taken out of the leaf edge line) to roll over, transforming itself into a stand and fall collar. After an extreme amount of length is deducted from the leaf edge, the resultant tightness causes the front edge to curl over to produce a lapel. For instance, Zangrillo (1997, p.150) sets the overlap at 3" (7.6cm) whereas Aldrich (1985, p.115) has only a 2cm (3/4") overlap at the shoulder end. The Shoben and Ward (1990, pp.128-129) drafting method has a Peter Pan collar with a slight roll and stand of 2.5cm (1"), reducing to zero at the front neck edge, using a shoulder overlap of 1cm (3/8") and. Sometimes the front neck is dropped, in actuality, a wedge of length, with its apex on the neck line, is pivoted out of front leaf edge to entice a roll in order to hide the neck line seam.

The drafting instructions (Source: M. Campbell) for the stand and fall (one piece) collar (overlapped shoulder lines) are as follows:

1. Delineate the front pattern on a piece of paper (Figure 3.3).
2. Add the back pattern, matching the neck point.
3. Overlap the shoulder end by 5cm.
4. Pivoting from the neck point, lower the centre front edge 6mm (to tighten the outer edge and hide the neck seam line).
5. The collar width, approximately 8-9cm, is marked as the outer edge.
6. Add 2.5cm of width (shaded area) at the centre back to allow the collar to roll.
7. Blend the leaf edge into the curve at the shoulder.
8. Produce the front design shape.

To say this collar begins with a flat collar is not strictly correct as the first procedure is to overlap the shoulder lines. The leaf edge has thus actually been shortened by a

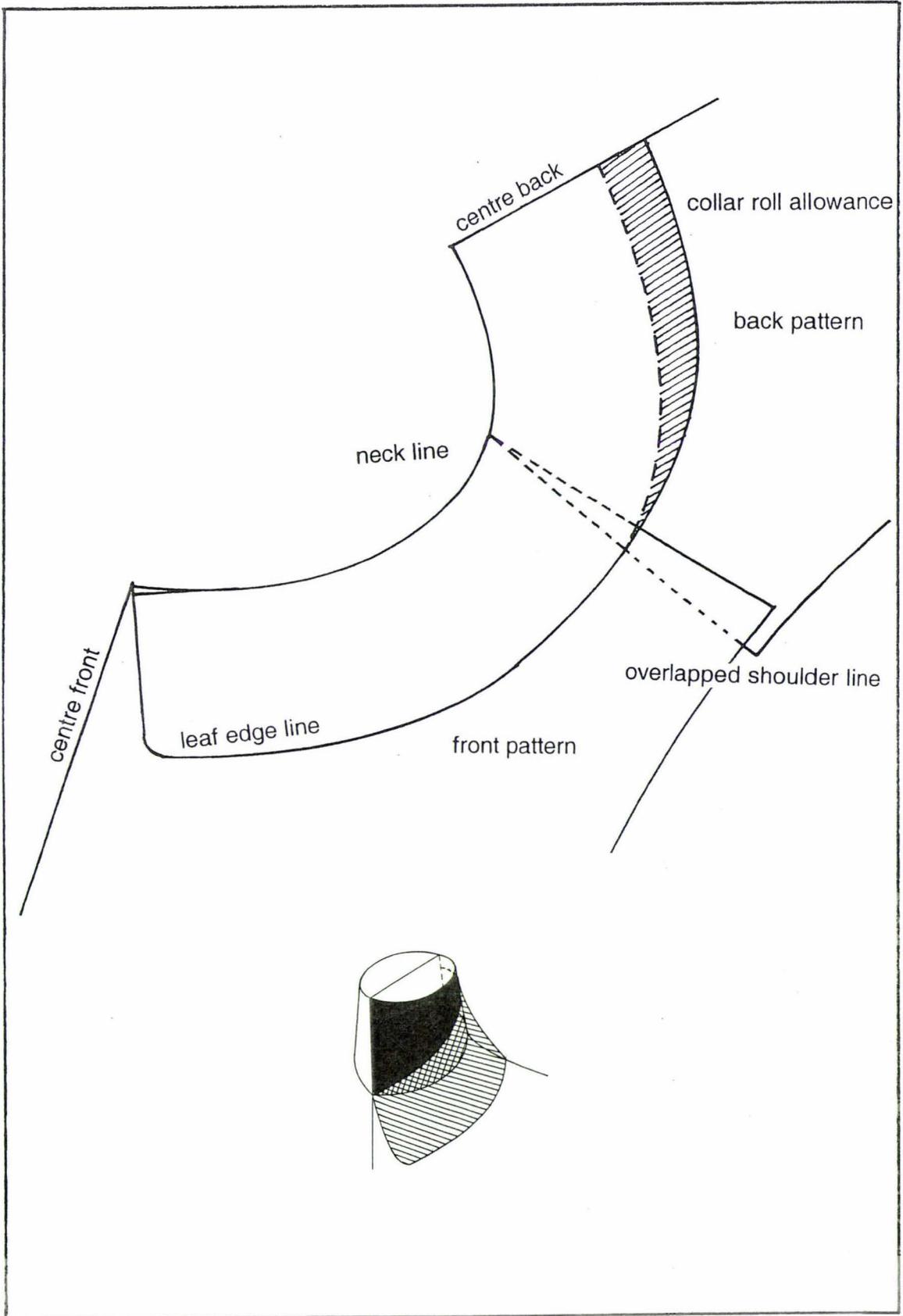


Figure 3.3 Conventional stand and fall collar drafting: Overlapped shoulder lines.
 (Drawing source: © M. Campbell).

given amount at the shoulder line, which in turn leads to a repositioning of the collar in height, compensated for with the addition of the 2.5cm at the centre back (shaded area on the draft in Figure 3.3). With this drafting method there are no explicit measurements or shapes given for the stand and fall sections, which happen to finish with a stand at the centre back of 2.5cm and approximately 5mm at the front. Neither is the position and shape of the break line mentioned or delineated. The resting position of the shortened leaf edge is also uncertain.

Unless previously trialled, the back stand height allowance might, or might not be enough to cover the neck line seam. The range of extra back fall widths suggests that there could be a variety of outcomes, for various reasons, such as fabric type and thickness or the exactness of execution; or it could be because the resting line of the leaf edge on the body is suspect. The question is: Why is there a range of fall widths from which to choose, why is the width not precisely acknowledged?

Conventional stand and fall collar drafting (overlapped leaf edge)

An alternate drafting method of constructing a stand and fall collar is to begin with the front and back patterns joined together at the neck points and along the shoulder line, this gives a flat collar with a very long leaf edge. The leaf edge is then reduced to the required length by cutting and overlapping the edge (Bray, 1985; p.83).

The drafting instructions (Source: M. Campbell) for the stand and fall (one piece) collar (overlapped leaf edge) are as follows:

1. Draw around the front pattern on a piece of paper (Figure 3.4a).
2. Add the back pattern, matching the neck point and shoulder lines.
3. Pivoting from the neck point, lower the centre front edge 6mm (to tighten the outer edge and hide the neck seam line).
4. The collar width, approximately 8-9cm, is measured from the neck line and marked as the outer edge.
5. Produce the front design shape.
6. Add 3cm of width (shaded area) at the centre back to allow the collar to roll and to hide the neck seam line.

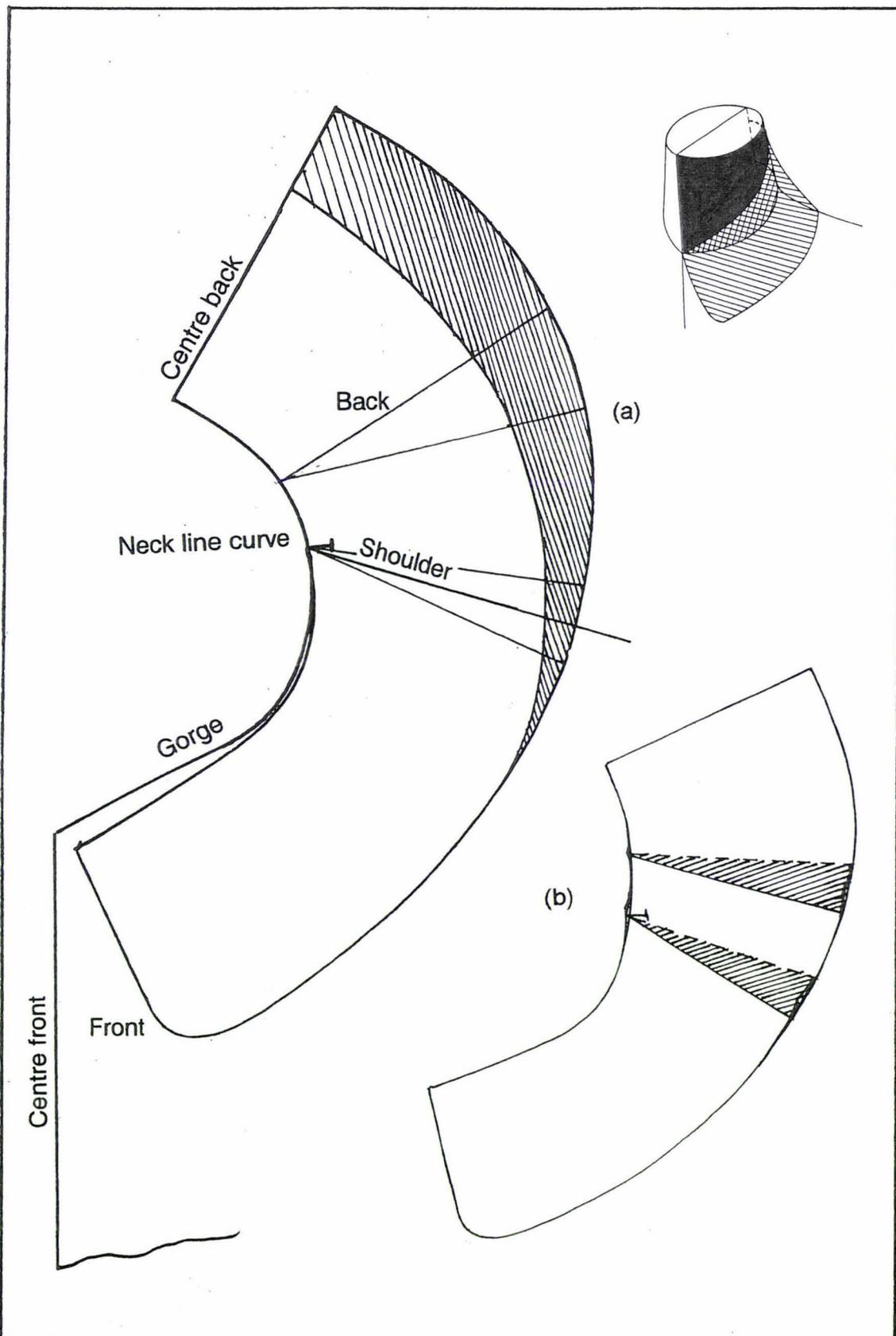


Figure 3.4 Conventional stand and fall collar drafting: Overlapped leaf edge.

(a) Wedge positions. (b) Wedges overlapped.

(Drawing source: © M. Campbell).

7. Position a wedge shape, measured 1cm either side of the shoulder line, with its apex at the neck point.
8. A further 2cm wedge is positioned half way between the shoulder line and the centre back line.
9. Cut out the collar shape.
10. Cut down each of the wedge lines from the outer edge to leave a pivot point at the neck line (Figure 3.4b).
11. Overlap each of the wedges by the 2cm and tape into position.
12. Draw around the collar shape on a separate section of paper.
13. Smooth through the troughs on the outer edge line and the points on the neck line.

As with the previous drafting method there is little that can be predicted or envisaged in advance of the toile as there are few specific measurements to deal with. The stand and fall ratio, the break line and final silhouette are all vague (the pattern gave a centre back stand of 2.5cm) with the neck line being the only line given a definite measurement, except that its position may be in doubt if the collar does not produce an aesthetically pleasing product.

Conventional stand and fall collar drafting (overlapped shoulder lines and leaf edge)

A Peter Pan variation (Aldrich, 1985; pp114-115) of stand and fall collar uses the front and back pattern sections with the shoulders overlapped by 2cm (Figure 3.5). A number of 0.75cm darts are taken from the leaf edge to reduce its length to try to give it a stand of a previously determined size and shape.

'The set of a collar, i.e. the way it lies and fits at the neck, depends on the shape of the inner or sewing-on edge. This in turn, depends on the difference in length between the two edges.' Bray (1985, p.78).

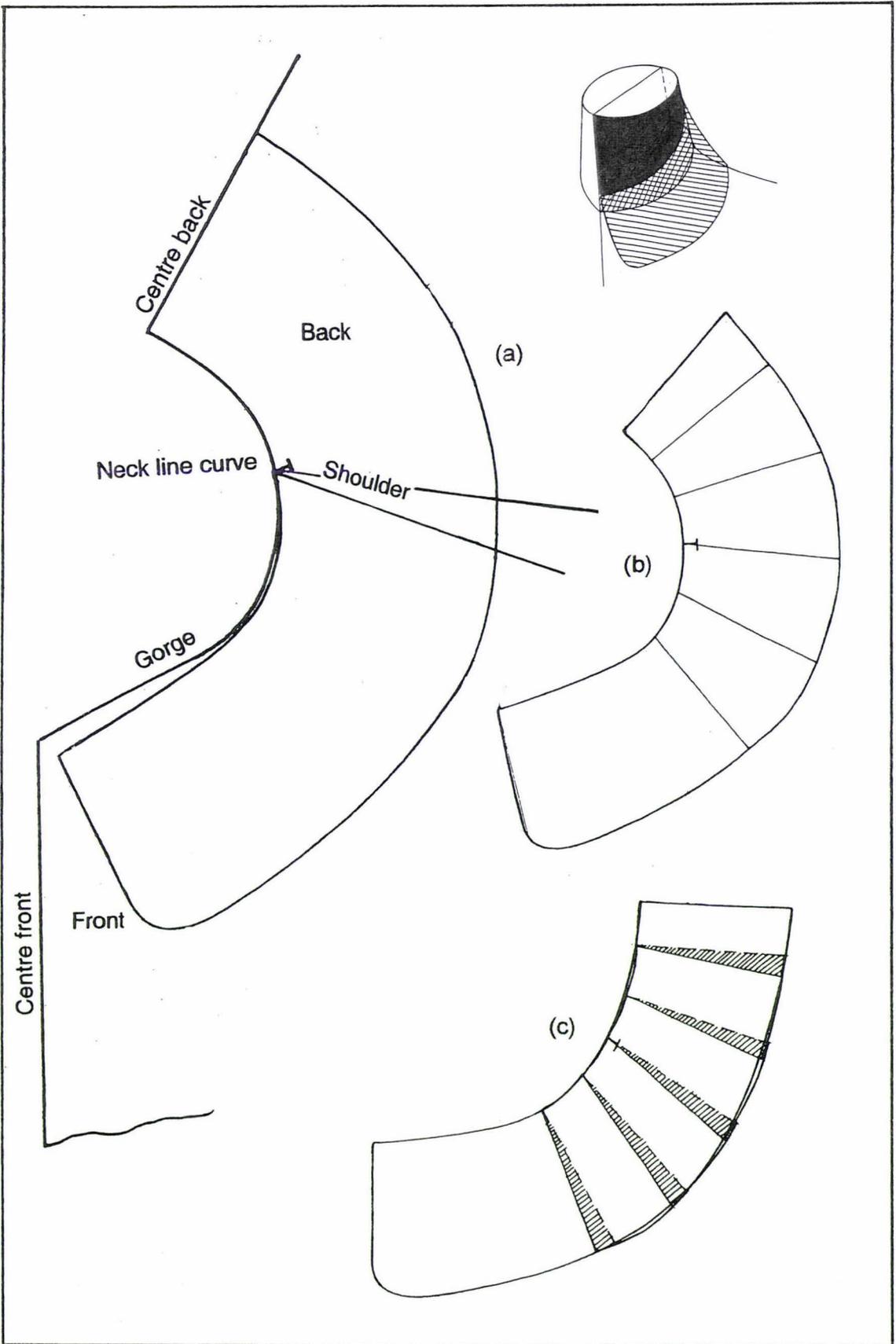


Figure 3.5 Conventional stand and fall collar: Overlapped shoulder lines and leaf edge. (a) Overlapped shoulder lines. (b) Wedge positions. (c) Completed collar.

(Drawing source: © M. Campbell).

In other words, reducing the leaf edge length of the collar by overlapping (wedging or darting) it at various locations will have an effect on the collar's neck edge. It will become straighter and eventually it will turn from concave to convex in shape. The bigger the wedges, the bigger the effect in each case, therefore, the shape of the collar neck line depends on what happens at the outer edge. Tightening the leaf edge incrementally gives, at each stage a collar's 'set' (the manner in which it sits around the neck and on the shoulders). This 'set' can range from aesthetically good to bad depending on the correct or incorrect locations and amounts of leaf edge deductions used. Until the toile is made, the practitioner cannot be aware of the results and, of course, whether it is of use or not.

The drafting instructions (Source: M. Campbell) for the stand and fall (one piece) collar (overlapped shoulder lines and leaf edge) are as follows:

1. Draw around the front pattern on paper (Figure 3.5a).
2. Add the back pattern, matching the neck point and overlap the shoulder lines 3cm.
3. Pivoting from the neck point, lower the centre front edge 6mm (to tighten the outer edge and hide the neck seam line).
4. The collar width, approximately 8-9cm, is measured from the neck line and marked as the outer edge.
5. Produce the front design shape.
6. Cut out the collar shape.
7. Draw a line across the collar from the neck point to the outer edge (Figure 3.5b).
8. At equal intervals of 3cm, draw a further four lines, two either side of the neck point.
9. Cut down each of the wedge lines from the outer edge to leave a pivot point at the neck line (Figure 3.5c)
10. Overlap each of the two back wedge lines by 1cm and each of the two front lines by 2cm, tape into position.
11. Draw around the collar on a new section of paper.
12. Smooth through the troughs on the outer edge line and the points on the neck line.

As with all of the other collars of this type there is nothing except experience to indicate the final shape and size of the collar (the pattern produced a centre back stand of 2.5cm and a front stand of approximately 1cm). How much more needs to be wedged out (or left in), of the outer edge to establish the personally preferred silhouette will be unknown until the toile is constructed.

Conventional stand and fall collar drafting (rectangle)

This drafting method (Figure 3.6) begins with a rectangle divided into unequal widths of stand and fall (Figure 3.6a). When the fall section of the collar is wider than the stand, (which is usual for a stand and fall collar), the outer edge must be lengthened, by a series of cuts (Figure 3.6b). Cuts are made from the outer edge of the collar pattern across to the opposite side (at the neck line edge, leaving a pivot point), this opens the leaf edge (Figure 3.6c) by the perceived (estimated) amount (Tuit, 1974; p.80).

The drafting instructions (Source: M. Campbell) for the stand and fall (one piece) collar (rectangle) are as follows:

1. Draw a rectangle A-B-C-D to represent the collar neck line length with a width of the combined stand (4cm) and fall (8cm) measurements (A-B is the neck line, C-D is the outer or leaf edge (Figure 3.6a).
2. Draw a line A-F (4cm) and B to E (2cm) to represent the break line.
3. Round off the corner at C.
4. A to G is the $\frac{1}{2}$ back neck measurement.
5. Draw a vertical line from G (Figure 3.6b).
6. The vertical lines from H, I, J and K are set at 2.5cm apart (measured outwards from G).
7. Cut out the collar.
8. Cut down each of the vertical lines leaving pivot points at G, H, I, J and K.
9. Place on paper and open each of the vertical lines at the outer edge 1.5cm (Figure 3.6c).
10. Draw around the resultant collar.
11. Cut out the collar pattern.

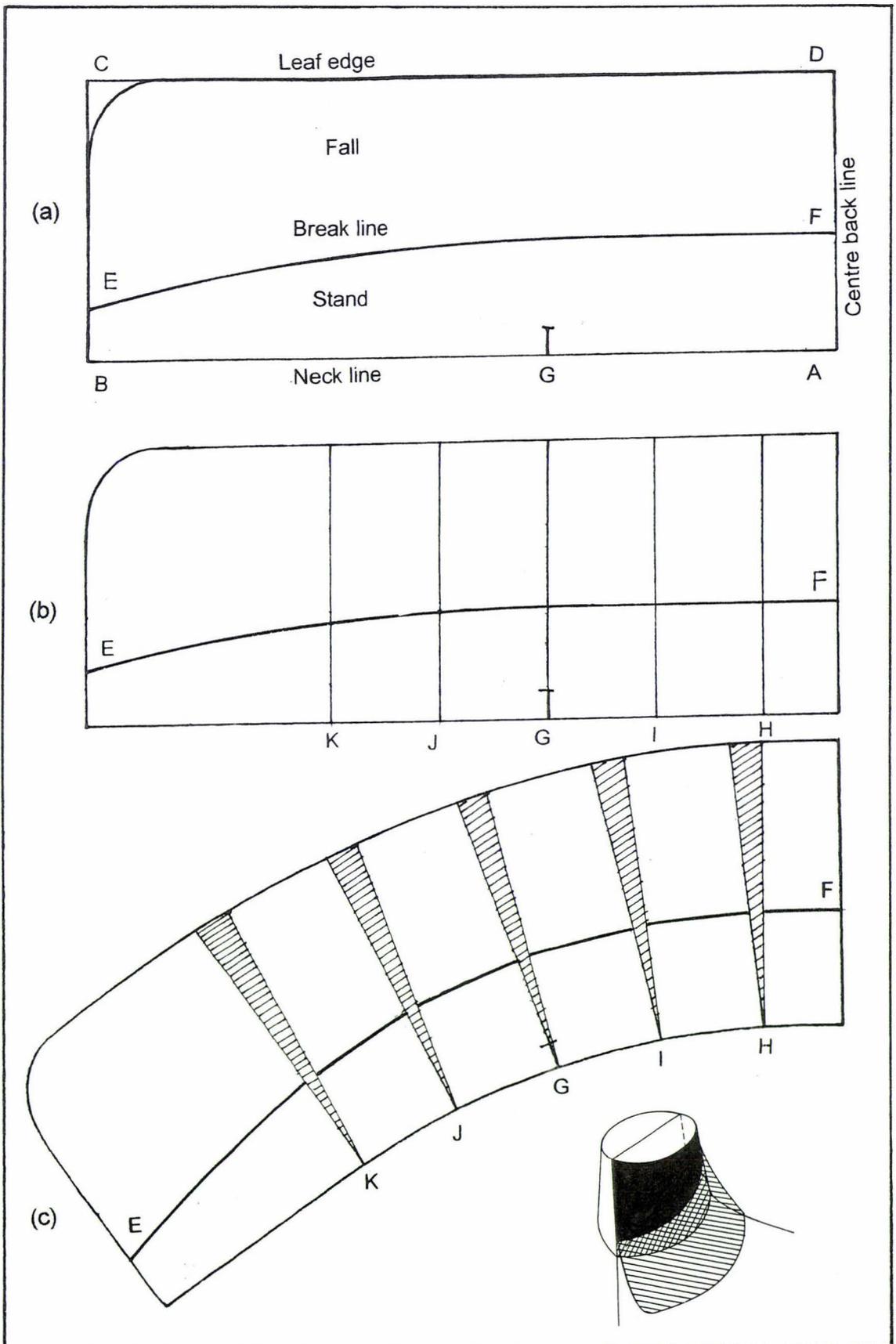


Figure 3.6 Conventional stand and fall collar drafting: Basic rectangle.
 (a) Rectangle. (b) Wedge positions. (c) Completed pattern.
 (Drawing source: © M. Campbell).

Depending on the drafting technique, the stand and fall widths could be ambiguous, for instance, if the break line were not indicated in the instructions or if the wedges were imprecise in some respect. Also the positioning and opened wedge allowances at the leaf edge may be incorrect for the envisaged collar silhouette. How can the draft be seen as performing correctly if all or the majority of elements for a certain collar silhouette are of an unknown quantity from the outset?

All of the above drafting methods that employed, in their procedures, overlapping the shoulders, leaf edge or top line, to shorten the line, proved to have various degrees of built-in restrictions to their performances, so too did the 'rectangle' method, with the introduction of length into the leaf edge. Because there must be an optimum pattern shape for a given collar design, an inordinate amount of time could be expended examining and analysing various assemblies of drafts and toiles to obtain the ultimate pattern shape for a particular collar design. This would result in a collection of unrelated drafts and toiles with no uniformity, standardisation or logic. 'Flow-on' effects to other profiles and sizes would only compound the problems.

(The conventional methods described, Figures 3.1 to 3.6, are not at variance with my personal methods. This is to be expected as most inexperienced practitioners follow the guide lines set by other, more established pattern-makers. It is usually accepted that these drafting methods are the best means of developing collar designs. It is not until a distinctive change in drafting procedures, such as those that follow, is discovered that new thought processes are set in motion which, hopefully lead to better drafting principles.)

3.1.4 Unconventional stand and fall collar drafting (three methods)

There are numerous examples of contemporary collar drafting methods available that are conventionally set-out in their methodologies. Occasionally a practitioner may embark on a different approach from the normal. The following collar pattern drafting methods demonstrate some of the more unusual techniques.

Unconventional stand and fall collar drafting, slight-roll (Pepin, 1942)

Pepin (1942, p. 149) (Figure 3.7) has an interesting method of drafting a slight roll or a half roll collar. This is, perhaps, a precursor of a similar system described by Kunick

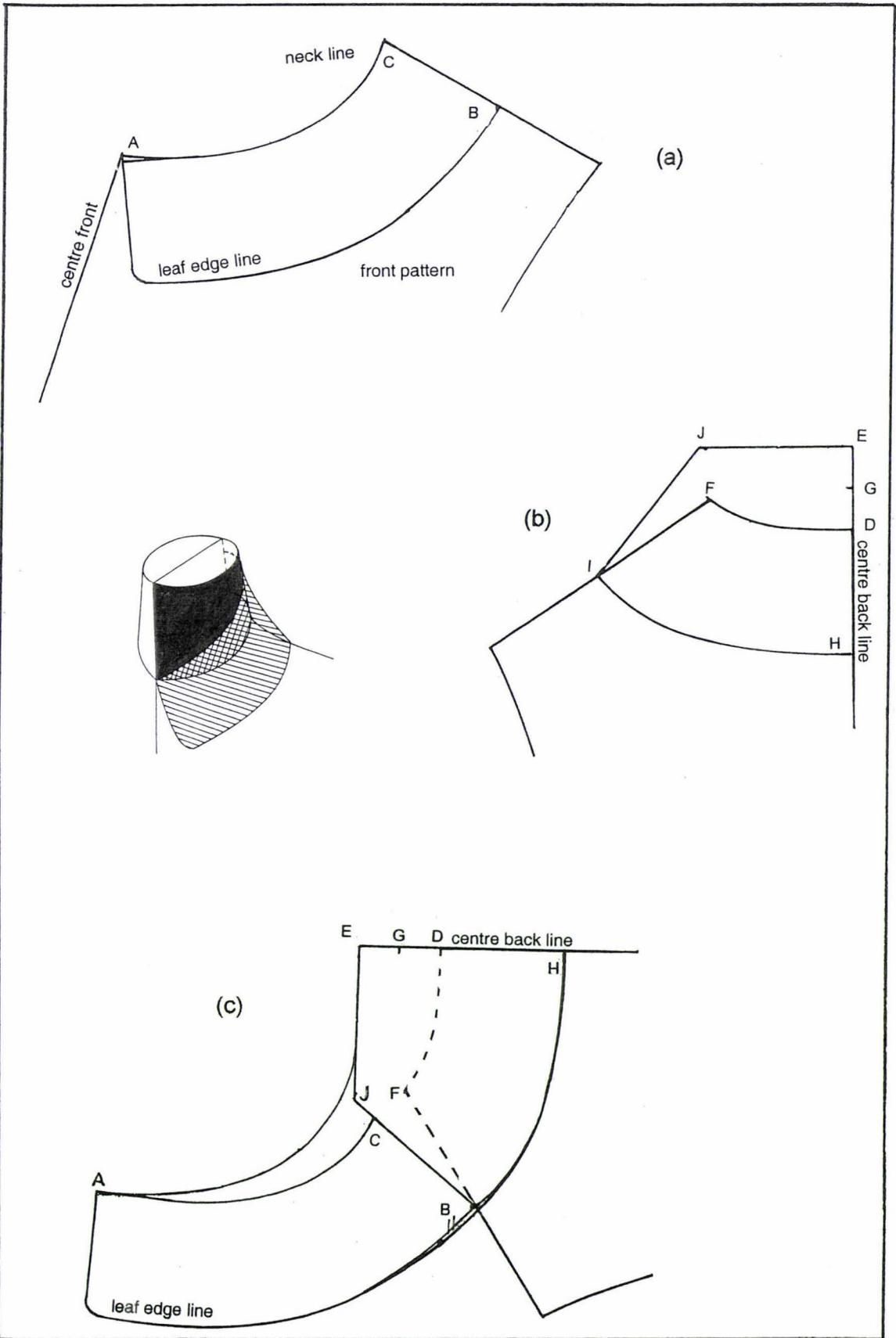


Figure 3.7 Unconventional stand and fall collar drafting: Slight-roll.
(a) Front section. (b) Back section. (c) Combined back and front sections.

(Source Pepin, 1942) (Drawing source: © M. Campbell).

(1967, pp.127-132); that of producing separate sections of front and back collar which are then joined later in the procedure to make the half collar pattern.

The drafting instructions (Source: Pepin (1942), with alterations of text for standardisation, for the stand and fall collar (slight roll) are as follows:

1. Draw the front and back patterns onto paper (Figure 3.7a and b).
2. Decide on the front collar width (8-10cm).
3. Shape the front style-line to the shoulder line A to B. Label the front neck point C.
4. On the back, measure up from D to E twice the amount of required stand. (Stand = 2cm. Total from D = 4cm). The back neck point is point F (Figure 3.7b).
5. G is the collar roll line, half of D to E.
6. From G measure down to H the desired width of collar plus 6mm.
7. Apply the shoulder measurement B to C, from F to I.
8. Join H to I.
9. Square across from E to J the back neck measurement D to F.
10. Join I to J.
11. Cut out the back collar section then join point B to I and match the shoulder line around points C and J, blend across the shoulder line and neck points (Figure 3.7c).
12. The half collar is A- C/J-E-H-B/I-A.

A number of areas are open to debate with this collar drafting method. Firstly, it is assumed that the curvature of the body neck line will be compatible to a well formed collar and its break line will be commensurate with its designed position above the centre back neck line. Although the centre back line stand height is given a definite measurement at this location, it is only at this position that the break line has any specific setting; there is no indication to its passage to the centre front. Next, it can be seen from Figure 3.7, 'C' that, unlike the outer edge line, the collar neck lines do not align correctly, forcing an alteration in shape and length to the collar neck line. The newly formed neck line shape is open to personal interpretations of shape which may lead to distortions in the entire collar. Once again this is a drafting method that results in an anonymous outer collar shape with obscure internal features yet to be revealed.

Unconventional stand and fall collar drafting, full-roll (Pepin, 1942)

As well as having an intriguing drafting method for the half-roll collar, Pepin (1942, p.152 no.7) also has a unique way of producing a full-roll collar (Peter Pan). As can be seen in Figure 3.8, the back collar sits flat and in complete accord with the back neck of the garment, whereas the front collar does not. The shallow concave shape of the front collar neck line contrasts with that of the deep concave curve of the garment neck line therefore it is the front of the collar that produces the roll, not the back.

'It is this shallow curve, sewed to the deep curve of the garment neck line which produces the roll around the neck'. Pepin (1942, p.152).

The drafting instructions (Source: Pepin (1942) with alterations of text for standardisation), for the stand and fall collar (full-roll) are as follows:

1. Draw around the front pattern and extend the shoulder line A to B (Figure 3.8).
2. Match the back neck point C with the front neck point at B, allowing the back shoulder line to match the extended front shoulder line.
3. Draw around the back pattern.
4. Decide on the full width of collar (10cm) from D to E. make E to F parallel to C to D.
5. Continue the neck line, from D to C, to G and beyond.
6. Measure the front neck gorge from B to G and apply the measurement along the collar neck line from C past G to H.
7. Delineate the front style line from H to I (the same width as D to E) and join I to F.
8. The half collar is H-I-F-E-D-C/B-G-H.

'It is suggested that you try this same type of collar in varying widths and with a variety of front shapes. You will then be able to observe its limitations' (Pepin, 1942; p.152).

Unfortunately these limitations are not discussed or hinted at. To find out what those limitations are requires trials of a considerable number of the various collar shapes and sizes within and possibly beyond the capabilities of this collar group. Firstly, as with other drafting methods, the body neck line is taken as correct and is, presumably, the

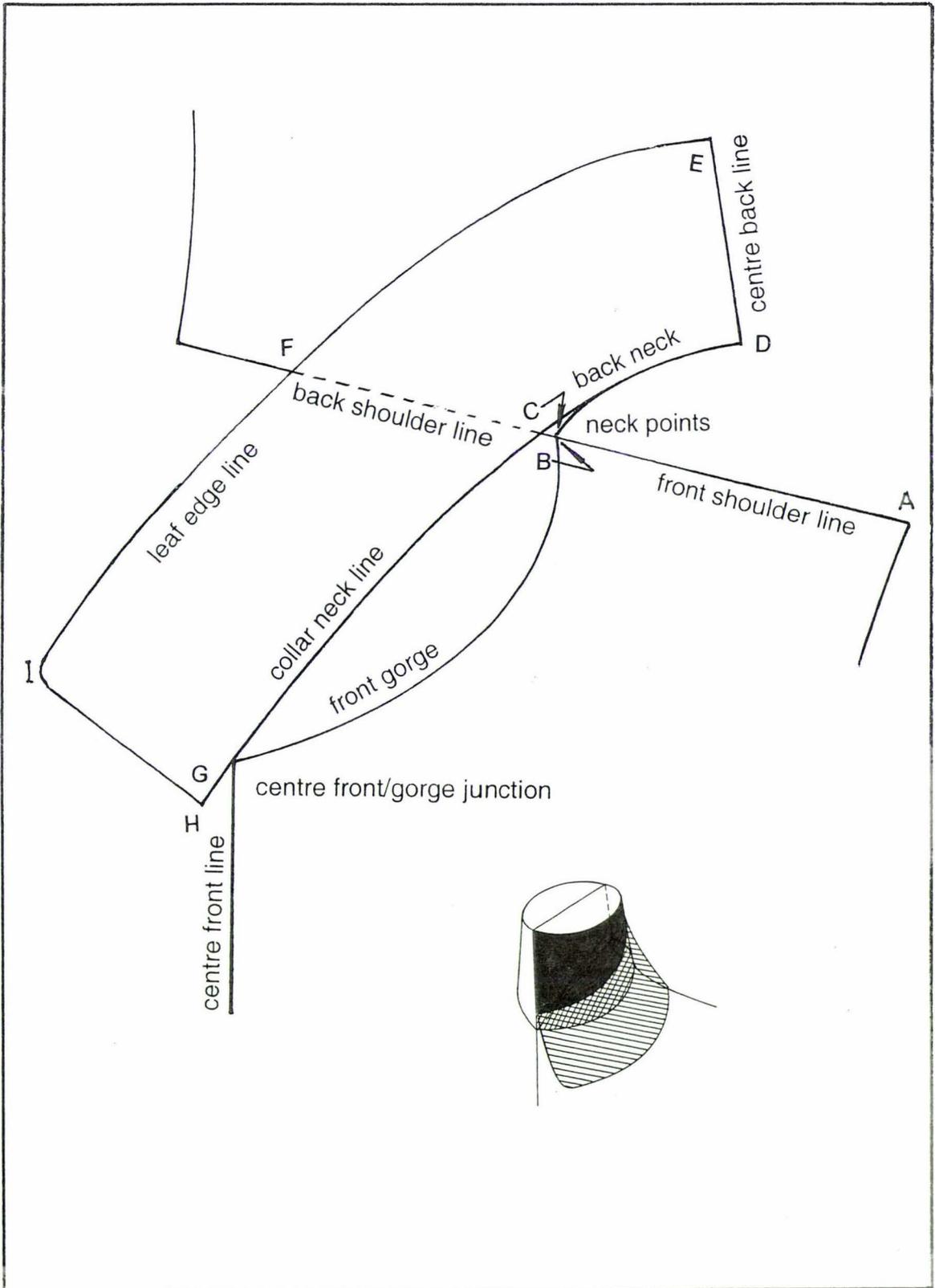


Figure 3.8 Unconventional stand and fall collar drafting: Full-roll.
 (Source Pepin, 1942) (Drawing source: © M. Campbell).

best position and shape; is this assumption correct? If not what will be the final collar shape? The back collar section is delineated as though constructed for a 'flat' collar with no additional stand section allowances, which begs the question; how can the full width of the initial collar be decided?

When outlined, the length of the back section of the leaf edge can be measured, but the information is of little use because its final resting position on the body is not known and will not be known until the collar is made up. (The back collar section has been constructed as a flat collar, not the required stand and fall type). There is a similar ambiguity with the front collar section leaf edge which means that the entire stand and fall widths will not be known until the collar is finally constructed in fabric; neither, of course, will be the position of the break line.

What can be expected of the final collar shape, size and quality from trials of this drafting practise? Pepin (1942) suggests that only tests will confirm the limitations of this collar drafting technique; however, some limitations, noted above, are apparent throughout the initial draft, notwithstanding the final collar which will, no doubt, show more defective areas; so why continue with more trials of a defective drafting method?

Unconventional stand and fall collar drafting (Shoben and Ward, 1990)

The depiction of the Shoben and Ward (1990, pp.128-130) stand and fall collar draft (Figure 3.9) shows the stand (dotted area, Figure 3.9a), the break line and part of the collar fall sections extending above the back and front body patterns into the neck circle line. Figure 3.9b defines the traced-off collar ready for cutting lines (Figure 3.9c). With this type of collar layout two (neck line and leaf edge line) of the three required lengths are known, as opposed to the usual one. But, until the wedge manipulations have been constructed (Figure 3.9d) their shapes are still tenuous.

The drafting instructions (Source: Shoben and Ward (1980) with alterations for standardisation for the stand and fall collar (roll at the back, flat at the front) are as follows:

1. Draw around the front pattern and lower the front gorge 5mm (Figure 3.9a).

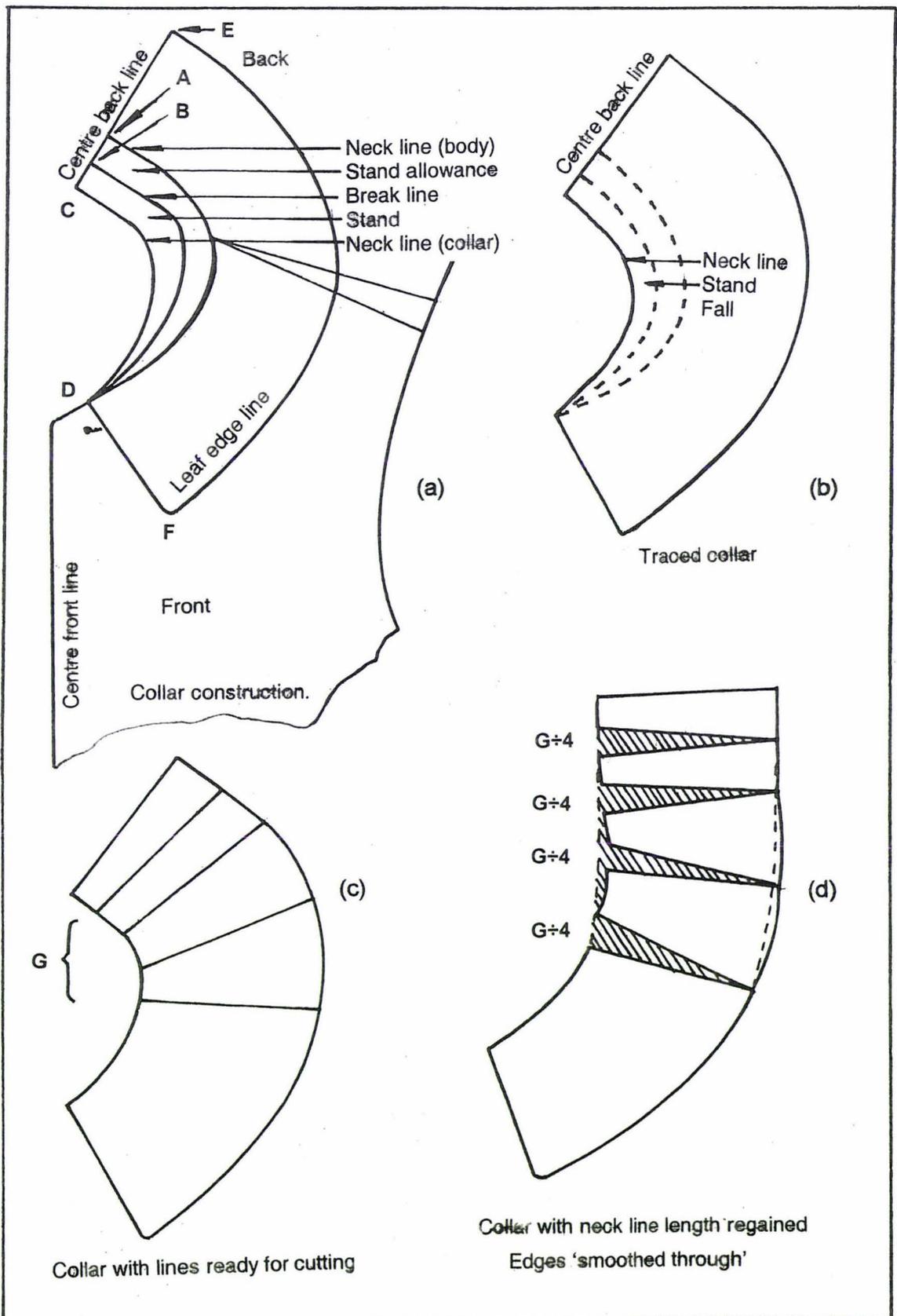


Figure 3.9 Unconventional stand and fall collar drafting:
 Stand drafted above the neck line. (a) Draft set-up. (b) Traced off collar. (c) Collar with cutting lines. (d) Final collar with wedges.
 (Source: Shoben and Ward (1990) (Drawing source: © M. Campbell).

2. Join the back to the front at the neck points.
3. Overlap the shoulders 1cm.
4. Draw around the back pattern.
5. Add the stand height (2.5cm) from A to B then add the same amount from B to C.
6. Draw the collar neck line from C to D.
7. Draw the crease line from B to D.
8. The fall width is B to E (7.5cm).
9. Draw the leaf edge, E to F, parallel to line B to D.
10. Trace off the collar pattern (Figure 3.9b).
11. Divide the collar into five sections and cut down the four lines (Figure 3.9c).
12. Measure the neck line from A to D.
13. Measure the collar neck line from C to D.
14. Take away C to D from A to D and divide by four to get G (shaded areas).
15. Open the four cut lines to equal G (Figure 3.9d).
16. Smooth through the neck and leaf edge lines.

There is more logic in placing the stand section above the neck line rather than the usual situation below the neck line, and, of course, in the position of the break line which might allow the collar to set in a more harmonious manner than is usually the case. There is no vagueness as to the resting place of the leaf edge as it is not cut and overlapped or interfered with in any way; it is set exactly in its intended position, the fall section being defined and set with more exactness than is customary. There is now more drafting information than is normal for this type of collar, however, the placement of the wedges (cut lines), to regain the neck length, and their sizes are not explained. Since the collar has to be harmonious with the neck column and the body, the placement of the cutting lines and the amounts wedged into them are important. As there is no exact location for the wedges they could be placed in either the right or wrong locations and may be of incorrect widths; why are they of equal width when the neck is not symmetrical? The straighter back section of the neck line will only need a small proportion of the necessary neck line length compared to the more curved front neck line section and there could also be other hidden discrepancies to account for the irregularities found in the collar trials. The dilemma for the designer is; how to find these irregularities, how to deal with them and how much deviation from the instructions is permissible without further distorting the collar. As is normally the

situation, the position and shape of the neck line is not addressed. Of course, during these deliberations and alterations the procedure may gradually lead to the development of a new set of drafting instructions.

Whilst representing an improvement over the other methods with regard to the increased amount of information offered, the problem with the Shoben and Ward (1990, pp.128-130) system is that it is not accurate enough nor does it go far enough to answer all of the questions required of a good collar drafting system. There is still a lack of information, especially for the inexperienced student or practitioner, as to how the neck line was established, why the cut lines are positioned as they are and why they are all opened by the same amounts in a regular pattern. Also, the exact shaping and size of the stand, and therefore the break line and the fall section, is open to too much interpretation; nor is there enough instruction with which to create and build both a single and comprehensive collar development system without encountering problems.

3.1.5 Conventional shirt collar drafting (two methods)

The most comprehensive study of shirt collars is to be found in *Il Collo* (no date). However, the usual conventional shirt collar drafts are not so informative. Conventional shirt collars are not drafted as a superimposed union with the front and back patterns but as a separate component using measurements from those two pattern pieces. They may be constructed as a combined stand and fall (one piece collar) or as two sections of stand and fall (two piece collar). Both are described below.

Conventional shirt collar drafting (one piece)

The one piece shirt collar (Figure 3.10) fits closely, although not as well as a two piece collar, around the neck and fastening at the throat. A collar button-wrap extension is added to match the button-wrap on the front edge of the forepart pattern.

The drafting instructions (Source: M. Campbell) for the shirt collar (one piece) are as follows:

1. Draw a horizontal line A to B to represent the $\frac{1}{2}$ neck length (Figure 3.10).
2. Square across from A and B.

19. Join K to L.

The centre back line, F to K is a mirrored line.

A number of points concerning this drafting process (to be found in Chaudhry, 1970, p.15; Pepin, 1942; p.154) are noteworthy. The collar neck line, although precisely delineated may not be compatible with the body pattern neck line, especially if they are from alternative drafting sources. There is no indication as to the 'real' location of the break line (only the quoted breakdown measurements at stage 15) which could also be influenced by the fit of the neck lines as they are sewn together. Changes to the position of the break line means a transformation of the stand and fall ratio. The concave curvature of the neck line gives the leaf edge a certain amount of extra length opposite and around the shoulders where it is needed, whereas the reverse curve gives a tightness and formal appearance at the front region.

Conventional shirt collar drafting (two piece)

The two piece shirt collar (Figure 3.11) follows on from the one piece shirt collar (Figure 3.10) with additional information to form the new shape and separation break lines (see Erwin, 1969; p.102 and Aldrich,1980; p.57 for alternative methods).

The drafting instructions (Source: M. Campbell) for the shirt collar (two piece) are as follows:

1. M from F is the stand width, 2.5cm (Figure 3.11).
2. N from M is 1cm.
3. Square across from M and N.
4. Join M to J following the curvature of the neck line F to G.
5. Draw a concave line to join N to J.
6. O from K is 1cm.
7. Square across from O.
8. Join O to L.

The stand section is bordered by F-H-G-J-M-F.

The fall section is N-J-L-O-N.

The centre back lines, F to M and N to O, are mirrored lines.

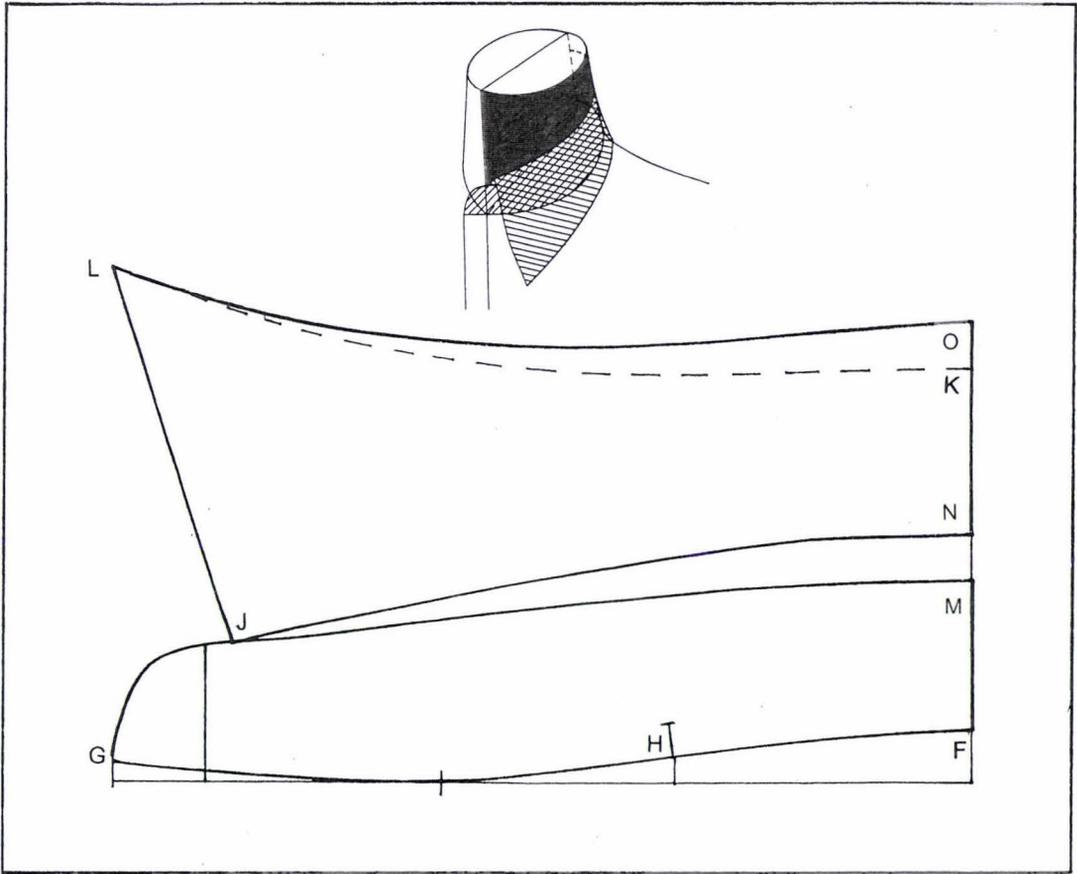


Figure 3.11 Conventional shirt stand and fall collar drafting: Two piece.
 (Drawing source: © M.Campbell).

The concave break line of the fall and the curved stand section endow the collar with a more compatible shape for the neck it has to fit, giving a better all-round fit when compared to that of the one piece collar. However, the same difficulties and ambiguous possibilities of the body neck line and break line positioning and stand and fall widths exist in this collar as are experienced in the former collar shape except, perhaps, to a lesser degree because of the extra separate, stand and fall, shaping qualities.

3.1.6 Conventional convertible collar drafting (one method)

The convertible collar is based on the normal round gorge neck line, and as the name suggests, is really two collar styles in one; the first has a fairly low fastening lapel when worn in an open attitude, the other fits, without a lapel, in a higher manner closer to the neck.

Conventional convertible collar drafting (Tuit, 1974)

It is expected that the higher button position, with this type of collar, will result in a raised posture for the collar resulting in a wider stand and a narrower fall section. Because there might be an inclination for the neck line to show below the centre back leaf edge an extra fall width allowance may have to be added to compensate.

Figure 3.12 is the second of two convertible collar methods of drafting described by Tuit (1974), and is expressed as having a curved neck line '*...and a straight roll line, which gives a better fit*' (Tuit, 1974; p82).

The drafting instructions (Source: Tuit (1974) (with alterations for standardisation) for the convertible collar (one piece) are as follows:

1. Draw a rectangle, A, B, C, D (Figure 3.12).
2. A to B is the $\frac{1}{2}$ neck line length minus 0.6cm; this line also forms the break line.
3. A to D and B to C equal the fall width.
4. Join C to D.
5. A to E is the $\frac{1}{2}$ back neck length.
6. Square both ways from E.
7. F is located on the leaf edge line.
8. A to G is 2.5cm for the stand width.
9. Square across from G.
10. Curve the collar neck line from just beyond the line squared from E (shoulder line) to the front at B. The centre front may be extended to form any shape of collar required.

The stand for this particular collar style is 2.5cm, tapering to zero centimetres at the centre front, the fall being described as 'that which is required' (Tuit, 1974; p. 82), although there is a previously illustrated collar with a stand equal to approximately half the centre back width. Judging by the shorter length of the leaf edge, as opposed to the neck line length and shape, this will be a very tight collar when fastened in the higher 'closed' position with a possible tendency for the break line to roll higher and, depending on the stand to fall ratio, expose the neck line seam.

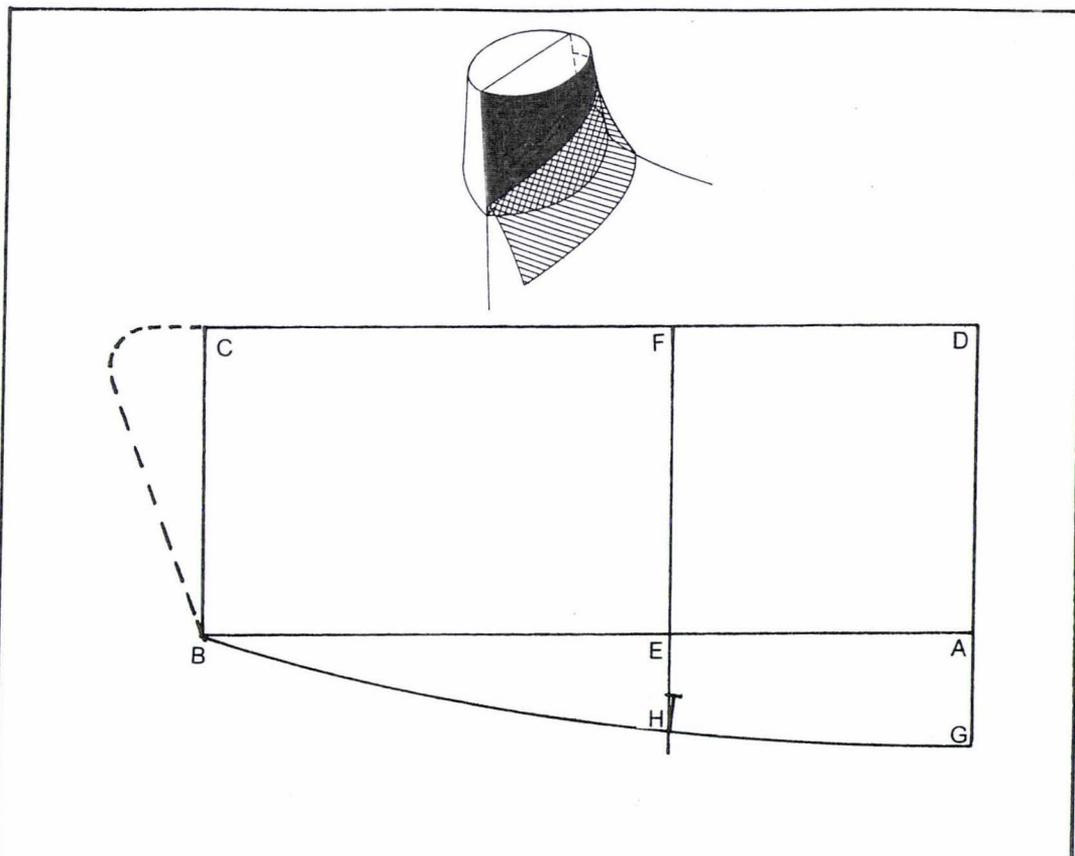


Figure 3.12 Conventional convertible stand and fall collar drafting: One piece.
 (Drawing source: © M. Campbell).

For the collar to successfully fold, with a straight break line, the stand and fall collar sections at the centre back would have to be of equal, or very near equal widths. When this is not the case, the fall being wider than the stand, the break line will adjust position to compensate, changing the stand to fall ratio in the process. To design a collar with a wider fall, the leaf edge would have to be made longer, with the introduction of extra length wedges, to allow the leaf edge to echo its length around the body sections, causing a curvature of the break line, a procedure not mentioned in the drafting text. No position is given for the top button placement when it is worn open (I suggest that when the collar toile is folded to form a break line, the end of the break line will automatically be the position for the top button; wherever that may be). Waiting until the toile stage is a random or unplanned method of designing not suited to predictable products.

3.1.7 Conventional tailored jacket collar drafting (one method)

There is a number of drafting method variations to achieve a tailored collar pattern. They have either a correct length break line with a need to stretch the leaf edge to the required length, or a too-long break line (which will possibly need to be addressed) and an adequate length of leaf edge. The former collar drafting method is labour intensive during the manufacturing process, whilst the latter might need extra work in the design room, to produce a two piece (split) collar pattern to reduce the break line length.

Conventional tailored jacket collar drafting (one piece)

This one piece drafting method chosen to demonstrate the tailored collar drafting technique (Figure 3.13) is a personal method conceived a number of years ago. It follows customary lines (e.g. Chaudhry, 1970; Aldrich, 1980) containing some of the normal defects found in numerous drafting examples, such as the shape of the neck line, the 'angle' at the neck point, the amount of 'spring' for the required leaf edge length and the position of the lapel break line. Some of these faults are discussed in the text following the drafting instructions.

The drafting instructions (Source: M. Campbell) for the tailored jacket (one piece) collar are as follows:

1. Decide on the stand and fall widths (2.5cm and 3.5cm respectively) (Figure 3.13).
2. Mark around the front pattern and add a 2cm button wrap at 'A' (button 1, 2 or 3).
3. Measure 2.5cm from the neck point to 'B' (stand width).
4. Join A to B and extend the line beyond B for the break line.
5. Draw a 5cm line (parallel to the break line) from the neck point to C.
6. Delineate the required lapel shape C-D-E-F-A.
7. Draw the collar step from E to G.
8. B to H is the half back neck length.
9. Square 1.5cm from H to I.
10. Join I to B.
11. Square across from I to locate J (2.5cm stand) and K (3.5cm fall).
12. L is 2.5cm from B and M is 3.5cm from B.
13. Join J to L and K to M.
14. Curve the collar break line from D to I.

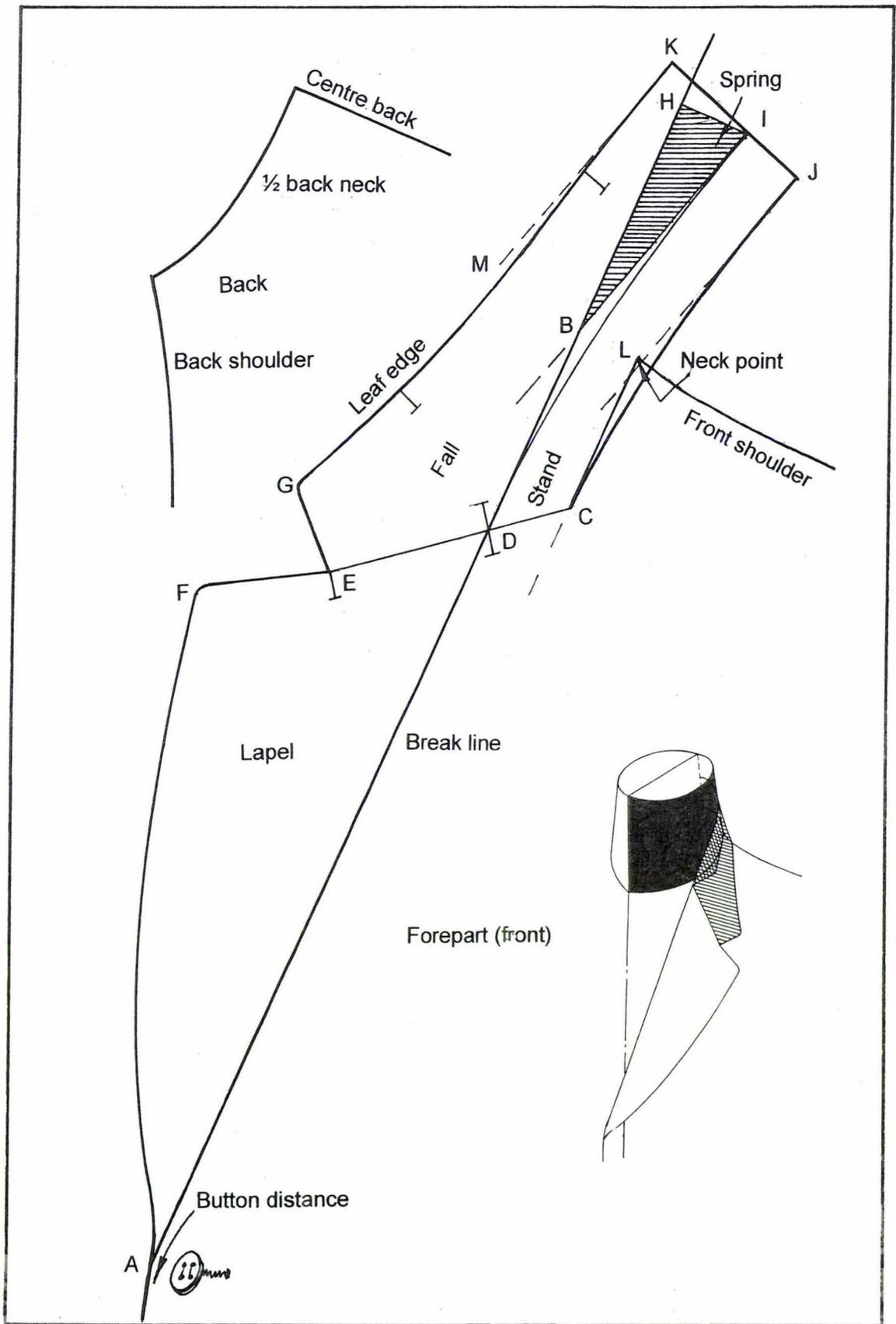


Figure 3.13 Conventional tailored jacket stand and fall collar drafting: One piece.
 (Drawing source: © M. Campbell).

15. The line curved from C to J is parallel to D to I
16. Draw the leaf edge line from G to K.
17. The half under collar is C-D-E-G-K-I-J-C.

One of the more conspicuous defects is found in the treatment of the front gorge; there is no attempt to follow the natural curve of the neck line, its location which, incidentally, has not been confirmed without doubt. This results in the formation of a point at the neck/shoulder line junction and the source of a defect found on the break line directly opposite. The position of the lapel break line, and therefore the collar break line, is open to doubt as its calculated location opposite the neck point is incorrect. The amount of 'spring' (refer to list of definitions) is quoted as an accurate figure which can only be calculated after a toile has been made. Why could this information not be available before the trial? Because of the insertion of 'spring' the break line has been instilled with extra unnecessary length which might have to be reduced by some means, although by how much is uncertain. Although the stand and fall have recognised widths they could be open to modifications since the leaf edge has not been checked to its final location on the front and back patterns.

According to the Collins Dictionary and Thesaurus (1989, p. 1023), 'Tailor-made' is defined as '*perfectly meeting a particular purpose*'. In this instance there is a lack of perfection to the tailored collar drafting instructions outlined above. A good deal is left to be dealt with the end of the whole process, at the toile stage.

3.1.8 Conventional shawl collar drafting (one method)

The under collar drafting procedure (not illustrated) for the tailored shawl collar closely follows the draft for the tailored step collar (Figure 3.13), the difference being in the outer edge which has a continuous line from the top button position at 'A' through 'F' and 'G' to the centre back line at 'K'. The outer edge, being a design line may be any outline appropriate for the style.

3.1.9 Conventional overcoat collar drafting (three methods)

Under collar patterns for tailored overcoats (Figure 3.14) have much wider falls than the one piece tailored jacket. Still, they may be constructed (drafting diagrams without full text) in almost the same manner.

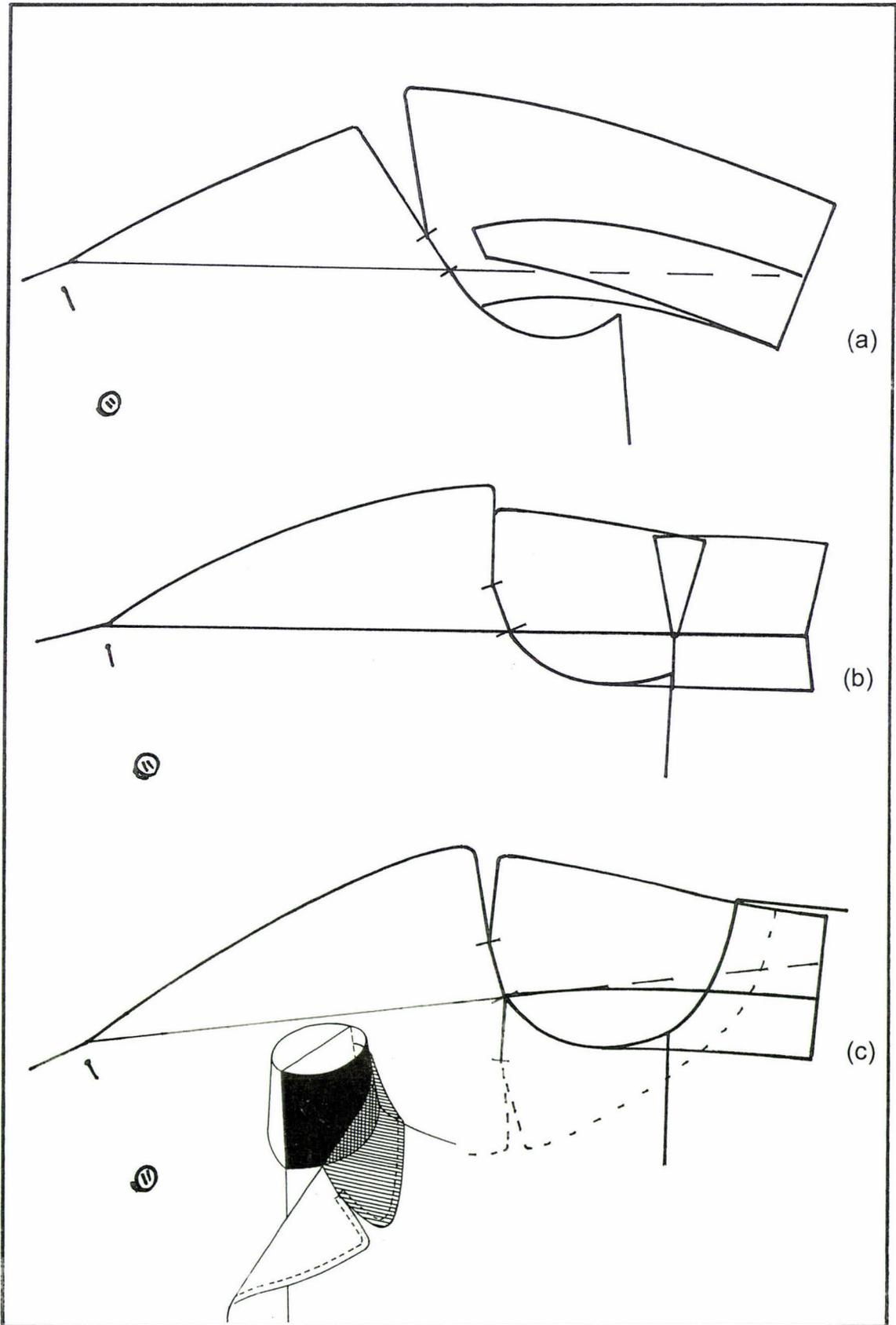


Figure 3.14 Conventional overcoat stand and fall collar drafting: One and two piece. (a) Two-piece (parallel to break line). (b) Two-piece (vertical, opposite neck point). (c) One piece collar.
 (Drawing source: © M. Campbell).

Conventional overcoat collar drafting (one and two piece)

Because of the difference in the ratio of stand to fall and the much longer length that the leaf edge has to traverse, compared to the neck line, the break line has lengthened significantly at a rate dependent on its position between the neck line and the leaf edge. Three solutions are presented to alleviate the problem of extra break line length in overcoat collars.

The drafting instructions (Source: M. Campbell) for the overcoat collars (one and two piece) are as follows:

1. Draft a split, two piece collar (Figure 3.14a).
2. Split the under collar across its width at the shoulder line and introduce length into the leaf edge, maintaining the break and neck line lengths as shown in Figure 3.14b.
3. Reduce the centre back break line, whilst retaining the neck and leaf edge lengths also shown in Figure 3.14c.

There are problems related to each of the three procedures (Figure 3.14). The first problem concerns all three options to reduce the break line length, and that is the position of the garment neck line, there is no guarantee that it will be in the most appropriate position for the collar configuration. The next problem concerns the position of the break line. Should the collar be one piece with a longer break line, or be split into two sections of stand and fall? Splitting the collar along the break line produces two curved lines, should they both be curved and if so why? Should they be separated along the break line or behind the line, if so how far behind the line?

The third alteration choice relates only to the under collar (the top collar would need, perhaps, to revert to the split collar method); shaping the centre back line to reduce the break line length produces too many irregularities as described in Section 2.4.11. Splitting the collar across its width at the shoulder line can also only be accomplished on the under collar, the top collar needing its leaf edge stretched to compensate.

3.1.10 Conventional Regency overcoat collar drafting (one method)

This type of collar and coat is available in a number of guises. Kawashima (1977) gives the following names: Regency (pp.60-61), Redingote (pp.64-65), Bonaparte (pp.94-95), whilst Shoben and Ward, (1990) uses 'Trench coat' (pp.138-141). These collars are available in either one or two pieces.

Conventional Regency overcoat collar drafting (Kawashima, 1977)

The following drafting procedure (Figure 3.15) is taken, with minor adjustments to convert from Imperial measurements to their metric equivalent, from Kawashima, 1977; pp.194-197:

The drafting instructions (Source: Kawashima (1977) (with alterations for standardisation) for the Regency (trench coat) collar (two piece) are as follows:

The collar fall section is.

1. Draw around the front pattern (Figure 3.15a).
2. Establish the button wrap at A, 8cm from the centre front line, in line with the depth of scye line.
3. B is the front break line position.
4. C is the front neck point.
5. D is the end of the gorge line.
6. E is $\frac{1}{2}$ C to D.
7. F is 13mm from E.
8. Join B to F and extend (break line).
9. G is the front gorge extended from D to B.
10. G to H = 4cm.
11. Join F to H.
12. Extend the front shoulder to find I on the break line.
13. I to J = $\frac{1}{2}$ the back neck measurement minus 1cm.
14. Square across 4cm from J to K.
15. J to L = 6cm.
16. Join K to L (square from this line).
17. K to M = 8cm.
18. H to N = 4cm.

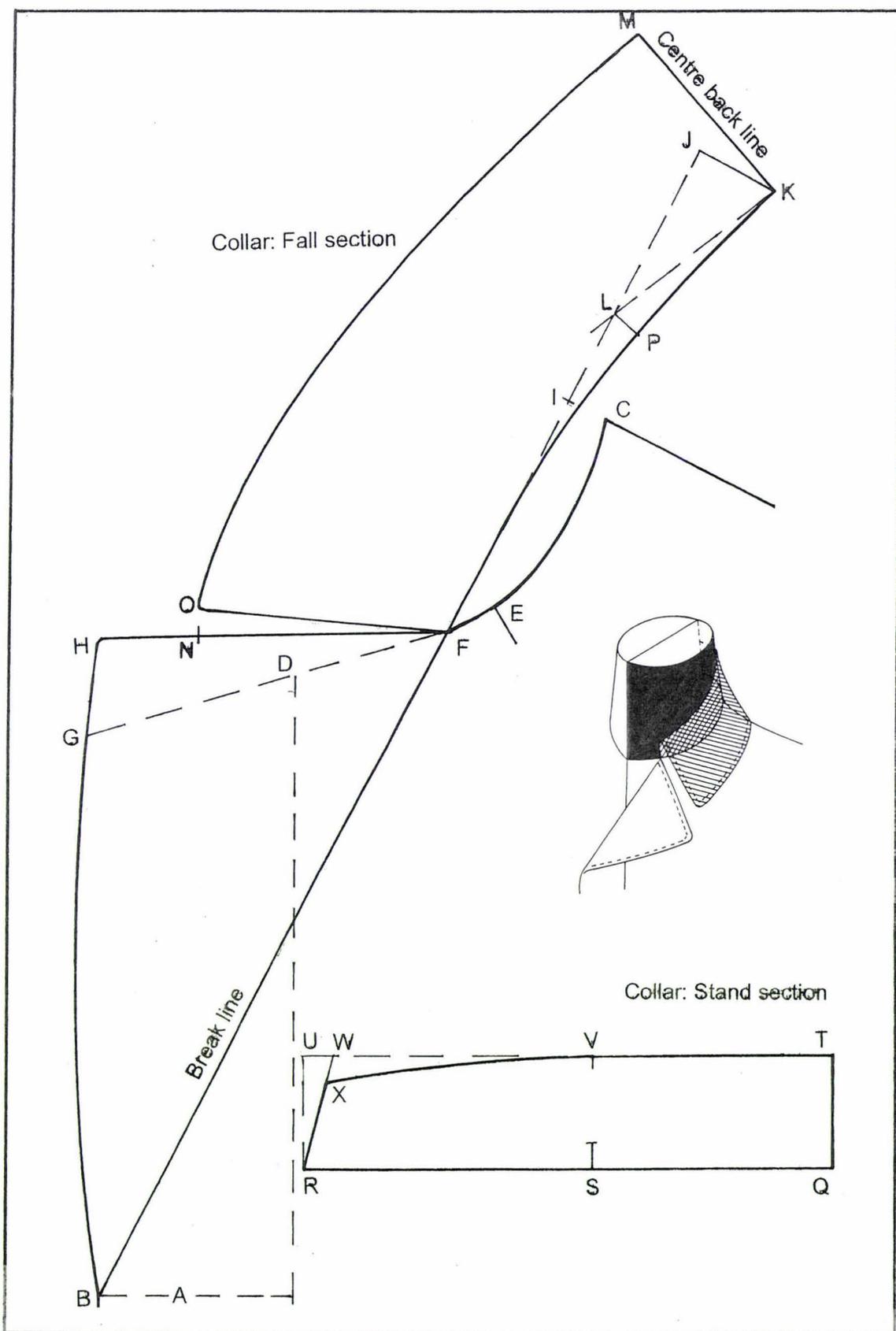


Figure 3.15 Conventional Regency overcoat stand and fall collar drafting:
Two piece. (a) Fall section (b) Stand section.
 (Drawing source: © M. Campbell).

19. N to O = 6mm.
20. Join O to F and O to M.
21. L to P = 6mm.
22. Curve the line K-P-F.

The collar stand section is:

23. Q to R = $\frac{1}{2}$ back neck length + the pattern neck line from the shoulder C to F.
24. Q to S = $\frac{1}{2}$ back neck length.
25. Q to T and R to U = 4cm.
26. Join U to T.
27. V is opposite S.
28. U to W = 13mm.
29. Join W to R.
30. W to X = 13mm.
31. Join X to V with a curved line.

The usual collar drafting problems related to all of the elements occur within this method. The resting position and length of the leaf edge on the body as opposed to the collar leaf edge length, the body neck line position as well as the lapel break line are all uncertain until the collar is made and placed around the mannequin neck.

There has been an attempt by Kawashima (1977, pp 196, 197) to reduce the collar break line by constructing the under collar in separate stand and fall parts although the reason for the curvature of the front section of the stand break line is not given. It is assumed that the reason that the collar fall is constructed on the same break line as the lapel is to make the draft easier to follow, even though the collar stand section is raised above point 'F' on the gorge.

3.2 General problems related to contemporary collar drafting methods

Throughout the collar making procedure there are almost as many problems and questions associated with collars as there are collars, many of them not documented. Whether it is in the design, pattern-making or manufacturing process all these problems have to be considered at some time or other. The aesthetics and functional criteria (such as weather considerations) of a collar contain proportions, function, fit, ease and fabric constraints as well as quality levels that depend in part on the collar

draft. The nearer to the conception stage of collar designing that errors can be found the better, as errors tend to compound throughout the entire trialling process.

In the majority of contemporary drafting methods the centre front and centre back lines of the body patterns are located in their respective fixed positions, along with their upper termination points at the neck gorge contour line. The centre front closure height position is easily determined for the design, usually the top button position; the top centre back and shoulder neck points, although related, are more ambiguous. Incorrect placement of the garment neck line can have a detrimental effect both on the collar, and the garment as a whole; but is only one of the many problems found in current drafting methods. Designing collars can be a difficult undertaking if pattern-makers have to follow and question at each step someone else's drafting methods. Problems arise because the end product silhouette is not without its doubts, even if the draft is accompanied by a design sketch it may only give an indication of the product; it may not be the required size, shape, width or length. After reviewing the drafts described above, it became apparent that not all problem areas are explained, leaving a considerable number of questions to be answered.

General questions pertaining to drafting methods that should be asked are:

- How should the drafting technique be chosen and will the draft be compatible with my personally drafted neck line?
- How is the exact 'required' collar shape produced from any given draft, and how does a change in design, shape and size (e.g. width of stand and fall) change the method/instructions needed to produce the draft?
- Is it possible to design a drafting system that can predict the final form and fit of a collar prior to manufacture?

3.3 Collar element analysis and discussion

The collar is divided into a number of sections and elements that are changeable in length, width, shape and position with each design change in collar type and style. Each section has its own set of problems which are exacerbated as they are combined and altered for certain affects. As a rule, all of the design elements that contribute to a

collar's values should be identified so as to give a succession of inescapable consequences. As the percentage of elemental predictabilities diminishes and the number of in-determinates increases so too does the probability of a worthy conclusion. The one element that should be a known factor in all the collar drafts reviewed is the neck line. However, this should not be automatically assumed. The collar neck line has to fit and be compatible with the body pattern neck line, so it is of prime importance to have this line absolutely correct. When a collar does not set in the required manner it is natural to assume that it is the collar that is at fault; however, collars are not always to blame and should not be thought of as compatible or attuned to just any neck line. Sytner (1955; p. 83) shows that some neck lines can be unsuitable for a collar style. These problems generally do not show until the toile stage, although a 'pointed' neck line at the shoulder junction is self evident, whether through ill-balanced front and back body patterns or because of the placement or shape of the neck line. It is, therefore, (according to Sytner, 1955) the body pattern neck line that is changed to help accommodate the collar, not the collar to oblige the neck line. There are times when a compromise is necessary, when this is the case the collar may have to be altered to better fit the neck (e.g. when the body neck line is lengthened). These are circumstances that illustrate my supposition that neck lines cannot be taken for granted and that in all instances they are an unknown element until the collar is attached. If body neck lines are questionable then all of the elements that make up the collar are suspicious.

Table 3.1 describes the collar design elements and the criteria of each. It is important for the formulation of a new drafting system that each of the elements, in both the collar and the body sections, are known. Without this certain knowledge a drafting system cannot have predictable collar making outcomes. Table 3.2 gives a breakdown of the design elements involved in each of the drafting methods reviewed, and shows which elements are known **beyond any doubt** (i.e. logically planned). (Except for the body neck line, the 'balance' of the front and back body patterns has not been questioned as this is outside of the scope of this thesis). Most of the reviewed drafting methods are deficient in a considerable proportion of the elements considered. It is vital that all the underlying design elements are of a harmonious nature with a defined position and depiction of shape, inclination and length. When this is not so problems in the drafting method occur that are, sometimes, difficult to correct without recourse to significant alterations to drafting procedures. The highest percentage of elements that are defined,

occur in the simple flat collar drafts (100%, if the collar were not altered to give a slight stand). This proportion becomes reduced in the more complex collar drafts because these have more elements to consider.

Table 3.1 Collar design elements and their criteria

| Elements→ Criteria↓ | Neck line (body) | Neck line (Collar) | Stand | Break line | Fall | Leaf edge |
|------------------------|---|-----------------------|-------|------------|------|-----------|
| Position. → | The final undoubted position of the particular element. | | | | | |
| Shape. → | The element shape is definite and not subject to later changes. | | | | | |
| Width. → | Ensuring the correct width of the element. | | | | | |
| Length. → | Assuring the length of the element. | | | | | |
| Fit (3D). → | Certifying fit (tight, loose, close to, or at a distance from the neck) | | | | | |
| Silhouette. → | Envisaging the 3D collar at the design stage. | | | | | |

Table 3.2 Known/unknown design elements in review of collar drafts

KEY: = Known. = U/K Unknown. = N/A Not Applicable.

| Figure 3.1a | | Flat collar: Straight shoulder lines. | | | | |
|------------------|----------------|---|--------|-------------|-------|------------|
| Figure 3.1 b | | Flat collar: Contoured shoulder lines. | | | | |
| Elements. | Body neck line | Collar neck line | Stand. | Break line. | Fall. | Leaf edge. |
| Position. | Known | Known | U/K | U/K | U/K | U/K |
| Shape. | Known | Known | U/K | U/K | U/K | U/K |
| Width. | Known | N/A | U/K | N/A | U/K | N/A |
| Length. | Known | Known | U/K | U/K | U/K | U/K |
| Fit (3D). | Known | Known | U/K | U/K | U/K | U/K |
| Silhouette (3D). | Known | Known | U/K | U/K | U/K | U/K |
| Figure 3.2 | | Mandarin: Stand collar. | | | | |
| Elements. | Body neck line | Collar neck line | Stand. | Break line. | Fall. | Leaf edge. |
| Position. | U/K | U/K | U/K | N/A | N/A | U/K |
| Shape. | U/K | U/K | U/K | N/A | N/A | U/K |
| Width. | U/K | N/A | Known | N/A | N/A | N/A |
| Length. | U/K | U/K | Known | N/A | N/A | Known |
| Fit (3D). | U/K | U/K | U/K | N/A | N/A | U/K |
| Silhouette (3D). | U/K | U/K | U/K | N/A | N/A | U/K |
| Figure 3.3 | | Stand and fall collar: Slight roll (Back roll with flat front). | | | | |
| Figure 3.7 | | Stand and fall collar (slight roll). (Pepin, 1942). | | | | |
| Figure 3.8 | | Stand and fall collar (roll all round). (Pepin, 1942). | | | | |
| Figure 3.9 | | Stand and fall collar (slight roll). (Shoben & Ward, 1990). | | | | |
| Elements. | Body neck line | Collar neck line | Stand. | Break line. | Fall. | Leaf edge. |
| Position. | U/K | U/K | U/K | U/K | U/K | U/K |
| Shape. | U/K | U/K | U/K | U/K | U/K | U/K |
| Width. | U/K | N/A | U/K | N/A | U/K | N/A |
| Length. | U/K | U/K | U/K | U/K | U/K | U/K |
| Fit (3D). | U/K | U/K | U/K | U/K | U/K | U/K |
| Silhouette (3D). | U/K | U/K | U/K | U/K | U/K | U/K |

| Figure 3.10 | | Shirt stand and fall collar (one piece). | | | | |
|--------------------------|----------------|--|--------|-------------|-------|------------|
| Elements. | Body neck line | Collar neck line | Stand. | Break line. | Fall. | Leaf edge. |
| Position. | U/K | N/A | U/K | U/K | U/K | U/K |
| Shape. | U/K | U/K | U/K | U/K | U/K | U/K |
| Width. | U/K | N/A | U/K | N/A | U/K | N/A |
| Length. | U/K | Known | U/K | U/K | U/K | U/K |
| Fit. | U/K | U/K | U/K | U/K | U/K | U/K |
| Silhouette (3D). | U/K | U/K | U/K | U/K | U/K | U/K |
| Figure 3.11 | | Shirt stand and fall collar (two piece). | | | | |
| Figure 3.12 | | Convertible collar (one piece). (Tuit, 1974) | | | | |
| Figure 3.13 | | Tailored stand and fall collar (one piece). | | | | |
| Figure (not illustrated) | | Shawl stand and fall collar (one piece). | | | | |
| Figure 3.14a,b,c | | Overcoat stand and fall collar (one and two piece). | | | | |
| Figure 3.15 | | Regency stand and fall collar (two piece). (Kawashima, 1977) | | | | |
| Elements. | Body neck line | Collar neck line | Stand. | Break line. | Fall. | Leaf edge. |
| Position. | U/K | U/K | U/K | U/K | U/K | U/K |
| Shape. | U/K | U/K | U/K | U/K | U/K | U/K |
| Width. | U/K | N/A | U/K | N/A | U/K | N/A |
| Length. | U/K | U/K | U/K | U/K | U/K | U/K |
| Fit. | U/K | U/K | U/K | U/K | U/K | U/K |
| Silhouette (3D). | U/K | U/K | U/K | U/K | U/K | U/K |

3.3.1 Collar neck line

As can be seen from many drafting books (e.g. Aldrich, 1985; Joseph-Armstrong, 1995; Bray, 1985; Kunick, 1967; Morris, 1947; Pepin, 1942; Shoben and Ward, 1990) necklines can differ in position, shape and length with each variance in collar design and centre front opening position. All of the possible shapes available to a collar cannot be compatible with the same neckline, nor give the best end product, and perhaps few are really in harmony. This may, or may not matter when making collars in a creative, manipulative manner (modelling). However, wholesale apparel and mass production need methods that are to be engineered rather than being artistically shaped. As each centre front opening is at a different height should the remainder of the neck line also be at different heights and positions to allow for the different body/neck contours? None of the drafting methods reviewed in section 3.1 mentions the position of the neck line.

Questions to be asked when designing the neck line are:

- How should the collar necklines be established?
- Does an inferior body neck-line shape and placement contribute to collar distortions?
- Does each design and type of collar have its own specific neckline position, shape and 'plane'; if so what should it be?

- If a collar has to be designed for its own neckline, what happens when some constructed away from the neck?
- What happens to a collar when transferring between different drafting systems and their different garment neck shapes?
- Is there an ultimate amount of convex or concave curvature for the neckline of different types of collar?
- How do leaf edge positions, lengths and shapes have a bearing on the shape of the collar neck line?

3.3.2 Collar leaf edge line

There are a number of methods to manipulate the leaf edge to produce a new style or a different collar type (e.g. Kunick, 1967; Cabrera, 1984; Morris, 1947; Shoben and Ward, 1990). The leaf edge may be stretched, as in a tailored collar, or the reverse, have the shoulder ends overlapped (as depicted in Bray (1985, p.82) and in Figure 3.3 of the drafting section 3.1), cut open at different sites with the intention of reducing the leaf edge length (Figure 3.4), or cut open at various points and length added (Figure 3.6). Few drafting books give the leaf edge lengths and shapes for all types of collars, even though a leaf edge will only sit comfortably in a position commensurate with its own length and shape either in space around the neck or around the shoulders of the body. When the length of the leaf edge is unknown, its position and distance from the neck line on the body must also be unknown.

Collar leaf edge manipulations (flat collars)

The leaf edge of a flat collar needs no manipulations to create a stand section as there is none required for this type of collar. When a stand section is needed the flat collar is no longer flat; it belongs in the stand and fall variety. (There may be a need to lengthen the flat collar on the leaf edge to compensate for fabric shrinkage during the manufacturing processes. This may be a problem for all fabrics to varying degrees).

Collar leaf edge manipulations (stand collars)

Stand collars do not have a leaf edge as such, since their outer edge is really the top edge, the same restriction applies. The top edge has to conform to a line around the neck, fitting snugly with decided amounts of ease allowances between the collar and the neck; just as a leaf edge has to conform to a line around the shoulders on the body.

The drafting method (Figure 3.2) to attain the top edge of a stand collar may suggest that the top edge has only been given an approximate length and shape for that which might be needed, with an ease allowance added according to the authors' experiences with that particular collar and its related neckline configuration.

To fit perfectly, without ease, requires that overlapped sections on the top edge of the collar be irregular in width to match the contours of the neck shape, ease may then be inserted in the appropriate areas. Without knowing the true shape of the neck a drafted collar and its true position around the neck may be slightly ambiguous. Tuit (1974, p. 88) indicates that the top edge of a stand collar should be 2.5-3.8cm shorter than the neck line length in order for the collar to fit the neck. To accomplish this, Tuit advocates three darts of 6mm plus a smaller dart until the top edge measures the required amount. Three darts of 6mm (= 18mm), to make the total at the smaller end of the range (2.5cm) requires another dart of 7mm, not a 'smaller' dart. How would a tighter fit at the top edge with darts totalling 3.8cm be achieved, with bigger darts or more darts, and how should they be placed?

A basic stand collar can be changed in its style, fit and appearance if the top edge is changed in length to affect the new design. However, free-hand placement of length in to a curve between two points is a subjective exercise as no two persons will allocate exactly the same amounts in exactly the same places (see Appendix A diagrams 1, 2 and 3). Yet, on this profile rests the success or failure of the collar. Changing the rate or position of top edge dispersion will result in a different shape and design each time.

Examination of the draft in Figure 3.2 and those depicted in Bray, (1985, p. 85) or Aldrich (1985, p. 117) suggest that to acquire the desired styling effect every time a number of queries need to be answered:

- Where and in what proportions should length be taken from the top edge of a stand collar? Is the final top edge length a known factor (Figure 3.2)?
- Why open and expand the top edge when the outcome is in doubt?
- What determines, or should determine, the top edge shape; does it matter?

Collar leaf edge manipulations (stand and fall collars)

Manipulating the leaf edge is (at the present time) the pivotal structure from which the stand, fall and break line of many three-dimensional styles evolve (including my own), even though the leaf edge might have a high proportion of deformities because of a shortness of required length. Tightening the outer edge of a flat collar is seen as a legitimate method of producing a stand/fall collar (Tuit, 1974; p77, Figures 3.3, 3.4, 3.5 and Appendix A diagrams 17 and 18) though there are problems and uncertainties associated with this manipulative method.

Tailored, or more structured, drafts endow collars with specific widths of stand and fall and give the leaf edge extra length through the use of 'spring'. If the drafting procedures used wedging techniques at the leaf edge (or overlap the shoulder lines) to affect a style change, or correct fitting faults, the two widths and shapes of stand and fall become more tenuous.

Based on the review of stand and fall drafts, including Figures 3.3, 3.4, 3.5, questions that need addressing are:

- Is there a relationship between standard, set amounts or varied amounts of overlap, their positions on the leaf edge and the stand height?
- What will be the amounts/ratios of overlapping of the cut lines for each different collar shape; will they be standardised or varied in size?
- Why use overlapped wedges and/or shoulder seams (Figures 3.3, 3.4, 3.5) to shorten the leaf edge when the outcome is in doubt?
- What is the correct length and shape of a leaf edge, excluding necessary ease requirements?
- What happens to the outcome when the original drafted collar is altered in shape and size prior to slashing and overlapping?
- What will be the final dimensions and configuration of the stand and fall and also the position of the break line?
- Are the final shapes and sizes of all of the required collars predictable, including distortions, their positions and their size? Will they fall within the imposed quality constraints?

3.3.3 Collar break line

The body necklines are always determined before the collar is constructed, even though their shapes and positions may be in doubt. Throughout the drafting methods examined (Figures 3.3 – 3.6, 3.8, and 3.10 – 3.15), the collar neck lines appear to be the only collar lines that are continually and consistently given values of length compatible with the body neck line (which are now open to uncertainty). Even when the collar is not drafted around the neck line it derives its length from the body pattern neck line, whether correct or not.

However, the line that is the most difficult to control, as it is generally influenced by what happens at the two outer edges, is the break, crease or roll line that divides the stand from the fall giving the various combinations of stand and fall, which contributes to the expansion of style names. With the exception of some tailored examples (Figure 3.13), most one-piece collars cut by a conventional manner do not have their break lines marked in a definite position. They are, therefore, prone to ambiguous placement during manufacture 'breaking' at some point between the inner and outer collar edges and dividing the collar into two equal or unequal parts. Once the final collar shapes of the neck line and leaf edge of a one piece collar are determined, these in turn produce the shape and length of the break line. The break may not be situated at a pre-determined, or needed position between both of these exterior edges, nor give the aesthetic quality aimed for.

Questions that arise related to the break line include:

- What effect does the shape of the collar's centre back line have on the break line?
- Which line, to be used for a break line, is easiest to fold and crease? Should it be curved, very curved (convex or concave) or straight; is there a choice? What is its correct length (excluding ease)?
- What happens to the break line of a Prussian collar when the neck curve is altered?
- How much extra length is contained in a one-piece collar break line compared to that required to fit around the neck circumference?
- What part, if any, does the ratio of stand and fall play in the length of the break line?
- What is the relationship between the neck, break and leaf edge lengths and width of stand and fall?

All of these questions could arise when making alterations in a collar designed for a particular neckline, so, what happens when collars are combined with substituted or unsuitable neck lines and the many permutations possible in size, length and shape?

Collar break line reduction

The two piece collar is designed to reduce the break line of a collar to decrease unsightly 'ripples'. Because of the change in direction that the fall has to negotiate from the neck column onto the body/shoulder area, the leaf edge has to be lengthened in a manner related to its position on the body; in the process the break line also lengthens producing extra material that is prone to deformation. Also, irregularities of the shape of the neck column and the position and the shape of the body neckline influence the collar neck line and thus the positions and amounts of reduction required of the two piece collar break line length which, depending on the collar, must vary to conform to achieve a specific fit to the neck.

As all collars and their break lines do not occupy exactly the same position around the neck, specified collar break line reduction amounts are only approximations. In practical terms this amounts to further pattern changes and toile experimentation. In view of the fact that break line length reduction is subjective, there appears to be no published literature that regularly, through the styles, give the true length of the break line, unless to give its shape and position between two points. Except in the more formal types of collar found in jackets and coats, some authors do not mention the break line in a consistent manner at all.

The following illustrations (Figure 3.16) are from personal resources and represent collars that are readily available from within the reviewed drafts. Figure 3.16a is a normal round gorge neck line to which the collars, illustrated, could be sewn. The round gorge is not the only shape of neck line, each type and size of garment might have its own neck line shape depending on the designer/pattern-maker.

Figure 3.16b represents a collar that has a 'hidden break line', there is no indication as to its position; this is only revealed when a toile has been constructed. Since the length and position of the break line is questionable, the stand and fall widths between the two outer edges are also undefined. This leads to uncertainty in the mind of the practitioner

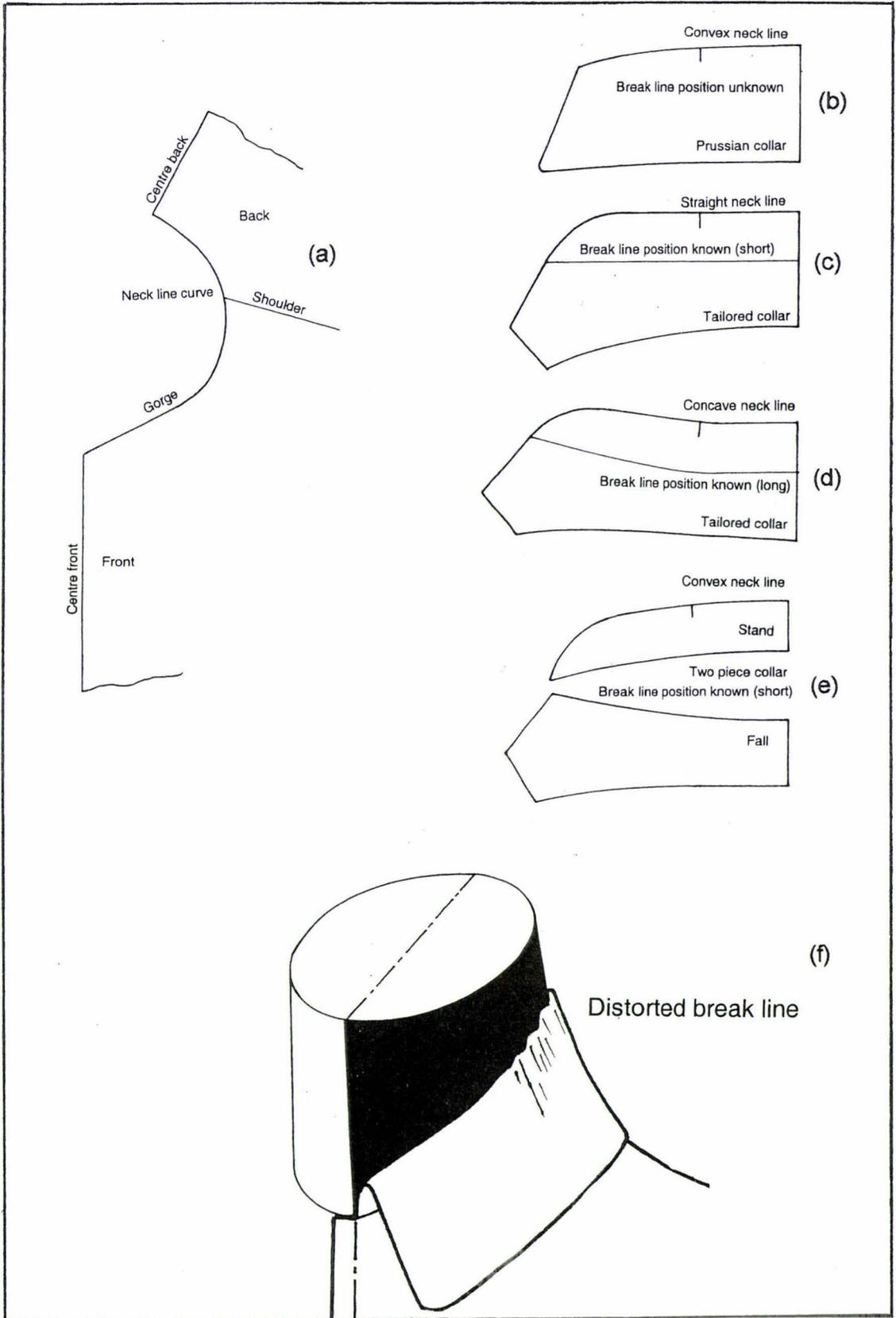


Figure 3.16 Collar: Break line. (a) Round gorge neck line. (b) 'Hidden' break line. (c) Straight break line. (d) Curved break line. (e) Two piece (split) collar. (f) Break line distortions.
 (Drawing source: © M. Campbell).

as to where the location of the break line will settle and how the stand and fall will develop. Whether or not the fall will cover the neck line adds to the questionable value of the draft to inexperienced pattern-makers and designers.

The collar illustrated in Figure 3.16c will require the outer edge to be stretched to length, although it does contain a suitable break line that is both short and straight. Figure 3.16d shows an opposite type of collar, it has the correct leaf edge length although because the break line is curved it may be too long and will, possibly, need to be reduced in length. If the break line experiences too many distortions, the one piece collar may be split along the break line, into two separate parts of stand and fall. This allows better length-reduction control of the break line to give a more 'snug' fit to the neck (Figure 3.16e). Figure 3.16f shows the result of a break line that is too long, experiencing distortions, where 'kinks' or angles become apparent when seen on the model; especially in the more curved sections opposite the shoulder line.

The outside edges of neck and leaf edge have to conform to their respective lengths on the body, although the break line conforms to an as yet unknown length around the neck column. The resultant shape and length of the collar break line might not be as required. However, unwanted length can be reduced by either shrinking, easing-on, or by splitting the collar into two separate pieces of stand and fall (Aldrich, 1980, pp.56-57; Shoben and Ward, 1990, pp.130-132). Experimental procedures to shorten the break line, to fit closer to the neck, by set amounts in set positions and then altering the resultant pattern until the required effect is achieved are too arbitrary. This causes time delays as the process has to be re-calculated in each instance of collar design, in most industrial practices. Any over-suppression of the break line fabric would invalidate the resultant collar as the break line may be found to lie within the neck perimeter of the wearer.

With regard to collar break line reduction, the problems to solve are:

- Is the collar pattern shape correct?
- Is the body/neck line shape and position correct?
- How much should the break line be shortened to prevent distortions, where should it be shortened and in what amounts should it be shortened?

- How much extra length, in both position and proportion over that which is required for a good fit, is contained in the break line of a two-piece collar, and does it differ with each collar? Could this amount be calculated, deleted or utilised (as ease perhaps)?
- How should break line control methods, e.g. draw-in, split, bias cut, shrink, ease, neckline shape be used (Cabrera, 1984; Morris, 1947; Shoben and Ward, 1990; Aldrich, 2002)
- How does the shape of the centre back line affect the collar break line and the fit of the collar?

The last question, concerning the shape of the centre back seam line, as a means of controlling the length of the break line (keeping it short), needs further investigation as it is not recommended by all designers. According to Sytner (1955, p.83)

'some junior cutters may be under the impression that to get a collar to "clip" or grip the neck at the back it is right to cut the collar with a suppression at the back neck...' (Figure 3.17).

Sytner (1955, pp.83-84) does not agree with the above procedure, of taking length from the centre back break line, because of the angles and distortions formed across the centre back of neck, break and leaf edge lines (Figure 3.17) and suggests that shortening the break line is best done by other methods. Sytner, therefore, advocates that a straight line be adhered to. Instead of shortening the break line, Morris (1947, pp.235-241) adds to the leaf edge at the centre back to give more length to that edge (and in the process keeping the break line short), this also gives a diamond shape to the centre back seam line.

Questions related to the collar's centre back line are:

- Should the centre back collar line be a straight line, an indented angled line (diamond in the right and left sides) or a concave curve?
- What effect does the centre back line shape have on the collar break line?
- What distortions are related to each of the centre back collar line shapes?
- What other method might allow a better fit of the collar to the back neck?

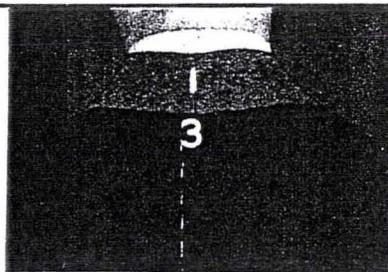
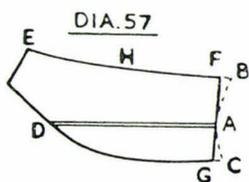
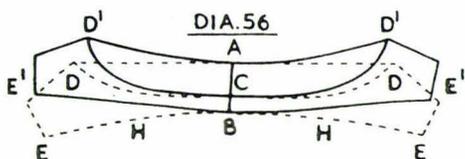
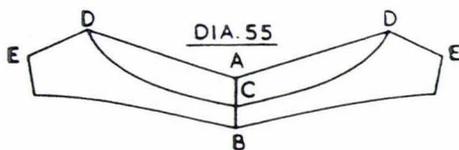
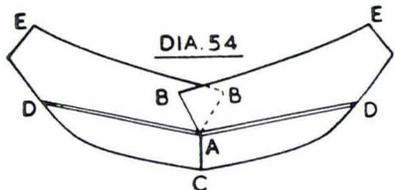
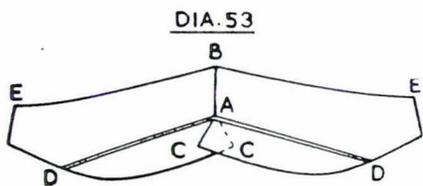
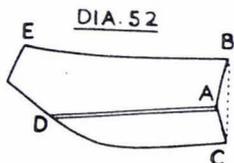


Photo. 187



Photo. 188



(A) is hollow in an angular form, it is low and stands away from the back neck of the wearer. The leaf edge of the collar, at B, and the stand, at C, both have a "point", or angular corner.

Diagram 53—This illustrates the under-collar laid flat, with the centre seams placed together at the fall (or leaf). Here we see the over-wrap at the stand (C-C).

Diagram 54—This shows the under-collar laid flat, with the centre seams placed together

at the stand. Here we see the over-wrap at the fall (B-B).

Diagram 55 illustrates the under-collar with the centre seams joined together and the stand folded over the crease (D-A-D). Now we see the angular shape and the "dip" at A; and the fall or leaf edge at B has a "point", or corner—as also has the stand at C.

Shortening of the crease row (D-A-D) can best be accomplished by stretching the stand (D-C-D) and the fall of the collar (E-B-E) over the shoulder at point H, also *slightly* shrinking the crease row (see **Diagram 56**). The dash lines in the latter diagram show the original collar and the solid lines show the manipulated one. I do not agree with the method of cutting a diamond-shape piece—or two triangles—out of the centre of the under-collar (see on **Diagram 52**).

Diagram 57—Alter the existing collar, or cut a new one, as shown by the solid lines E-F-A-G-D. This will shorten the neck (G-D) and the fall (E-F); and the stretching of these will bring A closer to the neck.

The "set" of the collar determines how it should be cut and manipulated.

Photograph 189—The crease row of this coat is slightly "round" and the collar is inclined to "kick off" a little at the centre back neck. This effect is not very unlike the one shown on **Photograph 188**, though the crease is not quite so high or so "round"; neither is the stand so high.

Photograph 190—If the leaf edge of the collar is lifted up, it will be found that the fore-



Photo. 189

Figure 3.17 Collar: Centre back seam line.
(Source: Sytner, 1955).

Both the angled (diamond) and curved (ovoid) centre back neck seams of the under collar distort the natural flow of any opposing design lines that cross the spine. The top collar does not possess a centre back seam line and thus cannot be conveniently shaped to conform to the contours of the under collar. The top collar has a naturally forming straight break line fold not imitating the angle of the under collar, therefore there is a disharmony between the two. In normal collar pattern-making circumstances the top collar will, more or less, conform to the under collar.

In normal situations the neck vertebrae are usually in a vertical alignment, as seen directly from behind (even though they might possess a forward tilt angle), so the centre back line of the collar must also be in the same alignment. Lines drawn at right angles across the spine and the centre back line of the collar (neck, break and leaf edge lines) are left and right side mirror images, therefore all of these lines must form straight lines. To allow the collar to 'grip the neck' in a more expedient manner than using a shaped centre back collar seam line, another pattern construction method may have to be found.

3.3.4 Collar and lapel break line (tailored and structured collars)

Suppressing the collar break line, in tailored and structured collars, helps to reduce distortions along its length, still, there may be other reasons that contribute to distortions. Not only may faults be found on the collar break line opposite the shoulder seam line, there may also be problematical imperfections present above the gorge seam/break line intersection and under the collar below the shoulder line (Figure 3.18a).

A considerable number of drafting methods do not place the break line with any degree of accuracy, if it is located at all. Collars that did not include a specific break line in the instructions and diagrams meant that the stand and fall widths were open to interpretation. Even tailored collars, usually the most sophisticated and predictable of drafting methods, are prone to these incorrect placements, lengths and shapes, leading to the same indefinite quantities of stand and fall ratios. Figure 3.18b is a common depiction of the front gorge and lapel area of a tailored jacket which show the differences and similarities, between the round and square gorge pattern construction. Both the round and square gorge are constructed in the same manner (forward of the neck point). The only differences between the two construction methods are the round

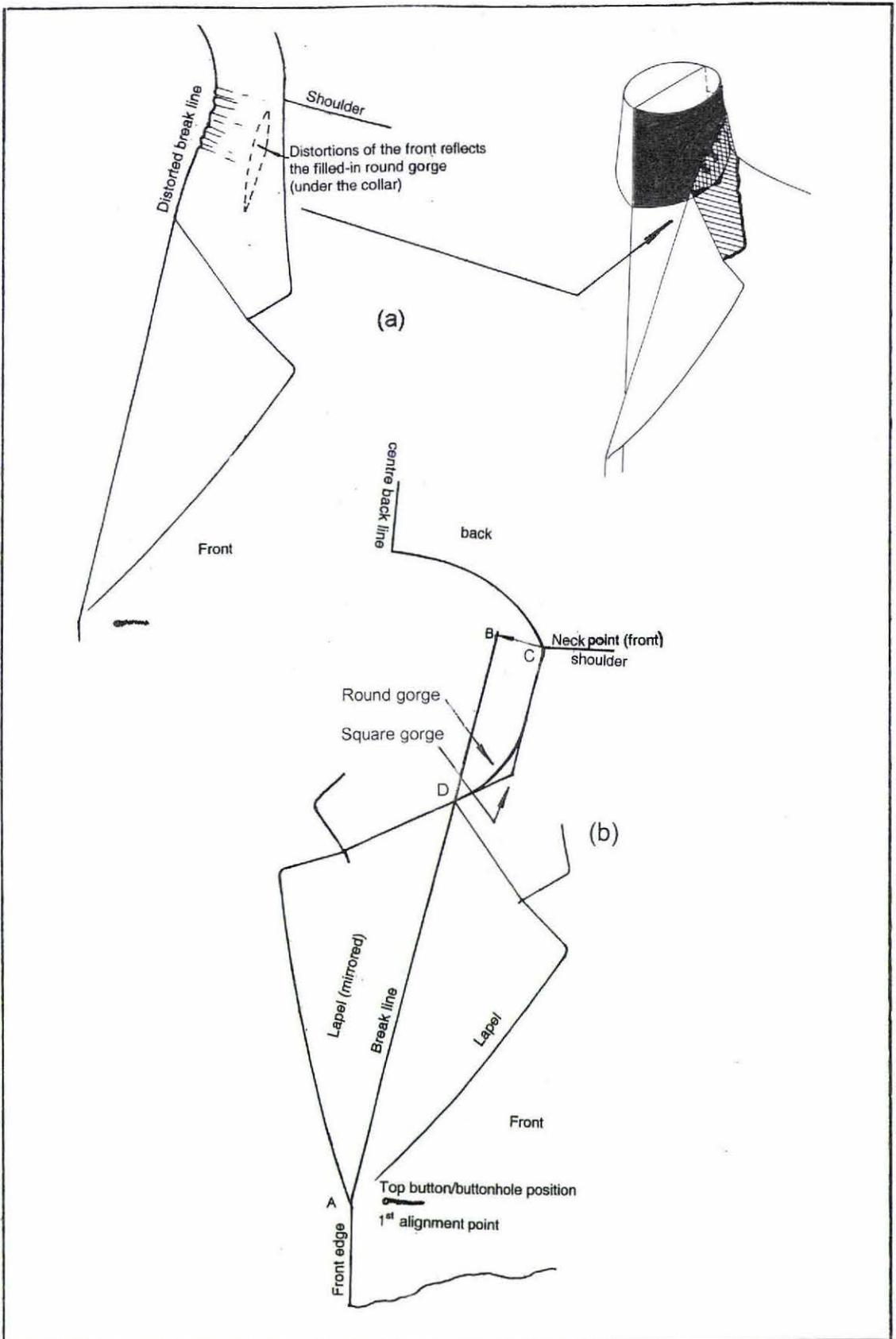


Figure 3.18 Collar and lapel: Break line (tailored and structured collars).
 (a) Break and gorge faults. (b) Round and square gorge with flawed neck and break lines.
 (Drawing source: © M. Campbell).

gorge arch from the break line (Figure 3.18b) and the angled corner of the straight gorge.

The break line traverses the distance between two points. The first point 'A' (Figure 3.18b) is positioned on the front edge opposite the top button/buttonhole position and the second point 'B' (Figure 3.18b) is at a collar stand distance out from the front neck point 'C'. The first section of the round gorge (from the neck point) constitutes a straight line, parallel to the extended lapel break line, which then curves into the lapel break line at 'D' (extending to form the top edge of the lapel). The first line of the square gorge (from the neck point) is also parallel to the extended lapel break line which forms an angle at the junction formed with the line extended from the top line of the lapel (point 'D').

The problem with most of the present reviewed methods of break line positioning, including Kawashima (1976); Shoben and Ward, (1990); Aldrich, (2002), is that they are not compatible with the collar and the natural round and square gorge shapes. A problem is also apparent when the back pattern is joined to the front at the neck points and shoulder line (Figure 3.18b). Because the straight front gorge line is joined directly to the front neck point (this also appears on round gorges), the physical curvature of the neck line is compromised, interrupting its natural flow and diverting the break line. A point or angle is evident at the shoulder end (neck point at point (Figure 3.18b, point 'C') where the back neck curve encounters the straight line of the front gorge.

Questions have previously been expressed concerning the break line of the collar, which leads to the following questions associated with the construction of the lapel break line.

Questions such as:

- Is the lapel break line in the correct position?
- Is the neck line the correct shape and in the correct position?
- Is the front neck point the correct position for the second break line alignment point (Figure 3.18b)?

- Should the natural neck line form a continuous curve from the right angle at the centre back line to the centre front line?
- Is the shoulder neck point located on, in front of, or behind the widest part of the neck circle?

3.3.5 Lapel break line position correction

All design elements that surround and help to form the collar must be correct and not susceptible to external influences. One such element is the neck line; from the neck line is constructed the break line. In this instance it is the lapel break line position that needs to be clarified. If the lapel break line is incorrect so too will be the collar break line.

The first mention of how to determine the correct location for the second point of the break line (point 'B', Figure 3.18b) has been located in J. P. Thornton's publication of 1893 (pp. 15-16). Thornton measures the collar stand, across from the **gorge hollow**, a standard 2" (5.08cm) position on the neck line, down from the neck point. This is a divergence from the normal descriptive position of the break line and shape of the gorge line (and is the reason why grown-on collars are not included in the new composite collar system and why a fish-dart is necessary below the front neck point as described in Shoben and Ward (1990, pp. 133-134). The shoulder point of the back section of the grown-on collar is positioned on the front body neck point, projecting the full collar width out from this point, not from the front neck hollow. Whife (1950, pp.120-121), referring to the 'fixing' of the stand and fall measurements states:

'...particularly the stand, because this measurement is used to determine the distance from hollow of gorge. If the stand is to be 1¼", the crease edge of lapel must be 1" from hollow of gorge; that is ¼" less than the stand'.

Dellafera (1950, p.120), states: *'if the stand is to be 1¼", the crease edge of lapel must be made 1" from the hollow of gorge; that is ¼" less than the stand'.*

To find the correct lapel break line for both round and square gorge shapes (providing the neck line position is correct) necessitates drawing the position of the collar stand width inside the neck circle (dashed lines in Figure 3.19a and b)) measured from the

back neck line and the front rounded neck gorge. A lapel break line extended from the front edge top button position (first alignment point A), will form a tangent (to the deepest part of the curve of the collar break line at position 'B' (Figure 3.19a) thereby maintaining the width of the collar stand section throughout its length. In Figure 3.19a, the distance, when measured, from the front neck point to the 'new' lapel break line (at '+') will be found to be narrower than the original distance from the front neck point and also narrower than the collar stand. However, once the 'lapel' break line (Figure 3.19a) has made contact with the 'collar' break line, the lapel break line (after point B) ceases to be relevant and is replaced with the collar break line which proceeds around the neck to the centre back.

As can be seen in Figure 3.19a the round gorge is curved the entire distance from the lapel break line to the front neck point, whereas the square gorge depicted in Figure 3.19b is only 'square' from the lapel break line at 'D' to the square gorge corner at 'E', and from there to point 'F', after which it regains its original neck curvature of the round gorge. Because the front neck point is no longer used as an alignment point, the newly positioned lapel break line has resulted in the following corrections: The 'bend' defect in the break line, observed in the top collar above the gorge seam line, has disappeared as has the angled 'point' previously experienced at the neck point; also, because the lapel break line has moved deeper into the forepart, the distortions under the collar caused by an excess of material, as well as the fish-dart, have also been removed.

3.4 Neck, torso and neck/torso junction

Analysing the elements that comprise a collar gives a clearer indication of what is required of each style. However, they are not the only considerations. There is also the relationship between the collar and the neck and torso sections. Unless these are given the same consideration only part of all the interactions will be understood.

3.4.1 Neck

Neck columns differ in posture, shape, length and width according to different individuals and size; these variations are translated through the drafting process to the formation of the collar which is attached to the body sections along the neck line.

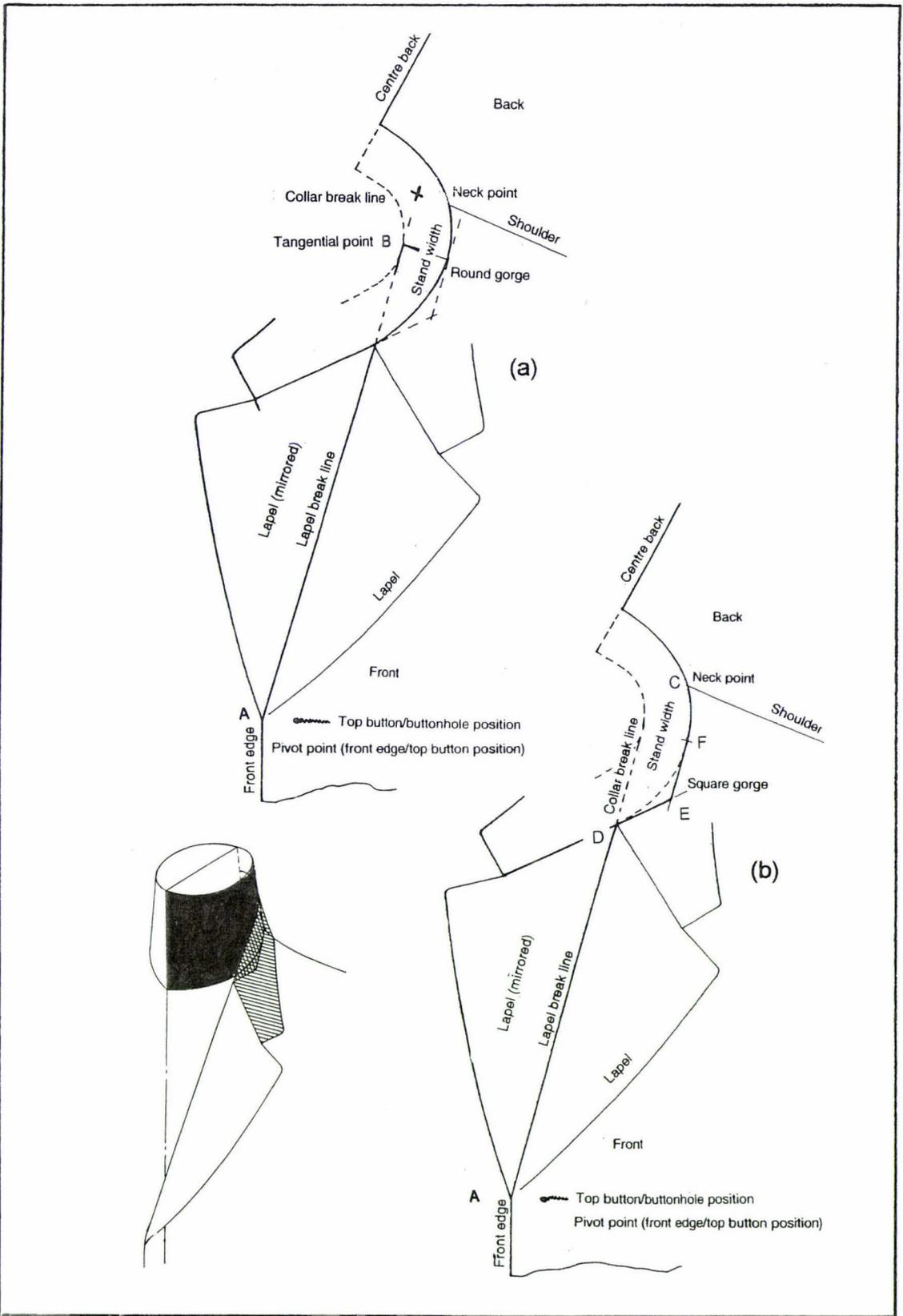


Figure 3.19 Lapel: Break line position correction. (a) Break line position correction. (b) Round and square gorge shape.
 (Drawing source: © M. Campbell).

The following questions can be associated with neck column design sites:

- How does the neck incline and taper towards the head, are the angles regular and do these angles affect the collar aesthetics, function and style?
- What is the inclined plane (from the back to the front) of the neck-body junction line? How does it change from style to style?

3.4.2 Torso

Each body is unique, there being no two exactly alike. However, mannequins have standardised dimensions and shaping. The back body section of the mannequin forms a more or less upright posture when compared to the front body section, both joining along the shoulder line which has a calculated angle to the horizontal of approximately 20°. The back body terminates at the neck along the neck line and combines with the front neck line at the neck point. The neck line continues around to the gorge at the centre front.

Questions relating to the torso to consider are:

- What effect do the contours of the body have on the neckline?
- What determines the positions of the centre back neck line and centre front button/hole fastening?
- Does each centre front button/hole position have its own distinct neck line and a collar to match?

3.4.3 Body/neck junction

Neck lines change in position, shape and inclination depending on the collar design. Unlike collar neck lines, which are numerous, there is only one body/neck junction line. The standard mannequin neck line position is usually stated as the junction (angle) of the neck column and the body sections at the centre back and the base of the throat depression at the centre front.

'The front of a basic neck line should be lower than the back to accommodate the natural forward tilt of the head' Brown (1992, p.270).

Questions for the designer are:

- Why is a basic body/neck junction line assumed (usually) to be correct in its position and therefore the starting point from which a considerable number of collar styles originate?
- What neck and body factors dictate the body/neck junction line position, its shape and length?
- Does an inferior body neck-line shape and placement contribute to collar distortions?

3.5 Summary

It may appear that to decline to make trials of contemporary drafts is inconsistent with trying to understand the various drafting processes. However, preliminary trials have shown that neither the drafts nor the patterns indicated the final shapes and 'sets' of the selected collars. Toile trials in most instances were problematical in assessment values as parts of the collar were not clearly defined, for instance, either measurements of the leaf edge were not given or sections such as stands and falls did not manifest until the end result. How can a value be given to elements that are not stated in the draft, in the pattern or in the toile? The collar shapes and sizes were, therefore, doubtful and open to interpretation.

Deciding whether collar elements met the correct standards of size, shape and tolerances set by individual authors was impossible since structural dimensions are not always specified in the drafts. What quality levels do the authors work to, are they higher or lower than personal quality attitudes? Can the quality of the results be bettered by a more logical alternative drafting approach?

An examination of selected drafting procedures for a range of collar types has identified numerous questions, problems, uncertainties and ambiguities in results. The problem with collar drafting methods is that they are all open to question and personal

interpretation being, generally, of a nebulous nature in some respect or other; mostly there is limited justification and rationalisation of their methodology. There is no published literature that provides a consistent over-all view of why faults develop in collar drafts, collar patterns or manufactured collars, nor how to deal with them when they arise. Although Sytner (1955) devotes a number of chapters to tailored collar faults, available documentation of problem areas is scant.

Except to mention that curved collar neck lines give flatter, on-the-shoulder, types of collars and straight neck lines result in tighter fitting collars, no reasons are given in the literature (e.g. Armstrong, 1995; Chaudhry, 1970; Kawashima, 1976, 1977; Pepin, 1942; Shoben and Ward, 1990) as to why drafts are constructed in their own particular manner, the methodologies they exploit and why they are 'correct' for a particular collar style. A considerable number of drafting practises consist of trial and error, based on experimentation and experience rather than on logical reasoning. It could, therefore, be said that traditional approaches such as these are empirical processes with no real theoretical basis for exactness of purpose. Many authors give the impression that they follow each other in their collar drafting endeavours, although there are exceptions such as Pepin (1942), Kunick (1967) and Shoben and Ward (1990) who introduce more interesting variations on traditional themes. Innovative collar drafting methods are rare; little stands out from the mass of collar drafting techniques, or contributes appreciably, to any significant depth in new ideas or methods.

None of the reviewed drafts, including the most comprehensive of systems (Shoben and Ward, 1990) specifies all of the locations and measurements of all of the design elements that make up a collar and its joining body neckline. Each design element has to fit and match other related elements and lines, whether on the stable surface of the body or in space around the neck. As collars fit around the neck, detailed accounts of the neck section relating to the angles and profiles of the upper torso could be of use in collar pattern making. Unfortunately, no published literature was found that linked the human neck contours to collar drafting.

There are a significant number of questions related to the various individual elements that make up a collar and its surroundings yet very few questions are considered or answered in published texts. Based on the review of collar drafting methods in chapter 3 a comprehensive series of questions has been developed that are related to each

design element, that could be of use to the novice and expert practitioner, for the evaluation of the quality of any drafted collar. Each of the problem areas associated with the design elements and lines that make up the top and under collars reviewed carries with it often concealed intrinsic knowledge which needs to be revealed to add to the whole that is necessary for the formulation of a collar drafting system.

With a few exceptions, such as Chiricota (2003) and Fang (2003), the field of 3D computerisation sees most resources seeming to be focused on the body region, whilst neglecting smaller areas such as the designing of collars. Research by Kang and Kim (2000) is just one of many attempts to describe the processes involved that take measurements from-three dimensions and flatten them; however, there appears to be no research that combines the major collar types and designs in to a single drafting system.

Chapter 4

Materials and methods

4.0 Introduction

This chapter describes the resources used to produce the drafts and toiles, together with fabrics and construction methods applied to create the composite collar drafting system. Once developed, the composite collar patterns were marked on to fabric, accurately cut out, made into standard three-dimensional fabric forms and placed on the mannequin for assessment, then photographed as a record of the results.

To proceed without reservations during the testing and confirmation of the composite collar drafting system, demands a certain amount of control throughout toile-making. It was therefore necessary to standardise materials and collar fabrication to ensure that results were a product of the drafting system not the materials. Accurate construction techniques were employed during the testing stage in order to reduce the opportunity for distortions to eventuate, the possibility of errors occurring and to eliminate unnecessary steps that might have an adverse influence on the final outcome.

4.1 Fabric

The fabrics for the toiles were chosen for their stability and resistance to distortion. The same fabric, unbleached calico, 100% cotton with a plain weave and with an area density of 127g/m², was used throughout the research for all of the trials of the new composite collar drafting system. Distinctions between the different effects of various fabrics, trimmings and threads in the final product were not considered or taken into account in the present research, neither was the relationship between textiles, garment construction and their relative associated allowances. Also, this research does not encompass, even though they are an essential part of any designers' duties, trials of materials including natural and man made fibres, weave, weight, straight or bias cutting and stretch and pliability properties. These may be examined in a possible future research programme.

4.1.1 Fusible

Fusing collars after cutting is prone to movement and shrinkage, which changes the size and shape of the collar before it is constructed and applied to the neck line. This

method was abandoned in favour of block fusing prior to cutting. Table: 4.1 describes the fusible used for the trials.

Table 4.1 Fusible used for the trials of the composite collar drafts

| | |
|--------------------|---|
| Supplier | William McDonald & Co. (Auckland, New Zealand) |
| Quality number | Quality number P870 (fusible interlining, plain weave) |
| Width | 112cm |
| Weight | 63.5g/m ² |
| Composition | 100% spun polyester |
| Coating | Micro dot type/Polyester coating |
| Colour | White |
| Fusing temperature | 130-150°C approximately (to give a glue line temp of 115-135°C) |
| Fusing pressure | 50-60 p. s. i. (3-4 bar) |
| Fusing time | 8-12 seconds |

4.1.2 Sundries

To eliminate distortions and to ensure that fabric sections are true to size, all drafting and collar pattern delineations were drawn using the same technical pencil with a 0.5 H lead. All markings of patterns directly onto fabric were carried out using a 0.1 Artline fine tip pen. Other standardised materials were limited to one type of pattern card (280g/m²), and a medium ‘tack’ masking tape for collar and body section fabrications, to replace distortion prone seaming.

4.1.3 Top collar fabrics

The top collar shape was constructed from the under collar pattern with additions for ease over the break line and certain piping allowances to hide the leaf edge seam line. Ease and piping amounts were appropriate for the classification of material and the area in which they were used. The vast array of fabrics open to clothing designers and apparel manufacturers adds to the trialling aspects to decide the correct amount of ease allowance. Tight weave, light-weight shirting materials have very little stretching ability, therefore only a small quantity of ease can be expected, or needed, from this type of fabric. A fabric with a looser weave such as a heavy-weight Harris tweed on the other hand, can be stretched appreciably, especially when cut on the bias. Heavier weight fabrics demand considerably more width and length allowances than lighter weight fabrics and the pliable attributes of such fabrics as Harris tweeds and wool

flannel, in general, lend themselves more successfully to the artistic qualities required by the traditional tailor. These contrast quite markedly to that of light-weight fabrics with no natural movement, such as those used in rainwear manufacturing. Standard-weight fabrics lie somewhere in between the light and heavy weight fabric spectrum and have their own amounts of tolerances. The handling of lightweight fabrics, such as suitings, falls more into the realms of pattern-engineering where manipulations via stretching and shrinking with the hand iron are replaced and facilitated with varying degrees of built-in allowances. Depending on the properties of the fabric these are calculated, through experience, for the situation and manner for which they will be used.

Aldrich (1996, p. 23) classifies fabric by weight as follows:

Table 4.2 Fabric weight classification

| Light weight (g/m ²) | Light/medium (g/m ²) | Medium (g/m ²) | Medium/heavy (g/m ²) | Heavy weight (g/m ²) |
|-------------------------------------|-------------------------------------|-------------------------------|-------------------------------------|-------------------------------------|
| 0-79.90 | 80-179.90 | 180- 299.90 | 300-449.90 | 450+ |

Allowances for comfort, seam shrinkage/seam take-up and fabric shrinkage are important aspects of collar drafting and collar construction. They are intricate subdivisions of the whole collar drafting allowance province that merits a significant independent exploration of the technical problems involved. It is a complicated side-issue that is difficult to exclude. Nevertheless, containment of the thesis to the technicalities of collar drafting is the main priority. As there are so many variables involved when dealing with fabric allowances and manipulations including the profusion of fabric types, weightings and independent characteristics are left to the individual designers to investigate in each case.

4.2 Fabrication methods

Usually, there are two types of seaming used for attaching collars to the gorge shape: the plain or flat seam and the zig-zag seam (ISO 301 and ISO 304 respectively, Laing and Webster; 1998. pp4-5). Seam allowances, sewing machine thread tensions, turning of edges and pressing are difficult to control and can differ considerably, causing undue deviations and abnormalities, distorting the shape and length of the seam line. These methods of joining fabric sections were thus abandoned in favour of a controlled method of affixing adhesive tape directly to the collar joining edges.

Personal preferences when deciding on such items as stretching of edges, shrinking of fabric, or drawing-in, and ease allowances vary greatly between designers and pattern-cutters and are usually treated as separate issues, nevertheless, it is important that they are reported if consistency of results is to be achieved.

Stretching the two outer neck and leaf edge lines is reliant on the expertise of the practitioner and is not appropriate for 'engineered' collar construction methods. The leaf edge of the composite collar was not stretched or shaped with the iron (see section 7.4.1), although very small sections of length were integrated into the drafting manipulations to reduce tightness when fabricated and placed on the model.

Shrinking, or the drawing-in of fabric, is applied to reduce its dimensions (e.g. along a break line) to produce a better fit than would be possible without cutting and seaming. Length reduction methods were incorporated into the composite collar system either by automatically reducing the one piece collar break line to a bare minimum or, if this was not sufficient, reduced with the introduction of a two piece collar pattern for further improvement.

Ease allowances may be placed along the leaf edge, the collar neck line and along the break line. There is no ease allowance in the composite collar system presentations in either the neck line or the leaf edge line (see stretching, above). The only time ease was incorporated along the break line length was in the normal course of the production of the one piece collar. In the composite collar drafting system, break line ease was thus not open to arbitrary interpretations, as in other drafting methods, but automatically and proportionally infused during the drafting process.

4.3 Mannequin analysis justification

In a complex structure such as a representation of the human form there must be more information than is firstly apparent. This information can only be revealed by careful, detailed analysis. It was considered appropriate to study the mannequin to disclose information, and to identify the areas that may be of importance to collar drafting. There are too many questions related, primarily, to the formulation of stand and fall collars to enable the development of a new collar drafting system without giving the neck/body relationship of the mannequin further consideration.

Defining and analysing the structure of the mannequin in a more informative manner may reveal the underlying relationship between the collar and the supporting neck and body areas and help to establish how neck lines, break lines and collars relate to (and locate themselves around), the body and neck in three dimensions. The mannequin exploration may also contribute to the reduction in the number of collar toile trials required for each of the collar styles reviewed.

4.4 Mannequin

The methods employed to attain the required lines and measurements for the mannequin were accomplished by manual processes. All toiles and patterns for the composite collar system were produced to fit a mannequin (Figure 4.1) commonly used in New Zealand industry; size, 87cm bust, 67cm waist and 97cm hips; manufactured by Purfex Models (Table 4.2). Body section darts that intruded into the collar construction area were pivoted into less intrusive positions and as both the left and right sides are considered to be symmetrical, all diagrams and drawings were based on the left side of the model.

Table 4.3 Mannequin size chart

| Mannequin (female). | | | Purfex Models. | | | |
|---------------------|--------------|---------------|----------------|--------------------|-------------------------|------------------------|
| Size | Bust (cm) | Waist (cm) | Hips (cm) | Neck girth (cm) | Shoulder length (cm) | Shoulder angle (°c) |
| 12 | 87.00 | 67.00 | 97.00 | 38.00 | 12.50 | 20 |

4.5 Method of mannequin analysis

To assist in the development of the composite collar drafting system, a method of delineation of the three major mannequin sections was required. The two distinct sections, the neck and the body areas, were divided into smaller sections, or sectors, delineated by section lines that were capable of being measured and assessed. The equally spaced lines were constructed on the mannequin, beginning on the highest point (the circular ‘wooden top-plate’), descending the neck to the neck line and continuing down the body contours at their respective angles. To accomplish the segmentation, calico was modelled around the mannequin in three separate sections of neck, forepart and back and the sector lines delineated with a pen, as described above. The three sections remained on the mannequin as a permanent record, for checking purposes, for all of the collar trials. Separate master patterns of the neck and body

sections (with sector lines) were later constructed for replication purposes during collar construction.

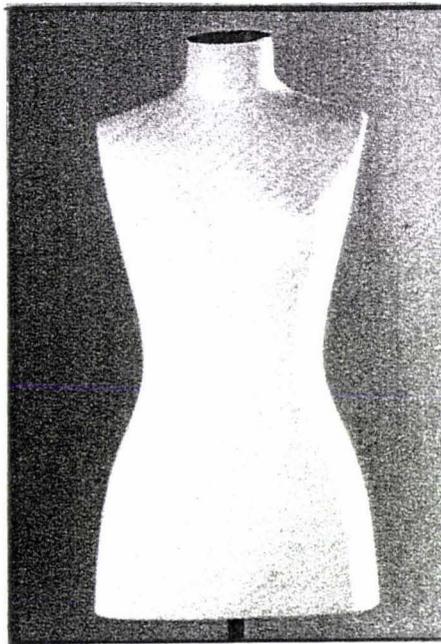


Figure 4.1 Mannequin used for toiles

FORM001 (Female form: Classic full length form)

Source: Purfex Models

4.6 Composite collar drafting system development

1. The composite collar drafting system was developed empirically through a series of investigations and trials of contemporary collar drafting methods. These trials found that individual collar styles could be classified into three groups.
2. The three basic collar types, described in basic terms as 'flat', 'stand' and 'stand and fall', were used as the starting point for the composite collar drafting system.

Unlike the flat collar, which has the front and back body patterns as initial drafting sources, the stand collar is at a drafting disadvantage. The stand collar does not have a neck pattern to rely on that can be used in the same way that the flat collar relies on front and back body patterns for its shape. If a basic flat collar pattern cannot be made successfully without the front and back pattern parts as foundations, it is not unreasonable to assume that a stand collar needs a pattern of the neck column for its construction.

With the production of front, back and neck patterns, drafts for two of the three basic collar types of 'stand' and 'fall' (flat), could potentially, be defined from their respective body or neck sections and written as a set of flat pattern making instructions without recourse to modelling on the stand. The third of the three basic collar types, the stand and fall collar, is situated intermediate to the flat collar and the stand collar because it sits astride both neck and body areas. At the moment there is no mathematical relationship between the neck and body areas to predict how a stand and fall collar will emerge and, unfortunately, adding a neck pattern to the front and back patterns does not allow the whole assemblage to lie flat ready for two-dimensional collar drafting. Drafting instructions for this type of collar can only be written, at present, after experimenting with stand and fall collar modelling on the mannequin, oftentimes by manipulating one or both outer edges.

3. Further examinations were performed to reduce the number of collar types. These were in the form of collar 'initiatives' which eventually reduced the three collar types to a single collar type based around the concept of a stand-band.

4. The single collar (stand-band) was further investigated to establish how it performed around the mannequin.

5. Results showed that a single, drafted neck line position was not plausible for the various collar styles that were meant to fit on it.

6. Subsequent explorations found that each front button fastening position, each change in the ratio of stand and fall, and each design, also required its own individualised neck line. Outcomes of this empirical development helped to form a better, more complete, method of collar drafting described in chapter 7.

7. Tests were performed to discover whether present drafting methods actually gave the correct placement of leaf edge length, for stand and fall collars, in order for that edge to 'set' accurately around the shoulders of the mannequin.

4.7 Composite collar drafting system methodology

The standardisation to a single collar type (through the two collar initiatives), the use of a stand-band and the unique neck line required for each collar brought together the elements needed for the realisation of the composite collar drafting system. Once the composite collar drafting system was developed, each collar style reviewed in chapter 3 was drafted; this time using the composite collar drafting system.

Each of the collars trialled had its own distinct forepart, back and unique neck line (also see * below) through the use a stand-band modelled in calico on the mannequin. The forepart and back toiles, for each collar, were removed from the mannequin, aligned with, and transferred to, the master patterns. The result was two master patterns (forepart and back) with all the individual collar neck lines superimposed. This method ensured that all of the toiles would fit the mannequin with the same quality standards, as well as acting as a permanent two-dimensional record.

Using the master patterns, with the sectioned stand-band added to the purpose-made neck line, collar drafts were constructed, in turn, for all of the individual collar styles. Once the stand-band was attached to the body neck line the front style area was delineated. Through the use of section lines, leaf edge length insertion became another predictable element within the composite collar system. From the drafts, collar patterns were made. These were transferred to calico and secured to the original forepart and back (*) for final empirical analysis and assessment, for fit and design qualities, on the mannequin. The toiles were then photographed from various angles to show how they 'set' on the mannequin to demonstrate the composite collar drafting system's capabilities in requiring a single fabricated 'confirmation' test. Results are described in chapter 5.

4.8 Summary

Evaluating the results of collar trials, without bias, is essential to the formation of the new composite collar drafting system. It is, therefore, practical to standardise materials and manufacturing methods to reduce the errors due to variations in resources and applications (e.g. inexact measurements such as the 'artistic' amounts of stretching and shrinking), the focus is then on drafting and collar making.

Analysing the mannequin, in more detail, was important for a better understanding of how the collar was integrated with the body and neck areas, and the principles that underpin good collar drafting. The mannequin was, therefore, divided into smaller, more controllable sections that were easier to measure and analyse. Without this analysis the composite drafting system and resultant collar pattern and fitting qualities of the collar itself could not be adequately assessed.

Chapter 5

Results of mannequin analysis

5.0 Introduction

The mannequin (Figure 5.1) is composed of three interrelated sections that make up the whole, all of which are relevant to the development to collar development. They are described in table 5.1:

Table 5.1 Mannequin sections

| • Front body section | • Back body section | • Neck column section |
|--|--|--|
| The front section of the mannequin, for this thesis, is restrained by: | The back section of the mannequin, for this thesis, is restrained by: | The neck section of the mannequin, for this thesis, is restrained by: |
| <ul style="list-style-type: none"> • The centre front line • The neck line • The shoulder line • The front scye line • The waist line | <ul style="list-style-type: none"> • The centre back line • The neck line • The shoulder line • The back scye line • The waist line | <ul style="list-style-type: none"> • The centre front line • The centre back line • The neck line (lowest line) • The 'top plate' (highest line/ source of all measurements) |

5.1 Neck and body junction

The neck line separates the neck section from the two sections that make up the body (Figure 5.1a, b). It is a cross section of the neck at the natural neck/body junction line from the centre back nape (at approximately the 7th cervical), through both shoulder sections down to the centre front at the gorge (sternal-notch) and is irregular in shape (Figure 5.1). (When measuring a figure, the back length of a garment is generally taken from the 7th cervical. When the front gorge is shaped, its centre front height is found at the front neck indentation).

Collars sit on and around the neckline from the centre back, through the shoulder-neck points and on to the centre front. The correct position and shape of the neckline is, therefore, an important element that helps to maintain a collar's shape. Any unevenness of the neckline will disturb a collar's 'set'. To contain the neckline as near as possible to a uniform shape, and to help eliminate undulations of the line, which might lead to collar distortions, it is useful to conceive of the neck/body junction as a regular, downward plane from centre back to centre front.

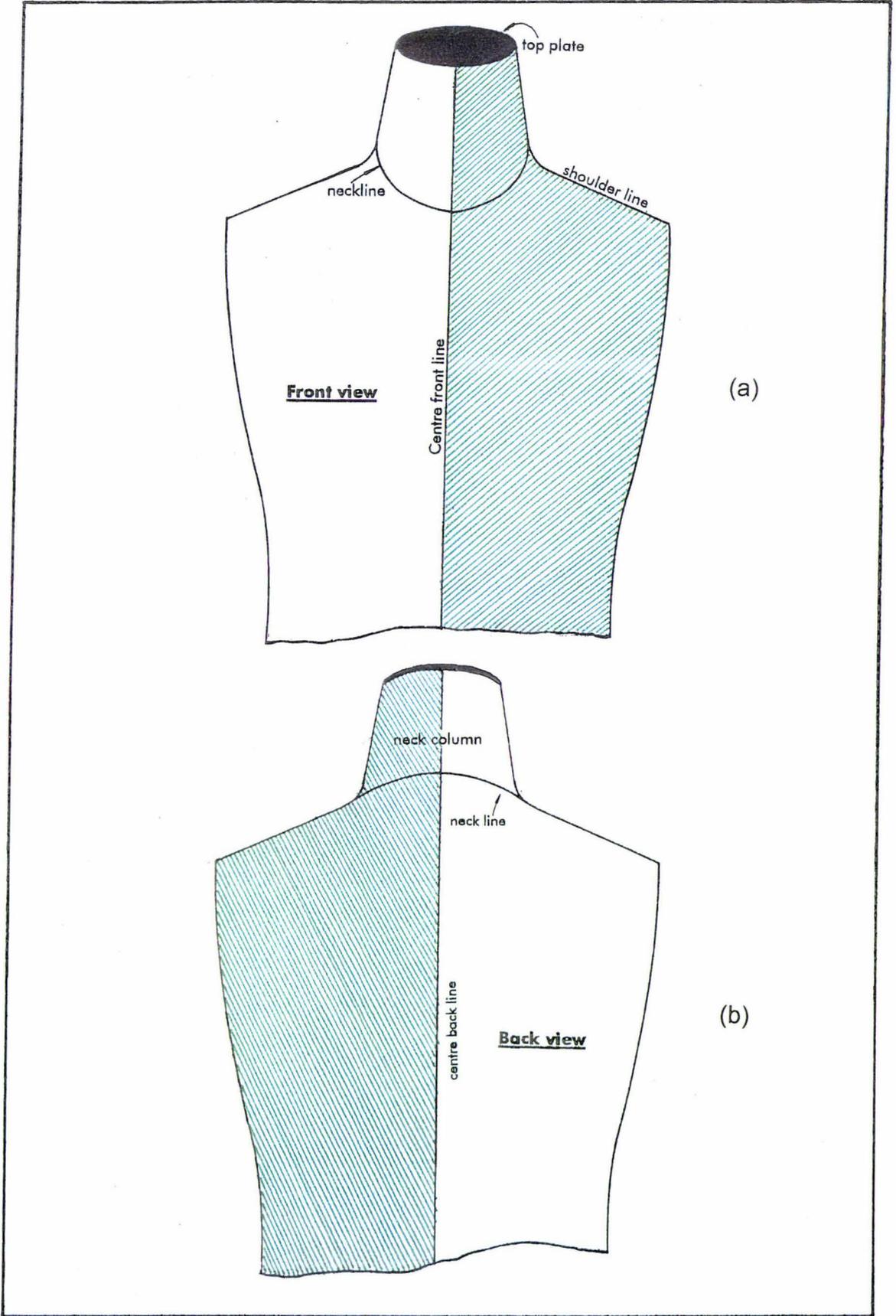


Figure 5.1 Three dimensional neck and torso sections
(Drawing source: © M. Campbell).

For the designer, aligning all three points on the neck line (centre back, centre front and shoulder neck point) are difficult to establish visually as usually one of the three points would almost certainly be out of alignment. To simplify the problem one of the points, the centre back point, has to be left to 'float'. The remaining two points are easier to find because they are more defined. The centre back point will then take its position on the plane extended from the previous two points. By the use of a profile-forming instrument, the neckline plane can be circumscribed on the mannequin to set the bounds between neck and body regions.

5.2 Neck and body sector lines

To obtain a more thorough analysis of the whole structure, the mannequin was partitioned into sections. The top-plate thus served as the initial area for sub-division of the mannequin (left side only) (Figure 5.2). The centre of the circular wooden top-plate (of this particular mannequin) was used as the base for the sub-division of the mannequin into sections around its surface. The diameter of the top-plate was 105mm. Twenty sectors of 8.2mm around the half top-plate circumference were considered adequate, (equal divisions of the sector lines were required for ease of measuring, too few lines would not achieve this requirement and too many would not be practical. Dividing the top-plate into twenty sectors, twenty one lines from 0-20, was deemed sufficient). The circular top-plate was marked with a centre front to centre back line, dividing it into semi-circles (Figure 5.2). The lower edge, or neck/body junction line, has irregular sector divisions because of the neck column contours and the manner in which the angles of the neck join the irregular line of the neck/body at different levels.

The left side of the neck covers an area from the centre front to the centre back, from the neck line to the top-plate. Some of the section lines that form the mannequin neck and body contours at the front and front-sides of the neck were slightly concave whilst others at the back and back-sides are straighter. The hollow sections are too shallow to accurately and separately shape to fit to the neck by manual processes, therefore they were straightened and joined to form the whole half neck section, this simplified the system and worked in well with high, tight-fitting collars, which could use the hollows as ease around the neck in these particular areas. Once the neck/body junction line was established, the sector lines of the neck were projected from the neck line junction or neck line base, across the front, the shoulder area and the back sections, expanding to account for the lowest and widest spread of collar and lapel designs.

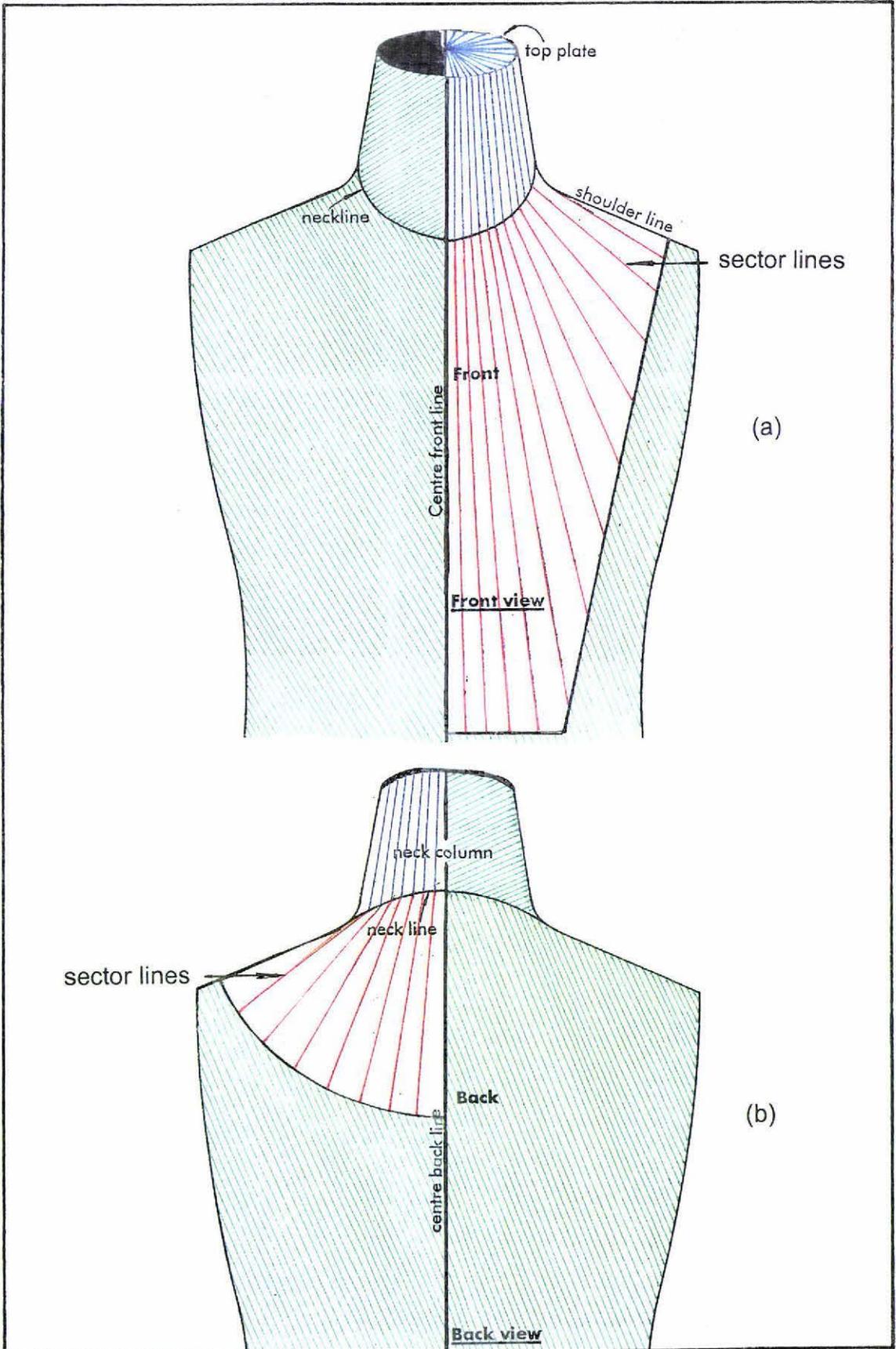


Figure 5.2 Neck and body sector lines
 (Drawing source: © M. Campbell).

5.2.1 Neck and body sector line angles

The top-plate (Figure 5.3) had an inclined plane from the centre back to the centre front of an angle of 18° to the horizontal. From the top-plate, the regularly spaced neck section lines projected in an irregular manner (depending on the neck angles) down to the neckline/body junction. These lines were numbered for easy identification from '0' at the centre back to '20' at the centre front. Each neck section line had its own angle (Table 5.2, A), and length measured from the top-plate to the neck/body junction line (Table 5.2, C and Figure 5.3). The neck angles ranged from 84° at the centre back to 78° at the shoulder and centre front. The neck/body angles (Table 5.2, B and Figure 5.3) showed the extent to which the body contours and sector widths diverted from the neck. They also indicated the ratio of collar leaf edge length insertion in each sector. The different slanting angles of each sector around the neck and body helped to define each of the many possible neckline planes, shapes and lengths from the centre back down to the left and right to the front opening position; they also formed the length of the break line and help explain why it is not possible to add a stand collar directly to the neck line without overlaps of fabric reducing the length at the top edge of the collar. (Of course, the bust dart is available for stand collar manipulations to increase the collar's top edge if fabric distortions around and below the neck line are acceptable).

Table 5.2 Mannequin sector angles and lengths

| Section Number | Neck sector angles (A) (From the top plate). (°) | Neck/body angles (B). (°) | Neck sector lengths. (C). (mm) |
|----------------|---|------------------------------|-----------------------------------|
| 0 | 84 | 171 | 53 |
| 1 | 84 | 171 | 54 |
| 2 | 84 | 170 | 54 |
| 3 | 82 | 166 | 55 |
| 4 | 81 | 162 | 56 |
| 5 | 80 | 156 | 58 |
| 6 | 79 | 149 | 59 |
| 7 | 78 | 137 | 62 |
| 8 | 78 | 131 | 64 |
| 9 | 78 | 124 | 66 |
| 10 | 78 | 124 | 69 |
| 11 | 79 | 124 | 71 |
| 12 | 79 | 128 | 73 |
| 13 | 80 | 137 | 76 |
| 14 | 80 | 140 | 78 |
| 15 | 80 | 142 | 79 |
| 16 | 80 | 142 | 81 |
| 17 | 79 | 142 | 83 |
| 18 | 79 | 142 | 84 |
| 19 | 78 | 144 | 85 |
| 20 | 78 | 148 | 85 |

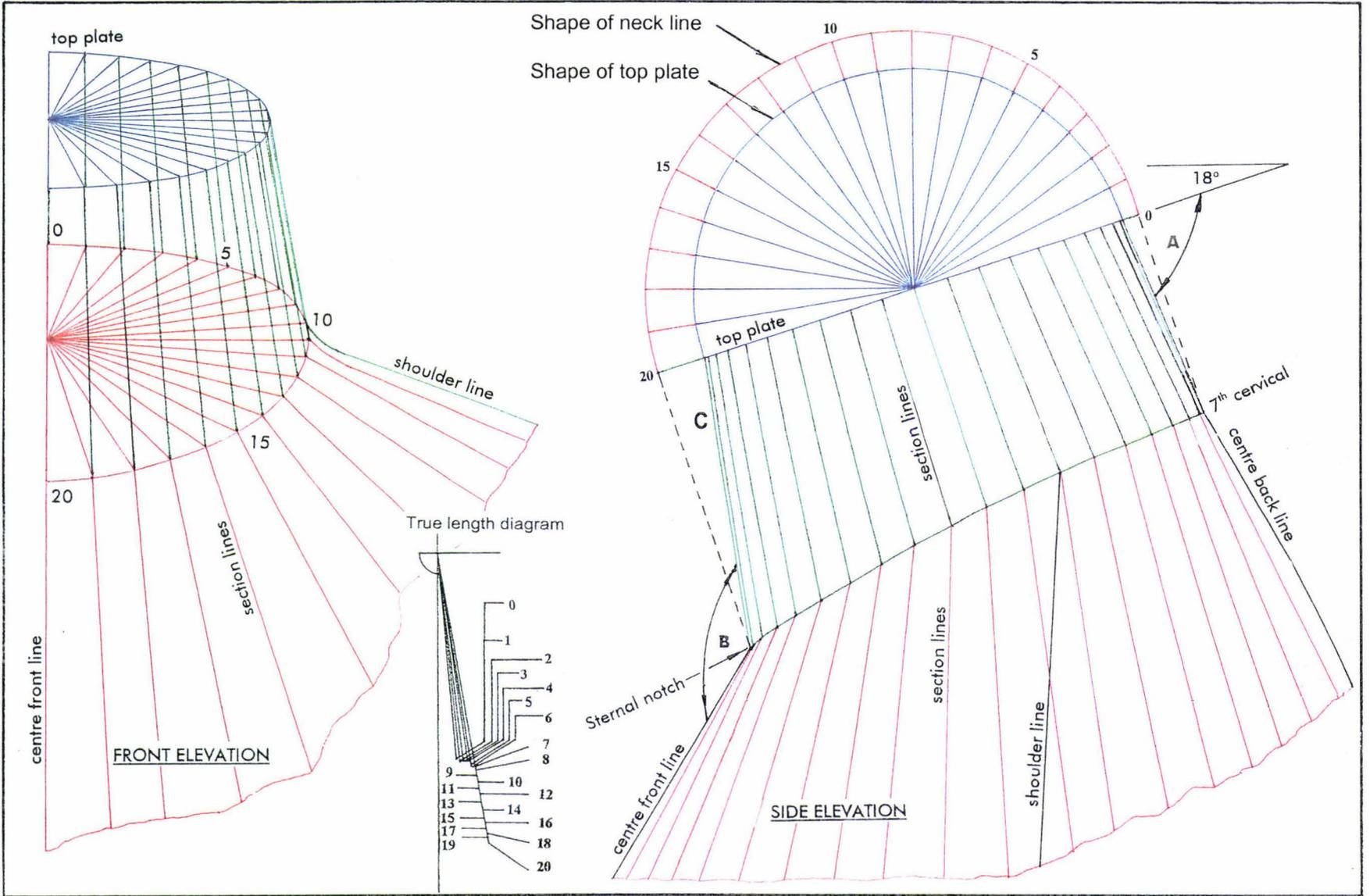


Figure 5.3 Neck and body sector line angles (not to scale)
 (Drawing source: © M. Campbell).

5.3 Two-dimensional neck section pattern

The neck section (or neck pattern) is separated, but also joined, by the neck line from the front and back body sections. In three dimensions the neck line is in harmony with both neck and body areas. The shortest distance between the centre front and the centre back points of the neck line, whilst in this configuration, is directly through the mannequin. This measurement is shorter than the distance between the same two points when in the two-dimensional mode of a draft or neck pattern. In two-dimensions, the front and back neckline points are spread further to enable the neck pattern to be laid prone (Figure 5.4, with its superimposed sector lines).

5.4 Two-dimensional body section patterns

The body separation lines are the neck line and the shoulder lines. At this point, if the front and back shoulder lines were straight they were represented as a single line. The front and back patterns, with their superimposed sector lines, could then be laid flat to form a single unit of front and back. However, if the shoulder lines are contoured to follow the body curvatures this will not happen. When the contoured shoulder lines are brought together to facilitate collar making they will have to match at the neck points and at the junction of the collar/body leaf edge line (wherever it may be located) at the required or prescribed fall distance from the neck line.

The same neck line of the neck section, as mentioned above, forms the neck line (and separation line) of the body sections. They were, in this three-dimensional format, the same shape through the mannequin and the same measurement; that which applied to the neck section neck line also applied to the body neck line. Taking the two sections, neck and body, from the mannequin to lay them flat alters this relationship. The two (neck and body) neck lines diverge in shape. The planes of the neck and the body and the angle of the shoulder transform the two neck lines into convex (neck) and concave (body) curves. The separation distance, when laid flat, between the centre front and centre back of the body neck line is more pronounced than the same two points on the neck section. Figure 5.5, with its superimposed sector lines, represents the front and back section patterns in two-dimensions fully joined at the shoulder line.

5.5 Two-dimensional neck and body sections association

Problems arose when trying to attach the three-dimensional neck and body sections of the mannequin into a single two-dimensional setting. This is because the shapes of the

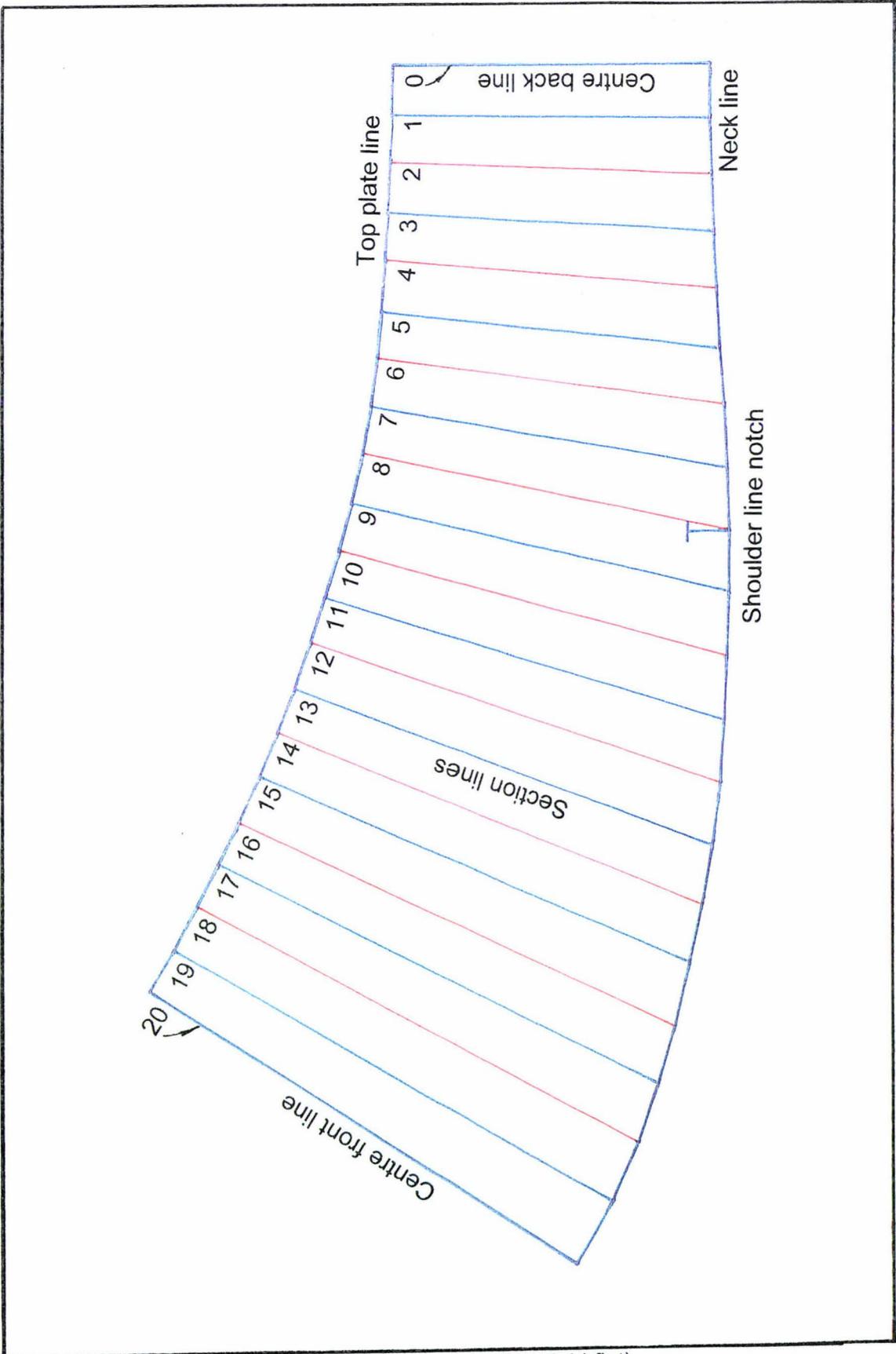


Figure 5.4 Two dimensional neck section (pattern laid flat)
 (Drawing source: © M. Campbell).

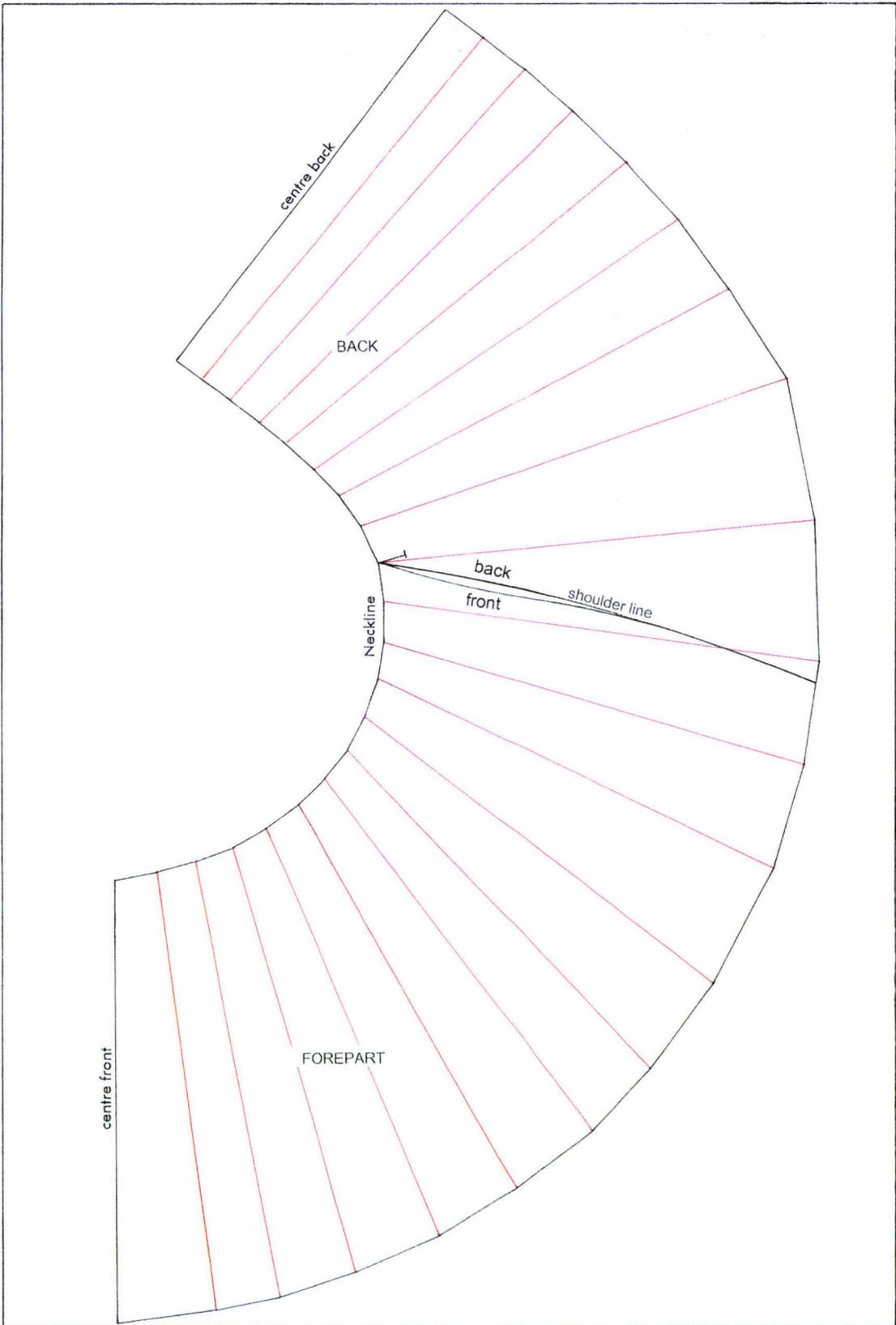


Figure 5.5 Two dimensional body sections
(Drawing source: © M. Campbell).

two sections of neck and body were no longer harmonious and would not fit or 'set' along the entire length of the contoured neck line, in a flat, two-dimensional manner, without diverging along separate routes (Figure 5.6). There was, therefore, a requirement that the neck area be divided, at each of the neck section lines, to allow the two portions of neck and body to sit in harmony on a flat plane. When joined to the body neck line, the neck sections overlap at the top edge (break or leaf edge line) by various degrees (Figure 5.7). In this configuration the front and back body section patterns (coupled with the collar stand) are ready for the amalgamation of the complete collar design and all its relative elements.

5.6 Summary

For greater control and accuracy in collar making, all of the elements that help to make up the collar should be known. None of the current drafting systems deal with the neck column as an entity in its own right, seeming to prefer to concentrate on the body patterns as the origin points for drafting techniques and the construction of collar patterns. As a consequence there is a gap in the knowledge related to collar pattern-making and design in general, as well as the relationship between the neck and the collar break line position, shape and length. A focus on the neck area obliges a shift in deliberation away from contemporary methods that seem to concentrate on the body areas, to confer the neck with an enhanced importance for collar pattern-making. Although the neck of a mannequin is an estimated, simplified resemblance of the human form, it is still a legitimate shape for experimentation. Analysing the neck structure gives a more unified, inclusive consideration, rather than the usual segmented view of the various parts. This analysis, of the neck and body areas and their sectionalised parts, will enable the collar to have length either added to, or subtracted from, certain lines in a more exacting manner than other drafting methods; the leaf edge or break line for example. This is a technically more correct process than the usual estimated or 'educated guesses' in contemporary drafting methods. This procedure gives the drafting system a more 'refined' structure to the whole methodology. The data assembled from the mannequin analysis and diagrams and the concepts generated from the sectionalised body and neck sections will be exploited to develop the composite collar drafting system, in chapters 6 and 7. The utilisation of a computerised 3D body scanner would be of enormous benefit to attaining the true representations of body and neck sections. This is discussed in recommendations for future research.

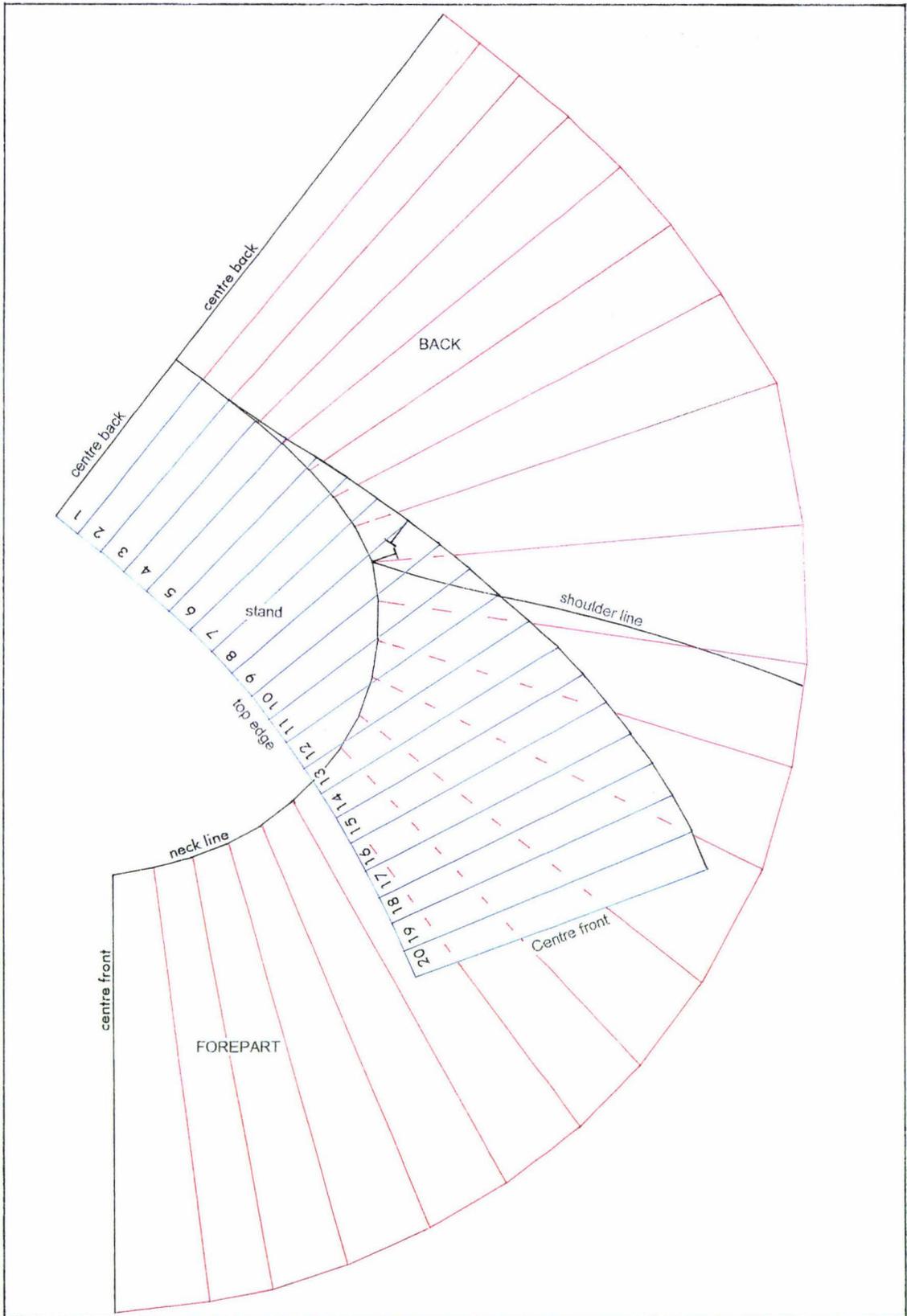


Figure 5.6 Two dimensional neck and body association
 (Drawing source: © M. Campbell).

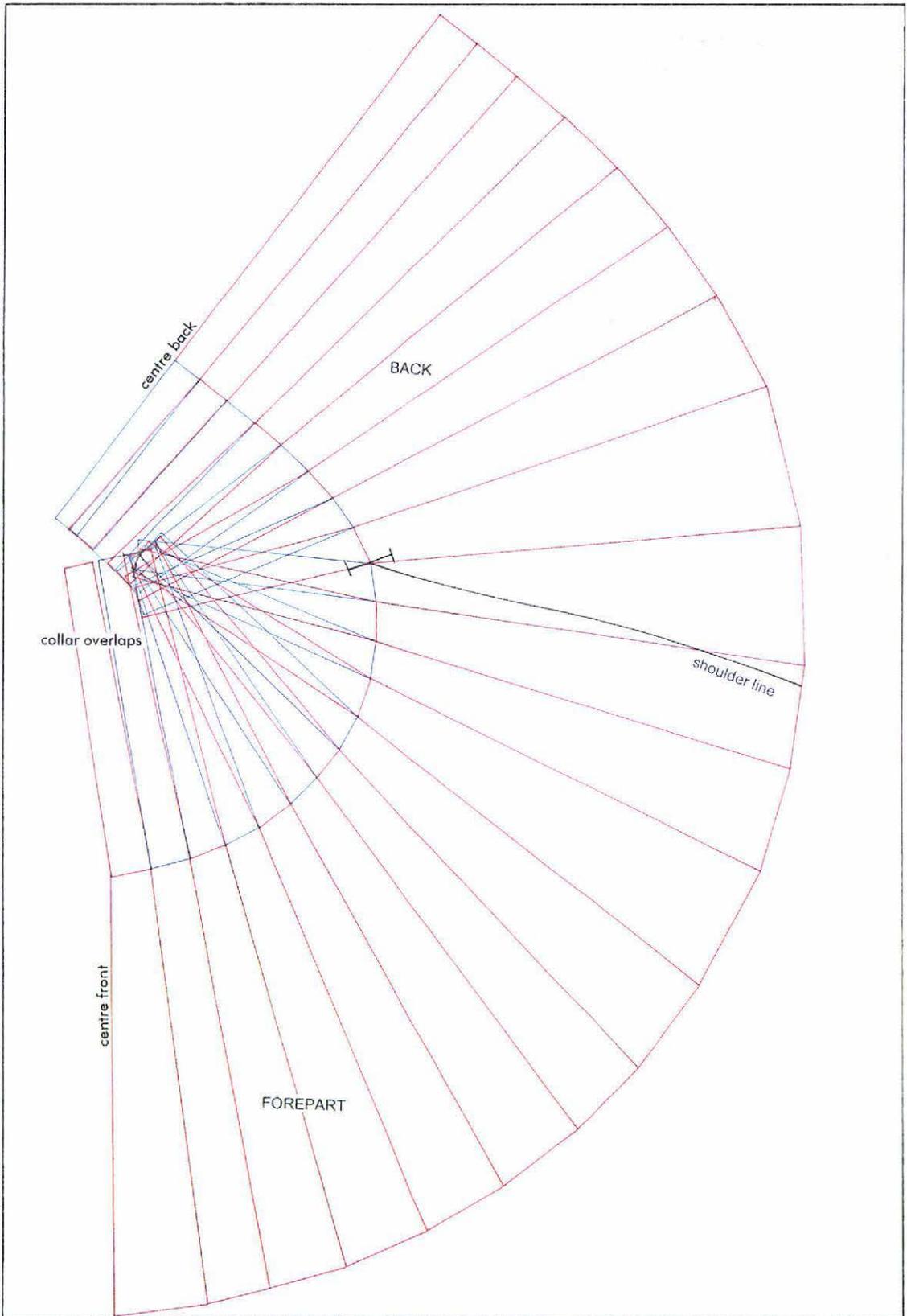


Figure 5.7 Two dimensional neck and body integration
(Drawing source: © M. Campbell).

Chapter 6

Composite collar drafting system

(Preliminary development)

6.0 Introduction

Chapter 6 describes the development of the composite collar system from two separate collar initiatives, the 'flat' and the 'stand' and their resolution. Experiments concerning leaf edge length insertion are also illustrated. The basic 'stand-band' which forms the foundation of the composite collar system and superimposition of design elements are clarified as is the formation (tracking) of the neck line. To achieve a single composite collar drafting system that is appropriate for producing both complex and simple collar types, there must be more information within that system; it must contain all the parameters of the more complex designs. Simple collars will thus become more complicated and the more complex collars will become even more complicated. This is because there is not enough information in existing simple drafting techniques to produce a more complicated collar pattern that requires further development and manipulation before it can be used.

6.1 Basic collar initiatives (two directions)

There are two basic collar draft initiatives, from either end of the collar spectrum, that have the potential to form the basis of the composite collar system. Each collar being free from distortions in their true state, setting either flat around the shoulder area or close to the neck of the mannequin, both of which can be manipulated to progress from one to the other advancing through the stand and fall collar. Respectively these will be termed the 'flat collar initiative' and the 'stand collar initiative' The flat collar initiative, situated below the mannequin neck line, forms a compatible concave neck line as it contours itself to the neck line and shoulder areas of the mannequin. The stand collar initiative, located above the mannequin neck line, has a convex neck line that echoes the mannequin neck line shape when it is in its natural position around the neck.

6.1.1 Basic flat collar initiative direction

A flat (fall) collar may have its outer edge closed incrementally, by wedging, to eventually compose a stand (Figure 6.1).

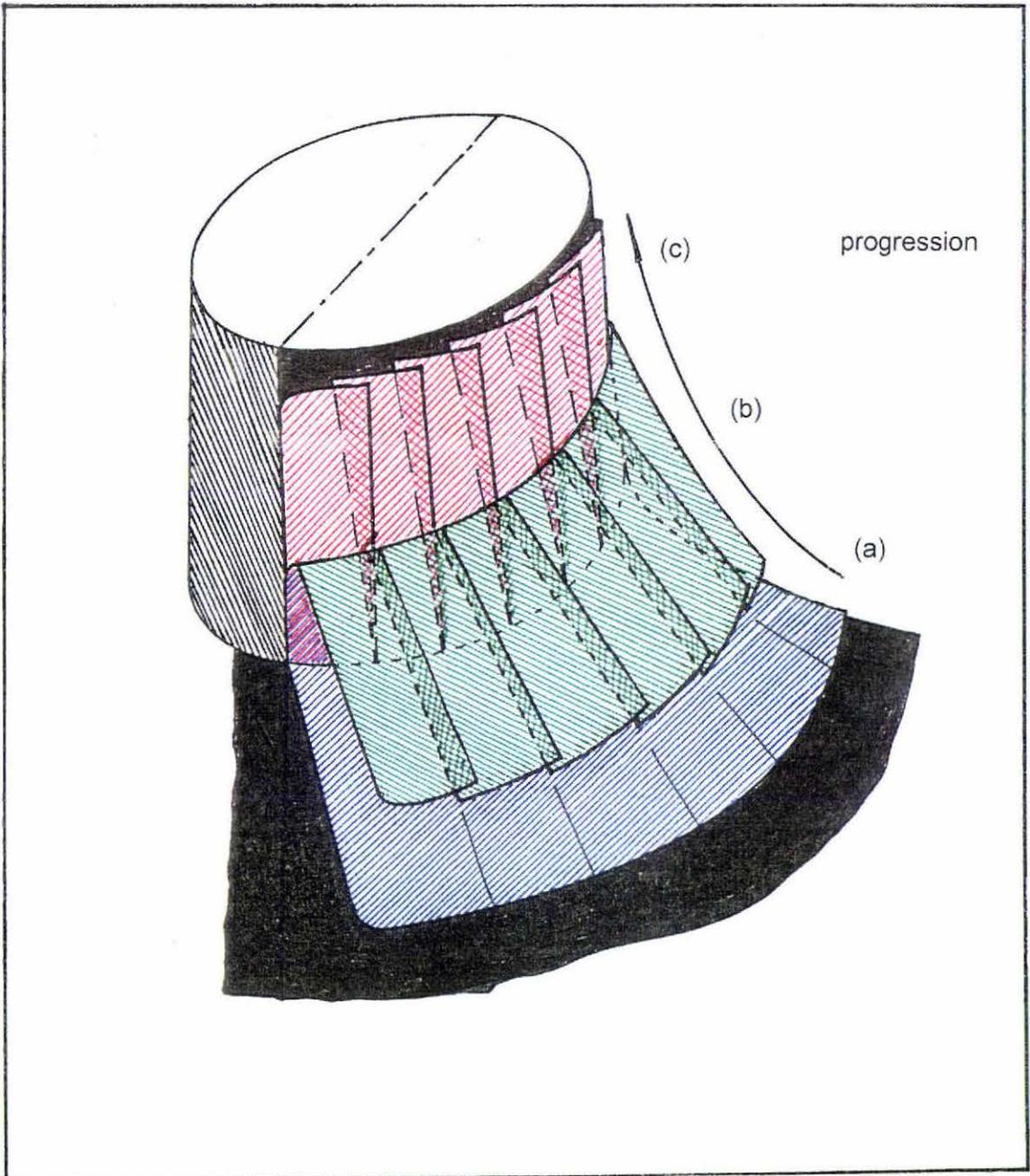


Figure 6.1 Flat collar initiative:
 (a) Flat collar with cuts through the leaf edge
 (b) Cuts overlapped. Shortened leaf edge forces formation of a Stand section and a higher setting
 (c) Completion of overlapped edges produces a stand collar
 (Drawing source: © M. Campbell).

Depending on experience and methods, drafting results will vary subject to where and how much reduction of the leaf edge takes place; results may also vary after proficiency has been achieved. Until the outer edge is overlapped there is no stand to this collar and therefore no break line. Once the overlapping has started the flat collar begins its transformation (Figure 6.1 (a)). A small stand begins to appear at a slight distance from the neck line and with it a curved break line also forms. As successive amounts of overlapping reduce the outer edge length, the stand becomes more prominent, moving the break line further into the collar width and reducing the fall, or flat section. Increasing the overlaps drives the outer edge nearer to the neck line, along the body area, until a definite crease is attained at the break line (Figure 6.1 (b)). Widths of fall and stand transpose until there is no fall width and no break line. At this point the flat collar does not exist, a stand only collar (Figure 6.1(c)) has evolved with an overlapped (what was the outer, or leaf edge) top edge line.

The amounts of stand and fall that form when the break line rolls, or creases, are governed by the following factors:

- The length of the leaf edge; which sites and anchors that edge on the body at a specific height on the shoulders, and a specific distance from the neck line.
- The width of the flat collar captured between the neck line and the leaf edge line which helps to form the 'roll' and the stand and fall separation (break) line.
- The amount of displacement, or incompatibility between the front point of the collar and the same point on the neck line, which impels the collar to roll. (Of course, the value of displacement, again, relies on the length of the leaf edge).

Reducing length from various sections of the leaf edge distorts the natural shape of the collar. When manipulated in this manner the neck lines of body and collar diverge and become incompatible. The incompatibility stems from the positional differences between the two centre front neck points of the collar and body produced by the alterations to the two outer edges. (It is reasonable to assume that a stand and fall collar is a distortion of the two initiatives). In other words, the induced stand, fall and break line are all distortions of a collar and body sections that are already in complete harmony; wedging disrupts this harmony causing an imbalance of pattern pieces. It

becomes apparent that the reason (in any system), that a stand and fall collar rolls or creases in the manner that it does, is because it has been designed and instilled with those qualities to do precisely that. It is not a chance eventuation (even though it may appear so to the designer); the problem is to get the collar to perform on demand to give the required outcomes.

How much should be taken from each overlap to produce a three-dimensional collar with stand and fall widths that are only images in the mind of the designer, is difficult to judge on flat paper. The same ambiguity exists even when the break line is given a specific placement between set widths of stand and fall. Where should the wedges be placed and how much should they overlap? This is purely a trial and error method that does not guarantee that the break line will not distort.

6.1.2 Basic stand collar initiative direction

A stand collar may start in a vertical aspect then have its outer, or upper edge wedged open enough to enable it to be pulled down to form a fall section and eventually to profile a flat collar shape. Stand collars are designed to 'set' up against the neck column with no fall or break line representations (Figure 6.2). To affect a stand and fall collar, from the stand collar, requires only a small turning (with cuts) near the top edge to initiate the fall section (Figure 6.2 (a)). Creasing the break line is easy to execute, and the widths of stand and fall are easy to control and regulate at this stage, the fall being still comparatively narrow. Because of the increased diameter of the neck near its lower edge, the outer edge of the collar becomes tighter as it folds lower and travels down the neck, the fall becoming wider and the stand narrower. To relieve the tightness, cuts are made further into the collar at the outer edge (approximately every centimetre), which begin to open as the fall widens further. As the fall enters the body area, further length is required to correspond with its new position on and around the shoulders (Figure 6.2 (b)). This is an easy exercise to perform, when compared to the flat collar initiative and leaf edge manipulations, as the leaf edge tightness automatically allowing the leaf edge openings to spread to the required amounts.

Initially, the break line does not exist on the stand-only collar. The break line is created at the first turning of the top of the stand section into a fall section. The break line is situated very close to the top edge, which has now changed into a leaf or outer edge, gradually moving further away from it as the fall widens. As more length is inserted into

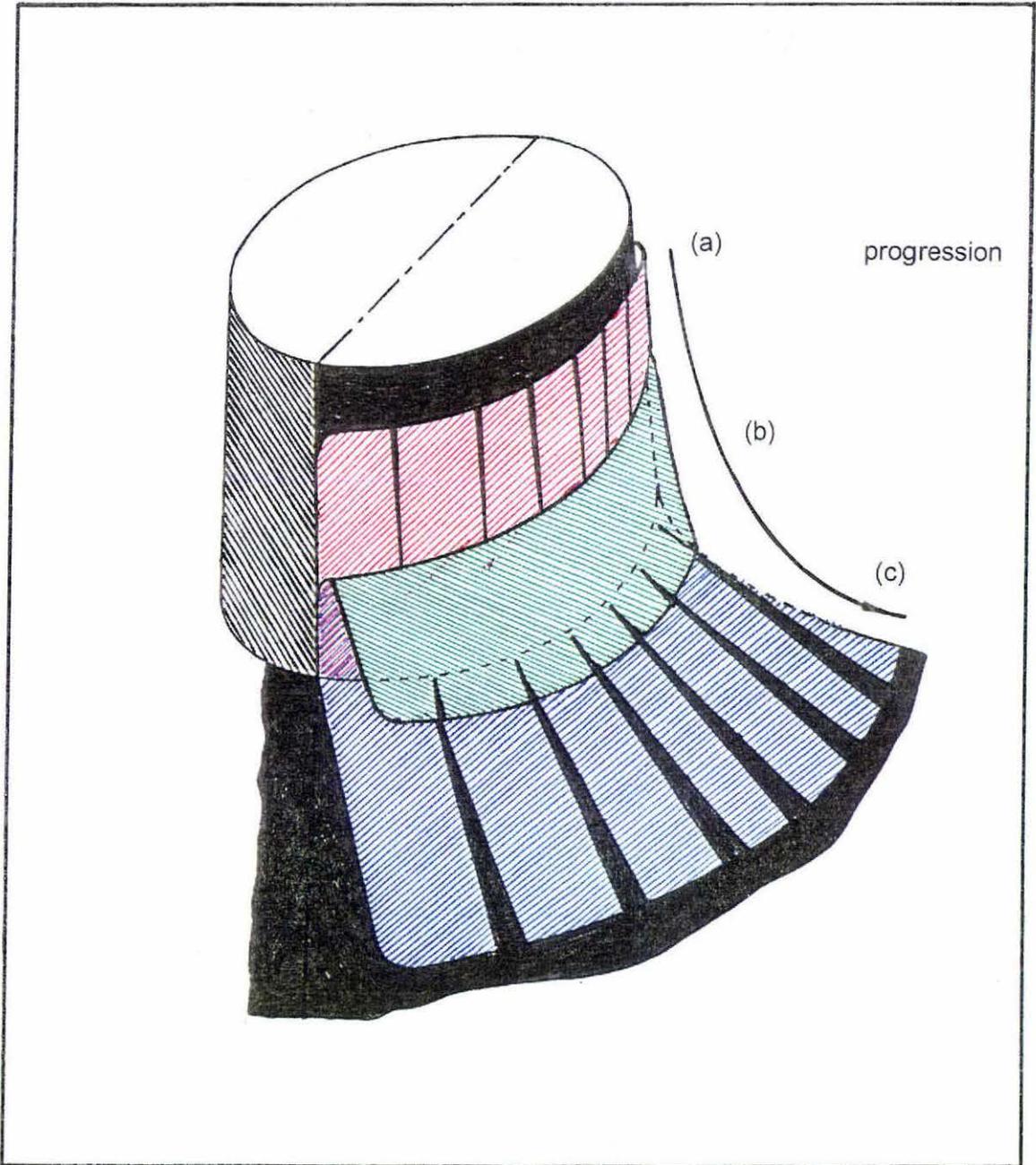


Figure 6.2 Stand collar initiative:

- (a) Stand collar with cuts through the top edge**
- (b) Cuts opened out. Longer top edge allows a fall section to form and a lower setting**
- (c) Completion of spread cuts produces a flat collar**

(Drawing source: © M. Campbell).

the leaf edge, the collar descends progressively lower on the neck; the fall widens, the stand narrows and the break line moves and forms closer to the neck line. Eventually, when the collar is totally flat (Figure 6.2 (c), the stand and break line cease to exist.

In the early stages of the transition from a stand collar to a flat collar, the crease or break line is straight, or relatively straight. When the fall widens and the leaf edge lengthens, curves are produced at both the leaf edge line and break line. The curvature of the break line will be relatively shallow, allowing the toile to crease away from, but still lying close to the neck of the model. In contrast, a greater width of fall-to-stand ratio, with a relatively longer leaf line and break line, will set in a more circular trajectory comparatively further away from the neck. (Just as the leaf edge line will set only in its position relative to the underlying body length so too will the break line set in a position around the neck relative to its length).

6.1.3 Basic collar initiative resolution (to form the composite collar drafting system)

The transformation from flat collar to stand collar, or the reverse, implies that when manipulations are taken into account and transferences of silhouette and size are allowed to emerge, there is only one type of collar, it is neither a stand collar nor a flat (fall) collar but a composite of both, with all of the collar elements available for use. Accordingly there should be only one type of drafting system. This principle is the basis of the composite collar drafting system.

Although both collar types, the flat and the stand, fit the neck line of the body patterns, one below and one above, there are differences in the way that the two collar initiates perform during manipulations; it is therefore essential to choose the most appropriate collar initiative for the unification of all collar types. Before deciding which collar initiative to use, a study of the break line is in order. It is normally assumed, from a given draft, that the body neck line position and its shape are accurate; these assumptions may not be correct when discussing a connection between the neck line and the break line. The break line can be either curved (convex or concave) or it can be straight.

'The crease edge of the collar must be kept as short as possible, which can only be achieved by drafting this line straight.' Morris, 1947; p236.

Trying to crease a curved section of fabric, pattern-paper or card, without distortions is difficult to achieve and control, and as the line begins to arch to a higher degree control becomes increasingly problematical, distortions being proportional to the amount of curvature introduced into the crease line. As the break line diverts excessively from the straight, the potential for distortions on that line increases. Conversely, a straight line is the easiest form to draw, to fold (a straight line takes almost no effort to crease as a break line) and to manipulate and it is also the easiest shape from which to obtain regular neckline curves for both collar and body patterns. Therefore, the break line shape is more convenient and acceptable, at least to start with, as a straight line than a curved line. However, of the three lines, neck, break and leaf edge line, the break line of the collar is normally the last to be considered in contemporary drafting processes. The general order of priority is usually; the neck line, the leaf edge line and then the break line.

Attaining a straight break line is complex activity when the neck line of the front and back body patterns are the first lines to be established. An easier method is to create the break line first, then the stand width (and shape of collar neck line), then the neck line of the body patterns. This is in direct contravention to the normal drafting methodology, but it does allow a straight collar break line to form in each case and the collar neck line will nevertheless fit the front and back body pattern neck line. This is because the front and back body pattern neck line will now be constructed from the collar neck line. Also, the fall section of the stand and fall collar will form from the folded break line, exactly imitating the stand width area. The fall area that lies outside the stand's jurisdiction, on the front and back body pattern shoulder regions, is the only area that requires wedge formations (at this juncture).

In essence the stand and fall collar is made up of two sections of stand collar together with an added, relatively small, section of flat collar (any section below the neck line).

This new collar element progression can only be achieved from a stand-collar initiative, not from the flat collar perspective and it can only be attained at the beginning of the collar drafting process. In other words it is easier to make the break line and all of the other elements from the stand collar initiative than the flat collar initiative; therefore the collar initiative will be performed from the **stand collar perspective**.

The oblong stand fits to the neck and establishes from the beginning the stand, Mandarin, or Chinese collar, one of the three basic types of collar fundamental to all designs. It also gives the elementary outline of the second of the three collar types required, that of the stand and fall collar. The third of the three basic models is the flat or fall collar which fits and lies perfectly flat around the shoulders and takes the contoured shapes of the upper body and shoulder areas. It takes any desired outline shape, within reason, along its two outer opposing edges of neck and leaf lines. (However, if this collar is to have a stand section of even the smallest of widths, which the vast majority would, it has to be reclassified, and assigned to the stand and fall collar type). The flat collar also forms (and completes the stand collar initiative) that part of the fall section of the stand and fall collar (with a leaf edge) that lies outside the stand's influence. However, there are problems associated with the insertion of length into the leaf edge.

6.1.4 Experimental insertion of leaf edge length

To create a three-dimensional collar of a certain silhouette requires that it have a unique two-dimensional pattern shape that is harmonious and commensurate with that collar. Other collar pattern shapes may perform to give different aesthetic values. To evaluate this concept, a system of experiments was devised to demonstrate that different collar styles could be achieved from the same prototype without any of them being legitimate for requirements, none of which would become apparent until made up and placed in a three-dimensional position. A trial was designed to establish how the shape, and set of a collar would change as a set amount of length was taken from a variety of placements along the leaf edge of a flat collar pattern. The results of four tests showing different methods of leaf edge insertion are described in Figures 6.3, being consistent with the following quote:

'The balance of a pattern is altered when a point of suppression is shifted, unless some compensating adjustment is made to the pattern' Kunick (1967).

A simple rectangular shaped collar pattern (Figure 6.3a) with an off-centre break line was used to illustrate that length can be inserted at any location along the leaf edge line without regard to logic, the final outcome of either the collar pattern shape or the collar fabrication and to observe the results as the addition of a standard edge length of 40mm was inserted to simulate the wedging-open of the collar's outer edge.

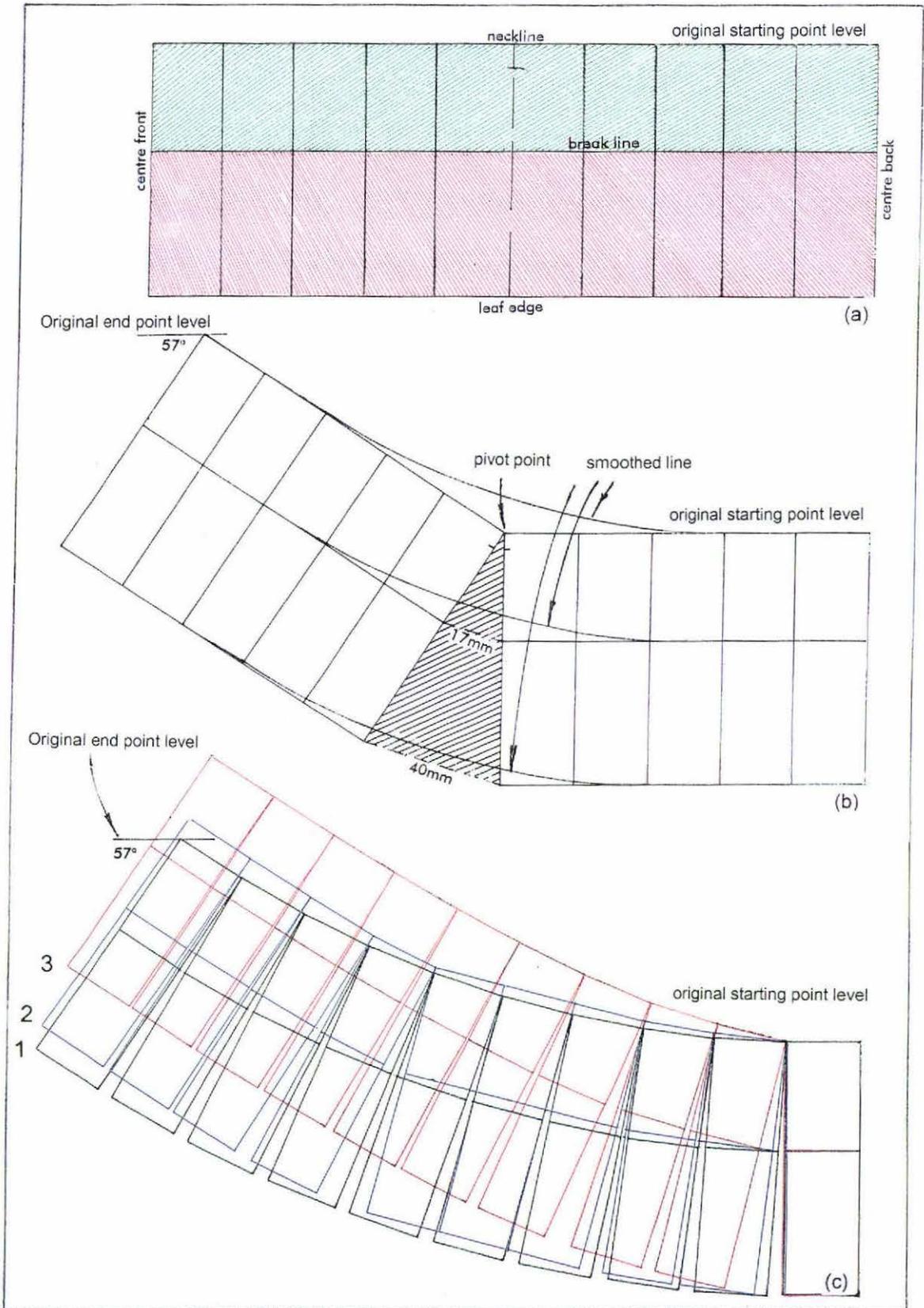


Figure 6.3 Experimental leaf edge length insertion:
 (a) Collar rectangle (b) 40mm length insertion opposite the neck point
 (c) Various length insertions (above the start point)
 (Drawing source: © M. Campbell).

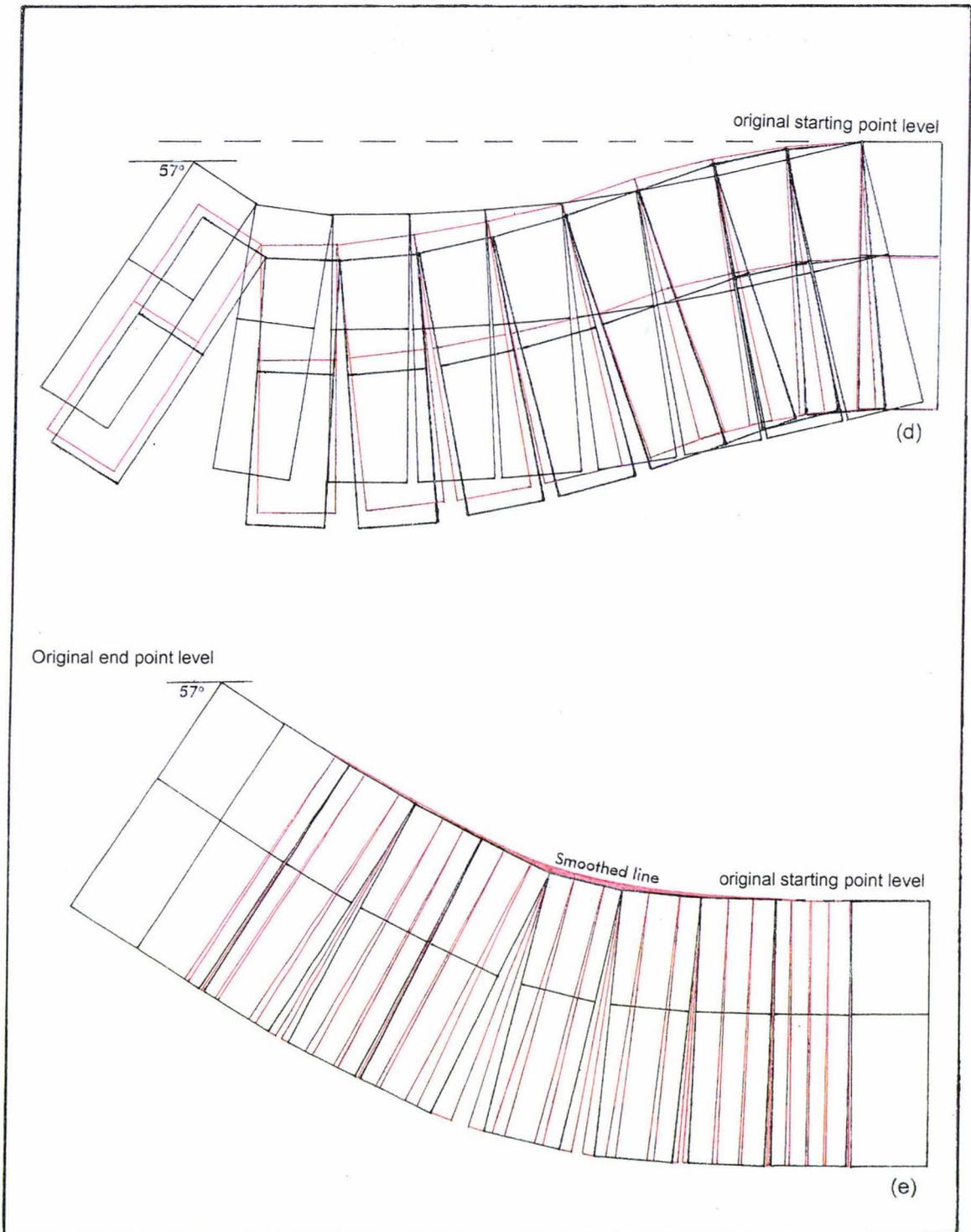


Figure 6.3 Experimental leaf edge length insertion (continued):
(d) Various length insertions (below the start point)
(e) Collar pattern with smoothed edges
 (Drawing source: © M. Campbell).

The rectangle (Figure 6.3a) was set with dimensions similar to a half-collar (70mm wide x 200mm long). The leaf edge position on the body, and therefore its length, was found by deducting the stand height from the fall width. Producing this measurement below the neck line position gave the required leaf edge line length. In this instance the required leaf edge length is 240mm with the present available length of the rectangle at 200mm leaving the total amount to be inserted at 40mm. The shoulder point is placed at the centre of the top edge (neckline) with the bottom edge representing the leaf edge. In all the experiments the centre back line position and 90° angles are static. For the purposes of experimentation and to provide additional distribution contrasts of leaf edge length insertion, the collar was divided into wedge section lines along its length at intervals of 20mm,

Test 1 (Figure 6.3b).

In this test the total 40mm is inserted at a single location on the leaf edge, directly across from the pivot point at the shoulder neck point, which automatically gives an addition of 17mm at the break line. After wedging 40mm into the centre line of the rectangle, the centre front neck line point changed in location to a higher position, forming an angle of 57° to the horizontal (dashed) line extended from the vertical centre back line. The centre back line remained in its original position with an angle of 90° to the horizontal. The neck, leaf and break lines are given symmetrical curves to eliminate the points at the wedge extremes. Whether the curves provide the best options for the collar is not known as the body sections are missing from this drafting method. The front edge angle of 57° is maintained throughout the experiments and although standardised for consistency this still gives a great deal of range for the alterations. Allowing the front edge angle to 'float' and change from 57°, to provide both acute and obtuse angles to the horizontal would considerably extend the possibilities.

Test 2 (Figure 6.3c).

The shape of the curved lines in test 1, are represented by shape number 1. The single length of wedge (40mm) has now been evenly distributed amongst the other wedge lines (approximately 4.45mm each) to give the regular curvatures. The second option (number 2) has the end point slightly above the original horizontal end point level. The neck line has been given an irregular shape, producing irregular wedge values (some closed). In position 3, when the end point is well above the original end point level, the segments are, again, all open, the amounts varying with the curvature of the inner

edge. More curvature means larger openings and, of course, the reverse applies. A comparison of the three options gives three distinct collar shapes. When both front and back angles are unaltered (57° and 90° respectively) almost any number, positions or combinations of wedges can be used (which always totals the same amount, 40mm) along the leaf edge as required in the original and it makes no difference whether the second end point is above, at, or below the original starting point. Potential exists to spread the 40mm measurement in any combination of mixes on the leaf edge. A combination of closed, overlapped and open segments may form if the neck line were simultaneously concave and convex in shape (see test 3).

Test 3 (Figure 6.3d).

The options to have the centre front neck line point below or on the starting level could have the cut sections overlapping and open, or a combination of closed, overlapping and open; but not all open. Reduction of length brought about by overlaps is exactly balanced with wider open wedges in other areas. Either method, with the end point above or below the original starting level gives the same result as far as leaf edge length is concerned, except that the first option fits in better with the normal concave collar neck line configuration and is the more harmonious method. All three shapes (below the starting level) in Figure 6.3d are exaggerated for effect, featuring the end point slightly below the extended starting level. (Notice the huge open wedges on the left whilst the area near the centre back features overlapped wedges to compensate).

Test 4. (Figure 6.3e)

Figure 6.3e portrays three collars, all with the end point in the same location. The result is that the 'anchored' end points, at the centre front and centre back lines, allow very little flexibility in collar shape, wedging amounts varying only fractionally.

In the examples above, all the sections consist of rectangular corners which have to be smoothed to remove the 'points' to give a continuous uninterrupted linear curve, in the process the numbers of 'obvious' depicted wedges are inter-spaced with unseen, smaller supplementary wedges that reduce the sizes of the 'obvious' original wedges which further distributes the additional length and spreads the 'load' further. As wedges only occur on curved sections any straight sections, without wedge additions, are free of change. Each of the seen and unseen wedges carries with it, its own proportion of additional leaf edge and break line length, which again always adds up to the original

length (in this case 40mm and 17mm respectively). Any ill-considered constricted arcing of the neckline, as in Figure 6.3d, could have a detrimental effect on the break line (and leaf edge) by introducing too much length into a short distance and thereby causing distortions.

The leaf edge tests (Figures 6.3) show that arbitrary placement of length is not a practical solution to the problem of collar leaf edge length distribution (and that, perhaps, the same impractical procedures may also be at work in other elements of collar design). The 'normal' method of opening the outer edge at the shoulder line (where it seems to be mainly required) may be only an approximate position of where length should be inserted, and may not bear a resemblance to the actual shoulder area where it has to 'set'. Placing the total insertion (40mm) into a single wedge is a simple method that may be deceptive.

Depending on the drafting method, the outer edge of the stand and fall collar, unlike the flat collar, could be an ambiguous quantity (This can also be applied to the top edge of stand collars). Overlapping the shoulder lines of the body patterns, or wedging fabric from the outer edge of a flat collar by various amounts to give it a straighter silhouette are not predictable methods of determining the three-dimensional shape of a collar; nor is opening wedges at the outer line of a rectangle by regular or irregular amounts to give it a more rounded silhouette.

The conclusion is that indiscriminate methods of infusing length in to (or subtracting length from) the leaf edge are unpredictable and cannot work if diverse changes of the size and/or shape of the collar are requested. To determine where wedges of materials should be placed to encourage a flat (or stand) collar to form a stand and fall, the above experiments show that there cannot be subjective amounts and random placements of those amounts. Wedges must be designed specifically for each area of the outer or leaf edge. The same can be said of the upper edge of a stand collar for a given neckline and neck column shape, the stand collar cannot be manipulated successfully unless there is an underlying method. There has to be a more systematic, logical and exacting approach to predetermine any such wedge insertions in the collar pattern and the envisaged three-dimensional fabricated outcomes.

The preceding tests have given an answer for 'what happens to a single wedge when the lines are smoothed', however, there are other questions that are not addressed. Questions such as:

- How is the correct shape of collar determined? What is the correct shape and are there options?
- Who or what determines the curvature of the lines to give the correct collar shape?
- What happens when the outer lines are curved in a regular or irregular manner?
- What happens to the shape (the amount of curvature) of the two outer lines and the break line?
- How many ways are there to insert length into a line and where will they be positioned?

6.2. Stand collar and related elements

The stand collar initiative originates and combines the following intrinsic elements that make up all the sizes, volumes, shapes, planes, lines and points for all collars that incorporate a stand no matter how wide or narrow, but not zero:

- All centre-back body section neckline height positions.
- All centre front break line height positions.
- All body neckline positions and lengths on both the forepart (front) and back.
- All collar break line positions and lengths
- All collar neckline shapes and lengths.
- All collar stand widths, (even if they vary in width at the front break line, or points) and lengths.
- All collar fall widths, lengths and positions, (along the break line and within the stand width extent and range).

The only line not included in the above list is the leaf edge line when the fall is of a greater width than the stand width. When the leaf edge extends outside of the dominating sphere of the collar stand section, the fall section that extends from the neck line to the leaf edge has to be correctly constructed; this can be achieved with the

sector lines on the front and back body patterns that were established in section 5.4 (page 138).

6.2.1 Superimposition of design elements (to create the composite collar drafting system)

The composite collar drafting system functions with all the collar types considered in the same manner. This differentiates the composite drafting system from other drafting methods, as the three collar types, flat, stand and stand and fall, will no longer operate as separate entities.

At a very basic level there is ultimately only one category of collar which when manipulated forms all the others. As stand collars have no fall, fall collars have no stand, and stand and fall collars have both, a process of unification and superimposition of some elements will take place, and all collars must be re-categorised into a single unit, or collar type.

Superimposition is an important device used within the composite collar drafting system as it helps to combine and unify all of the collars into a single discipline. The basic collar type to be used for all of the collar styles in the composite collar drafting system, will be the 'stand' collar which is now given the attributes of the 'stand and fall' type.

All collars will thus have the following attributes (elements):

- Neck line.
- Stand width (if it is not needed it will have a value of 0mm).
- Break line (superimposed or not)
- Fall width (if it is not needed it will have a value of 0mm).
- Leaf edge line also known as the top-edge line, if a stand-only collar is required.

Stand collar description: A normal stand only collar has a stand width but no break line and no fall width. With the composite collar system there is a need for both a break line and a fall. The break line (which now exists on all collars whether needed or not)

will be superimposed with the top or leaf edge line giving a fall width of 0mm (Figure 6.4a). As in all stand and fall collars, all of the original lines, as well as the stand and the fall are represented in the stand type of collar, except they may be hidden, or superimposed, with zero width dimensions.

Flat collar description: With the requirement of a fall only collar (with no stand width or break line), the break line will be superimposed with the neck line (Figure 6.4b). The stand registers as a width of 0mm. The width and shape of the flat collar area can now be altered to suit. As in the stand collar, all of the original lines and widths are represented except that one line (the break line) may be concealed below another.

Stand and fall collar description: When a stand and fall collar is required, both the stand and the fall are given their necessary widths (expressed in millimetres) which are automatically altered as required with the break line taking its rightful position between the stand and fall sections (Figure 6.4c). All of the original lines are represented and exposed as in the original, with none hidden or superimposed.

Each new collar design produces its own unique packet of information whilst using the same formula and processes in each instance. The new method of making collars is the same for all styles with only the dimensions and profile appearances changing. Style and shape may change because of alterations in position (height) and dimensions, such as stand and fall widths, but the procedures remain basically the same. Using different methods for different collar types and problematical individual styling is not an issue as one method combines all of them together into a single unit. Speculations of any of the measurements of overlaps and dart wedges to change style or fit, or to tighten a leaf edge to construct any of the 'stand' and 'stand and fall' collars is not required at all. Each style and shape of collar follows the same procedure with each element related to all of the others. Each step in the system follows a logical method retaining the correlation between the various elements.

6.3 Basic composite collar (stand-band)

Initially, the composite collar drafting system is based on the essential elements found in the simplest of stand collars. This is a plain stand-band with no design shaping (depending on the design the front design area may or may not need to be shaped).

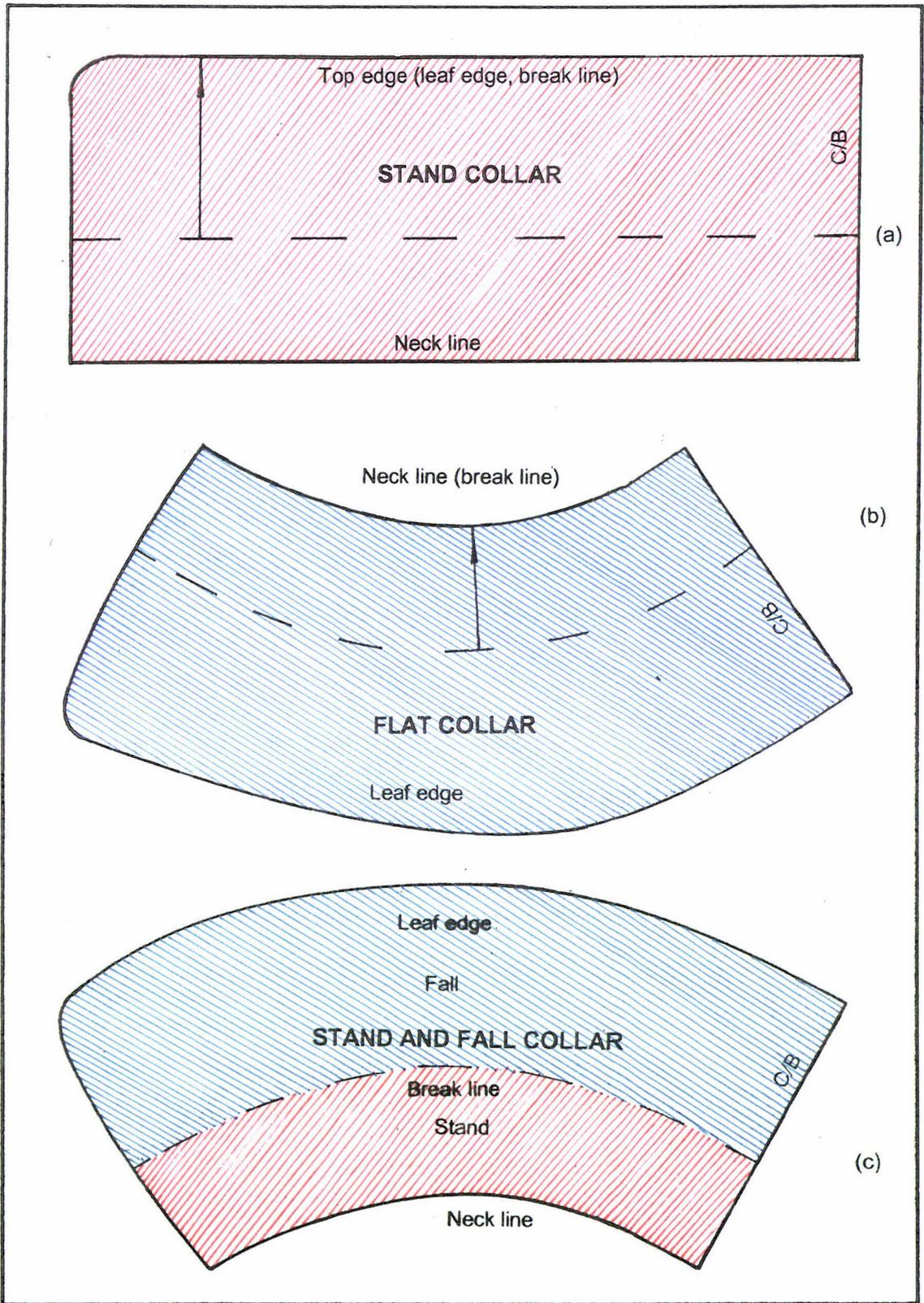


Figure 6.4 Superimposition of elements:
 (a) Break line moves to the top edge to give a stand only collar
 (b) Break line moves to the neck line to give a flat only collar
 (c) Break line between the neck and leaf edge lines to give a stand and fall collar (Drawing source: © M. Campbell).

The stand-band is a rectangle of any required length and width that represents the stand or Mandarin collar. It also characterises the stand section of a stand and fall collar. The stand-band is also an unseen element in the flat collar. The stand-band is a key design element in the creation of the composite collar drafting system. It is the fundamental shape around which the system develops.

The stand-band represents an elongated stand collar section (whose length depends on the height of the top button position, coupled with the required stand width) with further styling embellishments added later if necessary. This stand-band encourages the unification of all of the elements that make up a collar and assists the formation of the surrounding neck, lapel, facing and top collar areas of the garment.

The basis of the composite drafting system depends on the combined principles of modelling and drafting. Modelling the stand-band around the mannequin's neck which establishes the body neck line and the drafting of the body and neck sections and collar, thus blending generic collar types, styles and designs, giving the system its composite characteristics and allowing designers the free use of its adaptable nature. The nature of the composite collar drafting system means that all the collar styles reviewed (and their many variables) are absorbed within the system. The composite collar drafting system involves six steps:

1. Modelling the stand-band around the mannequin's neck to produce the body neck line.
2. Drafting the stand-band onto the neck line of the body section patterns.
3. Designing the leaf edge and front design area.
4. Unfolding the collar to form the one-piece under collar.
5. Developing the two-piece collar.
6. Constructing the top collars.

The stand-band has two long edges separated by the required stand width. The top edge represents the break line of the collar, whilst the bottom edge forms the neck line of the collar which is necessary to form the body neck line. The centre front break point of the stand-band is found on the top edge of the stand-band, whilst the centre back

neck point is located on the bottom edge (neckline) of the band. The longest length of stand band required (for the left side only) is calculated from the centre back to the lowest usable centre front break line point, which in the first instance is at waist level. To this is added, from the centre front closure, an allowance for a Double Breasted wrap-over and button/hole distance (the distance from the button/hole to the front edge). The break line of the collar and lapel continues beyond the centre line by various amounts depending on the widths of the button wrap and buttonhole distance. For greater accuracy, the band may be twice the length, from left front edge around the neck to the right front edge. All front left and right stand-band cross-over positions of the break line are found on the vertical centre line of the body and front pattern, they do not, at any position, form a right angle to the centre front line (Figure 6.5).

6.3.1 Body neck line placement

There are a considerable number of necklines possible within the range of the neck and body areas, ranging from a high buttoning shirt collar to a tailored collar and lapel buttoned at the waist level. All of the various collar designs and their respective front opening locations have their own neckline formed around the neck and body in a continuous line positioned somewhere between the required front edge height and button wrap and its corresponding centre back position (Figure 6.5).

The placement of the stand band is entirely reliant on three factors:

- The width and shape of the stand band.
- The front button closure height and position
- The contours of the neck and body.

Depending on those three factors all the necklines between the centre front and the centre back will vary, therefore different front opening heights cannot occupy the same neckline contours or position without distortions forming in the collar break line. The highest centre front neck point is located at the base of the neck at the sternum notch and is paired with the highest centre back neck point. Conversely, the lowest centre front position has the lowest centre back point (Figure 6.5). All other front openings are found between these two extremes. It becomes apparent that although the centre front

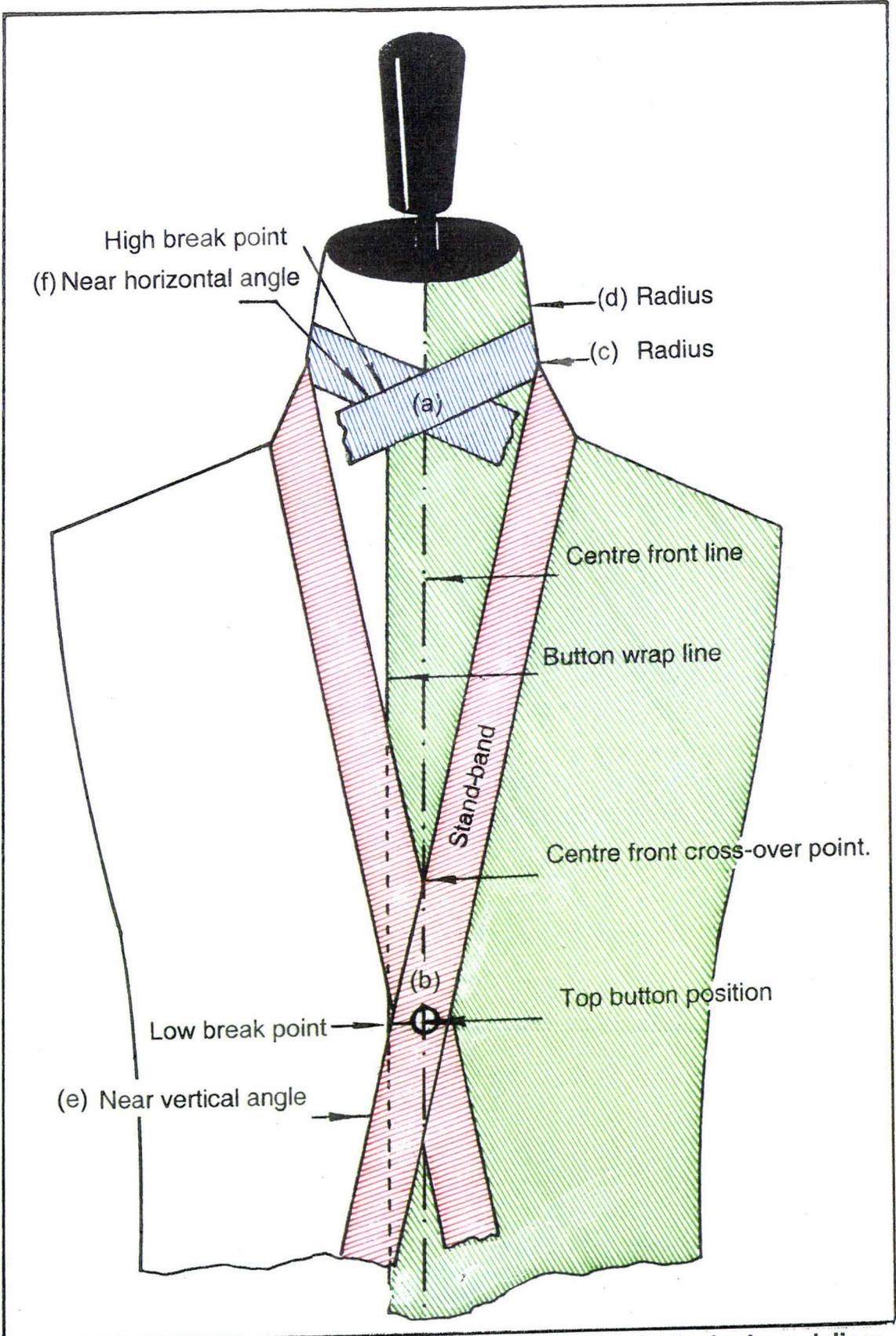


Figure 6.5 Positioning (tracking) of the stand-band to locate the body neck line:
 (a) High break point fastening styling (short band-high tracking)
 (b) Low break point fastening styling (long band-low tracking)
 (Drawing source: © M. Campbell).

cross-over fastening heights might be spaced in a consistent vertical manner, the centre-back neckline height positions are inconsistent because of the contouring of the neck and shoulder areas, the stand band encountering different aspects of this contouring as the centre back height is lowered. The degree of separation between the highest and lowest points on the centre front line amounts to approximately 340mm whilst the centre back points that correlate to both of the front heights amounts to just 15mm. (This difference can be seen when comparing the neck line positions of shirt block patterns and drafts to tailored jacket block patterns and drafts).

Every new centre front opening position, and therefore, the centre back position, (as found in the mannequin analysis), brings the stand-band edges into alignment with different sections of the mannequin neck column and body arrangement, both vertically and horizontally as it curves and descends from its own high centre back-point to its lower centre front-point. As such, the height, shape and length of each collar, lapel and neck line will be established as part of the manual process, with each front opening position. Some collars, determined by their high location on the neck (e.g. shirts) will consider all of the various neck sectors and their associated angles as they curve around the neck from back to front, whilst others (e.g. jackets) will encounter fewer sector lines and angles to automatically produce a collar neckline that sits in correct register with the neck and body areas.

High, buttoned collars (Figure 6.5 (a)) have most, if not all, of their widths within the confines of the neck, the stand-band following the more horizontal angles. The lower button fastenings have progressively more of the collar occupying the body and shoulder section locales and will continue to follow more acute neck line angles to the vertical (Figure 6.5 (b)) as the centre front cross over point is lowered. As the stand-band descends the body to a low closure point from the centre back neck, it comes more into contact with the shallower more horizontal angled shoulder, contrasting with that of the centre back neck and causing the band template to describe a longer radius and circumference than does a higher buttoned band. Once the shoulder gives way to the chest area the band twists and flattens on the body to a more vertical angle (Figure 6.5 (c)). A high, buttoned to the neck, collar style remains in a more horizontal alignment (Figure 6.5 (d)) though the extent to which this happens in practise also depends on the figure type and posture. The procedure does not change because of these differences, absorbing them during the course of its practised modelling aspect of the procedure.

In the new composite collar system the final shape of the body neckline is not determined prior to the collar but is produced as the collar stand band is positioned around the neck. From the outset, neck lines, break lines and leaf edge lines of the body and collar are related and all collars are compatible with their respective necklines, the contouring of the body and neck of the mannequin influencing their shapes and positions. There is a circuitous involvement between the elements, which ties them all together to form their own individual design package within the system. The front closure position and the stand band template, determines the body neckline position and shape, which in turn helps to produce the collar, which at the beginning produced the neck line.

6.4 Discussion

Using modelling techniques on the mannequin as a method of forming all the body pattern neck-line positions available to the designer would be a time consuming procedure to follow. An automatic computer programme would be preferable if there were a possibility of producing the same results.

Formation of the body neck line

The main problem to solve in the composite collar drafting system, before a computer programme is formulated, is related to the movement of the collar stand-band as it progresses from the centre front opening height on the left side of the three-dimensional mannequin, around the model at the centre back and down the right side to the right centre front closure point. This is the formation of the body pattern neck line. Modelling in this manner produces the whole neck line, left and right sides. It may be of benefit, and easier, to describe the formation of the left neck line from only the left perspective and from centre back to centre front. This is because the centre back of the collar has to form, always, a right angle to the centre back line of the body; they are really a duplication of the same line. This is a controlling line whereas any angle may be formed by the stand-band at the centre front.

There are three possible positions for the stand-band:

1. Entirely within the neck section boundaries.
2. Completely within the body environs.
3. Partially within both of these realms.

The first two arrangements are the more straightforward to execute as they are represented by their respective pattern pieces, the third is more problematical. They are described as follows

1. A stand, or stand and fall collar located entirely within the neck region takes on the characteristics of that section of the neck that lies directly beneath the collar's outline, no matter what the collar profile. As the neck of the model describes an approximate circular truncated cone, a pattern taken from this three dimensional silhouette can be laid prone entirely without distortions.
2. The front and back body sections can be accommodated onto a single flat plane and providing that the exterior edges, neck and leaf edge of the flat collar make contact with the underlying body patterns along their entire lengths, it might take any form or configuration as is thought proper for the style.
3. When the stand-band straddles the neck and body junction of the model it causes and contributes to an intricate collection of routines which makes this collar more challenging.

The analysis of the neck and body relationship of the mannequin (Chapter 5, Figure 5.3) has suggested a hypothesis of how the collar stand-band progresses and the body neck line evolves from a centre back position down to the centre front fastening position. The mannequin neck column was divided into twenty vertical sections down its length from the top-plate to the neck junction line (Figure 5.2). From the neck line they progress down and across the front and back patterns dividing the two body areas into the same number of sections.

Each neck and body section, along with the various angles formed with the body and neck column, is now used in the composite collar drafting system to give placement to the stand-band. It is through these section lines that the 'track' taken by the stand-band (the track changes with a change in the stand-band width) can be traced to give the correct neck line position for the decided centre front closure height. Each of the neck/body sections presents a different contour from the adjacent sections. This method creates the various neck lines for each different collar style. The individual

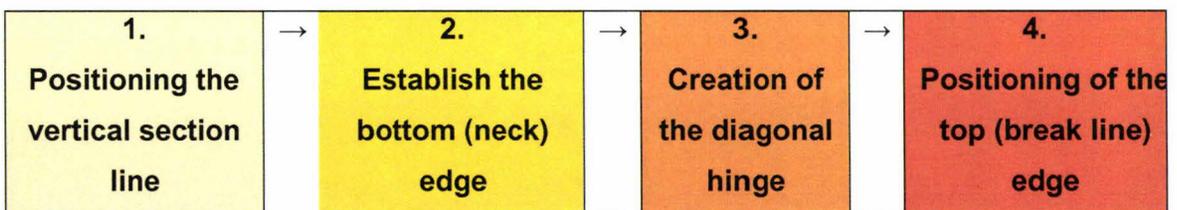
centre back height position of the stand-band, for the different styles, offers and presents a unique set of contours as the band progresses around the neck and shoulders and down the body from section to section.

The centre back line of the stand-band forms a right angle to the neck line (Figure 6.6a) and can be thought of as the first hinge in a series of hinges. All section lines are hinges, as are their diagonals (Figure 6.6b (1, 2 and 3)). The area between these hinges form triangles of half sections. Through these axes the half sections of the stand-band swing onto the body (or neck).

As both edges of the stand-band have to touch the neck or body sections, the determining factor for the positioning of the next section in the series is the next change in body or neck contour. The wider bottom edge touches the body area from the centre back line and along its length until it reaches the next section line (different body contour), forcing a halt to its progress (Figure 6.6b (1, Ø)).

At this juncture, to allow the top edge to touch the mannequin, the stand-band hinges, or pivots, across its width from the bottom of that section to the top of the previous section line (centre back at Φ), forming a diagonal hinge line between \emptyset and Φ (Figure 6.6b (2)). The next edge that forms, until it is stopped by a section line (neck or body contour), is along the top edge from Φ to Ю (Figure 6.6b (2)). Between Ю , on the top edge and \emptyset , on the bottom edge in Figure 6.6b (3), is where the next vertical hinge forms, ready for the next section of the bottom edge; and so on, in a series of edge placements and hinge pivoting until the stand-band terminates at the front edge (Figure 6.6b, c).

The process follows the following repeated sequence (Figure 6.6c)



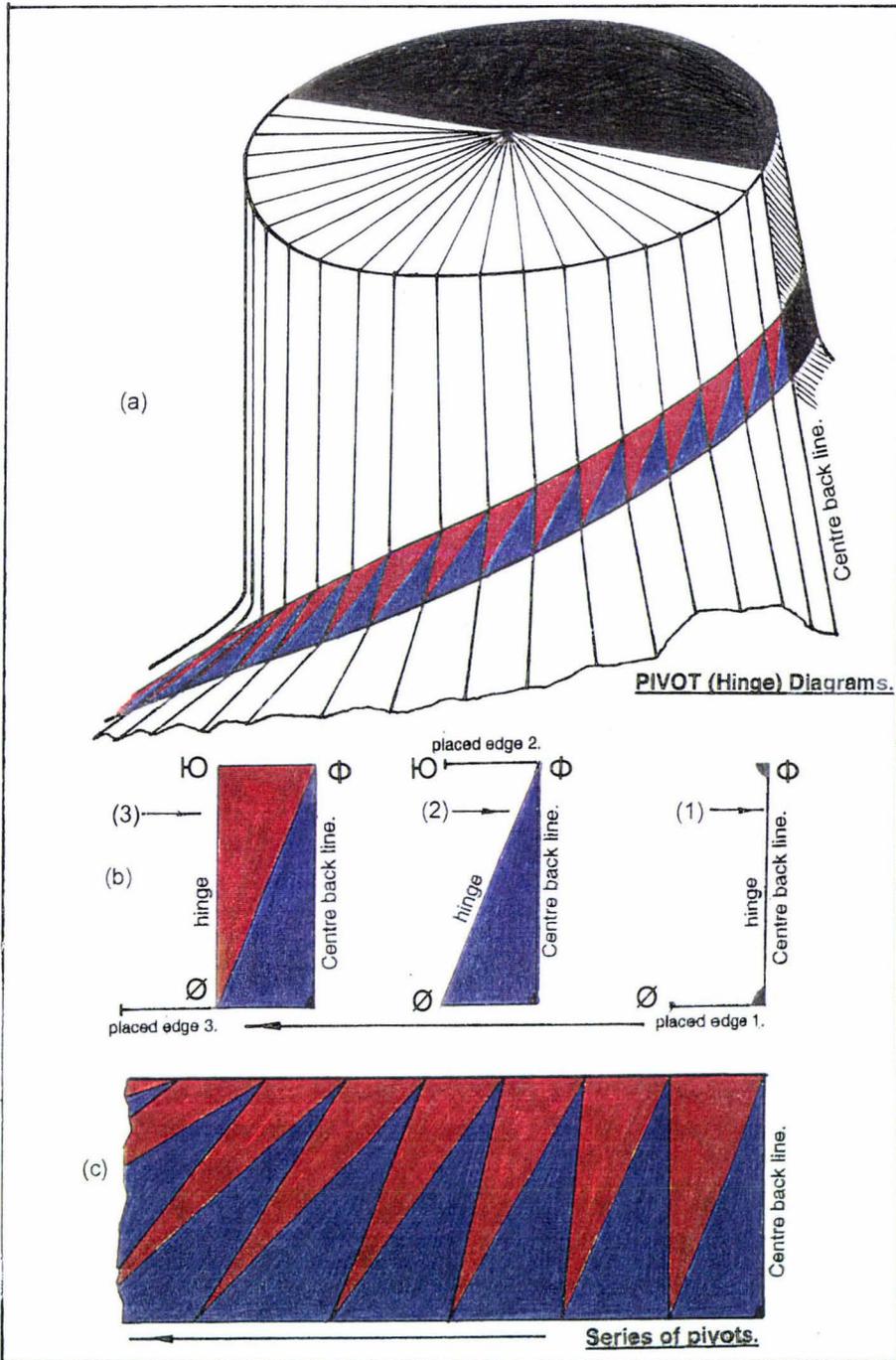


Figure 6.6 Formation of the body neck-line:

- (a) Stand-band around neck of mannequin
 - (b) Location of the centre back line (right angle hinge, Φ)
 - Placed edge 1 progression until halted by next contour (\emptyset)
 - Diagonal hinge formed between \emptyset and Φ
 - Placed edge 2 progression until halted by next contour IO
 - Vertical hinge formed between IO and \emptyset
 - Placed edge 3 etcetera
 - (c) Series of pivots showing hinge lines
- (Drawing source: © M. Campbell).

1. Vertical section line (1st vertical is the centre back) hinge. The full stand-band width touches the mannequin, giving the first pivot line from which the bottom edge 'swings' (Figure 6.6b, (1)).
2. Bottom edge. This edge touches the body only as far as a change in body contour occurs. At this point a diagonal hinge appears from the bottom edge to the top of the previous vertical hinge line (Figure 6.6b, (placed edge1)).
3. Diagonal hinge. This hinge pivots the top edge of the stand-band onto the neck (Figure 6.6b, (2)).
4. Top edge. The top edge touches the neck, along its length, only as far as a change in neck contours occurs (Figure 6.6b, (placed edge2)).
(The 1, 2, 3 and 4 sequence being repeated).

Always, the vertical section line instigates the formation of the lower edge of the band (and therefore the body neck line) whilst the diagonal line initiates the location of the upper edge (break line) of the band. The series advances until the band is exclusively within the body region. At this juncture pivoting is no longer required, the band lying flat against the torso. The band continues its uninterrupted passage as a parallelogram to the centre front line.

(It has to be stressed that the section lines are only illustrates of the interactions between the stand-band and the neck/body areas from the centre back around to the front edge. It is the contouring of the neck and body that dictates the actual procedure). Theoretically, that which is occurring on the three-dimension body could be applied or transferred to the two-dimensional pattern. Measuring the distances down (the body) or up (the neck) each of the section lines from the original neck line position (bearing in mind the neck/body angles taken from the mannequin analysis) gives the amounts to be subtracted from, or added to, the prone front and back patterns, to which can be constructed the required under collar, and lapel if needed.

6.5 Summary

The fundamentals of the composite collar drafting system require that the various collar categories and the diversities within those types, be reduced to a single collar type. This has been accomplished with the aid of the two 'collar initiatives' of flat and stand. The resultant collar type, the stand-band, was decided because it was the most appropriate shape from which to obtain a straight, easily creased, break line. Investigations into the allocation, or inclusion of leaf edge length showed that it has to be achieved in a more logical manner than previously described. All elements are combined in the composite collar drafting system, some of which must be superimposed to complete the unification.

The stand-band is used to define, on the mannequin, the individual neck lines associated with each change in design. The actual processes involved to achieve the position, or 'tracking' of each neck line has been theorised and described as a series of 'hinges' or pivoting motions around the neck and body areas that alter with each change in the front closure height position. The explanation of the progression of the stand-band, from the centre back to the centre front, in each requested collar design, may aid in the production of a two or three-dimensional computerised collar design programme. The creation of which would be of enormous benefit to practitioners.

Chapter 7

Composite collar drafting system (Collar style drafting process)

7.0 Introduction

Chapter 7 depicts drafts for a list of selected collars and the stages and processes using the composite collar system. Descriptions and examples of the front collar design area and a number of various collar styles are included. Top collars are represented in both one and two piece formats. The manual 'quick reference' composite collar system, grading, summary and discussion conclude the chapter.

7.1 Collar selection

Various current standard collar styles, described in the literature review, have been chosen to be drafted using the composite collar drafting system; they range from the flat collar to the stand collar with a wide array of collar styles in between. Table 7.1 lists these collar types, each of which was trialled from a basic draft to the final fabric toile (See Appendix B for composite collar style photographs).

Table 7.1 Collar types drafted using the composite collar system

| Collar types | Collar description | Figure numbers | Appendix B |
|------------------------|--|----------------|-------------|
| Flat | (Fall collar, (no stand) | 7.9 – 7.12 | (Not shown) |
| Stand (Mandarin) | (Stand collar, (no fall) | 7.6 – 7.8 | B1 |
| Shirt | (Flat front with a stand at the back) | 7.14 – 7.18 | B2 and B3 |
| Prussian | (Stand and fall collar, (all-round roll) | 7.39 – 7.43 | B9 and B10 |
| Tailored jacket (S.B.) | (Step, stand and fall collar) | 7.1 – 7.5 | B4 and B5 |
| Tailored jacket (S.B.) | (Shawl, stand and fall collar) | 7.19 – 7.23 | (Not shown) |
| Convertible | (Step, stand and fall collar) | 7.29 – 7.33 | B6 |
| Ulster overcoat (D.B.) | (Stand and fall collar) | 7.24 – 7.28 | B7 |
| Regency overcoat D.B.) | (Stand and fall collar) | 7.34 – 7.38 | B8 |

7.2 Stages in the development of the composite under collar

The composite collar system commences with the one-piece under collar, advances to the two-piece under collar; then proceeds to the one-piece top collar before forming the two-piece top collar. It is a single continuous developmental process that allows for pattern constructing flexibility and from the outset supersedes alternative collar pattern

construction methods available to the designer, since all collars follow the same procedure.

The two piece collar (separated stand and fall sections) is designed to reduce or maintain break line length in order for the collar to sit closer to the neck and to eliminate distortions of the collar in the break line. The usual process of introducing a series of wedges to shorten the two piece collar break line is not required in the composite collar system.

The itemised list shown below, describes the stages used in the development of the one piece under collar from the initial decision of the stand width to the formation of the two piece under collar ready for seam allowances. Related processes are appropriately subdivided in each of the stages.

Stage 1a: Decide the desired stand-band width and shape.

Stage 1b: Establish the top button position and button wrap width on the body toiles whilst on the mannequin. Construct the body neck line on the toile and patterns.

Stage 2: Design the under collar on the body and neck line (break line overlapped).

Stage 3a: Under collar separation from the body sections (break line overlapped).

Stage 3b: Under collar break line straightened (leaf edge overlapped).

Stage 3c: Under collar stand and fall sections unfolded.

Stage 4a: Under collar, one piece stand and fall (leaf edge length regained).

Stage 4b: Under collar, one piece under collar ready for seam allowances.

Stage 5a: Under collar, two piece stand and fall (from stage 3c).

Stage 5b: Under collar, two piece stand and fall ready for seam allowances.

7.3 Composite under collar drafting system

The following instructions follow the sequences set out above (stages 1a-5b) to develop the composite under collar drafting system, they are meant to give a detailed portrayal of the complete composite collar drafting and pattern-making procedures.

The tailored under collar has been chosen to show the full composite drafting system because it contains all of the design elements; a stand section, fall section, lapel, neck line, leaf edge line and break line. This collar will help 'set-the-scene' for the other style variations (with or without superimposition of design elements) in the composite collar drafting system.

Stage 1a: Decide the desired stand band width and shape.

The stand width has to be decided to enable a stand-band template to be made. The template for the stand-band, in this instance, is 30mm in width throughout its length (the front section may be reduced, if desired, in width or shaped as is sometimes used in shirt collar making).

The stand-band is shown (Figure 7.1 stage 1a) as the dashed lines (full length not shown) required for placement around the neck. The solid lines of the band represent the final size of the stand-band with the section lines (copied from the body when draped around the neck) superimposed and extended through its width.

Section 6.2.4, Formation of the body neck line, describes the passage of the stand-band around the mannequin and shows the pivoting 'gate hinge' action from one section to the next. Each front opening changes the positions of the sector lines on the stand-band and are, therefore, unique to that particular design. This is a lengthy procedure to undertake in each situation that may be circumvented. To make the process easier there are two other methods to consider:

The first method is to sectionalise the stand-band across its width in a regular manner, perhaps measuring and marking the lines every 1cm, at an angle of 90° to the break line, starting from the centre back line and progressing to the front edge. The sections, and the lines, remain the same for all collar designs allowing a single stand-band template to be used for the majority of collars. The second method, if 3D computerisation programme were possible, is for the computer programme to

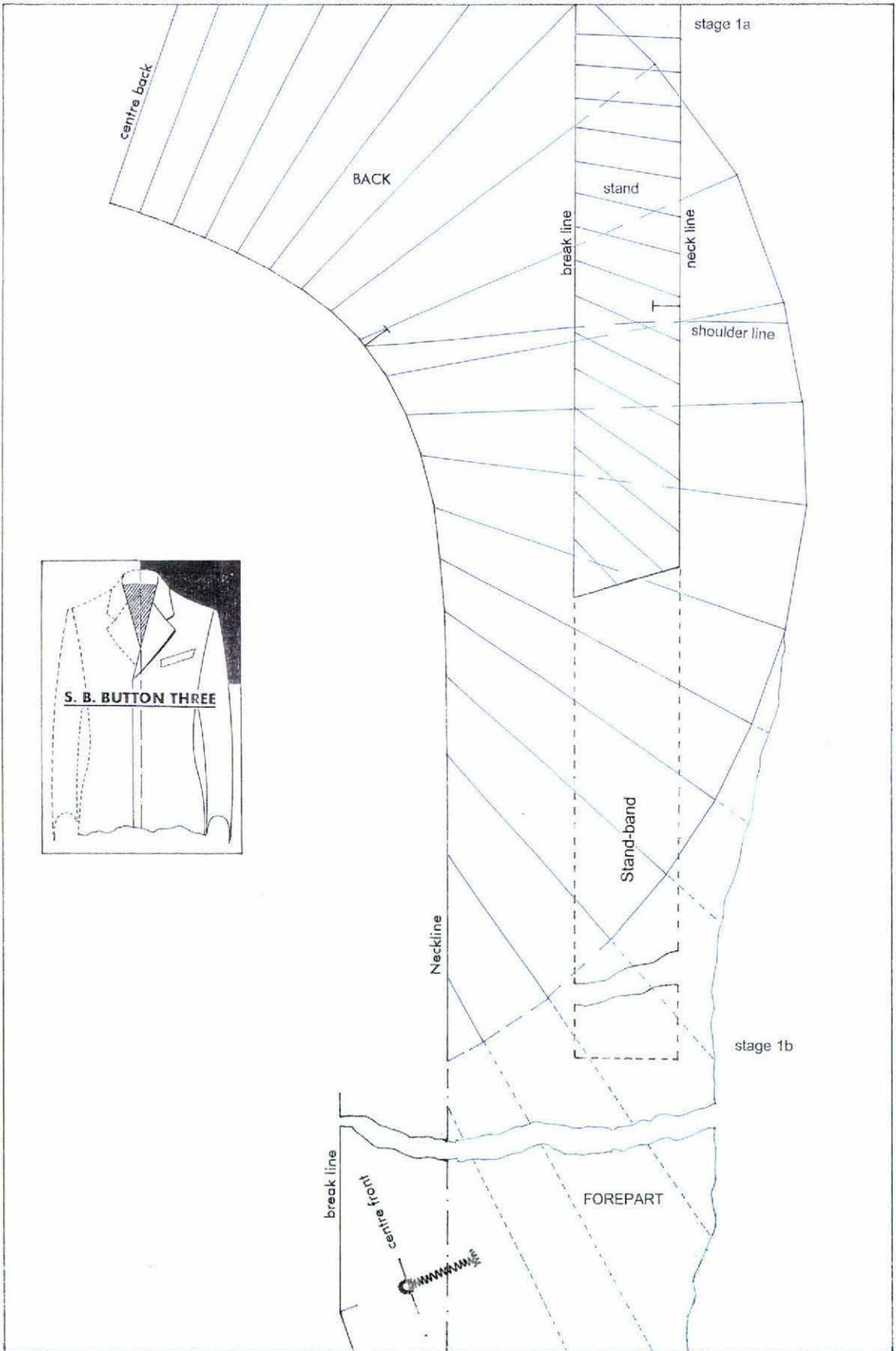


Figure 7.1 Composite under collar: Jacket (S.B. Button 3).
Stage 1a: Stand-band. Stage 1b: Neck line construction.
 (Drawing source: M. Campbell ©).

decide, through recognition of body and neck contours, where the sector lines or pivot 'gate hinge' points should be formed (an unknown process at the moment).

Stage 1b: Establish the top button position and button wrap width and construction of the body neck line on the toile and patterns.

The top button height placement and button wrap width has to be selected at the centre front line as a reference to activate the neck line position which can then be marked on the body toile (Figure 7.1 stage 1b). The neckline shape and position are established by draping the stand-band around the entire neck of the mannequin (Figure 6.5) so that the prescribed centre front crossover point and top button position are attained. For precision in 2D applications both edges of the stand-band (neckline and break line) touch the mannequin along its entire length. The neck and neck/shoulder contouring controls the stand-band as it curves around the neck circumference leaving the neck column at various points. (Each modification of vertical height of the centre front break-point closure gives each front break point its own unique neck line configuration). Once the final resting place of the neckline (bottom edge of the stand-band) is established on the mannequin and marked on to the forepart and back toile, it can be transferred on to the front and back body patterns. (It is at this stage that the sector lines are copied onto the stand-band).

Stage 2: Design the under collar on the body and neck line (break line overlapped).

Each section of the stand-band is added to its own section on the body neck line (Figure 7.2 stage 2). This results in sectional overlapping of the break line. Next, the width of the fall is decided at 40mm (stand plus 1cm = 40mm) and the position of the leaf edge line, below the neckline, is calculated (fall width, 40mm minus stand width, 30mm = 10mm). The front collar design shape is delineated and additions (measured from the break line of the band) such as the lapel and square gorge corner should now be outlined. Prior to manipulation, and during the design phase (Figure 7.2 stage 2), notches are positioned at a standard spacing length of 50mm (designer decision) on the collar starting at the centre back line. Notches aid

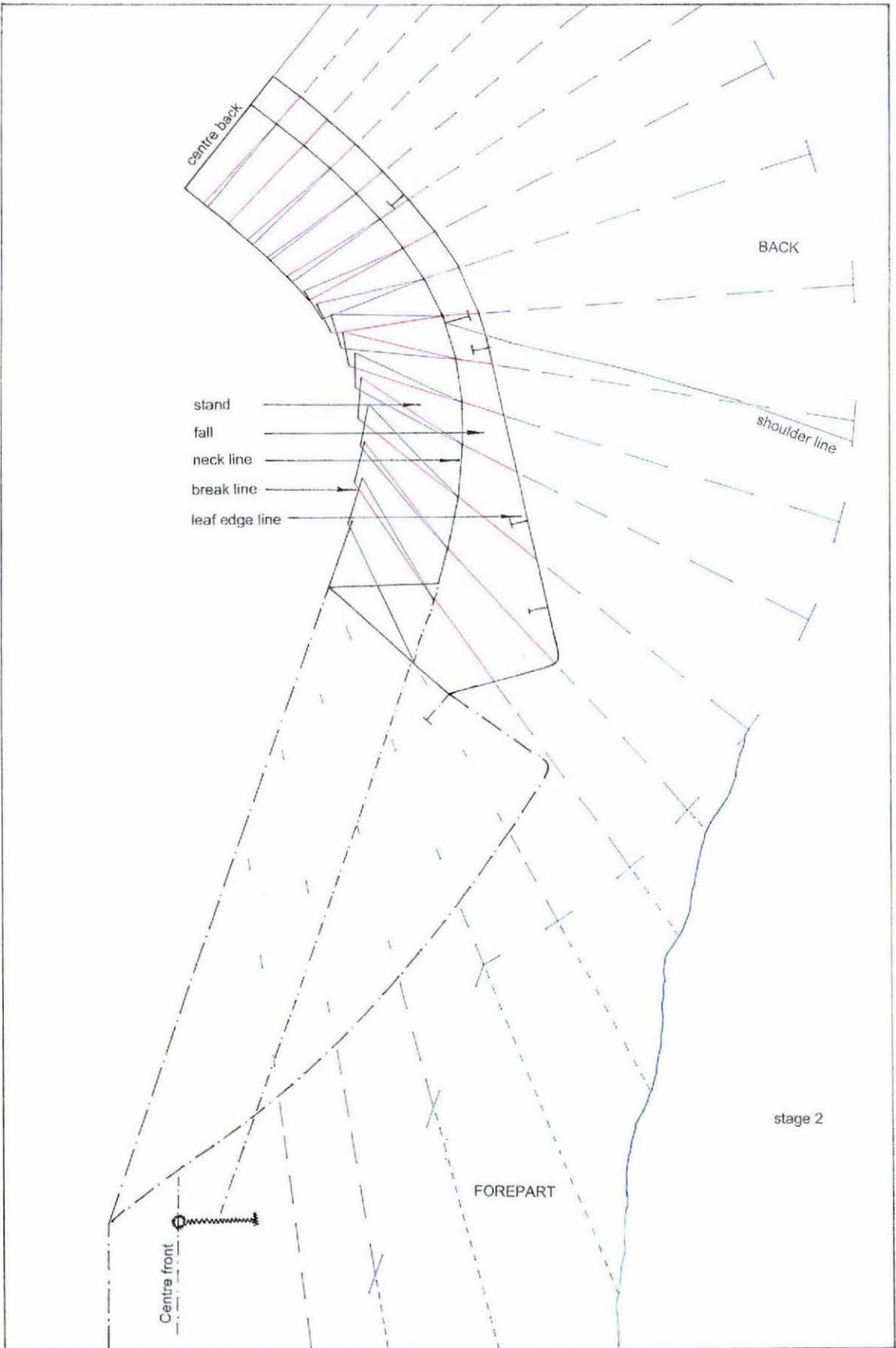


Figure 7.2 Composite under collar: Jacket (S.B. Button 3).
 Stage 2: Collar design (break line overlaps).
 (Drawing source: M. Campbell ©).

in the alignment of the top collar to the under collar and act as guides if the leaf edge is to be stretched.

Stage 3a: Under collar separation from the body sections (break line overlapped).

The one piece (1 piece) under collar stand and fall is separated from the body ready for further development (Figure 7.3 stage 3a).

Stage 3b: Under collar break line straightened (leaf edge overlapped).

The under collar break line is now straightened (Figure 7.3 stage 3b) by pivoting each section from the neckline until each attains its original stand-band sector length, when concluded the complete one-piece collar break line has been made up to length. Each pivoting manoeuvre straightens both the neckline and the break line whilst overlapping, or wedging and shortening the leaf edge of the fall.

Stage 3c: Under collar stand and fall sections unfolded.

The under collar is then unfolded to show both stand and fall sections (Figure 7.3 stage 3c). The system ensures that each portion of the leaf edge has the correct amount of length automatically infused into its sector for its own particular purpose, distinct design shape and style position. There are no ambiguities to this method of leaf edge length infusion; leaf edge lines close to the neck line will be shorter in each sector than those leaf edge lines set and radiating further out onto the body and shoulder areas. At this stage the break line is at its shortest for most practical purposes. The leaf edge is still in its overlapped stage. (It is now that a pattern for the under collar could be made that necessitates the leaf edge to be stretched to regain the required length. See section 7.4.1 stretched leaf edge, tailored collars, one piece).

Stage 4a: Under collar, one piece stand and fall (leaf edge length regained).

Further development of the under collar (Figure 7.4 stage 4a) is achieved by pivoting from each of the section points on the neckline edge to open their respective overlaps on the leaf edge (for collars that are not stretched on the leaf edge). These actions re-establish the true length of the leaf edge line.

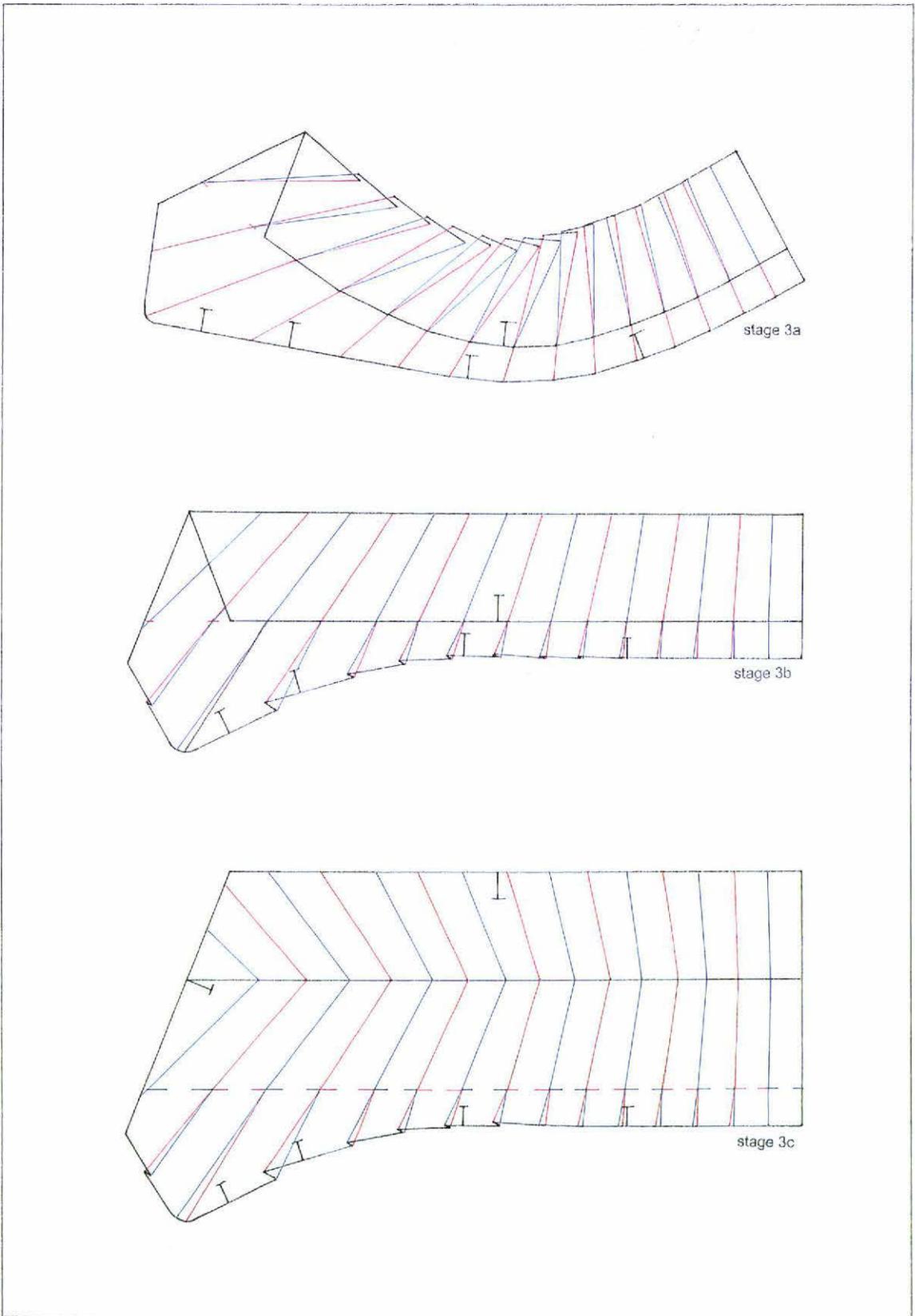


Figure 7.3 Composite under collar: Jacket (S.B. Button 3).

Stage 3a: Collar separation.

Stage 3b: Break line straightened (length regained).

Stage 3c: Stand unfolded.

(Drawing source: M. Campbell ©).

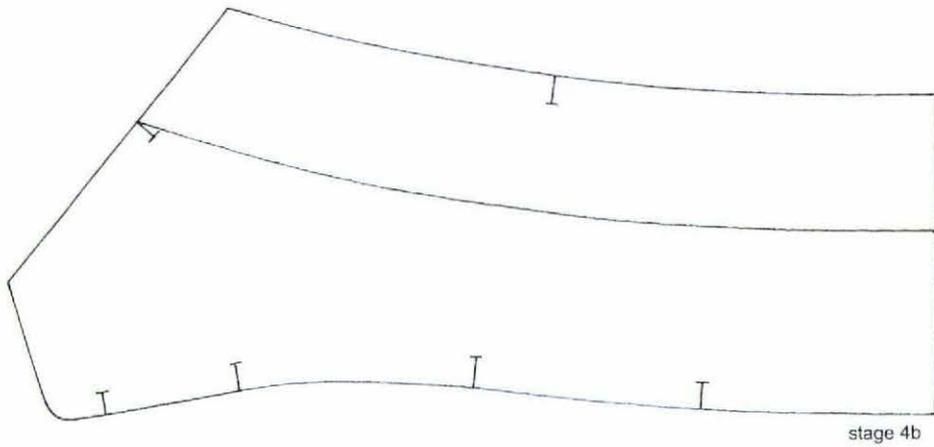
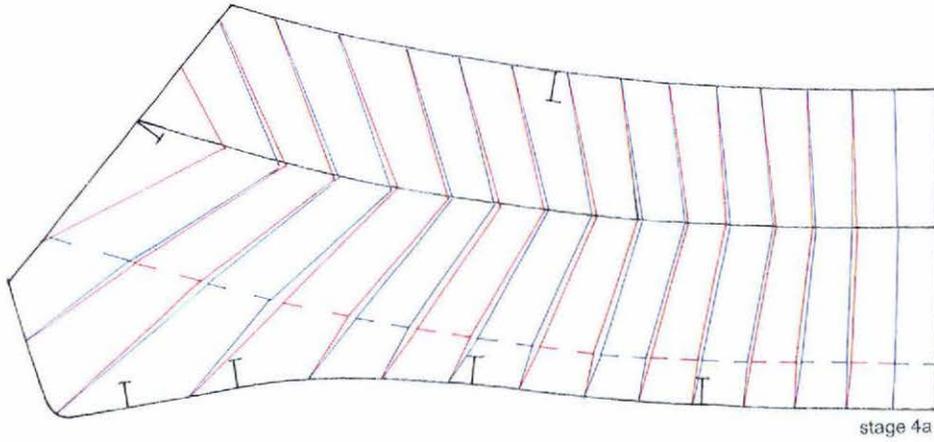


Figure 7.4 Composite under collar: Jacket (S.B. Button 3).

Stage 4a: 1 piece under collar (leaf length regained).

Stage 4b: 1 piece under collar (ready for seam additions).

(Drawing source: M. Campbell ©).

Unfortunately, this procedure always has the effect of opening the break line (at each sector line) and introducing length into it by amounts proportionate to both each leaf edge wedge width and the distance from neck line and leaf edge line. The extra break line length, which increases the distance between the collar and the neck of the wearer, can be utilised as ease if needed. Also, as well as instilling length into the break line, length is also implanted into the fall section lines, at the mirrored neck line position (dashed line on the fall section stage 4a). These intrusive amounts lift the collar away from the body causing a slight gap between the two components, instead of contouring to the neck and body. They may or may not cause malformations of the collar which could be shrunk-away by steaming, or left as found. (Any collar sitting over the body sections will need a certain amount of extra leaf edge length so that the edge will not be tight. Seaming will also affect the edge due to seam 'take-up' as the result of the action of the needle as it plies and compresses its way through the fabric).

Stage 4b: Under collar, one piece under collar ready for seam allowances.

At this stage (Figure 7.4 stage 4b) the under collar is ready to have seam allowances added to the neck line, leaf edge line and front design line, if required.

Stage 5a: Under collar, two piece stand and fall (from stage 3c).

The starting point for this development is at the unfolded phase in Figure 7.3 stage 3c. The stand, as depicted in Figure 7.5 stage 5a, has been separated from the fall section and remains in its original state with a straight break line). The fall region still has its overlapped leaf edge sections, shown in Figure 7.3 stage 3b). The leaf edge sections of the fall have to be manipulated to regain their original Figure 7.4a lengths. This is achieved by pivoting each of the section lines in turn from the break line until all of the sections have regained their original lengths, shown in Figure 7.5 stage 5a. The leaf edge now has the correct sectional lengths which correspond to the sectional lengths of the contours of the body where they will rest in the final product. The break line follows a shallow concave arc that more closely resembles the contours of the neck. Both stand and fall break lines remain compatible for their purpose of fitting closely to the neck without distortions

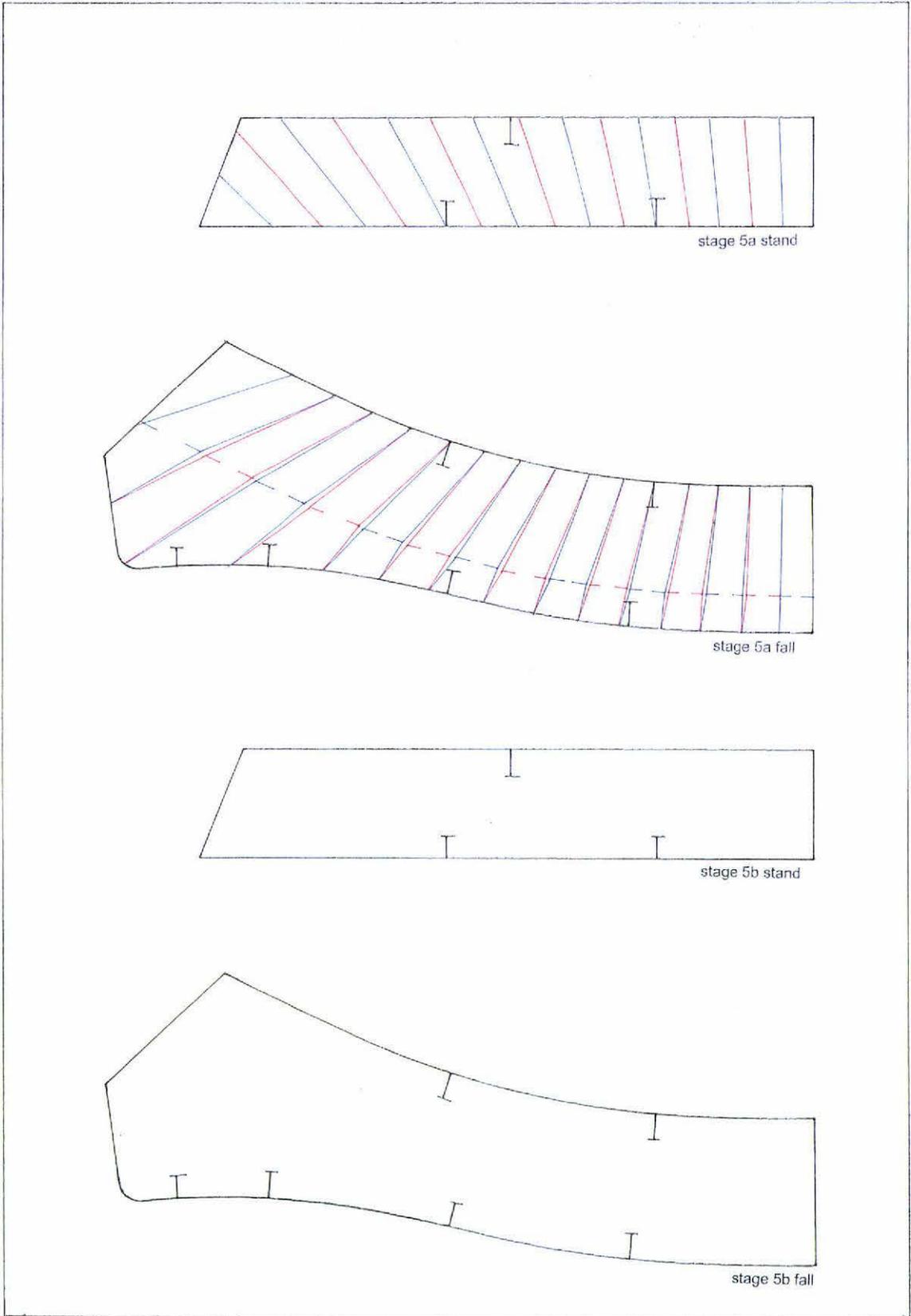


Figure 7.5 Composite under collar: Jacket (S.B. Button 3).
Stage 5a: 2 piece under collar, stand and fall.
Stage 5b: Stand and fall (ready for seam additions).
 (Drawing source: M. Campbell ©).

appearing along the break line and each echoes the other in length, even though they do not have the same shape.

The same problem in the one-piece under collar fall arises in the two-piece under collar; that of the extra length in the collar that separates it from the body and neck (dashed line in Figure 7.5 stage 5a), located on the fall section directly over the neckline. This line was elongated when the leaf edge length was recouped. It is lengthened more than the one-piece collar because of the shorter distances the pivot points are situated from the leaf edge compared to the one-piece collar. As in the one-piece collar the extra length can either be ignored or processed further.

To give flexibility in production and to save time, it is envisaged that both the one and two-piece collars are made at the same time as a continuous part of the collar pattern-making process, the designer then has a choice of using either collar, one-piece or two-piece, whichever is more appropriate for the purpose.

Stage 5b: Under collar, two piece stand and fall ready for seam allowances.

The under collar is now ready for seam allowances to be added (if needed) to the neck line, leaf edge line, front design line and the stand and fall break lines (Figure 7.5 stage 5b). Seam allowances are usually 1cm however, for the break line it is sometimes reduced to 6mm to reduce bulk at the fold.

7.4 Variations in collar design

Within the composite collar drafting system described above, there are variations of collar design that are open to interpretation by the practitioner. They must be included to the composite drafting system.

They include:

- Stretched leaf edge (for structured or tailored collars)
- The 'stand' only collar (no fall)
- The 'flat' no-stand collar (no stand)

(Neither the stand collar nor the flat collar, are really variations within the composite collar drafting system, they are both 'stand and fall' collars with superimposed lines

to accommodate, respectively, zero falls or zero stands. Nevertheless, they will be described to maintain continuity)

- Front design; shaped collar stand
- Ulster overcoat collar. (This collar is included to show a modification of dimensions than a true variation)
- Convertible collar (with two break lines)
- Regency collar (with two independent break lines; one for the collar, the other for the lapel)

These variations are described below.

7.4.1 Stretched leaf edge (one piece collar)

Engineered collars are constructed with the aim of eliminating skilled working of the fabric, for example, manipulations of the hand-iron in order to form a particular shape, suitable for tailored collars. The procedure, of leaf edge stretching, may, however, still be relevant in certain establishments. When this is the case the collar drafting process may be halted at the appropriate stage. The collar configuration in Figure 7.3 stage 3c may be ideal for tailored under collars (and top collars) which require the break line to be kept short at its original length, but needing the leaf edge to be stretched to length either by manual force, heat and steam, or by pulling and sewing it onto a controlling tape of longer length. Control of the stretch of the leaf edge, using a controlling tape, could be achieved with the use of marked tape and notches on the leaf edge shown as '⊥ or T' (Figure 7.2 stage 2). The marks on the tape might be spaced throughout its length at a standard distance of perhaps 50mm; the distances between the notches on the collar leaf edge are then stretched to match the marks on the tape.

The individual reductions in each overlap of the leaf edge (which have to be smoothed) are the amounts that need to be brought back up to length by stretching the leaf edge of the collar on to the tape, matching, progressively, each of the marks on the tape with each notch on the leaf edge, as it is sewn. After collar manipulation each of the lengths between the notches will have been independently increased to their correct lengths as depicted in Figure 7.4 stage 4a.

7.4.2 Stand-band (Mandarin) collar

The stand-band collar has, in this instance, a stand of 45mm (Figure 7.6a) and is without a fall section, which nevertheless, still has to be quantified for inclusion within the composite collar system. The whole process for the stand-band remains the same as the process described in the stand and fall (tailored) type of collar and depicted in Figures 7.1 – 7.5. Although all the stages may not be apparent to the eye they can be imagined to take place.

Stage 1a: Decide the desired stand band width and shape.

The stand width has to be decided to enable a stand-band template to be made. The template for the stand-band, in this instance, is 45mm in width throughout its length and shaped at the front edge. The stand-band is shown (Figure 7.6 stage 1a) as the dashed lines (full length not shown), of the stand-band required for placement around the neck. The solid lines of the band represent the final size of the stand-band with the section lines (copied from the body when draped around the neck) superimposed and extended through its width.

Stage 1b: Establish the top button position and button wrap width and construction of the body neck line on the toile and patterns.

The top button height placement and button wrap width has to be selected at the centre front line as a reference to activate the neck line position which can then be marked on the body toile (Figure 7.6 stage 1b). The neckline shape and position are established by draping the stand-band around the entire neck of the mannequin so that the prescribed centre front crossover point and top button position are attained. The sector lines are copied onto the stand-band.

Stage 2: Design the under collar on the body and neck line (break line overlapped).

Each section of the stand-band is added to its section on the body neck line (Figure 7.7 stage 2). This results in sectional overlapping of the break line. Next, the width of the fall is decided (in this instance it is set at zero mm). The break line and the leaf edge lines are, at this point, superimposed with the top edge of the stand-band.

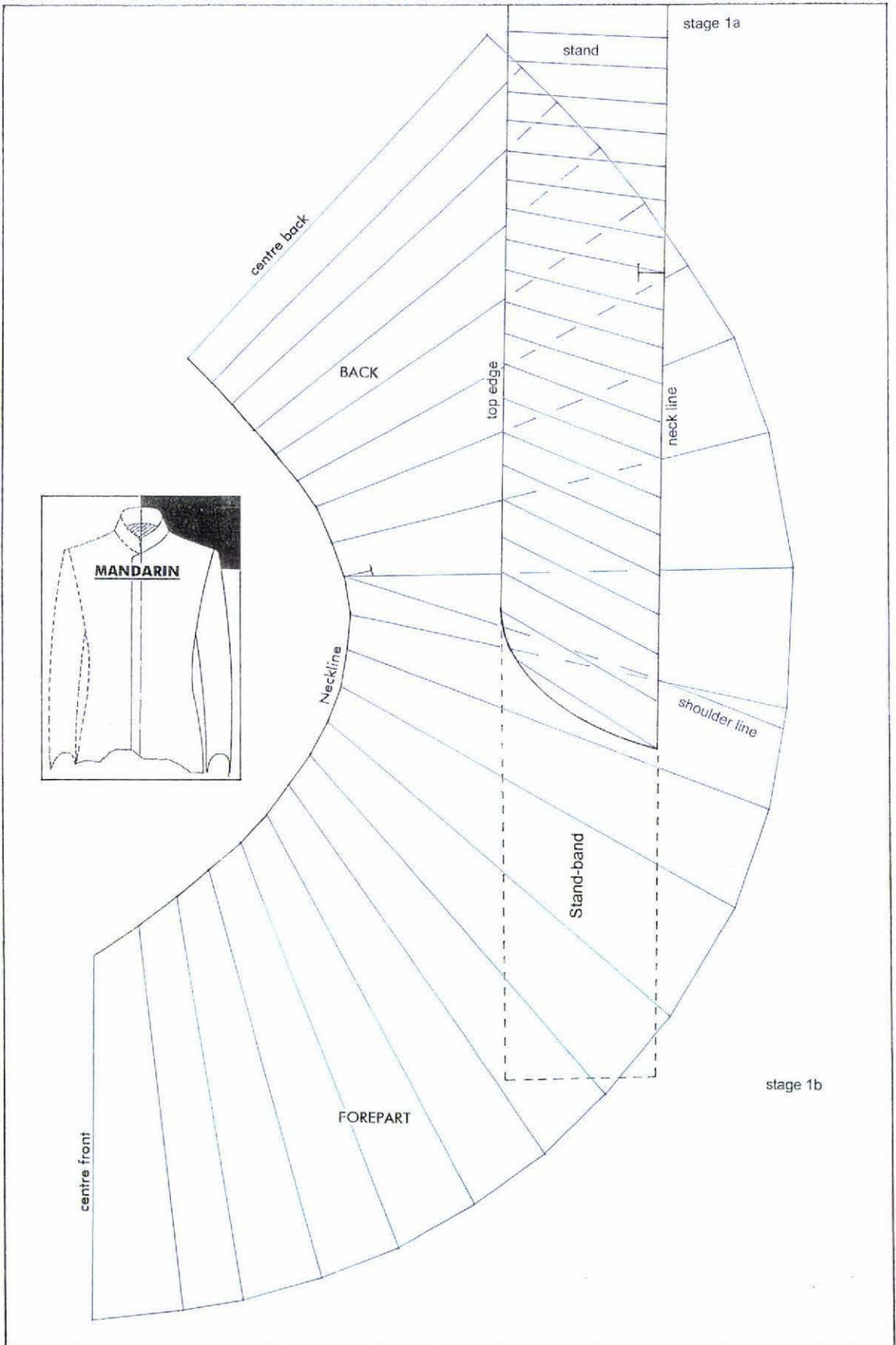


Figure 7.6 Composite under collar: Stand (Mandarin).
Stage 1a: Stand-band. Stage 1b: Neck line construction.
 (Drawing source: M. Campbell ©).

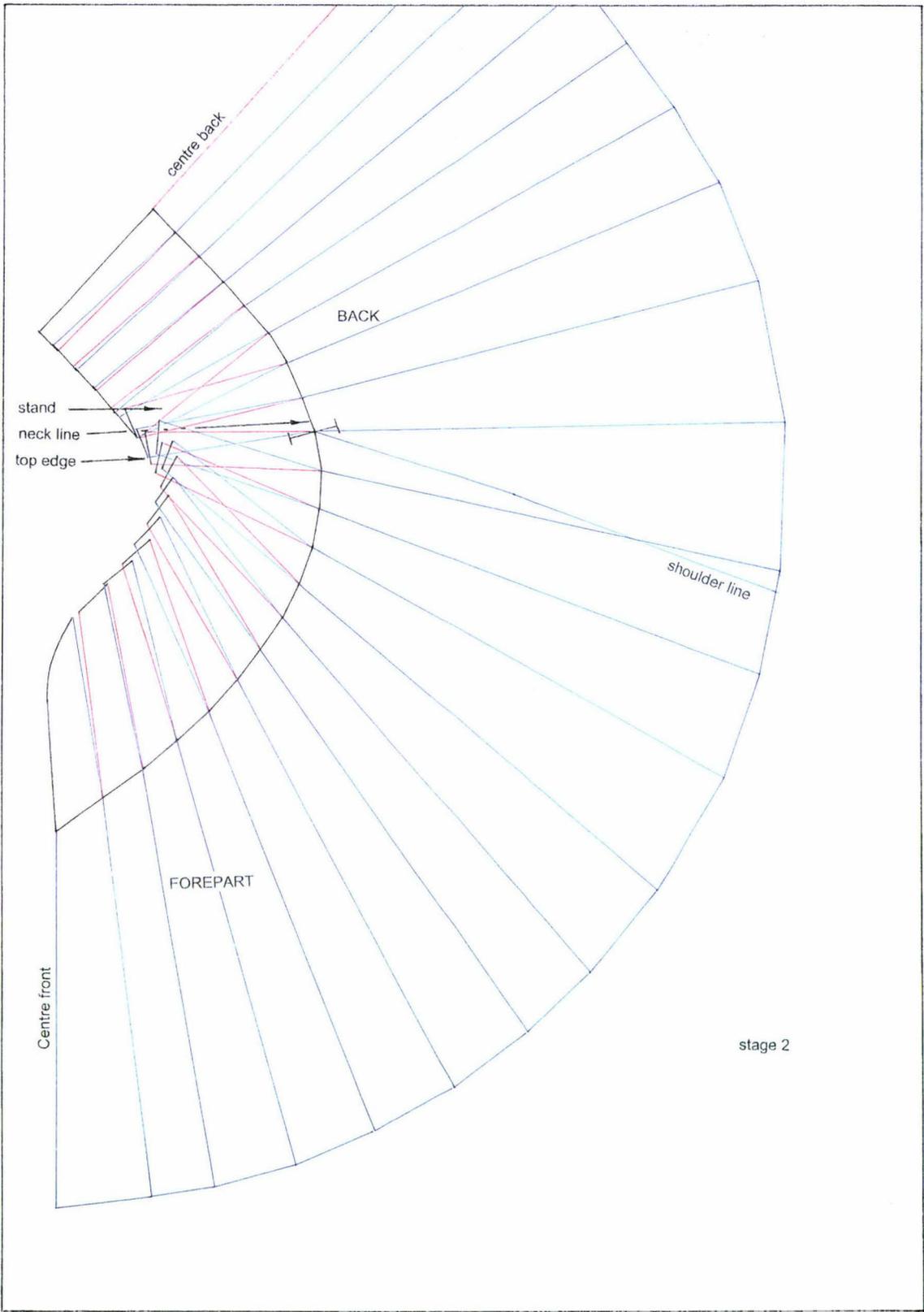


Figure 7.7 Composite under collar: Stand (Mandarin).
Stage 2: Collar design (break line overlaps).
 (Drawing source: M. Campbell ©).

The front collar design area is shaped. Balance notches, for alignment with the top collar, may be added during the design stage prior to manipulations.

Stage 3a: Under collar separation from the body sections (break line overlapped).

The one piece (1 piece) under collar stand and fall is separated from the body ready for further development (Figure 7.8 stage 3a).

Stage 3b: Under collar break line straightened (leaf edge overlapped).

The under collar break line is now straightened (Figure 7.8 stage 3b) by pivoting each section from the neckline until each attains its original stand-band sector length, when concluded the complete one-piece collar break line has been made up to length. Each pivoting manoeuvre straightens both the neckline (and the superimposed break line and leaf edge line). The phases incorporated in stages 3c and 4a still take place although they are hidden from view

Stage 4b: Under collar ready for seam allowances.

At this stage (Figure 7.8 stage 4b) the under collar is ready to have seam allowances added to the neck line, top edge and front design line, if required. Again, certain stages (stages 5a and 5b) are omitted as they are concealed procedures within the composite drafting system.

7.4.3 Flat collar

The truly flat (fall) collar, no stand, is the opposite of the stand-band collar. The width of the fall may be designated any width practicable for the design and the neck shape and position may be as required without a detrimental affect on the collar. In this scenario the same (but reverse) process as in the stand-band collar takes place in the flat collar, the break line moves to superimpose itself with the neck line giving a fall of 120mm with a stand width of 0mm. As with the stand-band collar some of the stages between stage 1 and stage 5 may not be required for this explanation. The first **observable** stage is thus stage 1b.

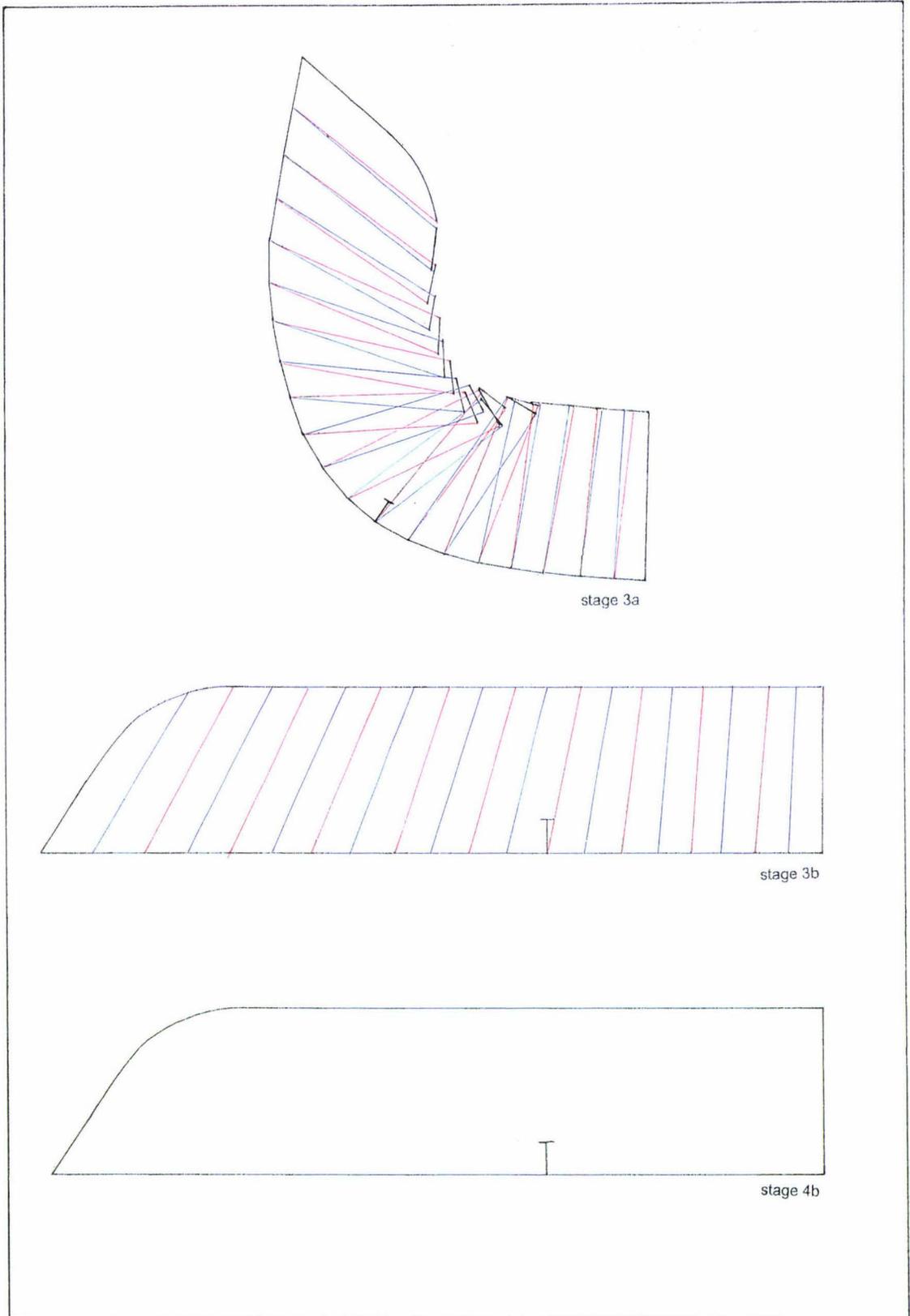


Figure 7.8 Composite under collar: Stand (Mandarin).

Stage 3a: Collar separation.

Stage 3b: Break line straightened (length regained).

Stage 4b: 1 piece stand (ready for seam additions).

(Drawing source: M. Campbell ©).

Stage 1b: Establish the top button position and button wrap width and construction of the body neck line on the toile and patterns.

The top button height placement and button wrap width is determined at the centre front line as a reference to activate the neck line position which can then be marked on the body toile (Figure 7.9 stage 1b). The neckline shape and position are established on the toile as the required design line.

Stage 2: Design the under collar on the body and neck line.

The stand is stated as 0 mm therefore there are no discernible overlaps. Next, the width of the fall is decided (set at 120mm) (Figure 7.10 stage 2). The break line is correctly superimposed with the neck line of the fall and the front collar design area is shaped. Balance notches, for alignment with the top collar, may be added during the design stage prior to manipulations.

Stage 3a: Under collar separation from the body sections.

The one piece under collar fall is separated from the body ready for further development (Figure 7.11 stage 3a). Stages 3a, 3b, 3c and 4a are unobserved, the next step continuing at stage 4b.

Stage 4b: Under collar ready for seam allowances.

At this stage (Figure 7.12 stage 4b) the under collar is ready to have seam allowances added to the neck line, leaf edge and front design line, if required. As usual, the centre back line is a mirror line. Stages (stages 5a and 5b) are omitted as they are concealed procedures within the composite drafting system.

7.4.4 Front design (shaped front collar stand)

Within all collar designs there are areas that are open to interpretation; the front design area is one of them. Standardisation of the straight break line gives a definite geometrical element from which to calculate the collar stand and fall widths. Stand widths may be regular in depth or tapered towards the front design area, which may, itself, be straight, angled in an obtuse or acute manner, or curved. Tapered stand widths, as with all collars with a break line, require that the break line remains straight whilst the neck line is shaped (Figure 7.13).

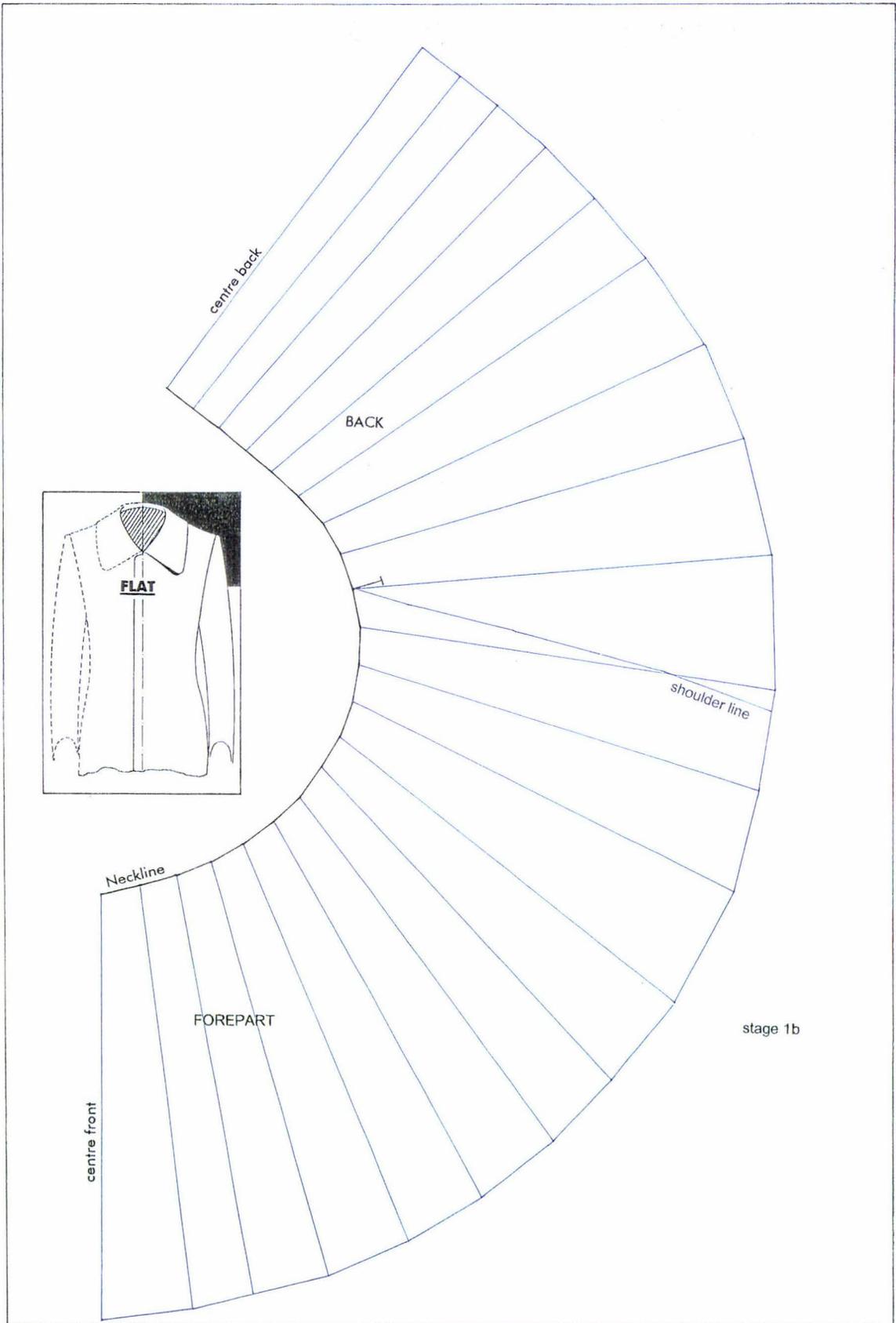


Figure 7.9 Composite under collar: Flat.
Stage 1b: Neck line construction.
 (Drawing source: M. Campbell ©).

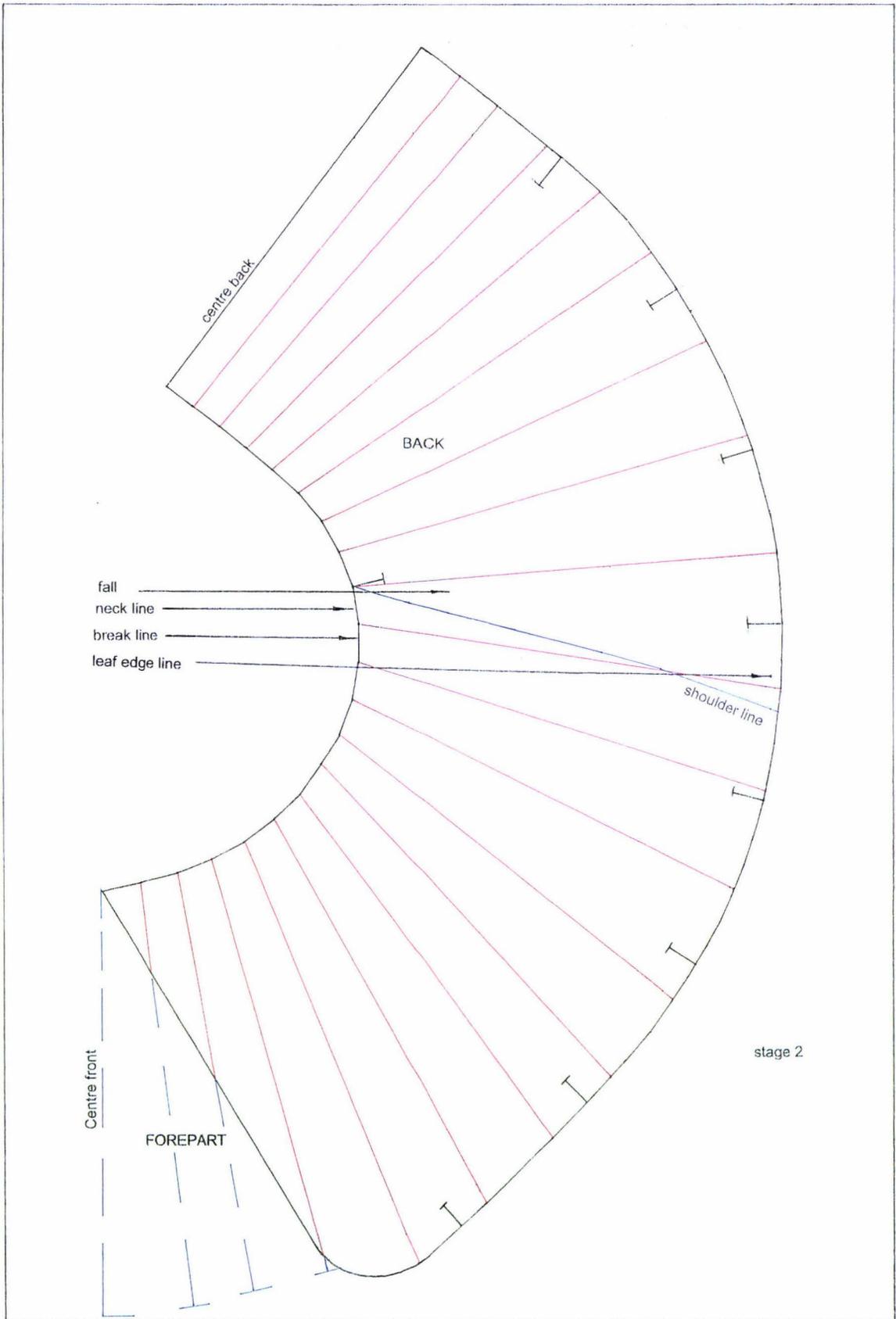


Figure 7.10 Composite under collar: Flat.
Stage 2: Collar design (zero mm break line overlaps).
 (Drawing source: M. Campbell ©).

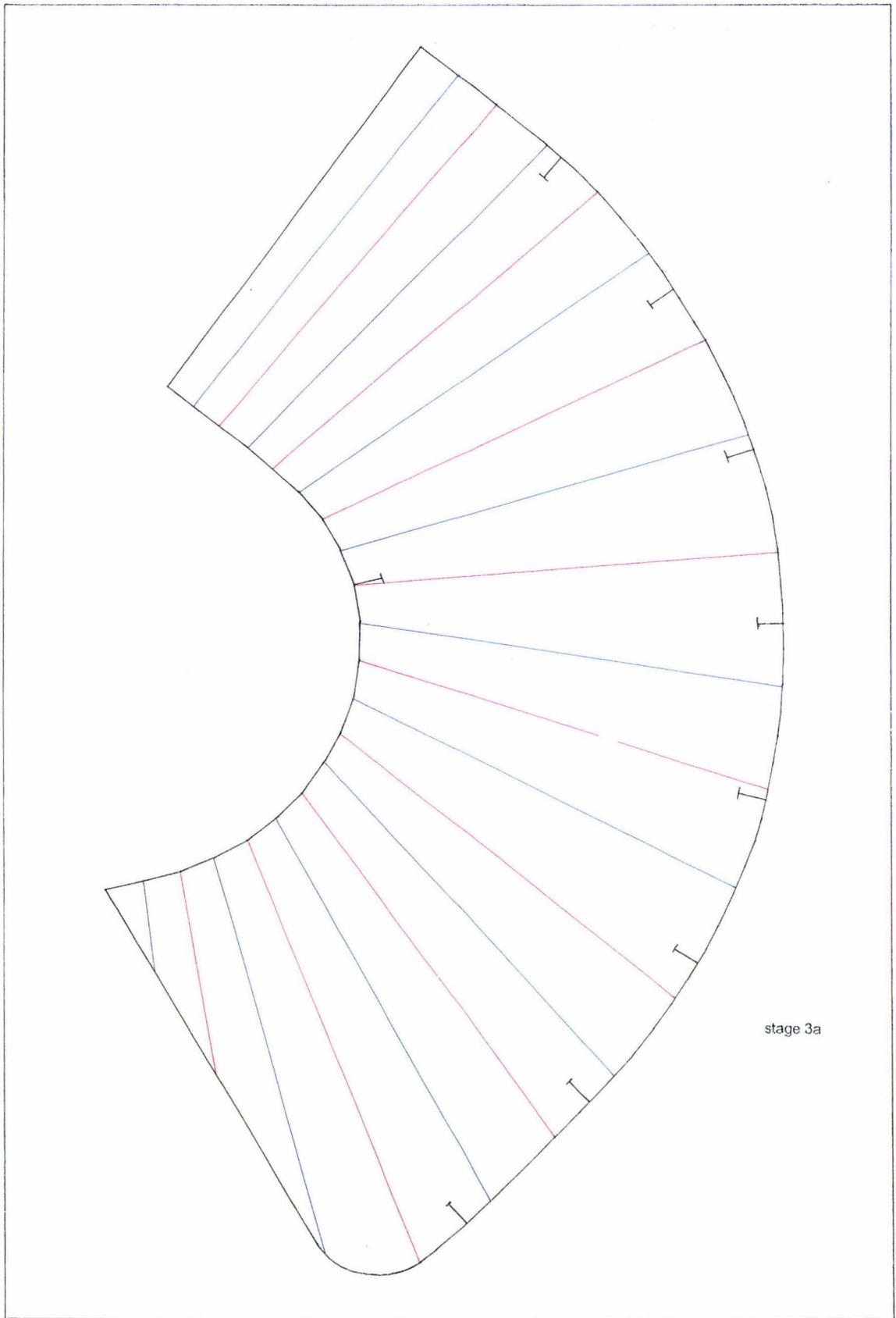


Figure 7.11 Composite under collar: Flat.
Stage 3a: Collar separation.
(Drawing source: M. Campbell ©).

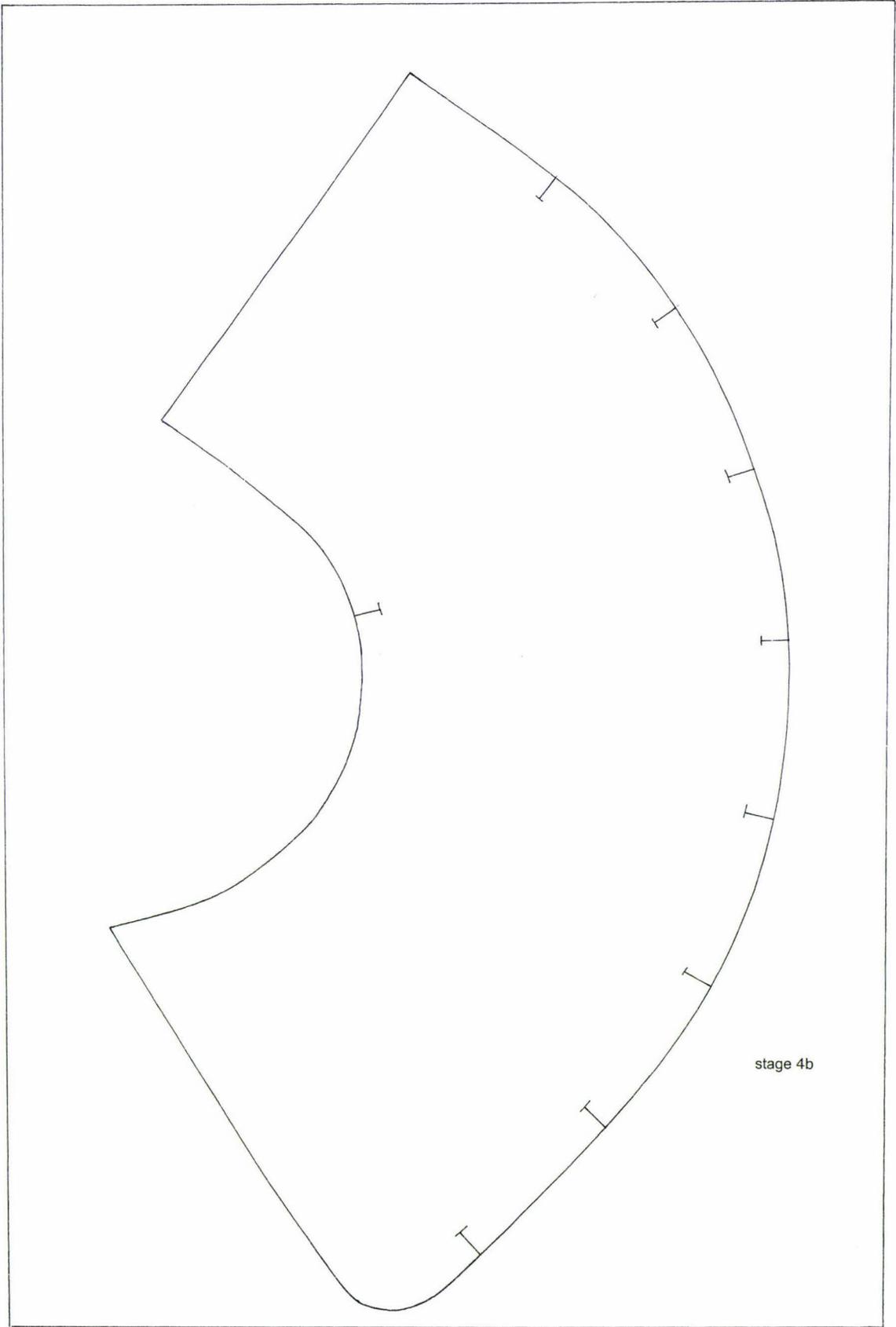


Figure 7.12 Composite under collar: Flat.
Stage 4b: 1 piece under collar (ready for seam additions).
(Drawing source: M. Campbell ©).

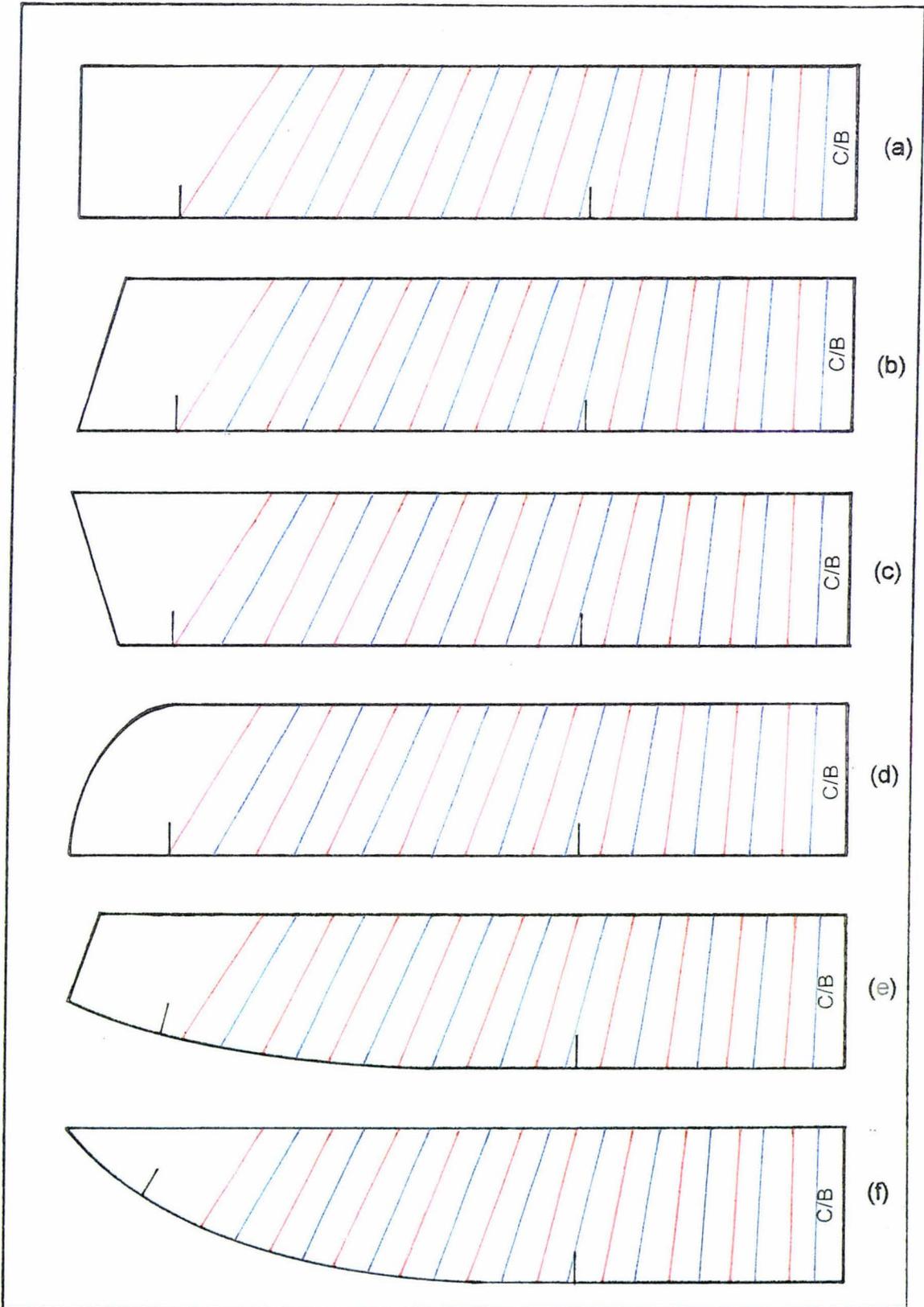


Figure 7.13 Composite under collar: Front design shapes.
 (a) Straight (b) Angles less than 90° (c) Angles more than 90°
 (d) Curved top edge (e) Curved neck line with straight, angled or curved front (f) Curved neck line.
 (Drawing source: M. Campbell ©).

Front design (reduced width of front collar stand)

Throughout its length the stand-band is usually regular in width, however, if the width at the front design area is to be narrowed for a particular style effect, it will be the bottom edge of the band that has to be reshaped, not the break line. This is to preserve the straight break line for ease of folding and to help sustain its original length in relation to the neck size and shape. The neckline of both the collar and the body sections must, therefore, be altered to the same degree to maintain parity, if not they will become incompatible with the neck column and distortions will arise at some point in the development stage of the collar; possibly through an observed tightness along the top edge. The change in shape of the front stand does not change the composite collar system as it is part of the front design area and therefore open to designer interpretation, with the manipulations continuing as described in the previous one and two piece under collars. Figures 7.14 -7.18 stages 1 to 5 represent a shirt collar; the stand and fall for this collar is set at the centre back as 30mm and 40mm respectively, with the front stand tapering to 0mm at the front (depicted in Figure 7.13f). (The irregular neck line shape of the neck section described in section 5.2.5 has been retained for this shirt collar demonstration).

7.4.5 Shawl collar

This particular shawl under collar with a stand of 25mm and a fall of 35mm (Figures 7.19 – 7.23) is related to the step collar, without the step. The collar is attached to the lapel along the gorge line in the usual manner, except that it is sewn beyond the normal position of the step, to the very edge (leaf) of both the collar and lapel, to give a continuous 'flow' to the outer edge of the collar and lapel, from the left front opening position to the right front opening position (forming a single component in the top collar).

7.4.6 Ulster collar

This type of collar is included to show that the stand and fall ratios may be changed to accommodate a wide range of measurements and still function as well as any of the other collars. In this example the stand section is 30mm wide with a fall section reaching from the break line 90mm into the shoulder area (a difference of 60mm as opposed to the jacket collar difference of 10mm). The composite collar drafting system for the Double Breasted Ulster overcoat proceeds in the usual manner illustrated in Figures 7.24 – 7.28.

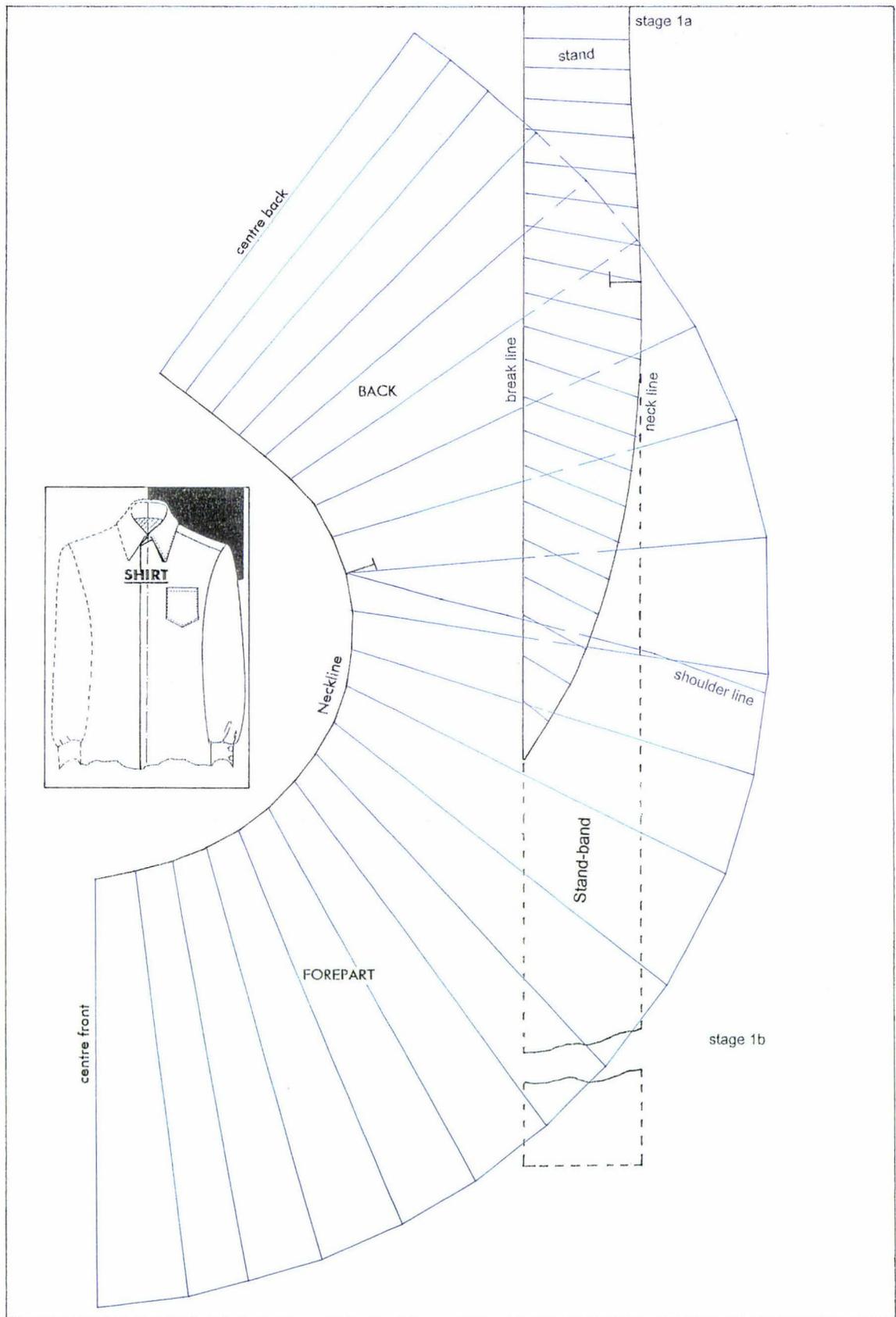


Figure 7.14 Composite under collar: Shirt.
Stage 1a: Stand-band. Stage 1b: Neck line construction.
 (Drawing source: M. Campbell ©).

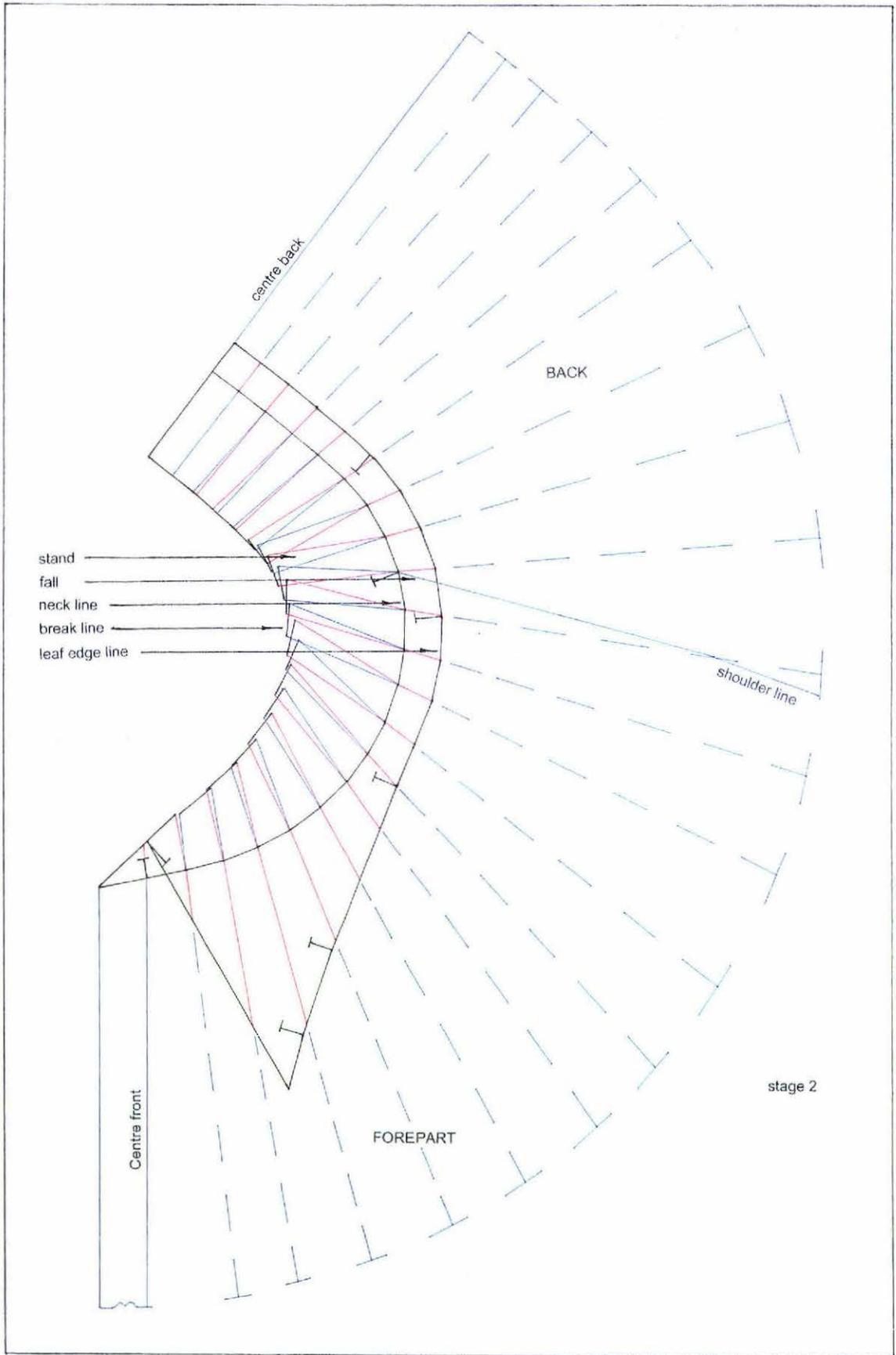


Figure 7.15 Composite under collar: Shirt.
Stage 2: Collar design (break line overlaps).
 (Drawing source: M. Campbell ©).

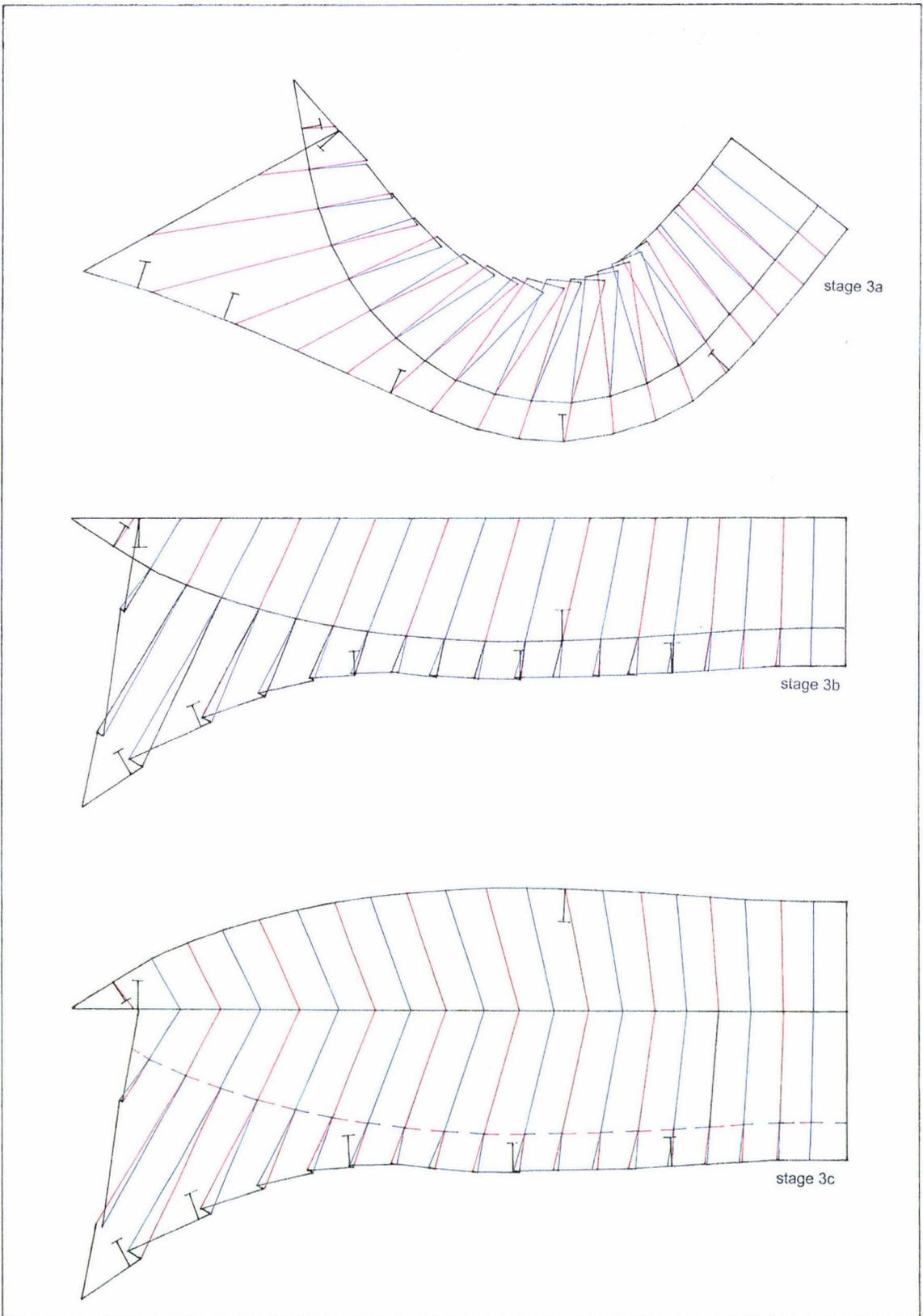


Figure 7.16 Composite under collar: Shirt.

Stage 3a: Collar separation.

Stage 3b: Break line straightened (length regained).

Stage 3c: Stand unfolded.

(Drawing source: M. Campbell ©).

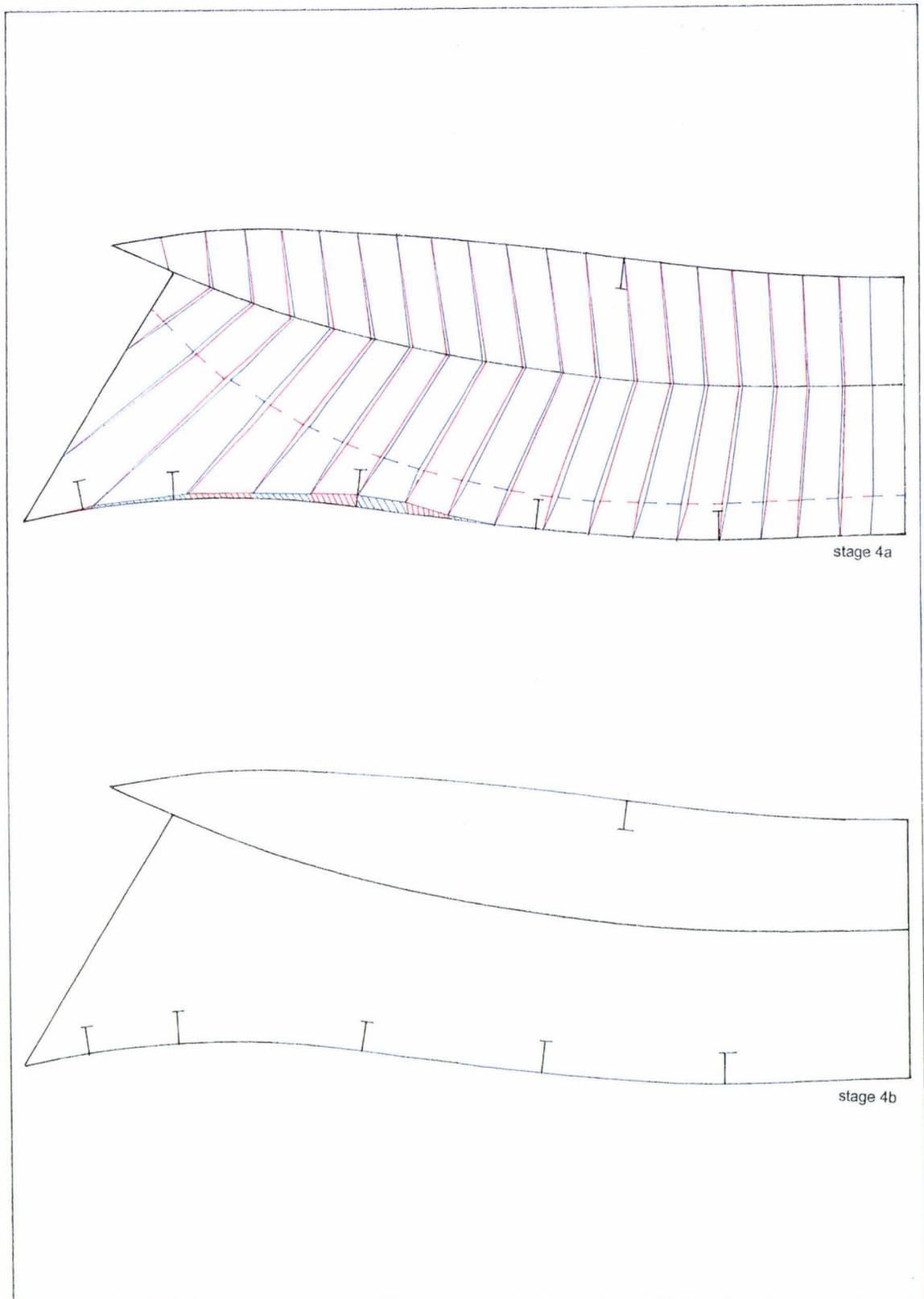


Figure 7.17 Composite under collar: Shirt.

Stage 4a: 1 piece under collar, stand and fall (leaf length regained).

Stage 4b: 1 piece under collar (ready for seam additions).

(Drawing source: M. Campbell ©).

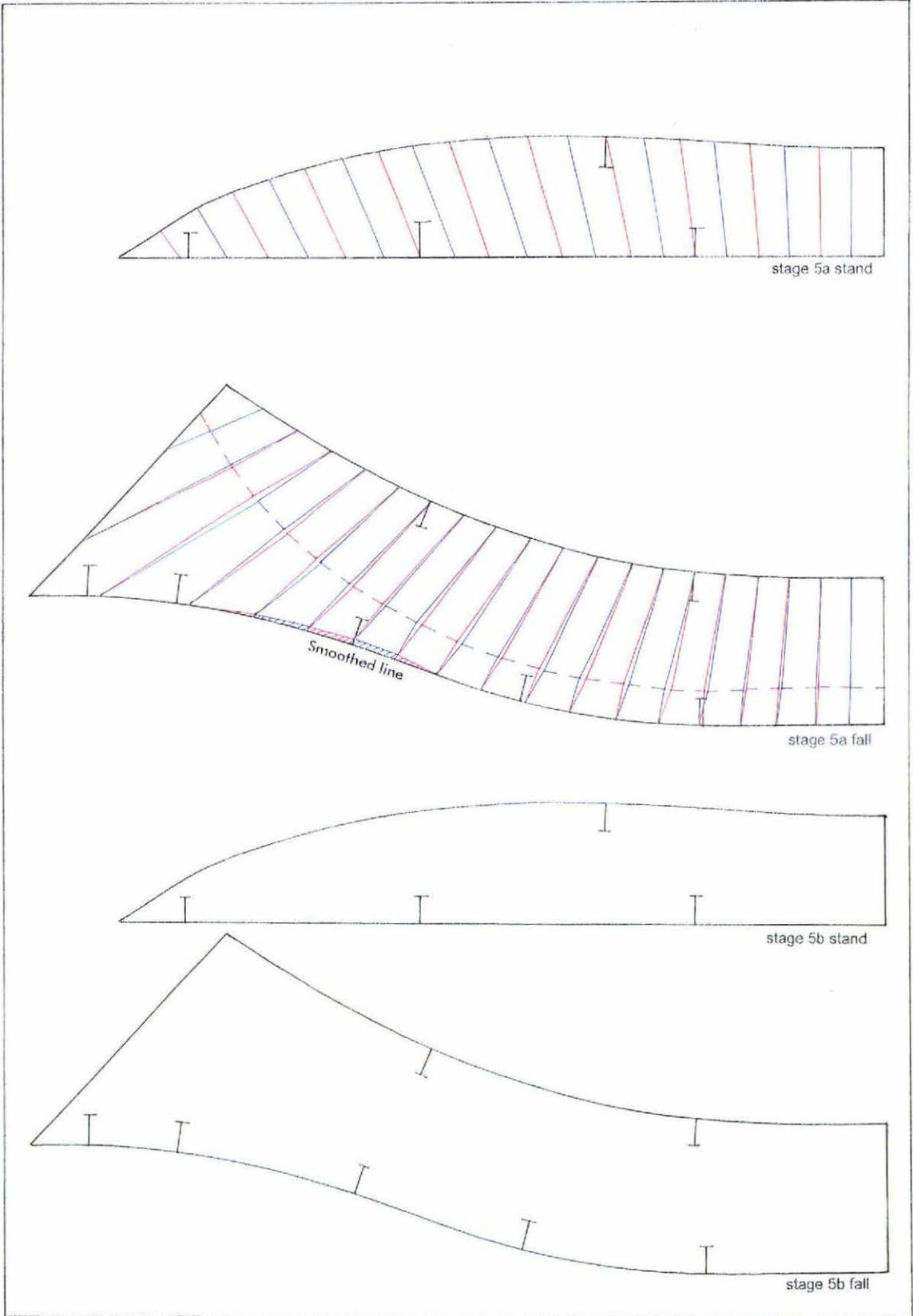


Figure 7.18 Composite under collar: Shirt.

Stage 5a: 2 piece under collar, stand and fall.

Stage 5b: Stand and fall (ready for seam additions).

(Drawing source: M. Campbell ©).

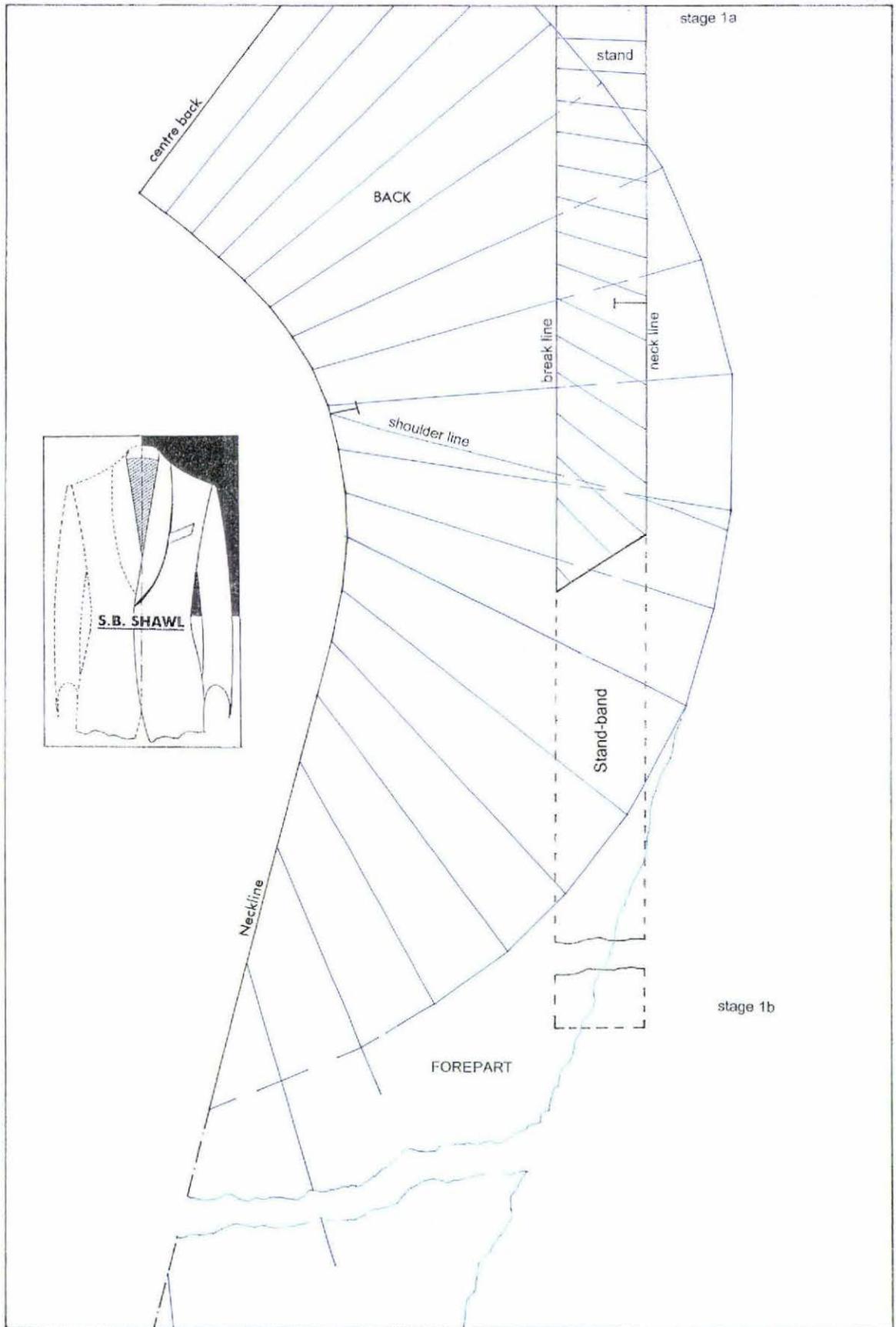


Figure 7.19 Composite under collar: Jacket (S.B. Shawl).
Stage 1a: Stand-band. Stage 1b: Neck line construction.
 (Drawing source: M. Campbell ©).

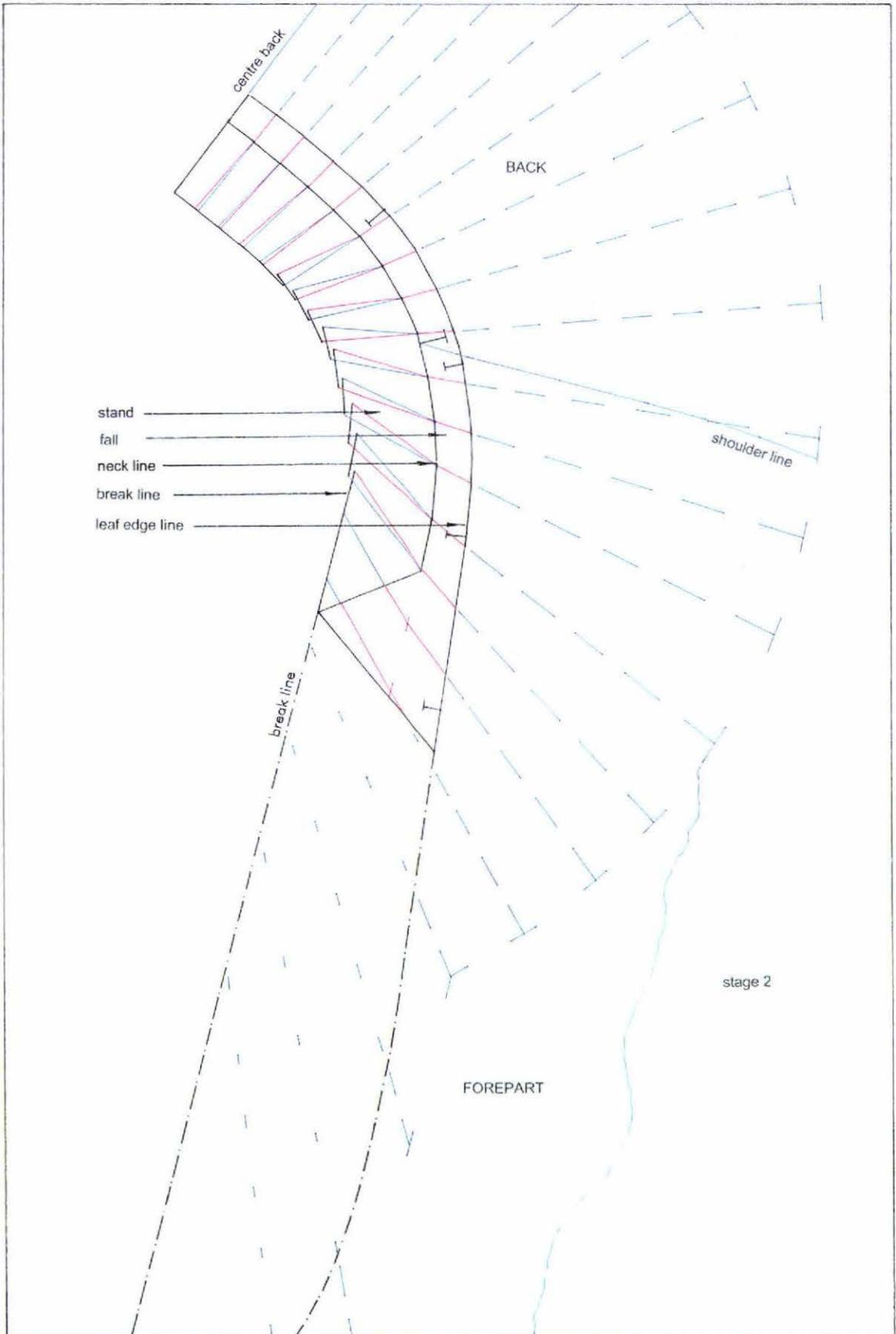


Figure 7.20 Composite under collar: Jacket (S.B. Shaw).
Stage 2: Collar design (break line overlaps).
 (Drawing source: M. Campbell ©).

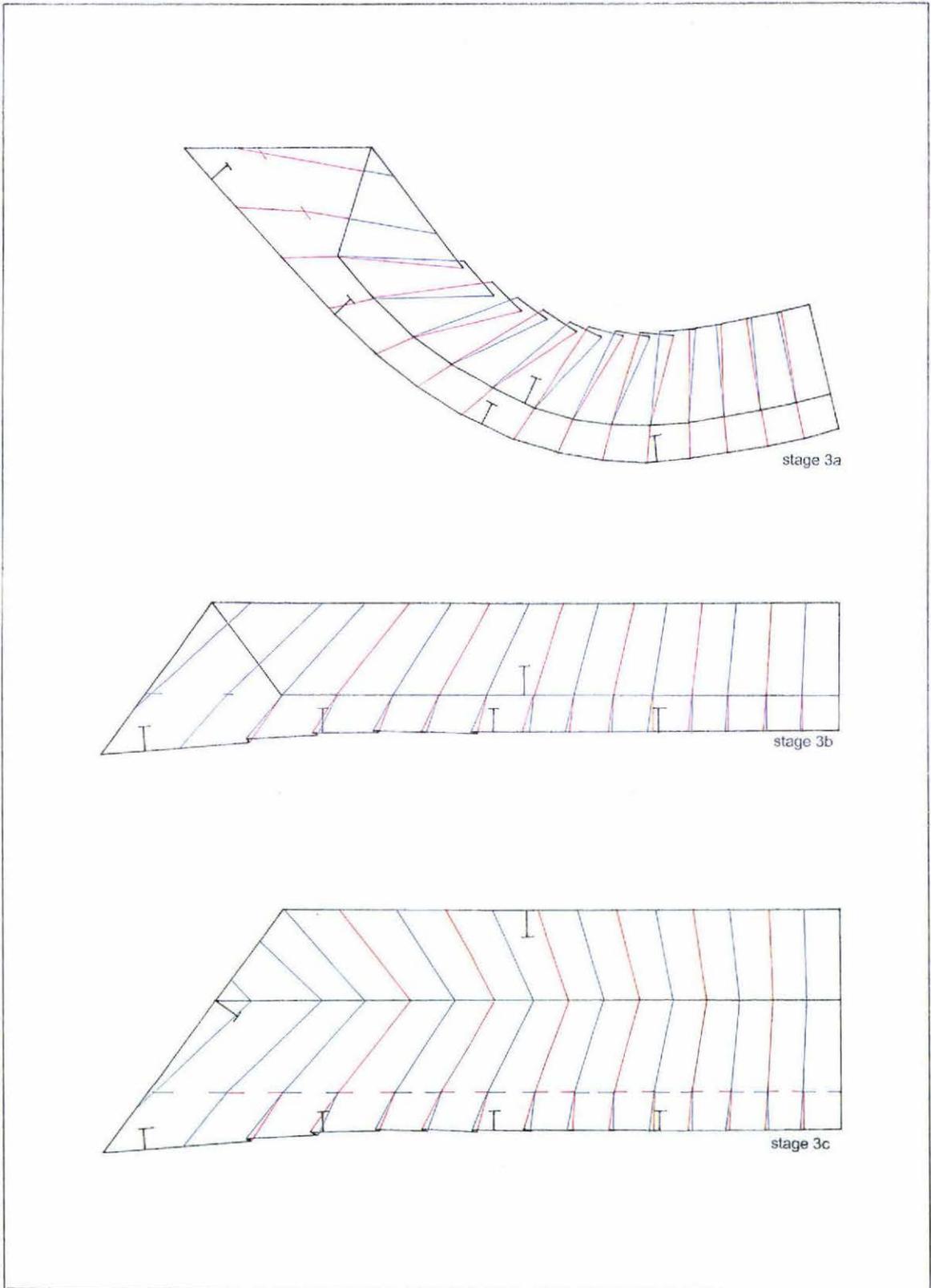


Figure 7.21 Composite under collar: Jacket (S.B. Shawl).

Stage 3a: Collar separation.

Stage 3b: Break line straightened (length regained).

Stage 3c: Stand unfolded.

(Drawing source: M. Campbell ©).

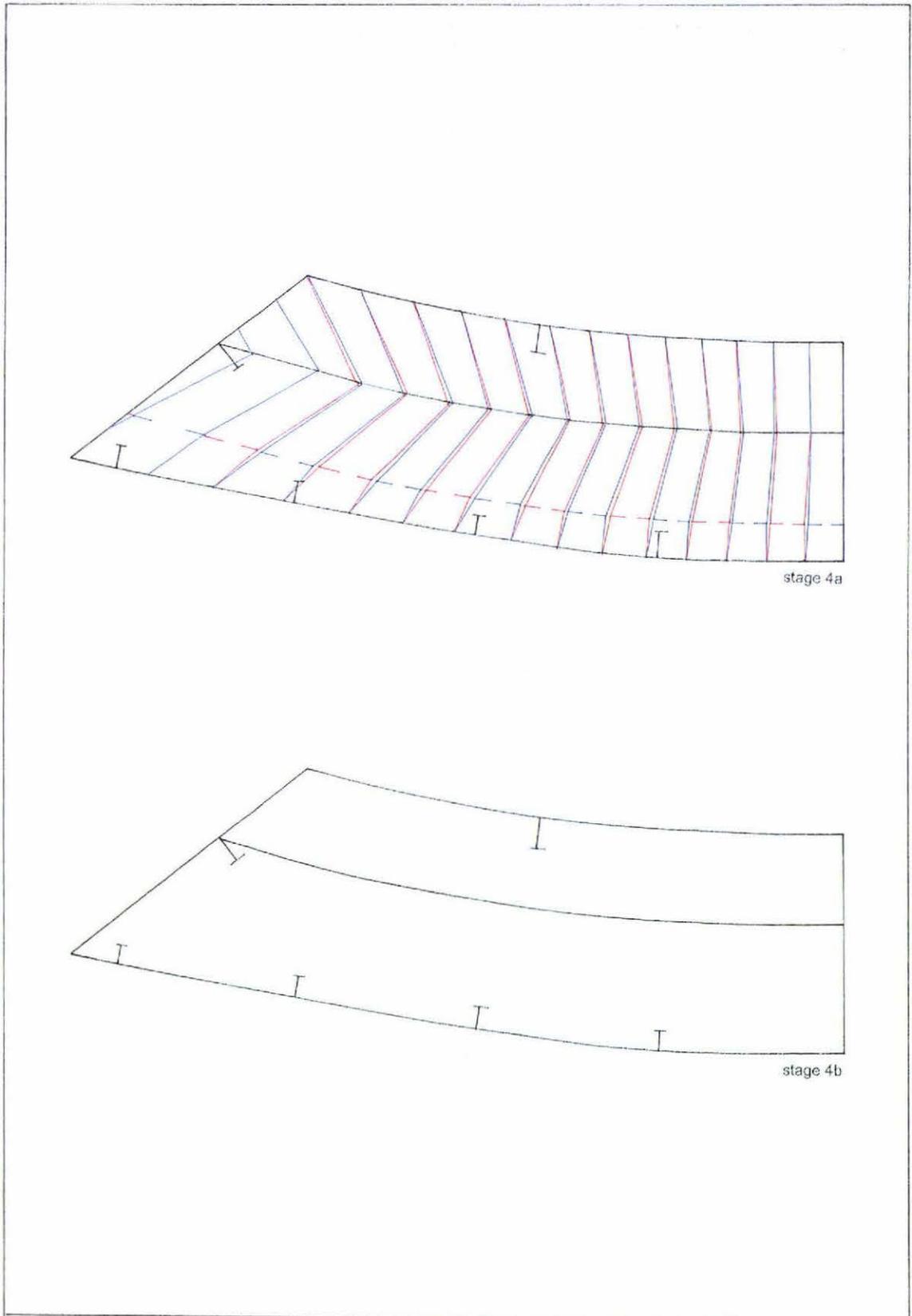


Figure 7.22 Composite under collar: Jacket (S.B. Shawl).
Stage 4a: 1 piece under collar, stand and fall (leaf length regained).
Stage 4b: 1 piece under collar (ready for seam additions).
(Drawing source: M. Campbell ©).

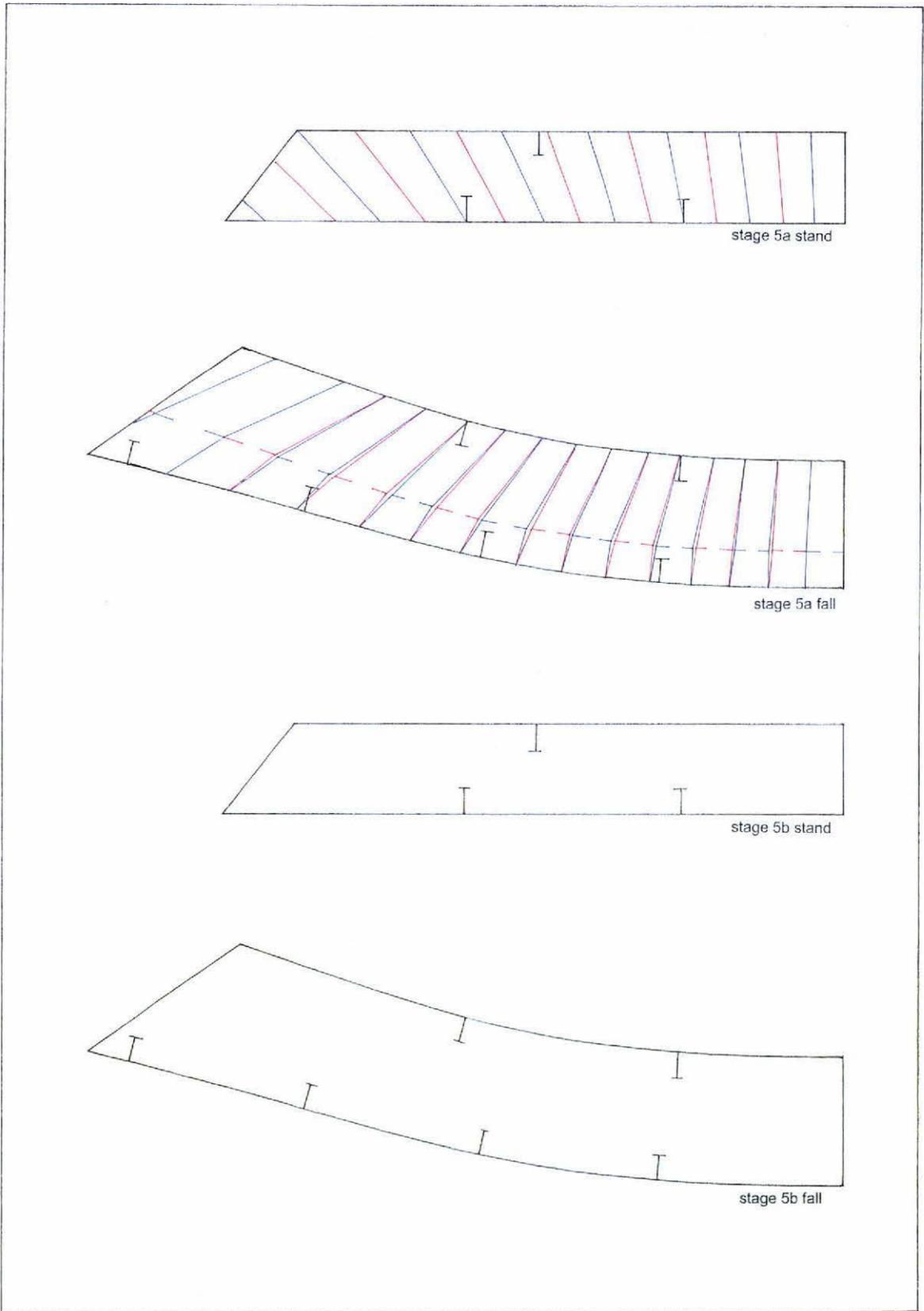
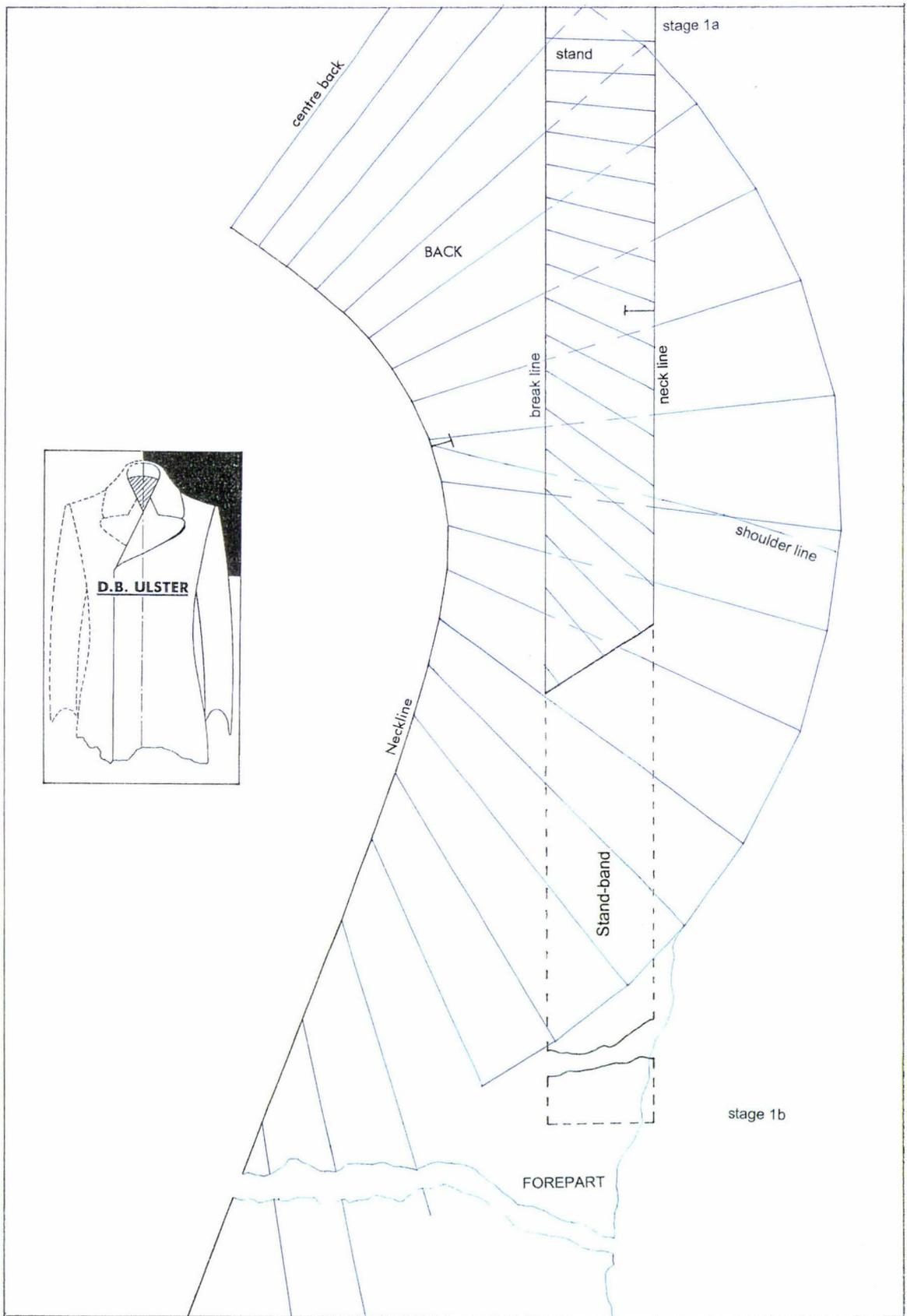


Figure 7.23 Composite under collar: Jacket (S.B. Shawl).
Stage 5a: 2 piece under collar, stand and fall.
Stage 5b: Stand and fall (ready for seam additions).
 (Drawing source: M. Campbell ©).



**Figure 7.24 Composite under collar: Overcoat (D.B. Ulster).
 Stage 1a: Stand-band. Stage 1b: Neck line construction.
 (Drawing source: M. Campbell ©).**

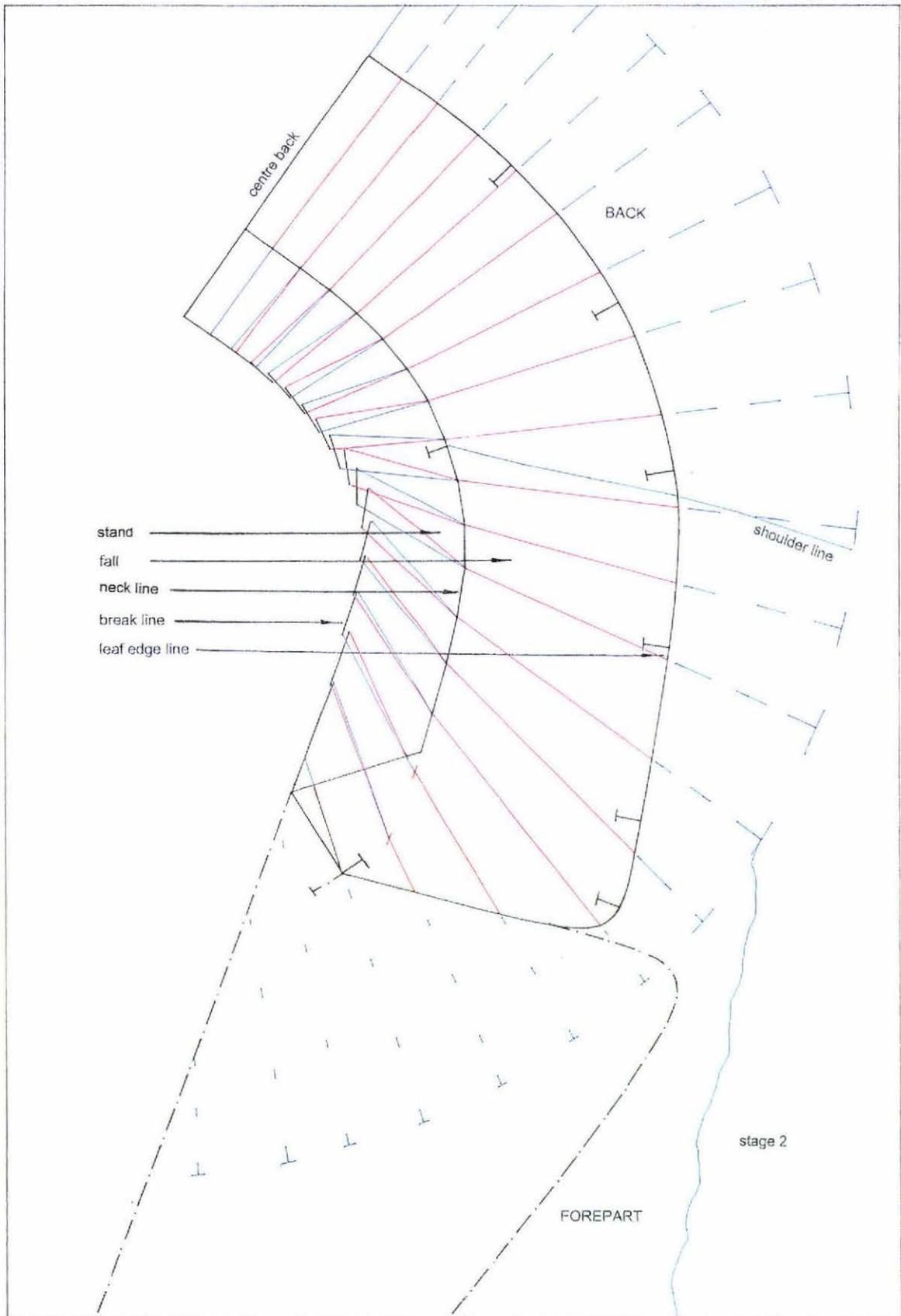


Figure 7.25 Composite under collar: Overcoat (D.B. Ulster).
Stage 2: Collar design (break line overlaps).
 (Drawing source: M. Campbell ©).

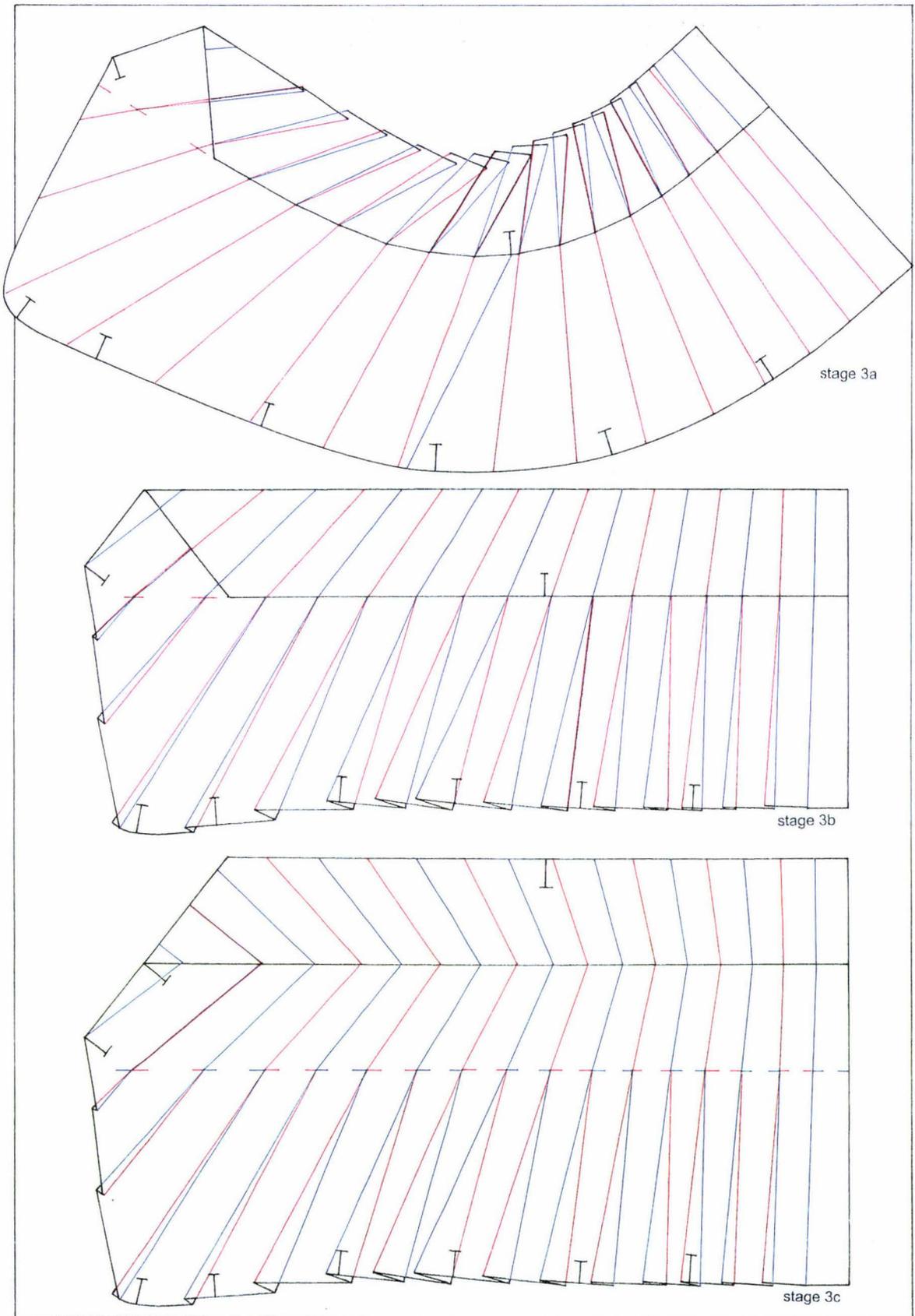


Figure 7.26 Composite under collar: Overcoat (D.B. Ulster).
Stage 3a: Collar separation.
Stage 3b: Break line straightened (length regained).
Stage 3c: Stand unfolded. (Drawing source: M. Campbell ©).

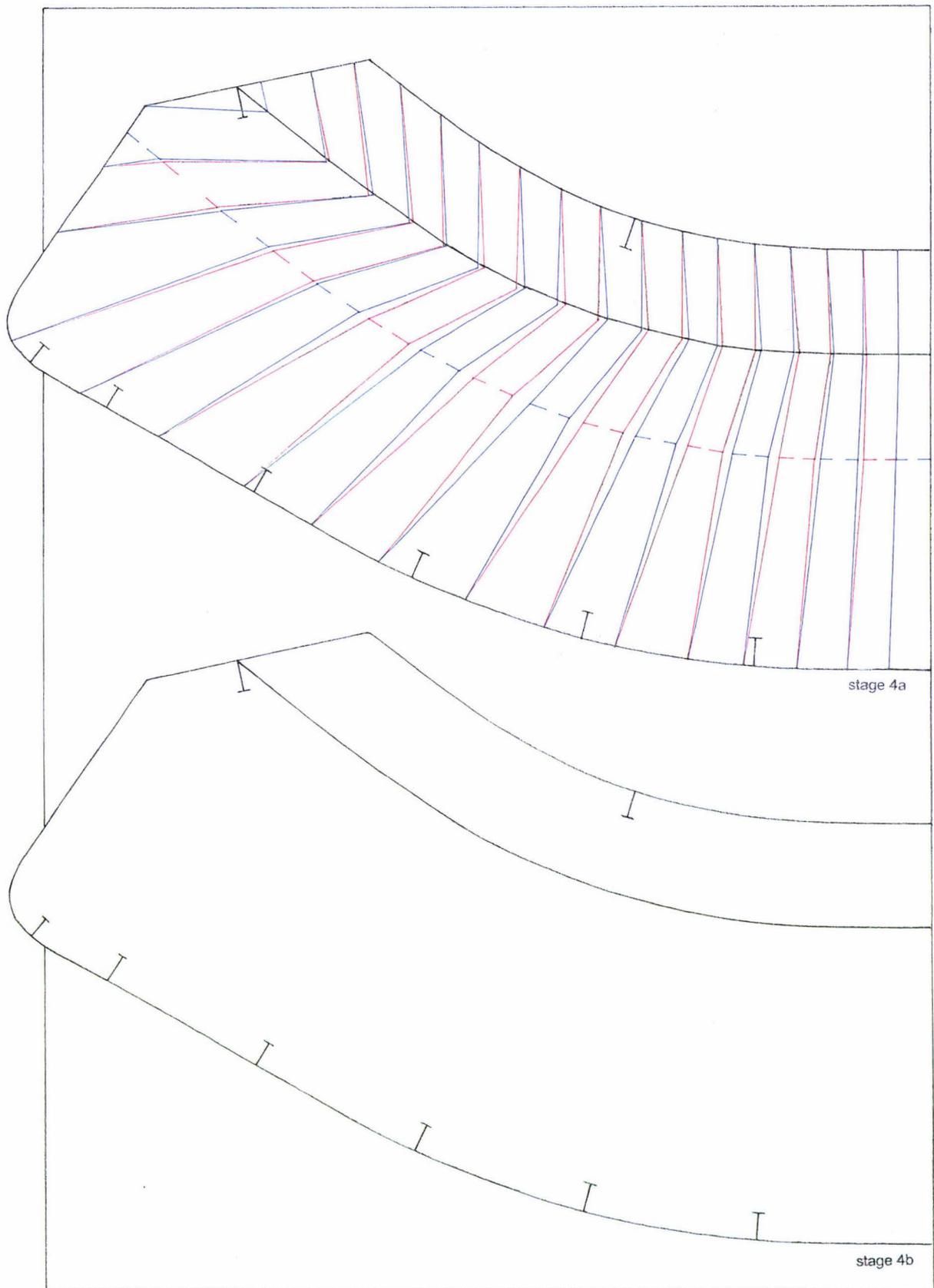


Figure 7.27 Composite under collar: Overcoat (D.B. Ulster).
Stage 4a: 1 piece under collar (leaf length regained).
Stage 4b: 1 piece under collar (ready for seam additions).
 (Drawing source: M. Campbell ©).

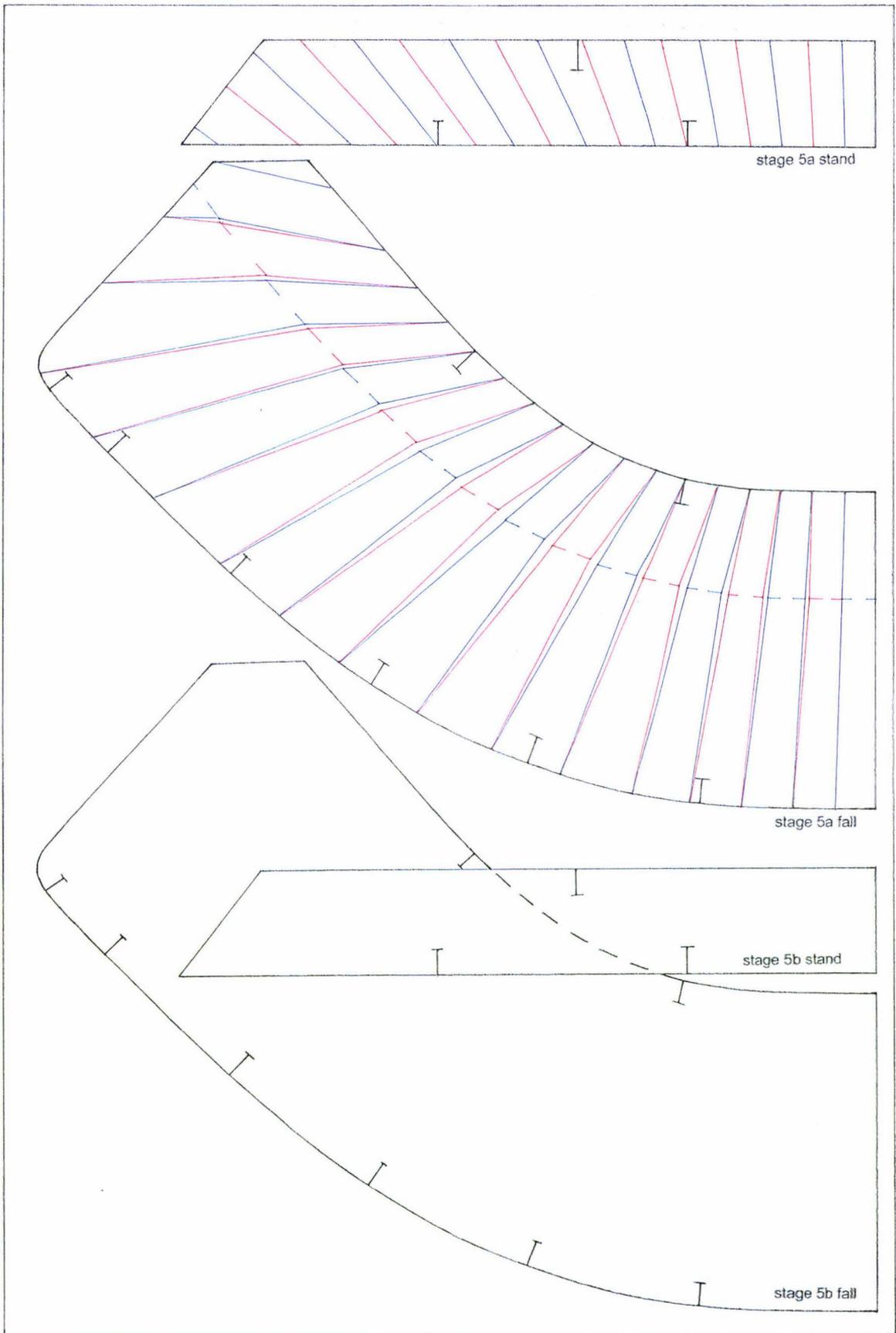


Figure 7.28 Composite under collar: Overcoat (D.B. Ulster).
Stage 5a: 2 piece under collar, stand and fall.
Stage 5b: Stand and fall (ready for seam additions).
 (Drawing source: M. Campbell ©).

7.4.7 Convertible collar

A lapel is the front portion of the forepart folded over onto itself, It forms to a greater or lesser degree, a triangular shape with the top edge being part of the front neck line (gorge) to which a collar may be attached. The bottom corner of the folded line (break line) of the lapel terminates at the front edge button fastening. This configuration may be transformed into a new style by unfolding the lapel in order to fasten the front edge and the collar in a higher position.

The convertible collar, unlike other collar types, is designed to 'set' in either a position high and close to the neck with no lapel, or 'breaking' down to the chest area with a lapel. The higher fastening style has no lapel therefore it has no break line below the collar; this only appears with the turning back of the front edge. The convertible styling is a confederation of two styles within the one assembly which complicates the collar drafting situation as there has to be a separate break line to complement each configuration. The first collar break line is a continuation of the lapel break line and the second is fully contained within the collar for the non-lapel, fastened to the neck, style.

The height of the front fastening has a considerable bearing on the position of the collar, the garment neck line, the collar neckline, the collar break line and therefore, the stand and fall widths. Complications arise in the convertible collar style when the conversion alters the placement of the lower button fastened style to the higher neck fastening design. The former collar and lapel configuration tries to convert to a new profile by emulating a collar with a higher fastening position and its related neck line. It has no choice during the conversion but to re-align itself with a new set of positioning co-ordinates around the neck and when this happens the collar is transformed from the relatively low fastening position to the higher location with all of the elements moving upwards to harmonise with their new situations.

The leaf edge is originally designed to be incorporated into the convertible collar model featuring a lapel and as such lies at a pre-determined distance from, and below, the neck line in order to hide it. When the higher neck style is required, the 'set' of the collar changes, it becomes tighter along the leaf edge forcing the break line to roll higher to a new break line position to accommodate its new front fastening arrangement. Due to the displacement of the break line and as the neck line does not move, there is a transfer of widths within the collar. The stand, from the neck line to the

break line, becomes wider whilst the fall, from break line to leaf edge becomes narrower. Because the leaf edge rises up the neck from its original location there is a possibility that the seam of the neck line will be exposed to view. To compensate for this eventuality, an additional amount of fall width (height), mainly at the back, should be considered when the original collar is formulated. (The problem with contemporary pattern drafting practices is how to decide what measurement to allow for an adequate amount of extra fall width without resorting to more trials. Experience would help, except that when this is not available another course of action will need to be found).

The composite collar drafting system enables the designer to calculate the localities of both collar positions and therefore their respective break lines. As these elements are known prior to the formation of the complete collar pattern, the differences between the two break lines can be assessed and the appropriate amount added to the fall width at the leaf edge to provide neck line coverage for both styles. The need to trial the collar, even by less experienced designers, to adjust the pattern to suit both configurations is avoided.

The procedure for the convertible type of collar (30mm stand and 50mm fall depicted in Figures 7.29 – 7.33), is the same as described in Figures 7.1 – 7.5, except it has two heights for the two front button positions. The difference between the two neck lines at the centre back line gives the calculation for the additional amount of fall needed to ensure coverage of the neck line when the style is fastened in the higher position. The same stand-band width is used to determine both break line positions, even though there is only one neck line.

(To maintain diagrammatic clarity, only the position and construction of the lower fastened collar and lapel is given in stages 1 – 3. The position of the higher collar break line is represented by the dot/dash lines in Figure 7.32 stage 4 and Figure 33, stage 5).

There is a perception, within this collar construction technique, of two break lines; however, there is only one break line that moves from the lower style position to the higher, collar-only, style when required. It is not necessary to plot the total course of the higher positioned neck line as it will only be utilised for the calculation of the additional

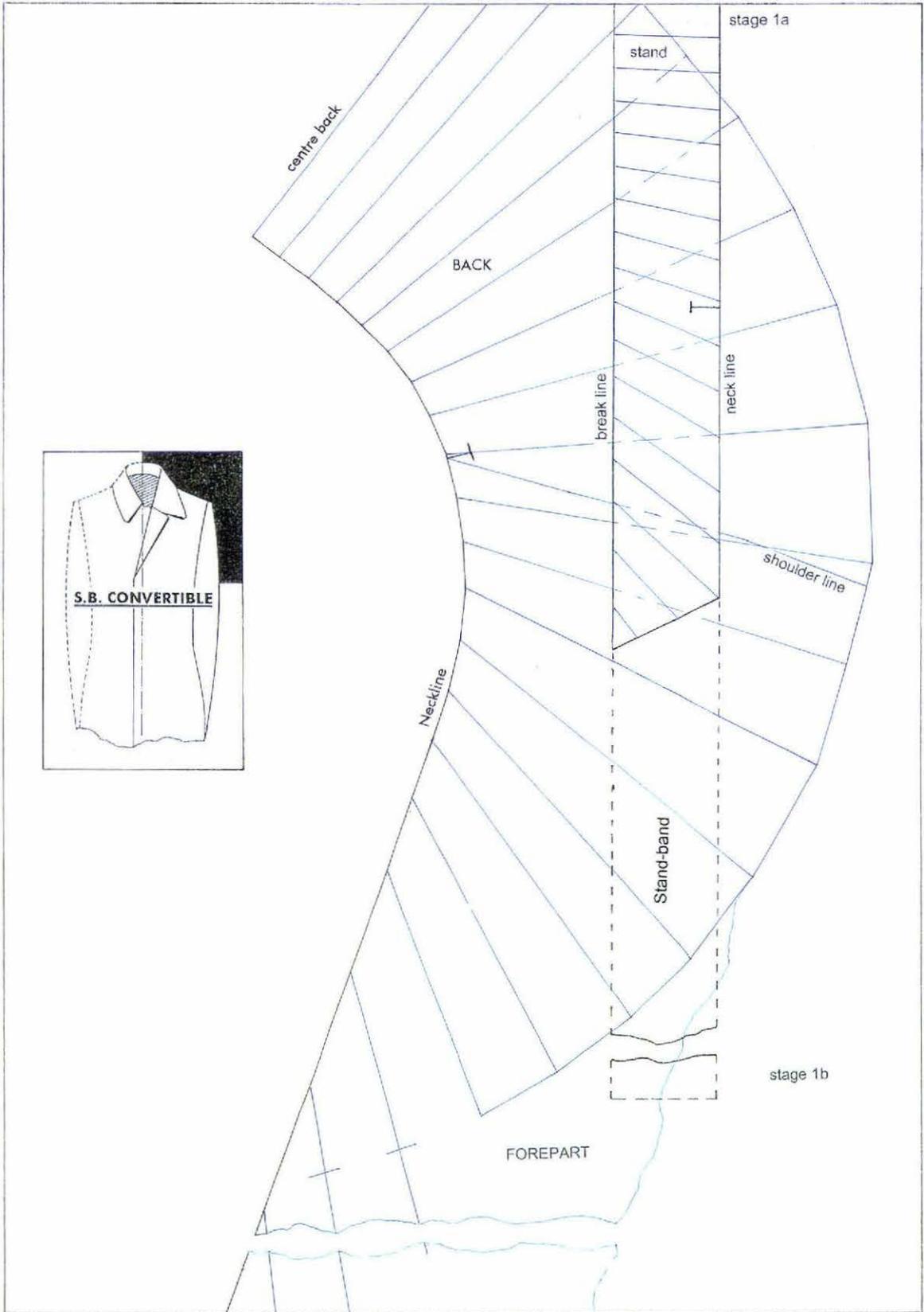


Figure 7.29 Composite under collar: Jacket (S.B. Convertible).

Stage 1a: Stand-band.

Stage 1b: Neck line construction.

(Drawing source: M. Campbell ©).

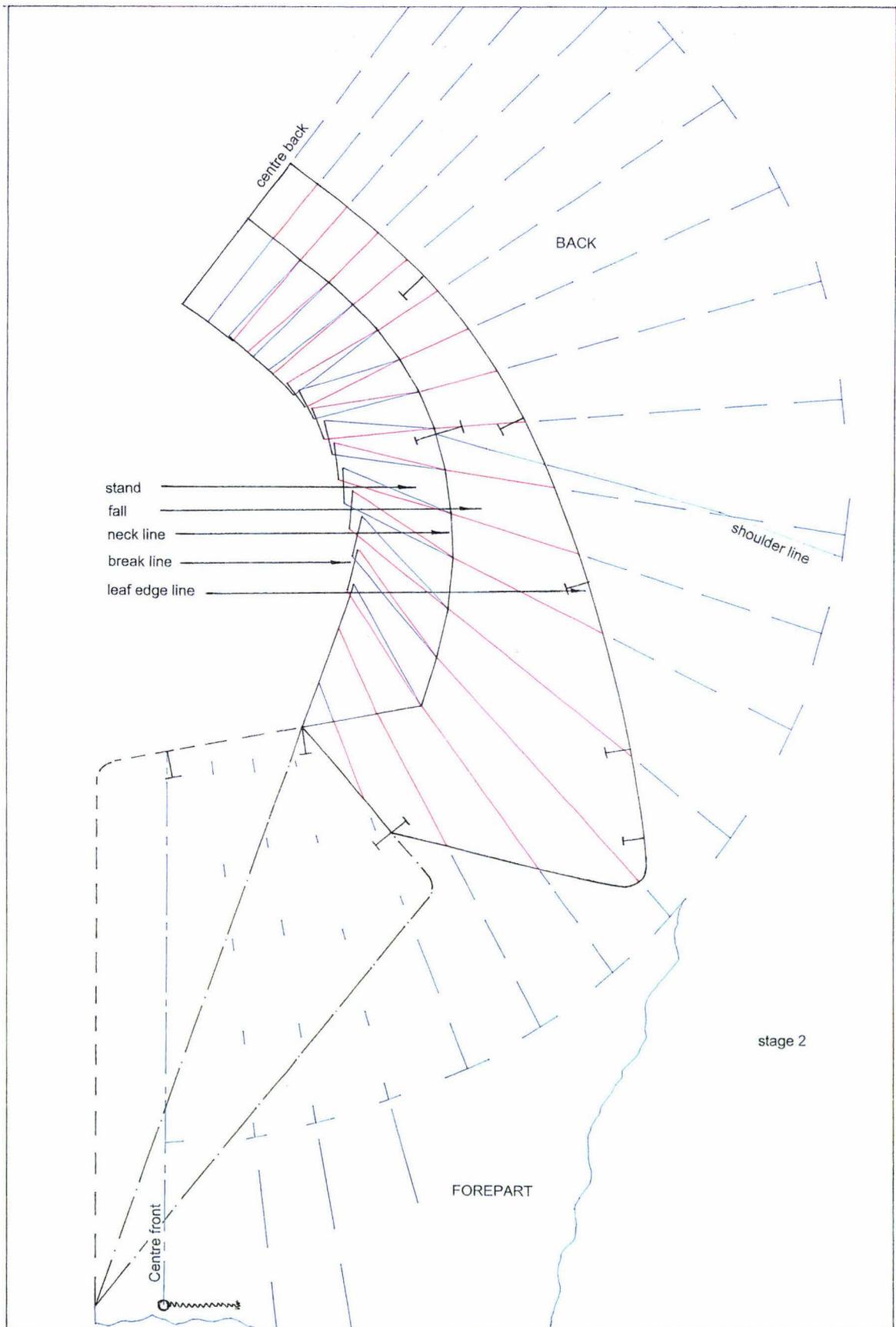


Figure 7.30 Composite under collar: Jacket (S.B. Convertible).
Stage 2: Collar design (break line overlaps).
 (Drawing source: M. Campbell ©).

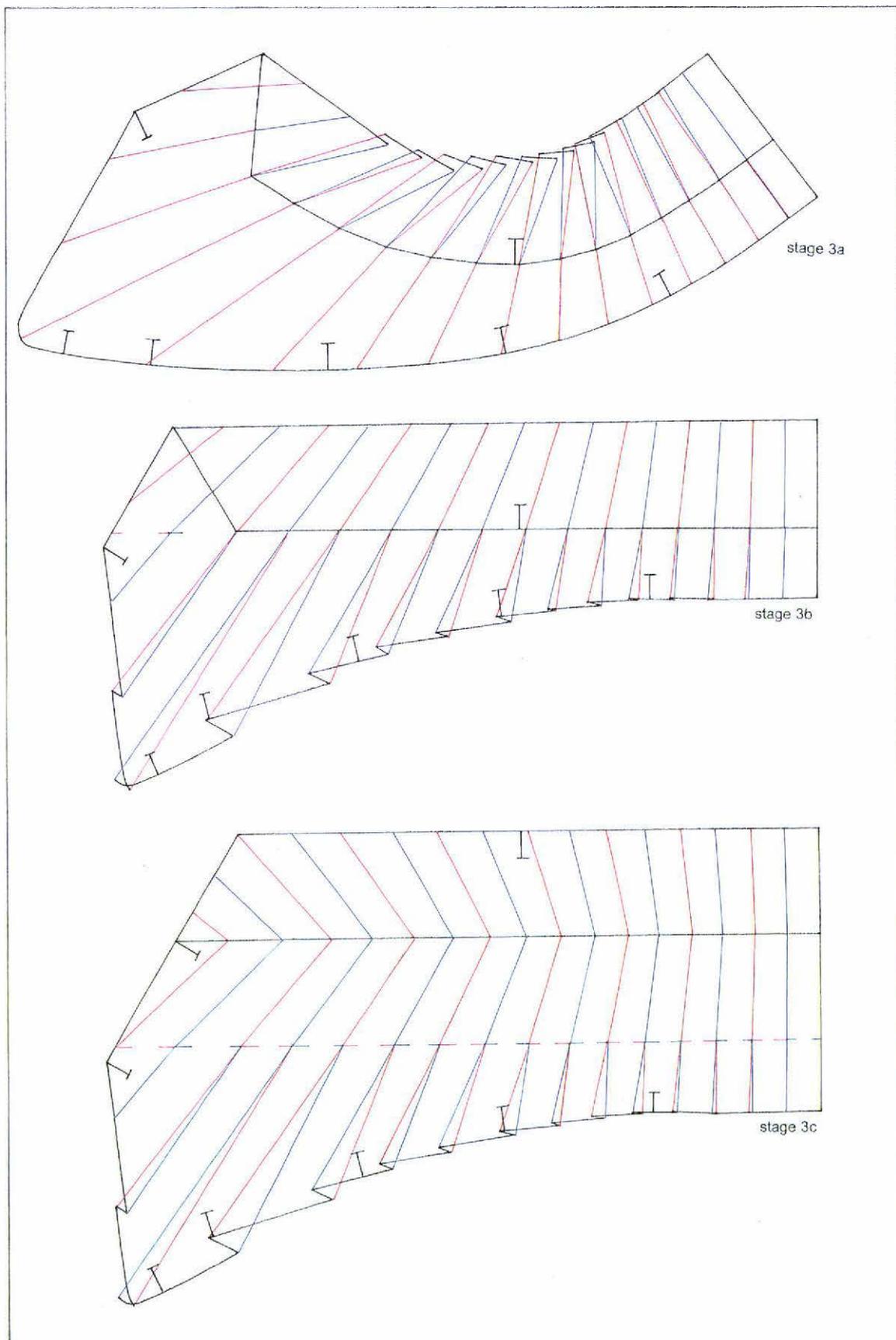


Figure 7.31 Composite under collar: Jacket (S.B. Convertible).

Stage 3a: Collar separation.

Stage 3b: Break line straightened (length regained).

Stage 3c: Stand unfolded. (Drawing source: M. Campbell ©).

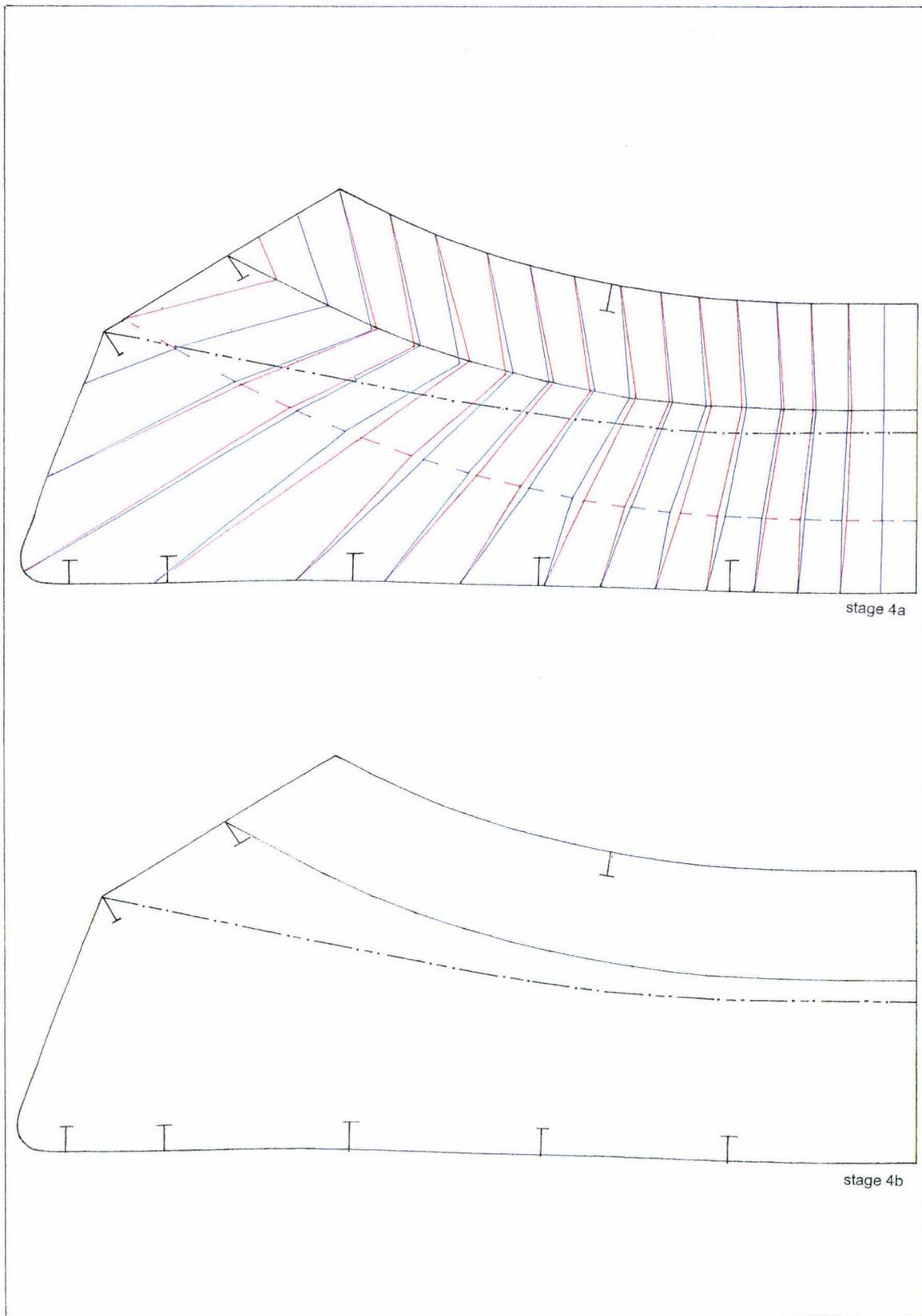


Figure 7.32 Composite under collar: Jacket (S.B. Convertible).
Stage 4a: 1 piece under collar (leaf length regained).
Stage 4b: 1 piece under collar (ready for seam additions).
 (Drawing source: M. Campbell ©).

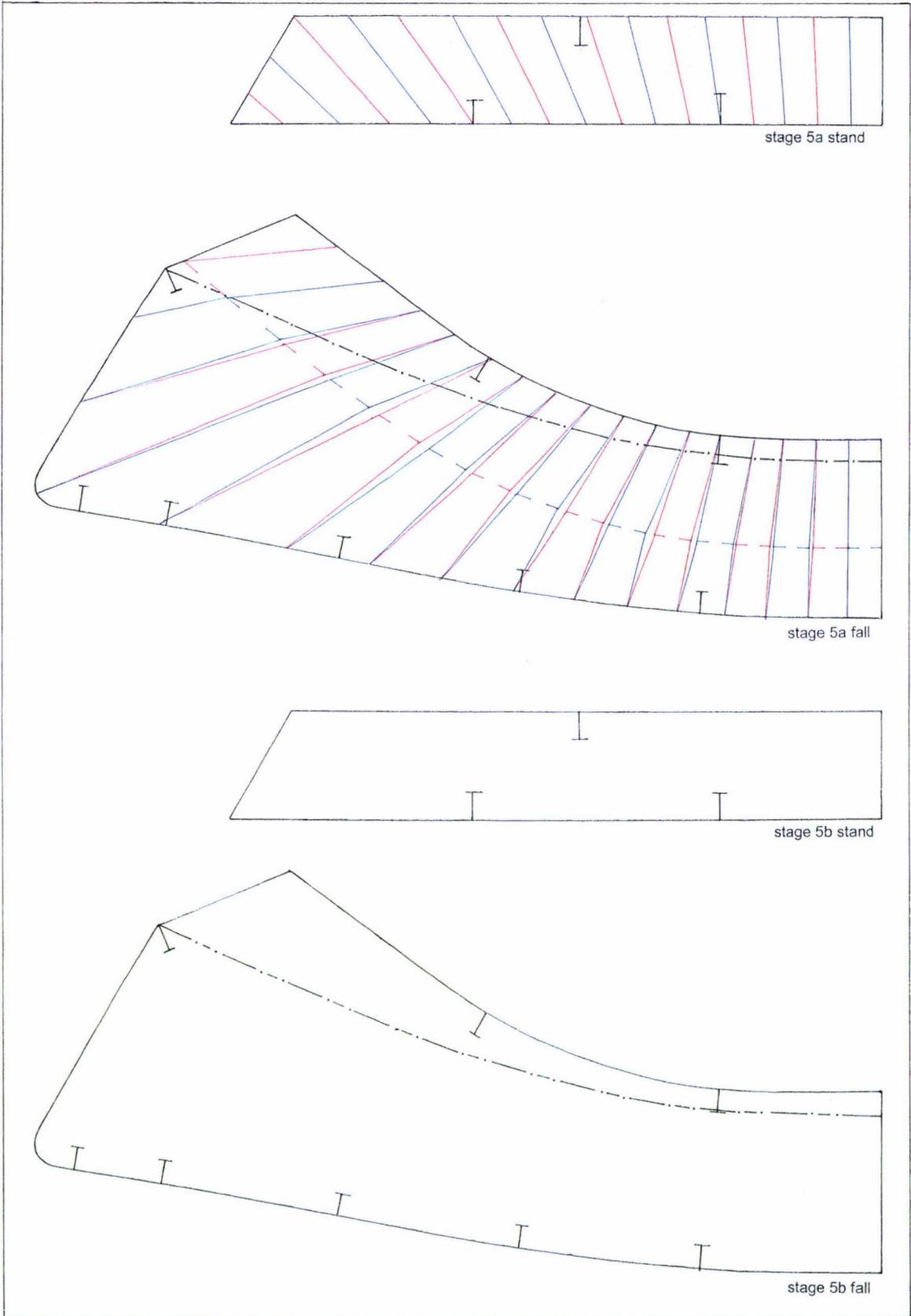


Figure 7.33 Composite under collar: Jacket (S.B. Convertible).
Stage 5a: 2 piece under collar, stand and fall.
Stage 5b: Stand and fall (ready for seam additions).
 (Drawing source: M. Campbell ©).

amount of fall for the higher buttoned style. All that is needed are the two end points of the new neck line for the calculation to be made. For example, if the neck line moves up to its new position at the centre back by 5mm to align with the new, higher, front opening position at the centre line, the amount to be added to the full stand and fall width is twice the amount, which is 10mm (5mm for the new height of stand and 5mm for the new width of fall). 10mm is then added to the fall depth at the centre back, gradually shaping in to the original front design line.

7.4.8 Regency collar

The Regency, Highwayman or Trench coat collar (Figures 7.34 – 7.38) is, to a certain extent, similar to the convertible with its double break line. It is a double breasted style comprising two break lines, one for the collar and one for the lapel, except it is only the lapel that moves to either an open lapel or closed to the neck style, not the collar. There is a stand of 30mm width, tapering slightly at the front, and a fall of 80mm. Unlike a standard tailored collar and lapel that are joined along the gorge line, the Regency lapel functions independently. The top button, for the break line position, is fastened at the chest locale with the front component either folded back on the forepart as a lapel style feature or is folded forward and buttoned into place to act as a weather shield to protect the neck.

The Regency collar could also be described as a 'Prussian' type collar terminating at the top of the lapel break line and centre front line. The autonomous collar break line follows its own line to its personal front fastening location which is higher than the accompanying front button/hole fastening point of the lapel. The lapel is not part of the collar and may or may not be taken into consideration as the situation arises. The collar comprises separated stand and fall sections to enhance the fitting capabilities of the break line and to better enclose the neck.

7.4.9 Prussian collar

This collar is similar to the reduced front design area shown in the shirt collar. There is no lapel to the round gorge Prussian collar and as well as changing the stand and fall ratio, it also includes a reduced front edge stand width of 15mm (Figure 7.13e). The back stand section is 30mm wide with a fall section of 80mm, a difference of 50mm, (shirt collar difference of 10mm). The composite collar drafting system for the Prussian overcoat proceeds in the usual manner and is illustrated in Figures 7.39 – 7.43.

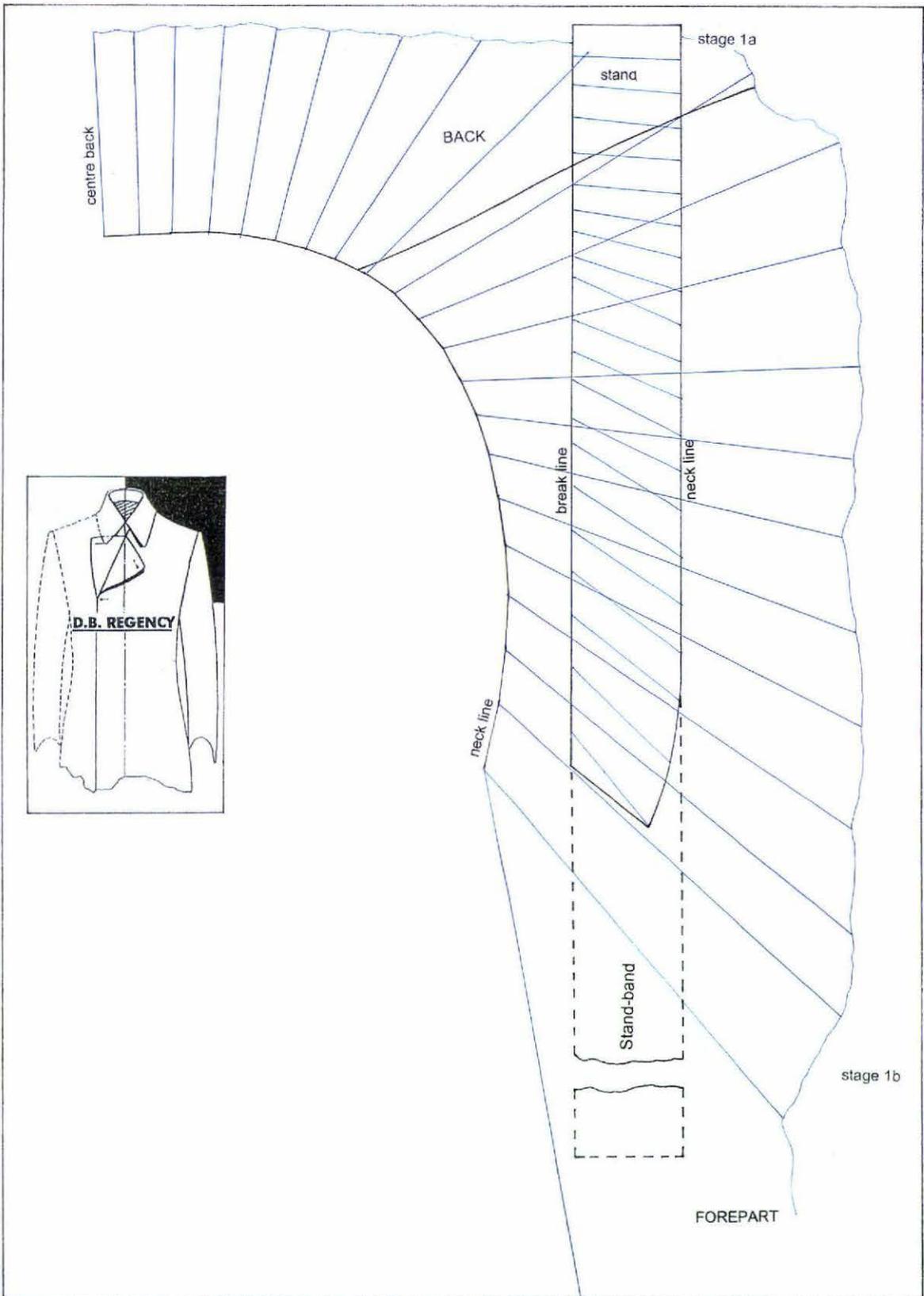


Figure 7.34 Composite under collar: Overcoat (D.B. Regency).
Stage 1a: Stand-band. Stage 1b: Neck line construction.
 (Drawing source: M. Campbell ©).

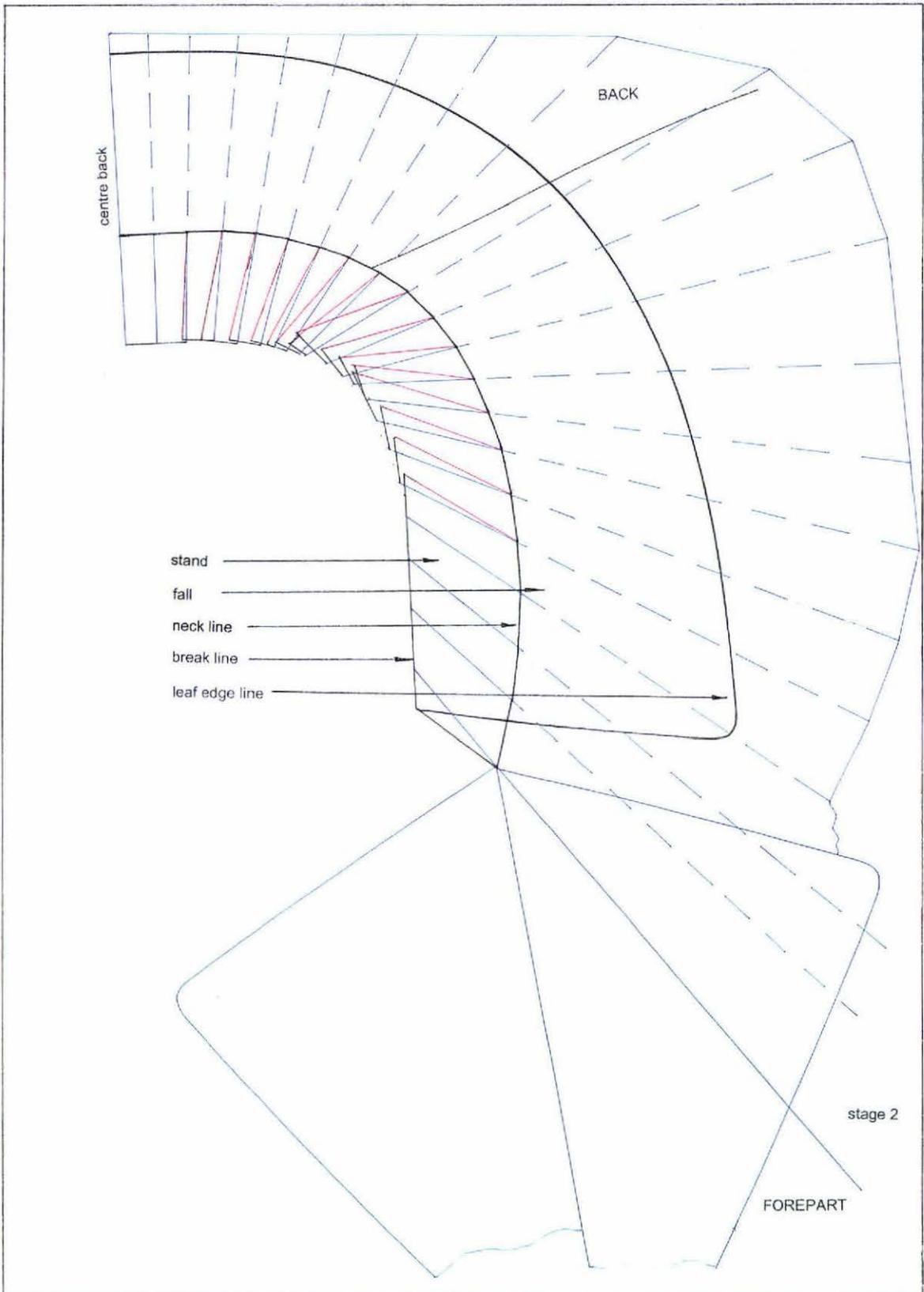


Figure 7.35 Composite under collar: Overcoat (D.B. Regency).
Stage 2: Collar design (break line overlaps).
 (Drawing source: M. Campbell ©).

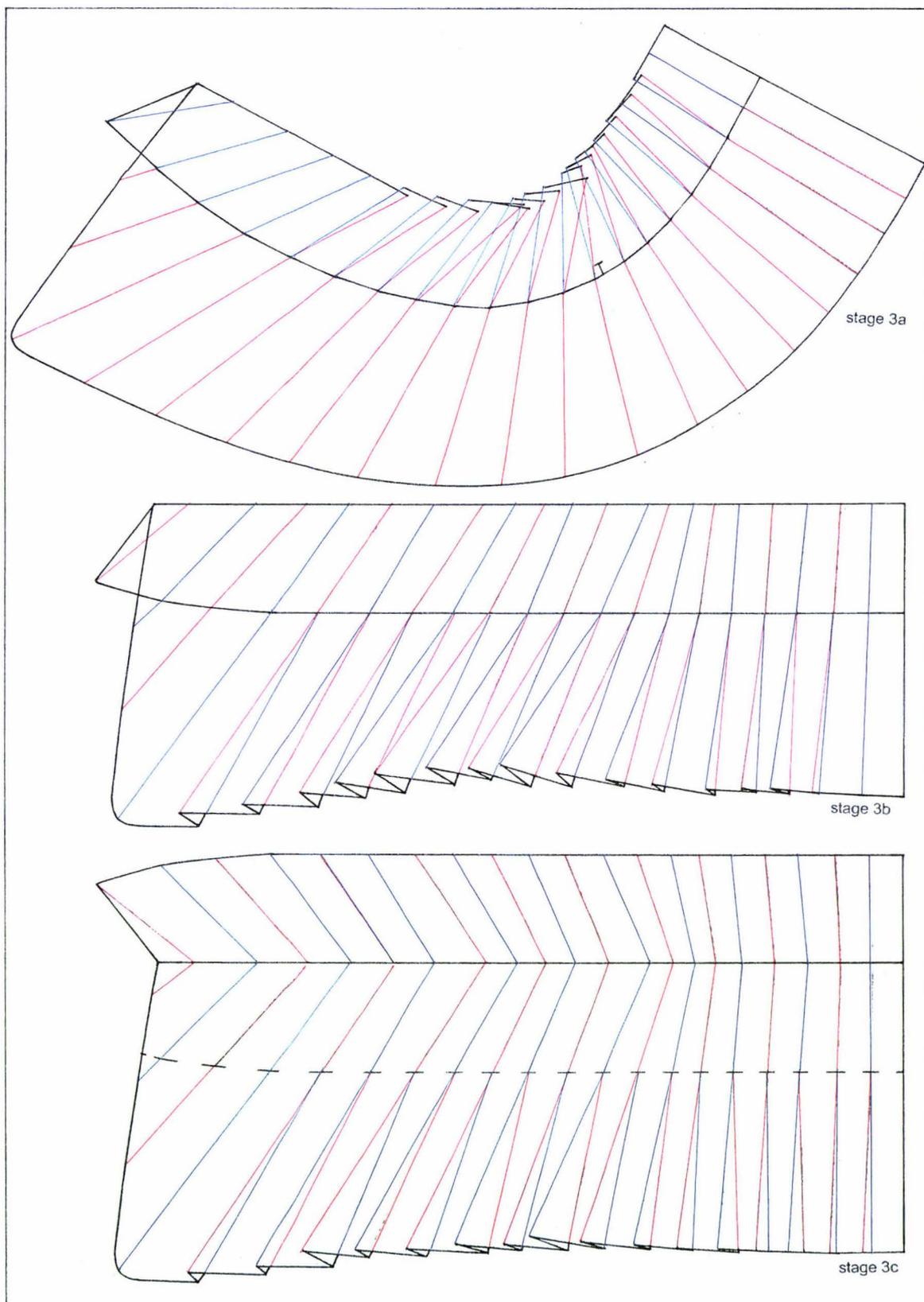


Figure 7.36 Composite under collar: Overcoat (D.B. Regency).

Stage 3a: Collar separation.

Stage 3b: Break line straightened (length regained).

Stage 3c: Stand unfolded.

(Drawing source: M. Campbell ©).

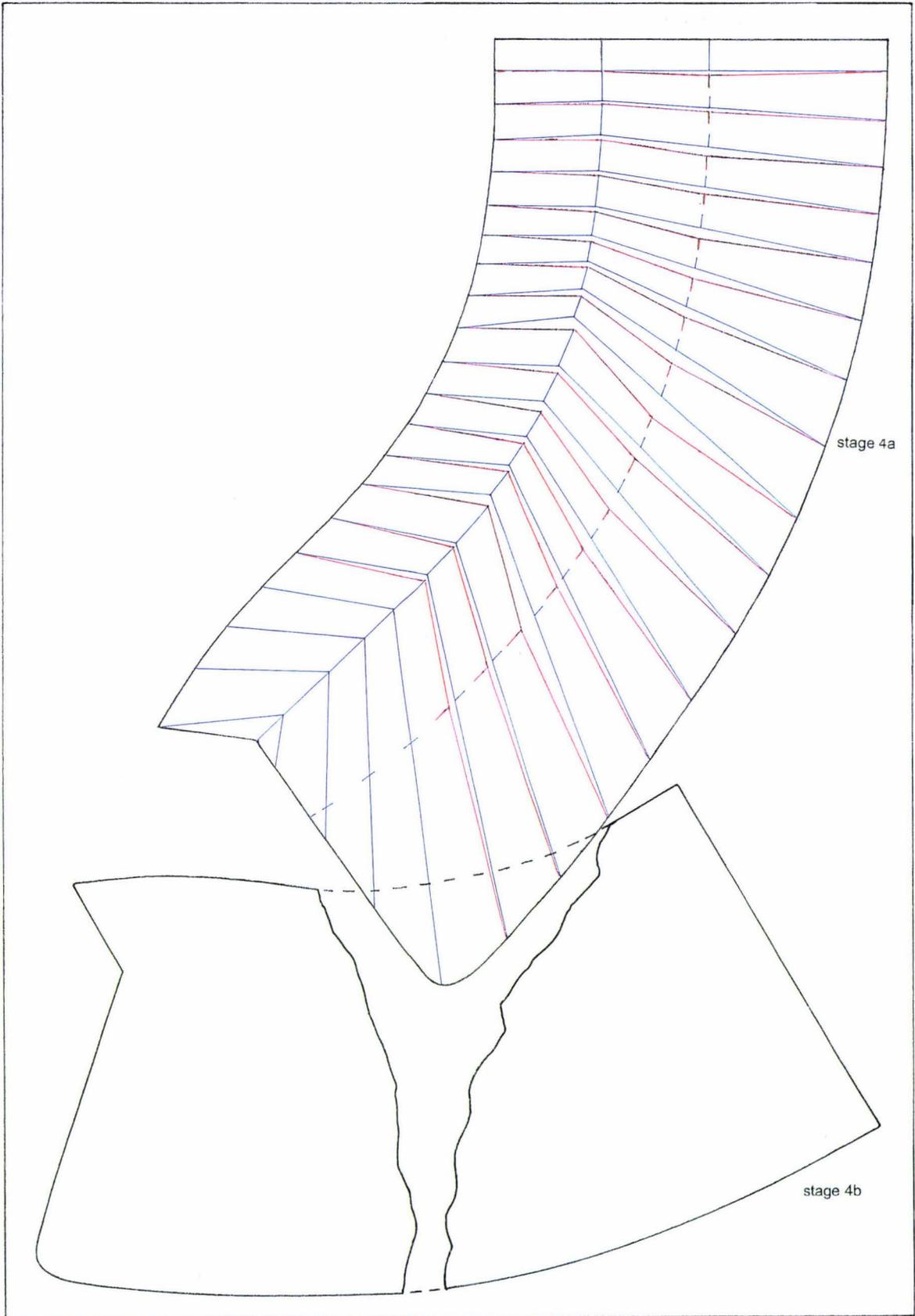


Figure 7.37 Composite under collar: Overcoat (D.B. Regency).
Stage 4a: 1 piece under collar (leaf length regained).
Stage 4b: 1 piece under collar (ready for seam additions).
(Drawing source: M. Campbell ©).

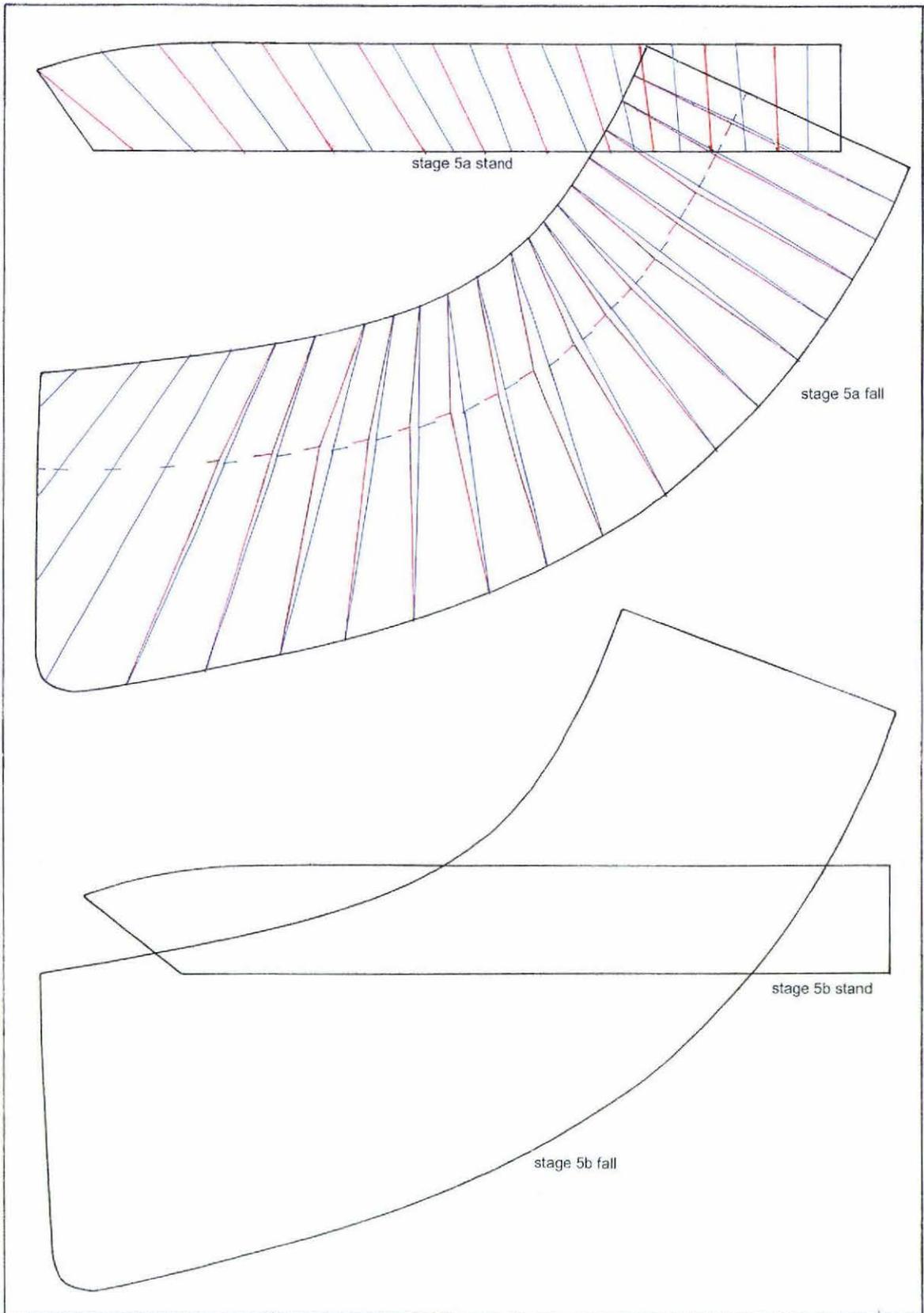


Figure 7.38 Composite under collar: Overcoat (D.B. Regency).
Stage 5a: 2 piece under collar, stand and fall.
Stage 5b: Stand and fall (ready for seam additions).
(Drawing source: M. Campbell ©).

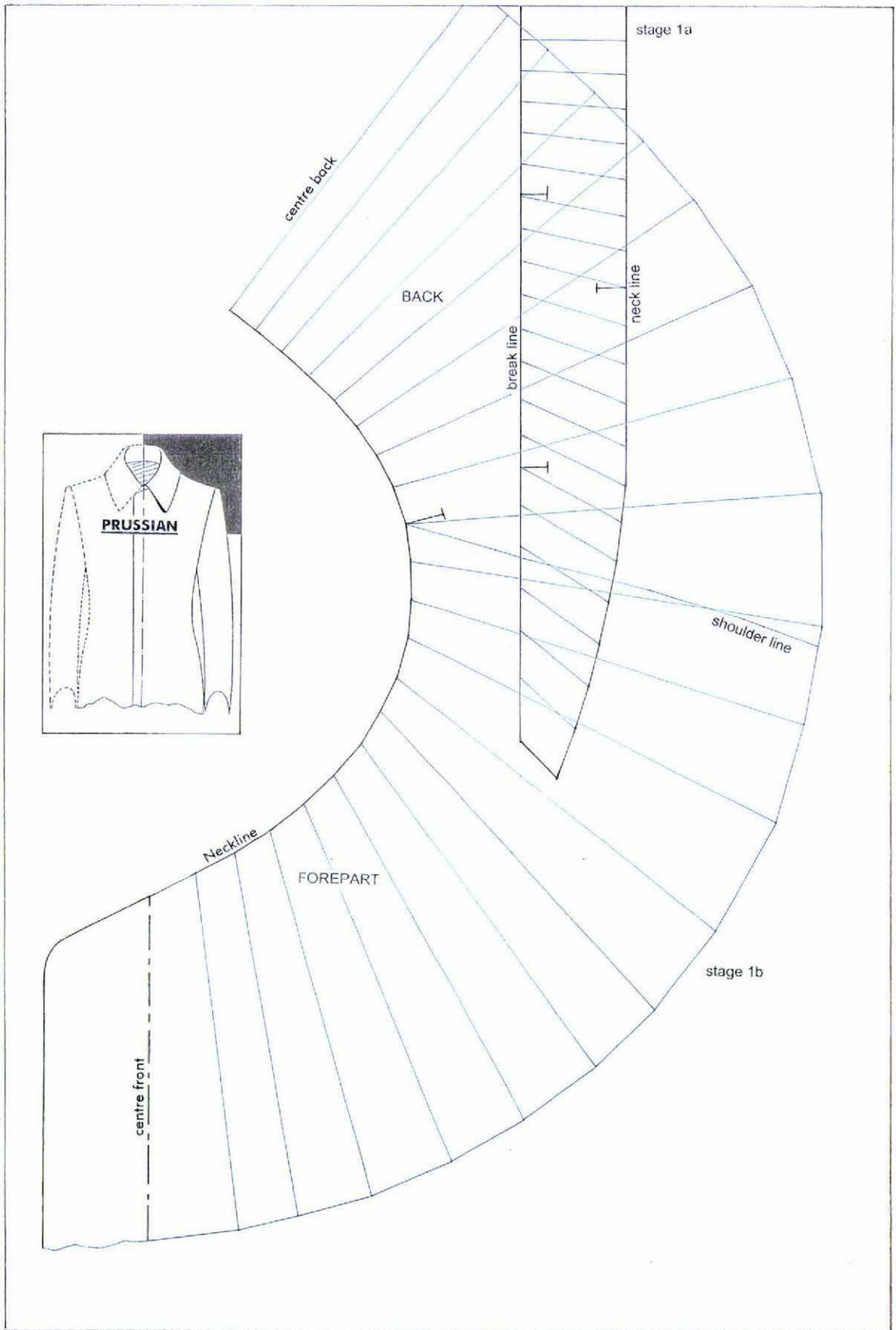


Figure 7.39 Composite under collar: Overcoat (S.B. Prussian).
Stage 1a: Stand-band. Stage 1b: Neck line construction.
 (Drawing source: M. Campbell ©).

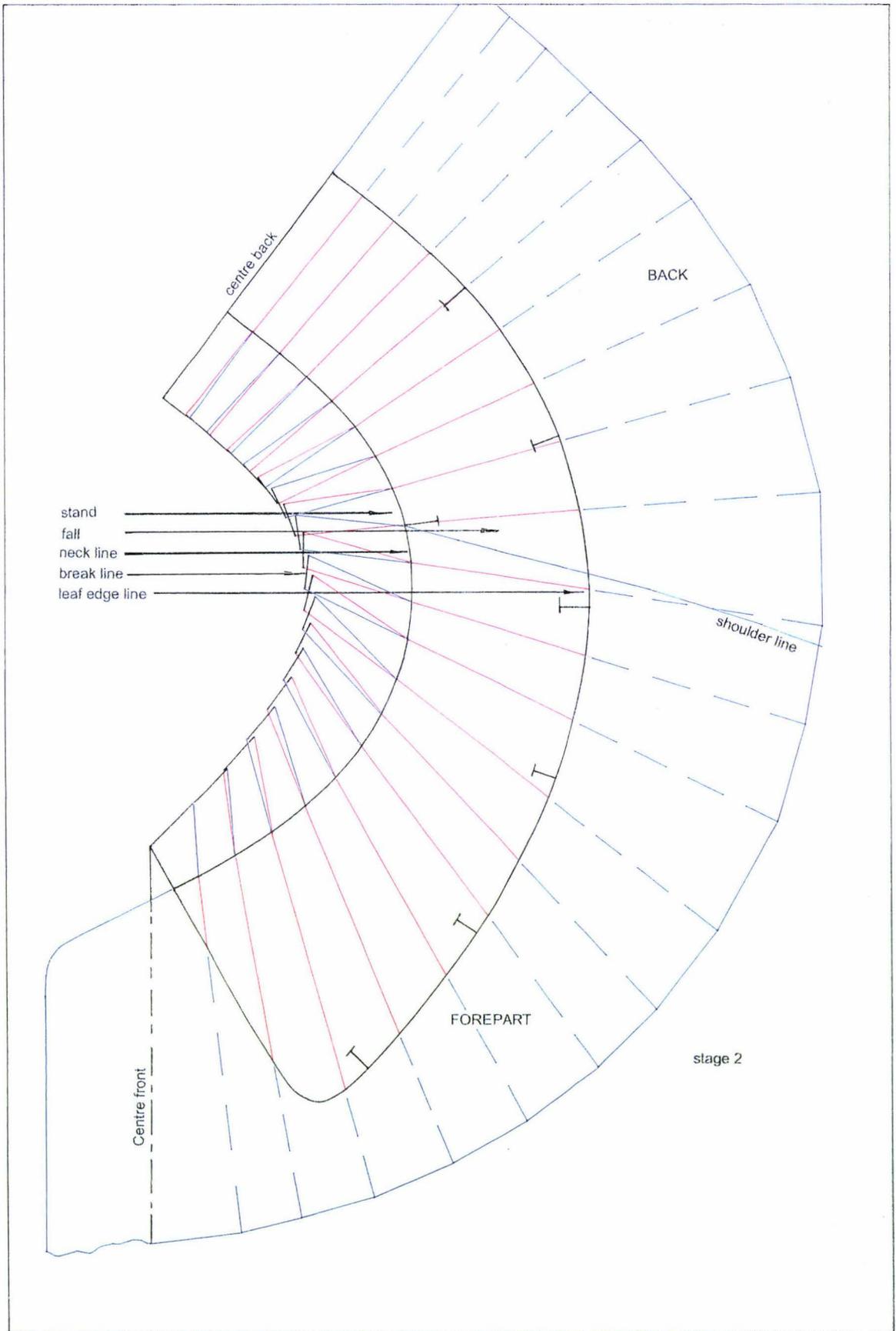


Figure 7.40 Composite under collar: Overcoat (S.B. Prussian).
Stage 2: Collar design (break line overlaps).
 (Drawing source: M. Campbell ©).

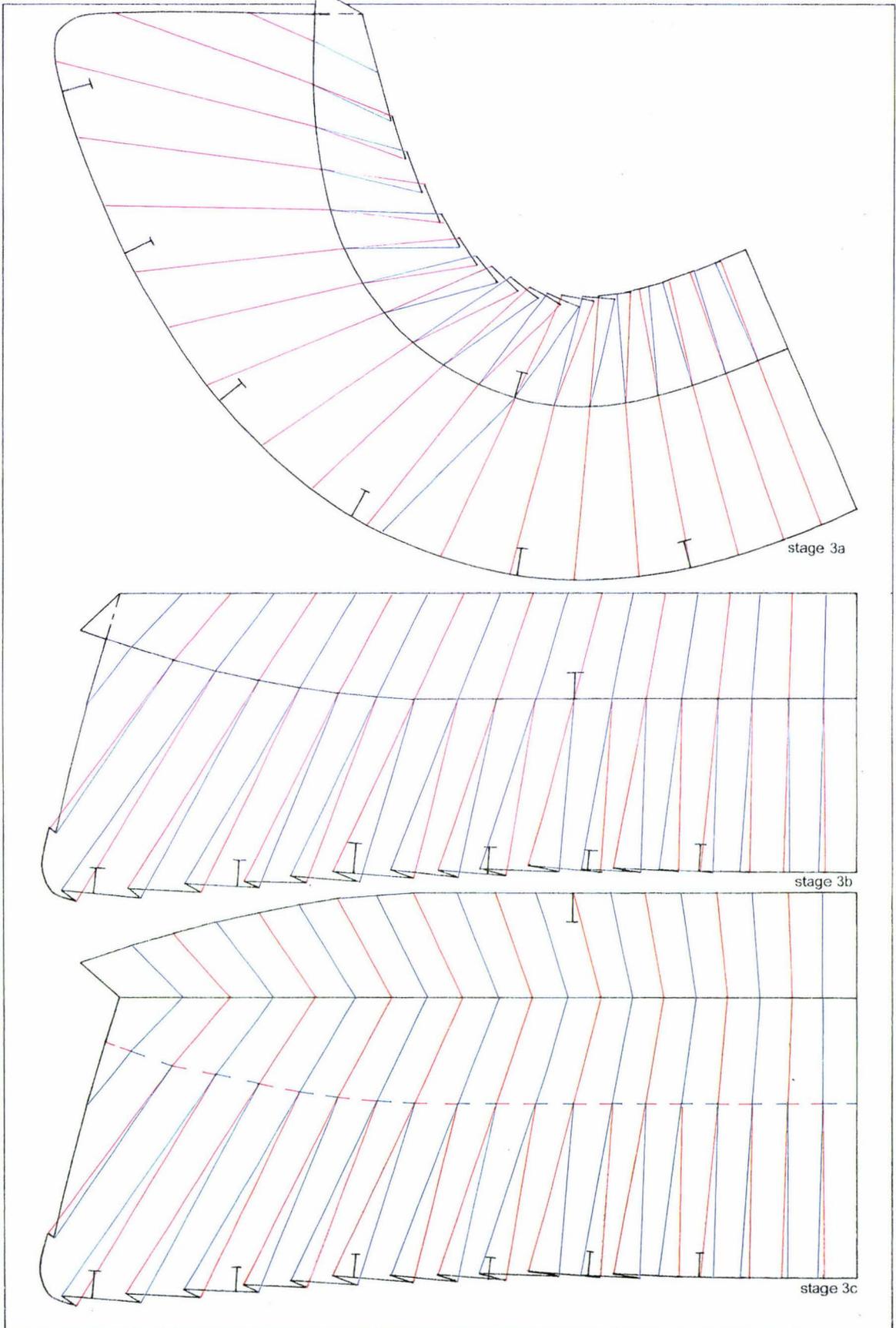


Figure 7.41 Composite under collar: Overcoat (S.B. Prussian).
Stage 3a: Collar separation.
Stage 3b: Break line straightened (length regained).
Stage 3c: Stand unfolded. (Drawing source: M. Campbell ©).

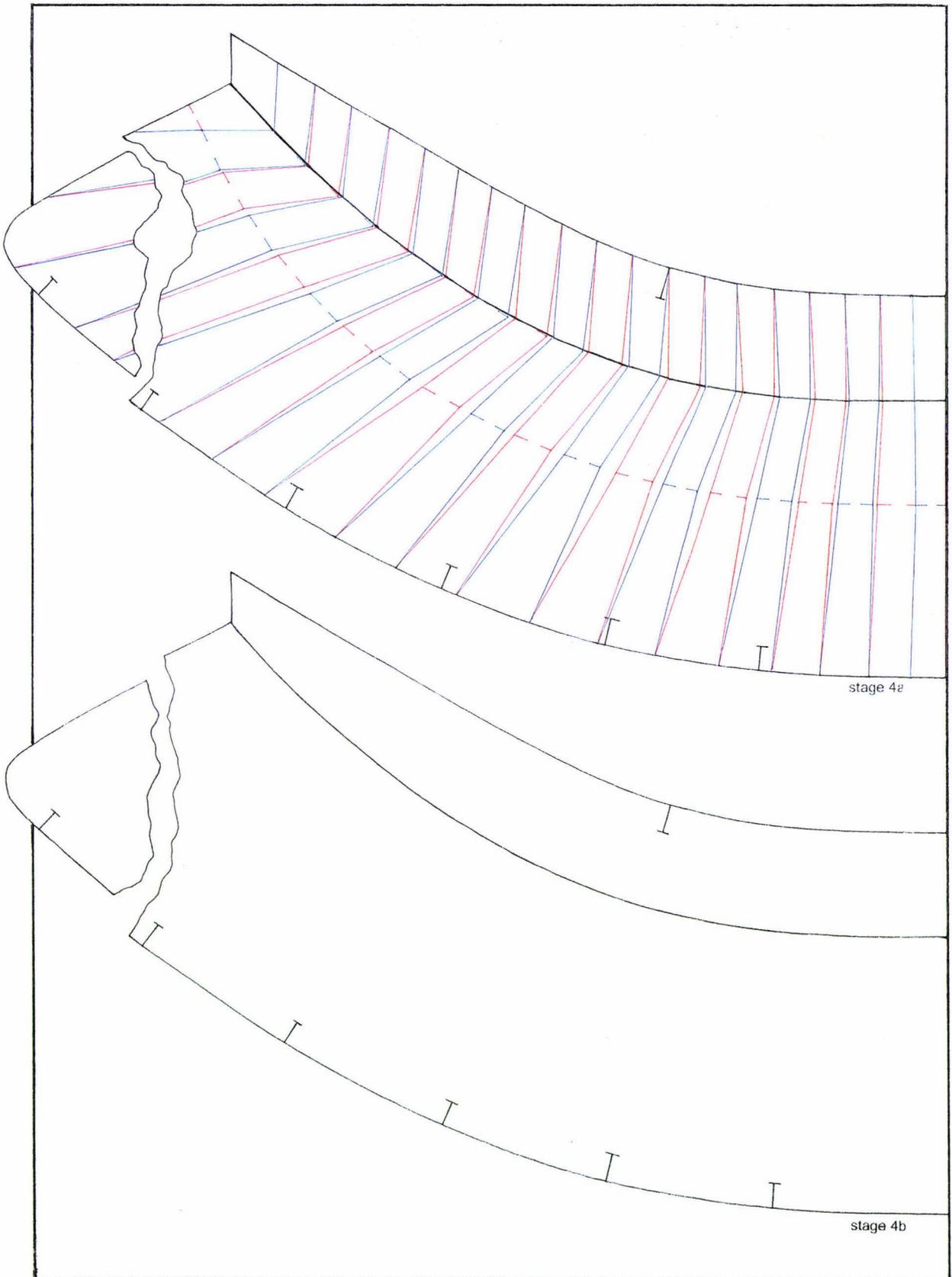


Figure 7.42 Composite under collar: Overcoat (S.B. Prussian).
Stage 4a: 1 piece under collar (leaf length regained).
Stage 4b: 1 piece under collar (ready for seam additions).
(Drawing source: M. Campbell ©).

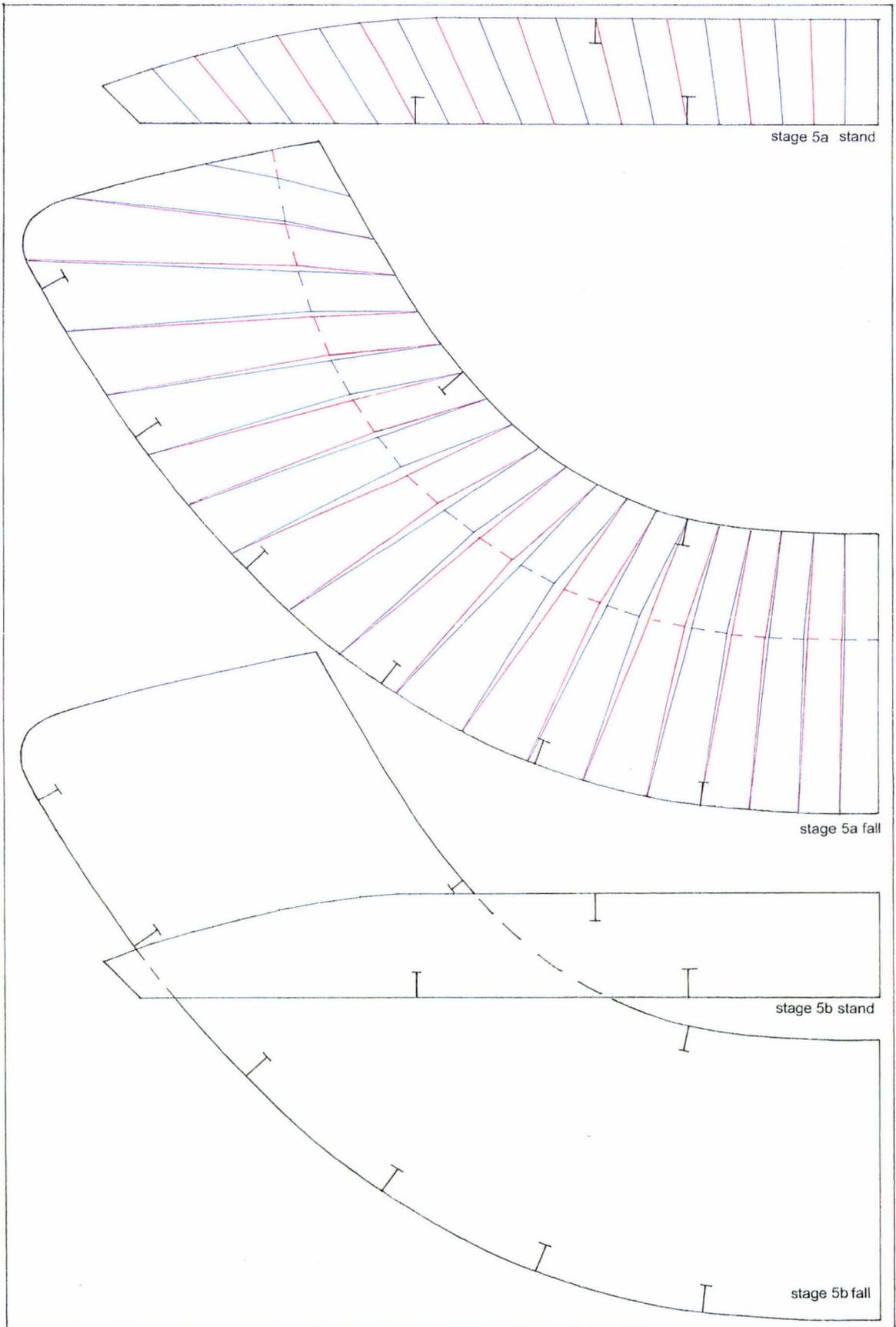


Figure 7.43 Composite under collar: Overcoat (S.B. Prussian).
Stage 5a: 2 piece under collar, stand and fall.
Stage 5b: Stand and fall (ready for seam additions).
 (Drawing source: M. Campbell ©).

7.5 Top collar and shawl collar/facing

Although the top collar of a garment is the section that is open to view, it is the under collar that provides the support and underpinning foundation which is used to make the top collar. All of the collar types investigated and presented in the top collar stage diagrams follow the same course of action (unless it is a designer choice) through the stages to **guarantee that the outcomes are always predictable and to enable procedures to be standardised.**

Depending on the collar type there may not be a great deal of difference between the shapes of the under and top collar patterns except when dealing with shawl collars or to compensate for variations such as extra width, ease allowances and the hiding of seam lines.

Collar ease can be further broken down to the following:

- Piping.
- Break line roll.
- Comfort.
- Tightness relief (in fabric thickness and layered sections).
- Seam shrinkage/seam take-up.
- Fabric shrinkage (due to pressing and fusing).

Ease is instilled by either stretching, wedging or with extra fabric allowances added to the under collar to make the top collar.

7.5.1 Top collar break line, width (one piece collar)

The top collar, whether of a one or two-piece design, sits over the bulk of the folded section of the under collar and takes a longer route to cover the distance over the break line between the neck line and the leaf edge line. Extra width, to relieve top collar width tightness, at the break line, is required to fill this requirement; the amounts depending on the type and thickness of outer fabric and interlining used. If this extra width is not allowed the top collar will be pulled over and curl at the leaf edge to compensate for the needed width.

The top collar stand construction begins with the under collar taken from Figure 7.3 stage 3c shown in Figure 7.44 stage 1a. The amount of break line allowance is inserted between the fall and stand (Figure 7.44 stage 1b). The fall is then delineated along the centre back line, along the leaf edge and down to the neck line front gorge point; then joined to the square gorge corner on the stand. Because of the break line width addition there is a distortion of the gorge line which has just been straightened; however, it will be compensated by a similar movement in the facing construction (not described in the text).

7.5.2 Top collar break line, length (one piece collar)

Ease is required around the neck between the wearer and the collar to allow the wearer some degree of comfort. The amounts of ease instilled into the break line around the neck (one or two piece collar) should be directly proportional to the stand wedge amounts as they are positioned and arranged around the neckline curve. Straight sections of stand that are independent of wedges (usually those below the neckline in the least restrictive areas) need the least amount of ease, if any (lapels may be included in this category), whereas sections with more curvature will have more ease because of the number and widths of the section wedges.

A one piece collar will automatically have ease (or length) built into the break line when the leaf edge is brought up to length when pivoting each section from the neck line (as Figure 7.4 stage 4a of the under collar). The amount of ease is relative to the difference between the stand and fall widths. The larger the difference in width between the stand and fall the greater the amount of ease instilled into the break line length (this may or may not be acceptable depending on manufacturing constraints).

A shirt collar with a stand-to-fall width difference of only 5-10mm has less ease in the break length than an overcoat collar with a stand-to-fall difference of 20-30mm. This contrast is in keeping with both types of collar. The shirt fits fairly tightly around the neck, is more restrictive and uses a lighter fabric, so requires less amounts of ease; whereas the overcoat having to follow a wider neck circle requires more ease to accommodate the extra length and also to fit over both shirt and jacket.

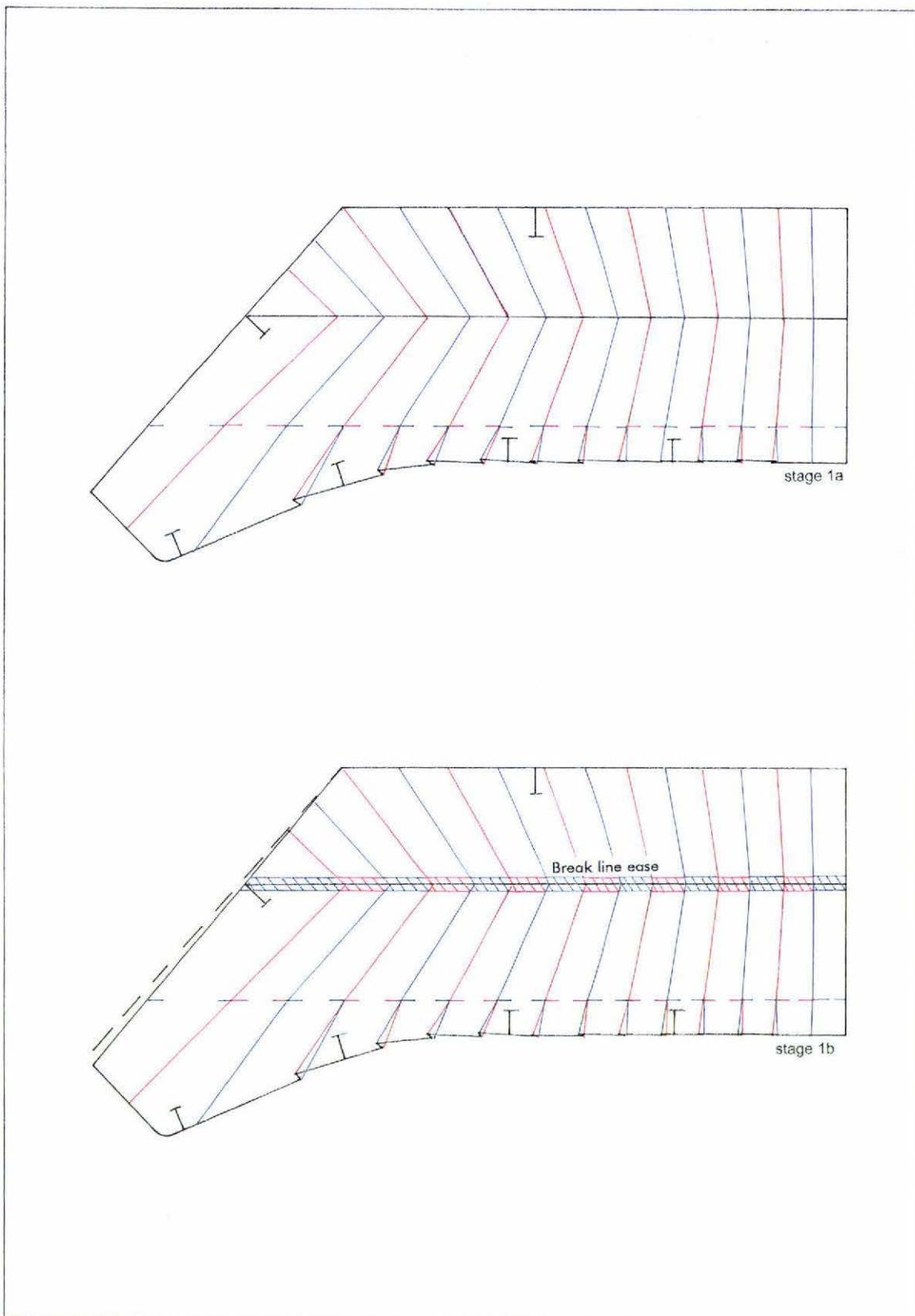


Figure 7.44 Composite top collar: Jacket (S.B. Button 3).
Stage 1a: 1 piece (stand unfolded).
Stage 1b: 1 piece (with break line width addition).
 (Drawing source: M. Campbell ©).

7.5.3 Top collar leaf edge, width (one and two piece collar)

After the break line width allowance has been added (and the leaf edge length has been recovered, as depicted in Figure 7.4 stage 4a) piping allowances can be calculated and added.

Piping is the amount of extra width around the leaf edge and front design line of the top section of a collar over that of the under collar. It is used to hide the seam line and give a neat and acceptable finish. The amount of piping depends on the fabric to be manufactured. The bulk or volume of heavy-weight fabrics will need more of an allowance than that of lightweight fabrics. Twice the amount of required piping width has to be allowed; 50% of which will extend out beyond the under collar leaf edge line and 50% to turn under to meet the under collar leaf edge seam line. The total piping allowance required is decided then measured out from the leaf edge of the under collar, continuing around the step to zero at the front neck gorge line (Figure 7.45 stage 2a). Figure 7.45 stage 2b shows the top collar (with break and leaf edge allowances included) ready for seam allowances.

7.5.4 Top collar break line, width and length (two piece collar)

Ease (or length) is automatically imposed in the break line when the leaf edge of a one piece under collar is brought up to length (see Figure 7.4 stage 4a). As a two piece collar is designed to be fit closer to the neck than the one piece collar it does not have extra wedge amounts along the break line, as a result it will set tighter to the neck unless allowances added for this effect. Figure 7.46 stage 1 shows the under collar ready for top collar allowances.

(The break line width allowance for the two piece top collar is shaped and formed from the under collar in the same manner as the one piece top collar depicted in Figure 7.44 stage 1b, with an additional step for the split collar line). The seam line required to split the top collar into two separate sections is not positioned at the under collar crease line. To hide the top collar 'split' seam line from view, it is placed further into the stand area (the distance and shape is open to designer choice, usually 6-10mm) and notched to balance the seam line (Figure 7.46 stage 1b). The stand is then separated from the fall (Figure 7.47 stage 2a stand). The leaf edge of the fall is brought up to length using pivot points placed either on the pattern edge (split top collar seam line), or on the

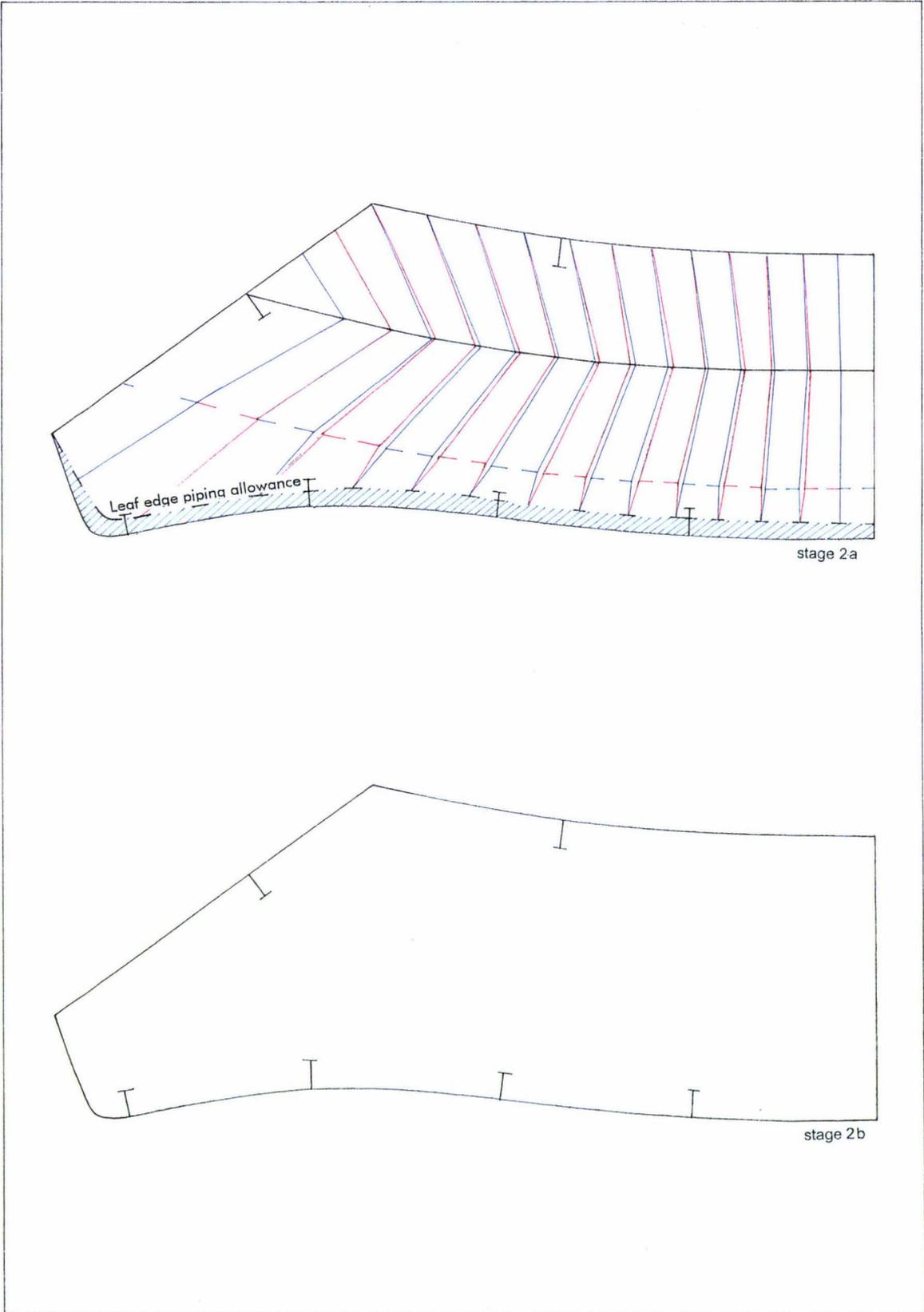


Figure 7.45 Composite top collar: Jacket (Button 3).
Stage 2a: 1 piece (leaf length regained and piping addition).
Stage 2b: 1 piece (ready for seam additions)
(Drawing source: M. Campbell ©).

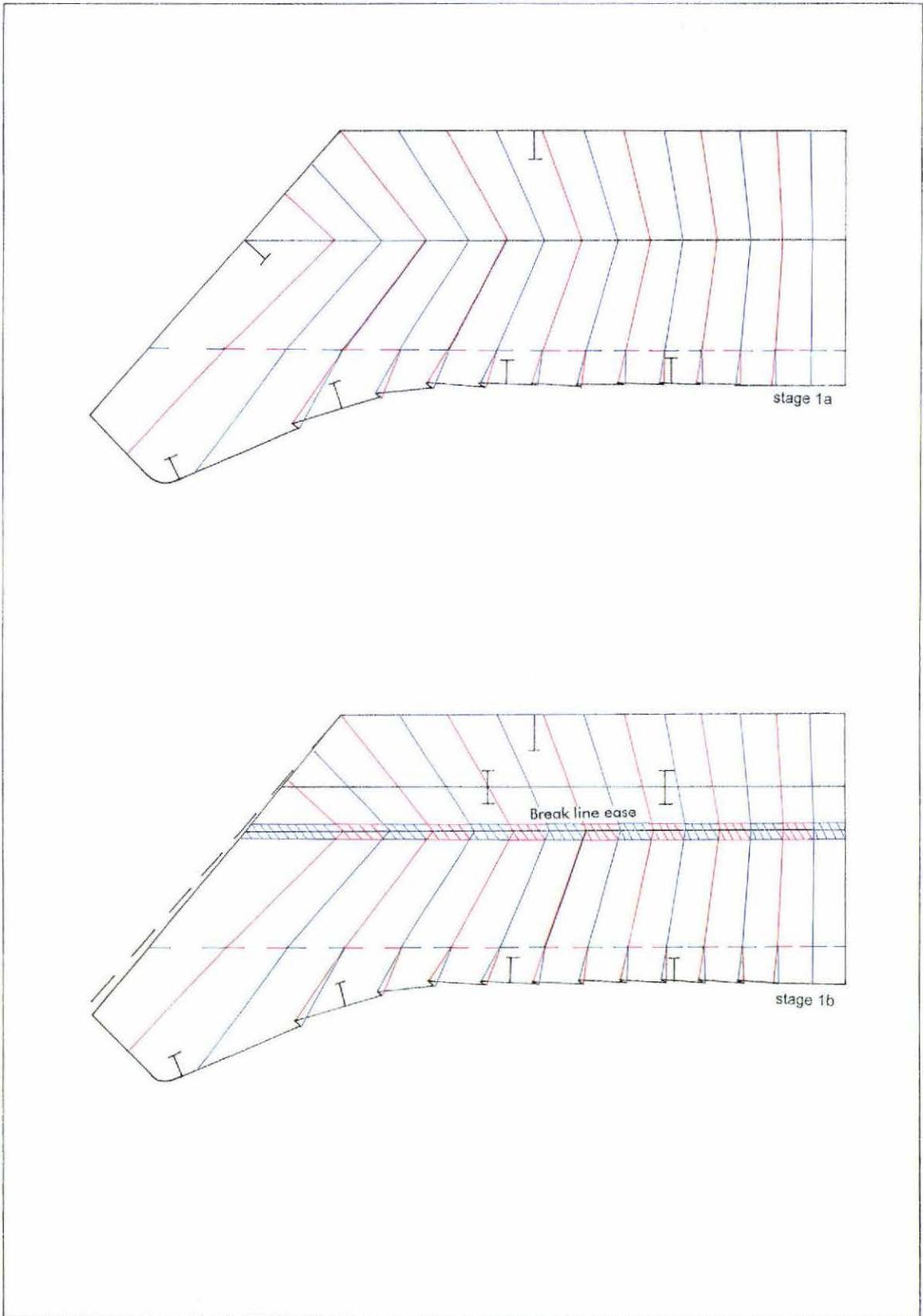


Figure 7.46 Composite top collar: Jacket (S.B. Button 3).
Stage 1a: 2 piece (stand unfolded).
Stage 1b: 2 piece (with break line width addition and separation line).
 (Drawing source: M. Campbell ©).

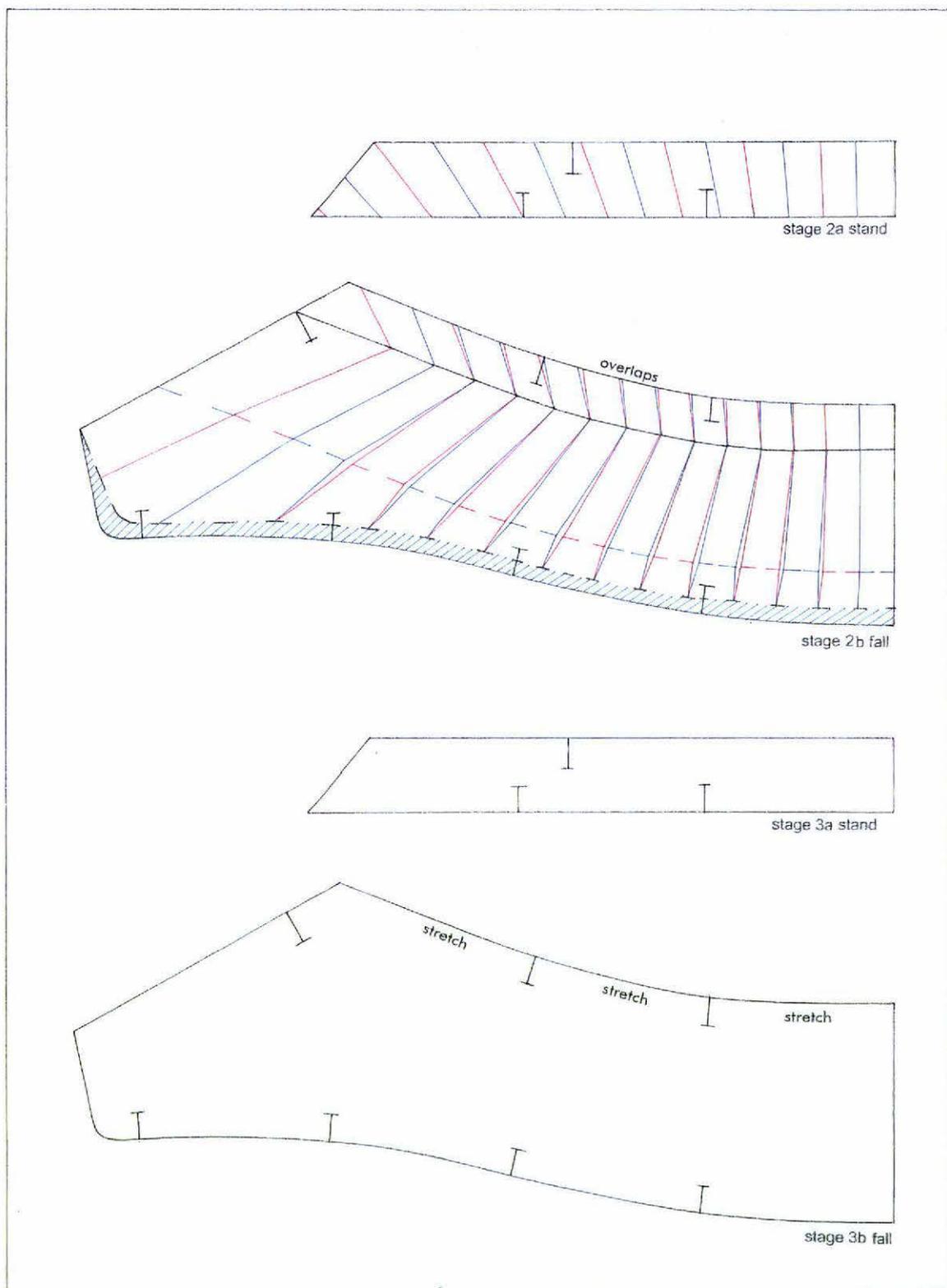


Figure 7.47 Composite top collar: Jacket (S. B. Button 3).

Stage 2a: 2 piece, separate stand.

Stage 2b: 2 piece, separate fall (leaf length regained and piping addition).

Stage 3a: stand (ready for seam additions)

Stage 3b: fall (ready for seam additions)

(Drawing source: M. Campbell ©).

original under collar break line shown in Figure 7.47 stage 2b fall. Piping allowances are added as shown in the one piece top collar.

The first method (not illustrated), pivoting from the edge, as well as introducing length into the leaf edge, also produces slight amounts of length into the top collar break line, which may or may not be acceptable depending on manufacturing constraints.

In the second method (Figure 7.47 stage 2b fall) leaf edge length of the fall is regained by pivoting each section line at their respective points along the under collar break line. Pivoting takes place on the break line to maintain the relationship between the under collar and the top collar break lines. Because the pivot points are not located on the outer edge, overlaps form on the new 'split' seam line edge, shortening it by various amounts depending on the leaf edge wedge values as shown in Figure 7.47 stage 2b fall. When the stand and fall are sewn together the fall section has to be stretched on to the stand section. Figure 7.47 stages 3a stand and 3b fall show the separate stand and fall ready for seam allowances.

7.5.5 Top collar leaf edge, length (one and two piece collar)

It is recommended that length in the form of ease be instilled into the leaf edge of the top collar to compensate for shrinkage in pressing and sewing 'take up', or contraction of the seam, and to relieve any tightness between the collar and its underlying garment. There is also a necessity to compensate for the extra length incurred because of the piping projecting out from the under collar. Most of the ease allowance will be inserted, depending on the designer's choice, in the vicinity, and either side of the shoulder seam line where contouring is at its most severe. An ease allowance is warranted throughout the top collar leaf edge length in the same ratio as the wedging apportionments.

7.5.6 Top collar, shawl collar/facing (one piece collar/facing)

A standard facing is a separate section of the garment in the area below the gorge seam line of the top collar, it is the top section of the lapel and it is not normally considered as a component of the collar. A shawl collar (top collar) is a contrast, it can be described as an extended collar section from centre back around the shoulder region, passing across the gorge line (which is dispensed with) into the facing area and down into the forepart section to the front button closure. The under collar, in some

instances, still retains the dividing line (gorge seam line) that separates the collar from the lapel, whilst others are joined to form part of the forepart pattern.

The new composite drafting system for one piece shawl collars (not illustrated) uses the same drafting methods to establish the top collar break line and leaf edge line allowances as shown in the one piece step top collar described above, except with the facing having firstly been joined at the gorge line.

7.5.7 Top collar, shawl collar/facing (two piece collar/facing)

Two piece shawl collars are treated the same as other two piece top collars, regarding the break line width allowance, except that the displaced break line has to be curved (Figure 7.48 stage 1) and taken to the outer edge of the facing past the end of the under collar/lapel gorge line. The position and curvature of the break line is, as with the normal 'step' top collar, open to designer influence. The collars are then processed in the normal way with the stand separation (Figure 7.49 stage 2a stand) and the fall, pivoted from the break line, with its leaf edge piping (Figure 7.49 stage 2b fall). Figure 7.50 stages 3a stand and 3b fall are ready for seam additions; as in previous split top collars the break line could have a reduced seam width of 6mm. A further seam could be added either at the centre back line or at a point below the top button closure position, where it is unseen, to reduce fabric wastage due to the considerable length of the full facing which extends from the left hem line to the right hem line.

7.6 Composite collar grading

The topic of contemporary grading has been covered in the literature review; however, the composite collar drafting system may dictate and impose a change in grading procedures and grading proportions. A preliminary attempt is made to highlight some of the steps that may be necessary in a future investigation to determine a new grading structure for the composite collar and whether or not a new grading system is justified.

Steps that may be necessary include the following:

1. Acquire a number of standard mannequin sizes comprising a given size range

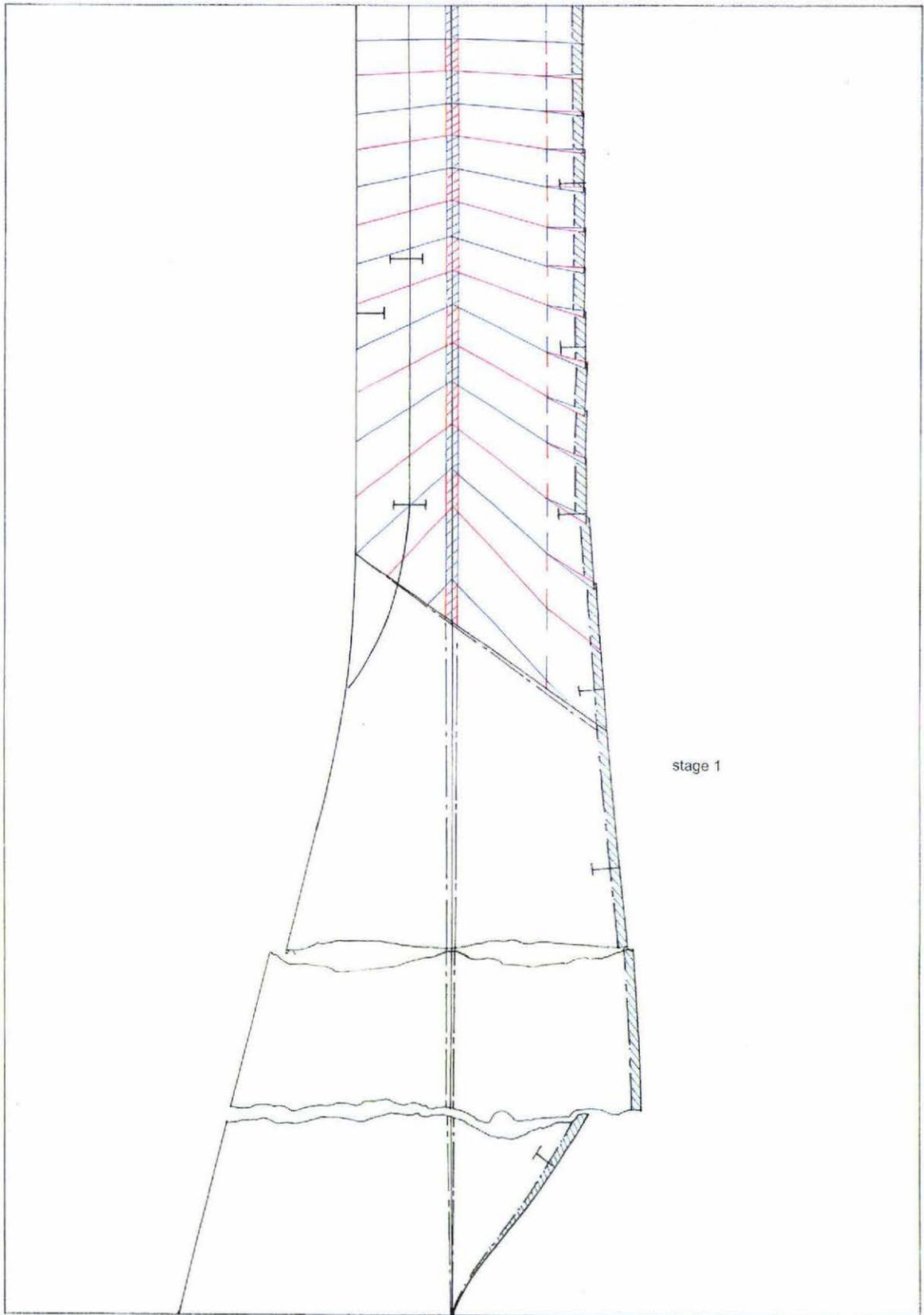


Figure 7.48 Composite top collar: Jacket (S.B. Shawl).
Stage 1a: 2 piece (stand unfolded with break line width addition,
separation line and leaf edge piping addition).
 (Drawing source: M. Campbell ©).

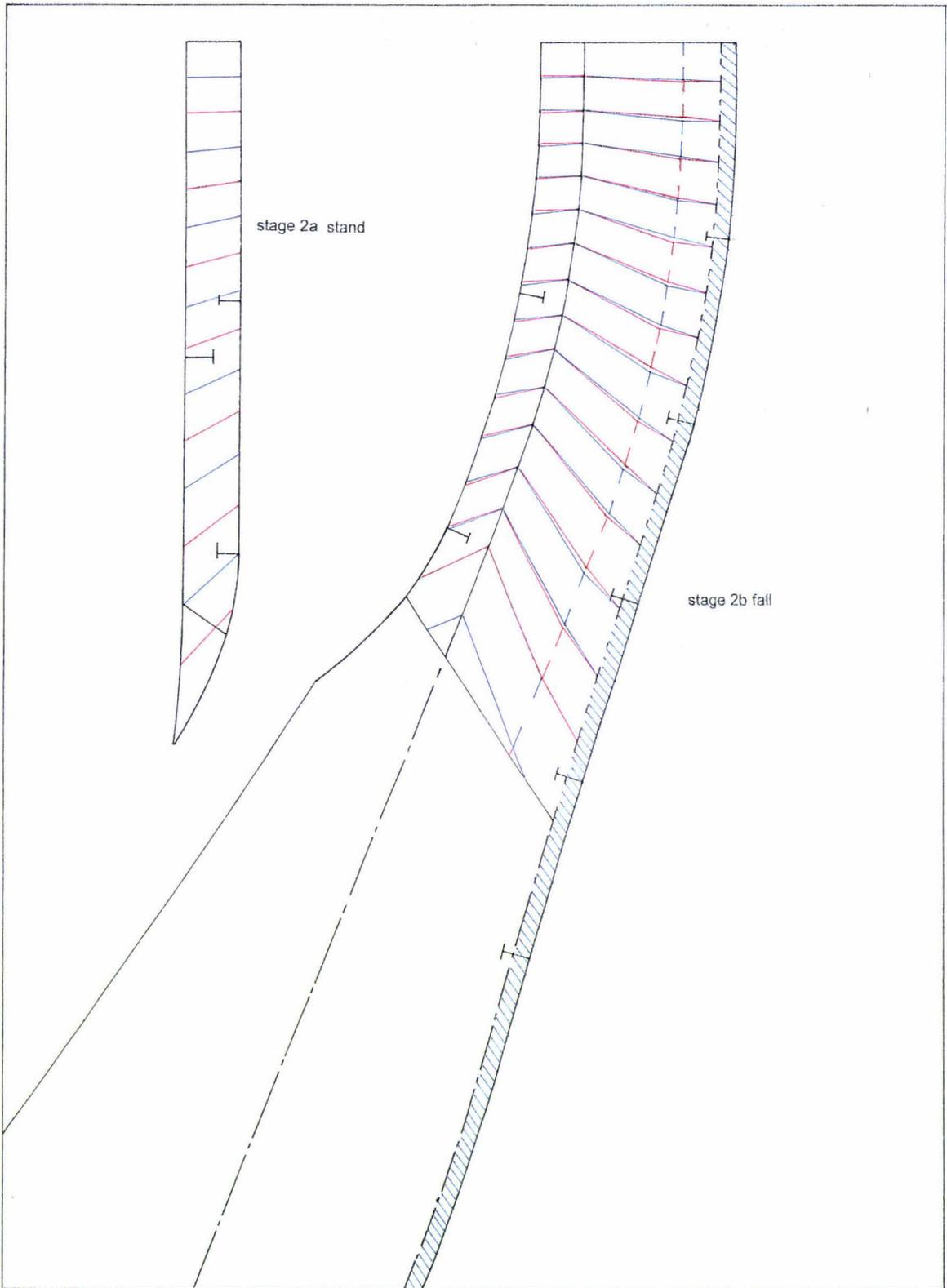


Figure 7.49 Composite top collar: Jacket (S.B. Shawl).

Stage 2a: 2 piece, separate stand.

Stage 2b: 2 piece, separate fall (leaf length regained and piping addition).

(Drawing source: M. Campbell ©).

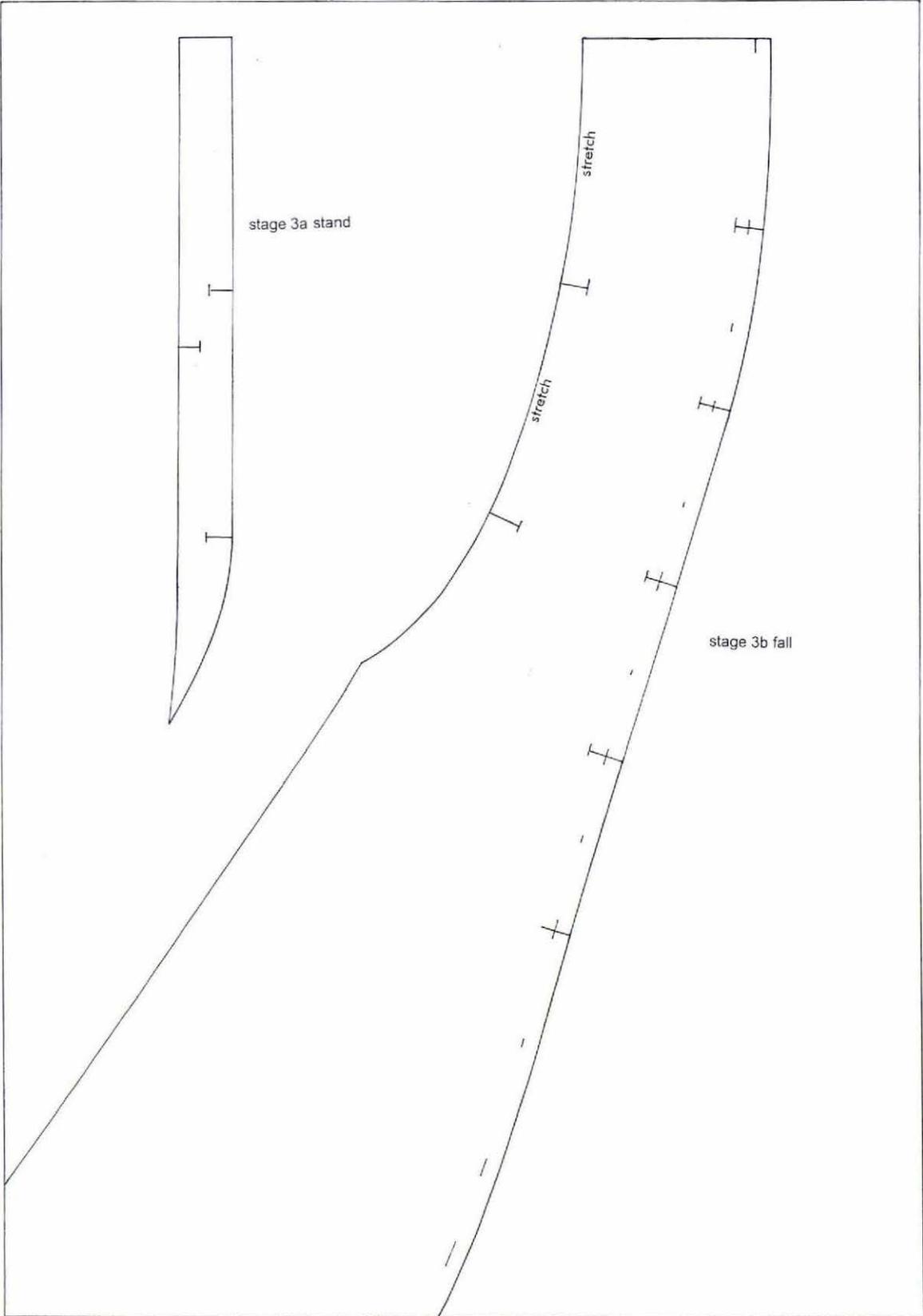


Figure 7.50 Composite top collar: Jacket (S.B. Shaw).
Stage 3a: stand (ready for seam additions)
Stage 3b: fall (ready for seam additions)
(Drawing source: M. Campbell ©).

2. Develop standard toiles to fit the mannequins (see numbers 6, 9) to establish the differences (to be marked on the toiles) in neck line and grade positions/amounts between the existing patterns and grades and the new grades.
3. Determine the top button position/height and standard button wrap on all the sizes involved (there may be several vertical and horizontal positions to determine their diversities)
4. Decide on the stand band width and requisite front shaping (there may be several widths and shapes to determine their grade diversities)
5. Undertake a number of collar style variations (to compare and contrast their qualities)
6. Determine the neck line 'track' (there may be several neck line tracks, depending on the above factors)
7. Measure grade amounts/proportions for the various experiments
8. Establish the differences between the 'old' (existing) and 'new' grades
9. Establish new grade rule tables for the appropriate grade points (there may be several. There may also be a need for various standardisations of grade rules if there are only slight differences between the rule tables).
10. There may also be a necessity to analysis each size of mannequin (neck and body areas and their relative sections) to, perhaps, enable an automatic 2D grade to emerge from the 3D data.
11. The composite collar drafting system itself may provide an alternative course of action to normal grading; will there be a need for composite collar grading if a composite collar drafting computer programme is feasible and available?

7.7 Manual composite collar system (quick reference method)

The 'quick reference' composite collar template system is meant as a substitute for the involved and complicated manipulations that are required for the explanation of the system as a whole. A collar template system is quicker and easier to understand for most practical situations. The manual drafting method for composite collar making follows the same procedure as that required for the expanded composite collar drafting system, except in a simpler form.

A break-down of the quick reference manual composite collar system is as follows. (Note that there is no need to mark sector lines on the toile or the mannequin and only the left side is used for this description):

One piece under collar:

1. Place the sewn body toile on the mannequin (on which to delineate the new neck line).
2. Estimate the length of the stand-band.
3. Establish the desired stand and fall collar dimensions on a template, the break line and approximate front design area shape (Figure 7.51a).
4. Add sector lines across the template. (The number of sectors would be a personal choice depending on the quality expectations of the practitioner).
5. Cut out the template and crease the break line.
6. Cut up each of the fall sector lines from the leaf edge to the break line.
7. Place the template around the neck to the desired front edge/top button height and tape into position (Figure 7.51b). (The fall section should be above the stand).
8. Check that one of the sector lines, on the template, is at a right angle to the centre back line of the toile and mannequin, indicate this position on the template. Tape the stand into position (Figure 7.51c). (If the centre back line is between the sector lines mark a new line on the template).
9. Mark the toile neck line from the stand-band neck line of the template. This aligns both the collar and body neck lines as a perfect match. Fold the fall into position.
10. Develop the collar leaf edge and front design lines in more detail according to taste. Cut around the shaped edges.
11. (The contours of the body will have opened each of the cut sector lines by various degrees depending on their location around the neck). Tape them into position as near to the leaf edge as possible to maintain their individual opened widths.
12. Remove the template from the neck line and place on pattern-paper (Figure 7.52a). (The template will not lie flat so complete the cuts along the sector lines from the leaf edge to the neck line).
13. Tape into position on pattern-paper and add seam allowances and an appropriate amount of ease if required. (Each of the opened wedges has introduced length

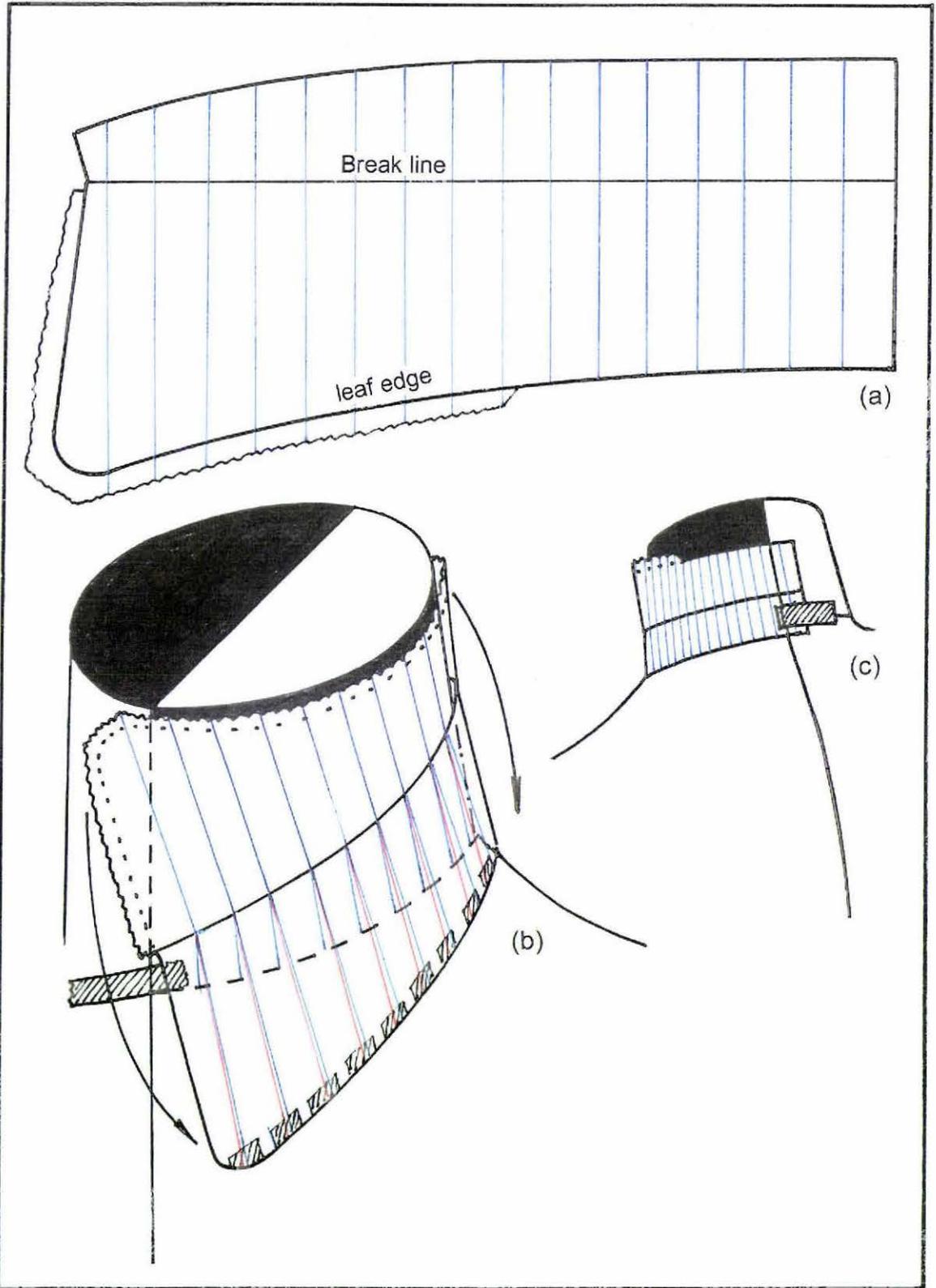


Figure 7.51 Composite under collar: Quick reference method.

- (a) Under collar shape with estimated front design area.
 - (b) Under collar located on the mannequin (front/side view).
 - (c) Under collar located on the mannequin (back/side view).
- (Drawing source: M. Campbell ©).

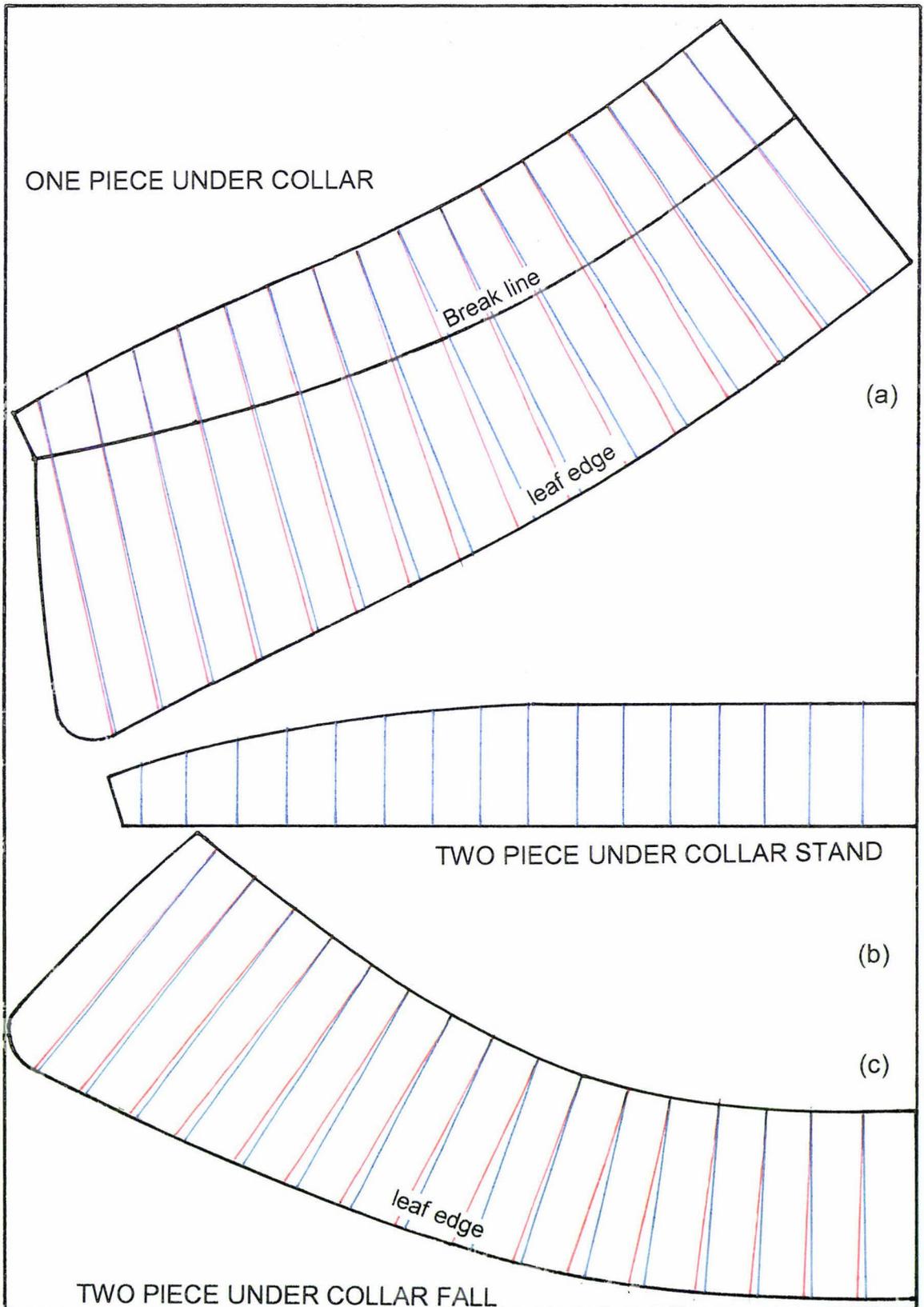


Figure 7.52 Composite under collar: Quick reference method.
 (a) 1 piece under collar (no seam allowances).
 (b) 2 piece under collar stand (no seam allowances).
 (c) 2 piece under collar fall (no seam allowances).
 (Drawing source: M. Campbell ©).

in to the break line, in their own specific amounts. If this is unacceptable consider a two piece collar).

Two piece collar:

14. From the one piece collar, cut away the stand section from the fall area along the break line (Figure 7.52b and 7.52c).
15. Using the segregated stand section close each of the opened sector lines along the break line to re-establish the straight break line.
16. Using the fall section close each of the opened sector lines at the break line. (The break lines of the stand and fall should now be the same length).
17. Add seam allowances and mitre the stand break line seam for the production pattern. (The stand template has been straightened due to the section wedges being closed, however, the fall has the opposite affect of having more curvature introduced into its profile; nevertheless, it is still compatible with the stand, the body contours and neck line. The edges are then blended to smooth any resulting points at the section and outer line corners. After seams, ease and notches have been added the pattern is creased along the centre back line, folded and cut out ready for use as a full pattern).
18. Develop the one and two piece top collars using the composite top collar method.

7.8 Summary

All of the collar styles under review, from the flat to the stand, and the various styles in between, have been combined within the single composite collar drafting system that enables individual design discretion. All of the steps in the drafting process are open to view, even though some of the elements, such as an unelected stand and break line in a flat collar or a flat section and break line in a stand collar may not be visible. Only the convertible appears to be out-of-step because of the need to set in two different positions. Nevertheless, those two positions are still integrated as a component of the system. They represent two styles of collar, one being the shirt and the other a tailored collar and lapel. The full drafting system ensures predictable outcomes in each design variation, guess-work is eliminated and there is no need for the usual manipulations required later in the process, to attain the required collar shape and quality standards. Top collars, whether a shirt collar, step collar, shawl jacket collar or overcoat are incorporated to finalise the collar organisation.

Chapter 8

Discussion

8.0 Contemporary collar drafting

Contemporary collar drafting takes many forms, depending on the required collar design. Drafting instructions and diagrams may be formulated in order to duplicate the design at a later date, or to pass-on knowledge to students and apprentices. These drafting instructions and diagrams may vary depending on the personal methodologies employed by the designer. There appears to be no exactly duplicated methods between designers, even copied instructions may be altered to suit the terminology of the copier. Each collar design may be changed in appearance to fit the desired collar silhouette envisaged by the designer. Each designer may prefer a collar design image that differs from other designer visualisations. This leads to further alterations to a collar draft and yet another drafting method; and so on down the years. The result is a vast number of drafting methods that may not be adequate. Not all drafting alterations are 'improvements' to the method or the fabricated collar. To understand how collars perform in reality, there is a need to evaluate the elements that make up the whole collar and mannequin assembly.

8.0.1 Review of contemporary collar drafting methods

There are numerous drafting approaches available to create a collar pattern, which have their own in-built idiosyncrasies which contribute to a particular three-dimensional collar formation. The degree to which they achieve their purpose varies depending on the drafting practise. Often-times there is a difference between the Imagined and the actual result. To authenticate the drafting method there are 'principles' that explain how and why a particular technique is supposed to work, some principles are described below.

Bray (1985) gives, among others, the following quoted rules:

- (1) *The 'set' of a collar, i.e. the way it lies and fits at the neck, depends on the shape of the inner or sewing-on edge. This, in turn, depends on the difference in length between the two edges.* Bray (1985, p.78)

This collar 'set' relies on a 'leaf-edge wedging' method, the outcome being doubtful, and depends to some degree on the practitioner's knowledge of collar shapes. It is really saying 'check the shape and difference in these two lengths to give an **indication/idea** of how it **might** turn out, because it is not guaranteed to do so'. The technique does not match the leaf edge with its corresponding placement on the body which equates to the making of an unknown final shape of collar on the mannequin.

As demonstrated in the leaf edge experiments (described in chapter 6), length could be positioned almost anywhere within the boundaries of wedge amounts or angles, leaving considerable room for error in both drafting procedure and collar fit and appearance. When the final length and shape of the outer edge is not known, then neither is the position of the break line nor its length, which also means neither the stand nor the fall widths are known, or guaranteed not to distort. In fact, with these types of manual and qualitative alterations very little can be predetermined unless trials have been undertaken to assess the collar manipulations. Without a standardised and systematically controlled environment a number of collars might have the same over-all dimensions yet at the same instant have a diverse range of shapes; none of which is necessarily the shape required to achieve the collar design since they cannot all be compatible with the same neck line.

(2) *'...every collar must be cut for its own neck line, and it is useless to try to fit a collar cut for one neck line into another of a different size and shape.'* Bray (1985, p. 79)

The statement implies that both the collar, and the neck line it has to fit, must be in harmony. Unfortunately a designer cannot construct any kind of collar around any neck line using any drafting techniques. Both the collar and its neck line are reliant on each other. The stand section neck shape creates the body neck line, from which the fall can be calculated. The composite system is in harmony from the outset and does not rely on pre-set neck lines or arbitrarily wedged leaf edges.

(3) *'In theory, all collars, whatever their style, may be cut by outlining them first as flat collars on the bodice pattern, and then obtaining the correct fit at the neck by darting.'* Bray (1985, p. 79)

The meaning here is that there is only one method that encompasses most designs of stand and fall collars. Except the method leads to the same distortions indicated in (2). Unlike the composite collar system, this method of drafting takes no notice of the break line, which should be as straight as possible. Any collar that is cut from a concave neck line must start with a distorted break line with extreme curvature. Again, there is no guarantee of success.

Erwin (1954, p. 99) describes the following process for designing collars:

'In all collar designing there are certain steps that save much time if followed. First, establish the desired neck line before drawing the elevation. Second, roughly sketch the shape of the collar in the elevation. Third, develop the roll of the collar until it sets just right. Then, work on the final silhouette and last, develop details after the major shape and roll are approved.'

The above principles, and their associated practices, are unsound as the review of contemporary drafting (chapter 3 table 3.2) has shown that not all collar drafting methods give descriptions of all of the elements that make up the collar for a particular design. With a considerable number of contemporary drafting methods, the neckline length appears to be the only line of the collar that has a known value in all cases (refer to table 3.2). Even if the line itself is in doubt, whilst most of the other lines, such as the top edge of a stand collar or the break line of a stand and fall collar have to be discovered eventually by whatever means at hand, usually trial and error. The outer, or leaf edge length is, on some occasions, not given a specific measurement, except perhaps, in a few instances (Kunick, 1967; Shoben and Ward, 1990), although the stand and fall widths are sometimes indicated in specific collar types such as the tailored varieties.

It was assumed that pattern construction instructions for making collars were given to ensure predictability of results and to link method with outcome, cause and effect, with the least amount of time, energy, cost and experience. However, further investigations into the Shoben and Ward (1990) drafting technique (section 3.1.4, pp. 84-87), which contained more information than most, found that although the front and back patterns were taken from the same book as the collar draft, and therefore all were, presumably, made to compliment each other; the final collar showed considerable deformities within

the design, especially along the break line. Whereas a minimum of time should have been expended on this particular investigation, considerable time and care was applied using a variety of approaches to minimise the distortions inherent in the drafting instructions.

Although some contemporary drafting methods (described in chapter 3), such as the tailored variations, seem rational in their methodologies, demonstrating good or relatively good results, depending on the approach, in general, the range of collars produced were inadequate for ease of use and predictability of outcomes. There were too many open-ended questions to warrant further investigations of any of the drafting methods. It was disappointing to discover that the concluding design shape, size and fit of the collars were not apparent at the drafting stage, some being only approximations of the diagram silhouettes. Even when diagrams were provided, their true proportions of stand and fall did not appear until a much later phase of development.

All of the drafting methods reviewed did not perform as expected. Adding or subtracting length from various lines or edges, using a range of possible methods, did not work to a satisfactory level; nor did they explain why the particular method would be the best one for the task. The expected design results either did not eventuate or they had to be altered to give the required aesthetic qualities. Predictability of performance of outcomes, at the drafting stage, was not an issue as none of the drafting methods encouraged a feeling of confidence in the final product. Too many areas and design elements, such as the body pattern neck line, were given as being correct when in fact they were ambiguous, relying on similar techniques and previous drafting creators to give the answers. They were, therefore, taken for granted, imitated and replicated one from another. As there is no conformity between one type of contemporary collar draft and the next, instructions differ, confusion reigns and until experience in collar making is gained the results are often-times dubious; contemporary collar drafting methods could be well past their useful lifespan.

8.1 Composite collar drafting system

By virtue of there being no obvious single drafting technique that could be adapted to encompass all of the collar types and styles under review, the introduction of a 'composite' collar drafting system could prove to be a useful method of designing. Through this research, a new manual process has been explored and developed where

not only is it possible to give a method for each traditional type of collar, but also to amalgamate them into a single system to include design differences. The new system not only gives all of the required measurements and design capabilities but also all of the shapes and size proportions prior to making the toile and preceding the construction of the first pattern; and at the same time be able to predict to a much higher degree the collar outcomes, leading to a shorter response and a quicker turn around of styling requirements.

The composite collar drafting system is organised to standardise, yet retain flexibility of designing, remove some of the costs associated with collar generation and to de-skill the operations as much as possible. It has the potential to improve design choices within companies with the commitment to change.

The key points of the composite collar drafting system are:

- A logical system of drafting
- Transparency of methodology
- A single drafting system for all of the collars reviewed and their variations
- Potential for a reduction in the number of trials (see appendix B for single trial results)
- Potential for a reduction in the knowledge and training required to draft collar patterns
- Potential for an enhancement of quality and aesthetics
- Potential for enhanced fitting capabilities
- Could promote an increased confidence in the system and its results

The new system differs from contemporary drafting methods in a number of areas (refer to section 8.1.1, pp 251-255). One such important element is a neck line that changes with each change in collar design. The most favourable neck line profile for a stand and fall collar pattern depends on its three-dimensional design. Collar neck lines may be straight, convex or concave, each relating to the characteristics of the style. High, tight-to-the-neck, fastening stand-collars will have convex neck line curves whilst progressively lower fastening collar neck lines become straighter until flatter collars attain concave contours.

The three basic collar types, discussed in chapter 2, reduce the number of available collar opportunities to the 'flat' collar, 'stand' collar or the 'stand and fall' collar.

Empirical investigations found that the most logical collar to use to form the composite collar system was the '**stand and fall**' variety because it incorporated both 'stand' and 'fall' elements which could be superimposed when not required, as well as a break line. However, during testing it was found that it was usually the break line that gave problems of fit, producing distortions when the collar was connected to the body neck line, which needed to be rectified to improve the whole collar aesthetics. The stand collar, it was found, could be induced to form a fall section with a straight break line; then be altered to a stand and fall collar before forming a flat collar, without too many difficulties. Conversely, the flat collar, although simple to construct, does not implement itself easily to the other two collar types. Although neither the flat nor the stand collar has a naturally occurring break line, they do originate from opposite directions of the collar continuum that represent both sections of the stand and fall collar. Producing a straight break line would be easier with a stand collar than from a flat collar, it was, therefore, decided that the best collar type to use as a base for the composite system would be the stand collar. This continuous collar creation from stand, through the stand and fall to the flat collar, only becomes apparent on the mannequin.

The mannequin, as a whole, played an indispensable role in the creation of the composite collar drafting system and was instrumental in forming a body neck line for each and every collar. The neck column and torso angles and planes were important parts fundamental to the formation of stand or stand and fall collars (flat collars are easily delineated on the body patterns). These neck and body contours, as well as the front closure height and stand width were integrated to allow the formation of all the various configurations of collar designs. The body neck line cannot be established without the collar and the collar cannot be completed without the body neck line.

8.1.1 Composite collar drafting system principles

The new composite collar making system comprises a number of principles or beliefs that differ from those of conventional collar drafting techniques.

Design/drafting:

- In any collar drafting system the least amount of knowledge of the whole process requires the most amount of development and conversely, the maximum amount of knowledge within a drafting system requires the least amount of improvement. (The more knowledge the less chance of error).

The composite collar drafting system contains all of the design elements and integrated knowledge required to construct any of the selected collar types without recourse to trialling improvements.

- Each three-dimensional collar shape has its own individual recipe of elements that is part of a single non-transferable design entity.

Any change in the elements that make up a collar and its environs, or recipe, brings about a change in the collar design and silhouette.

- The 'set' of a collar must be integrated into the draft at the creation of the design.

The composite collar drafting system integrates the final silhouette into its methodology at the design stage; it does not need adjusting at the toile stage.

- Discrepancies occur in collars because of the incorrect shape of the collar pattern, the incompatibilities between the collar and the neck line it has to fit, the drafting approach used to establish them and the expectations of the designer.

Because contemporary drafting methods do not guarantee the end product pattern, they are, unlike the composite system, unsuited to predictable results.

- A final collar design appears as it is because it is the only configuration allowed by the related elements within the whole inter-connected components.

The composite collar drafting system complements, or reconfigures, the design elements for the only collar pattern configuration allowed for the requirements of the pattern maker.

Collar sections:

- The basis for all collars is the stand-band.

The stand-band is a rectangle which, depending on the design, may be reduced to zero millimetres at the front edge.

Linear elements:

- The stand-band is based on straight lines.

Contrasting with other drafting systems, the straight line is the basis for all collars (even the flat collar, as inevitably the flat collar will have a stand of some descriptive width). The straight line is essential and influences all of the other lines and sections that contribute to the composition of the collar and its connecting body areas. All other elements are subservient to this line.

- Elements that make up and unite the collar/lapel design and torso package can be matched in five categories:

- 1. The size and shape of the straight break lined stand-band, coupled with the front opening position.**
- 2. The body and collar necklines,**
- 3. The lapel and collar break lines.**
- 4. The neck column and collar top edge lines.**
- 5. The body and collar leaf edge lines.**

When all five groups are known and integrated, all of the collar types and design variations will fit. All five of the above categories are integrated into the steps set out in the composite collar drafting system in chapter seven.

- The straight break line is the most advantageous line for collar construction.

The break line takes precedence over all other collar related lines, as all other lines and widths (stand and/or fall) cannot be formed without the prior formation of the break line. The shape of the break line must be as straight as possible to avoid distortions along its length. (Although not always possible to have a straight line on a one piece collar, it must be aimed for at all times).

- Necklines of both collar and body must be related and compatible; the body neck line must be constructed from the collar stand neck line shape. (A collar using one

set of instructions cannot necessarily be transplanted onto a neckline constructed from a separate and unrelated set of instructions).

Neck lines should not be thought of in terms of being 'set in concrete', they transform to fit the particular configuration of the collar, therefore a single, standard neck line to which a variety of collar styles and shapes may be attached is incorrect. Collars must fit their own neckline.

- The collar stand band-width in combination with the centre-front closure position and body contours dictates the neck line position; accordingly, there is only one neck line for each centre front fastening height (unless there is a change in the stand band width).

To be fully integrated within the composite system, collars must conform to the contours of the body and neck, and the button fastening position, which change with each design.

- The leaf edge line of the collar must be designed in the exact position on the body that it will occupy in three dimensions. No other position will suffice.

Increasing the distance between the neck and leaf edge of a flat collar, without changing any of the original outer line lengths, results in the collar no longer lying flat, it will begin to ease away from the body to form a separating crease line between the two new components of stand and fall. This means that the greater the difference in fall width the more significant the effect. Shortening the leaf edge length without changing the collar width has the same effect. In other words, the relative differences in widths between the neck edge and the leaf edge line of the collar and the neck edge to the resting position of the leaf edge line on the body gives a collar its 'set'. It is this factor that causes disharmony, creating a crease line along the length of the collar separating the stand from the fall and giving a collar its 'style'.

The leaf edge length of a collar will always echo the length of its position on the underlying body. Wedging procedures of the outer edge are rejected. Conflicting and capricious actions concerning the reduction of the leaf edge by the insertion of cut lines from neck line to leaf edge, then overlapping

them, ensures that the leaf edge location on the body has been compromised to such an extent it is now totally unknown. Distortions of the entire collar into inappropriate contouring in all its elements has occurred producing a collar that is now incompatible for the unaltered body neck line.

- The only shoulder line overlapping allowed are those contoured shoulder sections outside of the collar area.

Overlapping the shoulder lines is discouraged in the composite collar drafting system. However, if the shoulder lines are shaped, overlapping of the shoulder lines, at a pre-determined leaf edge width from the neck point, may be required.

8.1.2 Evaluation of the composite collar drafting system

The introduction of the composite collar drafting system invalidates the necessity to accumulate the knowledge required to implement present drafting techniques in order to pattern make all of the collars reviewed. The requirement for designers to choose a certain collar drafting method, instead of an alternative method, that is also compatible with personal body pattern drafts, is no longer essential as the composite collar system encompasses and replaces the vast majority of drafting methods. The system is fully integrated, transparent in its methodology and produces predictable results. The results are entirely dependent on the collar style requested by the designer. From a quality and silhouette perspective, the collar shape delineated at the commencement of the design/drafting process produces the correct collar pattern from which the final collar style silhouette is created at the conclusion; as shown in appendix B.

The choice of collar styles to investigate was determined by the need to encompass as wide a range of shapes as possible, the objective of the experiments being to establish the performance of the composite collar drafting system. The observations of these trials show the flow-on effects of supplementary collar variations within the two extreme collar styles of flat and stand.

Alterations in style, size, shape, as well as all of the related elements, are capable of expression without recourse to drafting changes. The composite collar system

automatically inserts the required length amounts into each section of the leaf edge element commensurate with the design and its distance from the neck line as the collar leaf edge length and shape has to echo the length and position of its under-lying body line. Each sector has its own non-standard length and each change in design changes that length of the leaf edge in the correct ratio in every instance.

All break lines are straight, to begin with, and form a right angle to the centre back line. In a one piece collar, leaf edge length insertion disrupts this straight line causing it to curve. The amount of curvature will always be the least amount possible for any one piece collar design. The curvature depends on the amounts of leaf edge length insertion and the break line's position between the neck line and the leaf edge line. The amount of break line reduction, whether by easing onto a tape or using a two piece collar, is directly related and proportional to the amounts inserted at the leaf edge. The closer the break line is to the leaf edge line the more length will be proportionately introduced into the break line and vice versa. The collar break line and the lapel break line are formed at the same time. They are not calculated from the neck point, negating the use of a fish dart to reduce unwanted body width under the collar.

Chapter 9

Conclusion

9.0 Conclusion

Collar drafting has existed for well over one hundred years with no significant change in course of action within that time period. Over the years the vast accumulation of literature using the same drafting formulae attests to the impracticalities of prolonging these un-coordinated efforts. The present methods of drafting collars are inconsistent, non-predictable, time consuming and expensive to maintain. The same exploration of existing practises by younger practitioners only compounds the underlying confusion and adds to the carousel of never-ending change with no advantage. This almost timeless exercise seems pointless when all the methods are assembled, explored and analysed; there is a continuous pursuit of perfection using imperfect techniques. Few, if any, of those drafting methods reviewed are capable of adaptation between any of the collar categories especially when there are variations between the elements within the whole process. Until drafting methods change, many questions (such as those detailed in chapter 3) will remain unanswered to be perpetually explored by both the knowledgeable and the uninitiated practitioner.

The composite collar drafting system is an attempt to break from the traditional routes of collar drafting to generate a new methodology where the whole drafting process is open to examination. Hence, the end product becomes available before testing in three-dimensions. The advantage is a more thorough knowledge of the underlying drafting structures and principles at each phase in the collar development, options are then available to adjust or revise as the occasion demands, prior to wastage of materials and other resources. Hard won experiences through a, seemingly, infinity of experimentations may be replaced by a single prototype for each design. The whole of the 'single-method' composite collar drafting system approach is transparent and holistic in nature, giving first time results in each collar design. Estimations of collar size and shape, seen in contemporary drafting methods, are discouraged in favour of the more exacting procedures of the composite collar drafting system, which counteract these ambiguities. All of the elements that make up the collar and its environs are taken into account during the collar design process.

Many questions raised in contemporary drafting methods (in chapter 3), along with the 'known and unknown elements', such as body and collar neck lines, break lines and stand and fall, have been answered progressively during the composite collar drafting procedures. Key features to note are:

- The indispensable role played by the mannequin in the formation of the composite collar drafting system. Without analysing the mannequin new collar development concepts would not have been possible.
- The formation of all neck lines, their positions and shapes. A unique neck line for each collar was seen as a pivotal element in the formation of the composite collar system.
- Correct position, shape and length infusion of leaf and top edges. The precise placement of length in the leaf and top edge lines was possible only with the addition of section lines on the mannequin.
- Correct break line shape length and position (both one and two piece collars). The concept of a straight break line on the stand-band enormously simplified the composite collar system whilst endowing that line with an enhanced quality.
- The establishment of the straight centre back line of the collar was deemed to give a better finish to all of the collar styles.

The composite collar drafting system is based on a logical system with a clear methodology. It is a single system that is adaptable to all of the collars reviewed, including their variations, whilst reducing the number of trials to confirm a design.

9.1 Suggestions for further research

Collar drafting has a number of side issues that are not investigated in the development of the new composite collar drafting system. Some issues that have an affect on collar-making include manufacturing methods, materials, their properties and their behaviour; and collar and neck grading. (There is a recognition that the precise location of the leaf edge line (and therefore its length) on the body, will differ between two and three-dimensional drafting systems. This is because the distance between the crease line and the leaf edge position on the flat is further apart than the same two points in three-dimensions).

Collar computerisation (3D CAD)

The explanations of the composite collar system are demonstrated from primarily a two dimensional perspective (once the body neck line has been established) and appear to be fairly complex when compared to present drafting methods. Depending on the

practitioner, exact observance of these instructions through manual processes may not be a practical option, it may be better to adopt the quick reference method. A more realistic alternative could be computerisation. The information contained within this research project might have the potential to be transformed, with further research, into a 3 Dimensional, made to measure, computer programme to enhance designer's skills and facilitate present day technology in the field of apparel manufacturing. The only areas that may need designer influence are in deciding the dimensions of the stand and fall and the front collar shape; all of the other processes, including the stand-band tracking, might be automatic within the computer programme.

Integrating the composite collar design and drafting system into computerisation may be best achieved using three-dimensional body-scanning techniques to produce the tracking method which firstly establishes the required body (and body pattern) neck line for the design, before creating the under and top collars. If all neck lines for the size range were produced in this manner there would be no need to grade under collars, therefore, top collars would not require grading. Within a composite collar computer software programme there may be a need for only a minimum of operation time, the whole process leading to both a greater degree of flexibility and product choice for designers and production personnel. The construction of both one and two piece collar of numerous shapes and sizes would also be easier to create, with less recourse to exploration and experimentation. If computerised, there would be an automatic production of complementary one and two piece top collars for each designed under collar.

Linking fabric to collar design and drafting

Collar drafting and pattern-making systems will remain incomplete until designing has been combined with a computer programme that can analyse fabrics, their properties and their affects on garment manufacturing techniques. Differences in manufacturing methods have various effects on the fabric during sewing and pressing, whilst the weight and construction capabilities of fabrics have an affect on the seam. These complications need to be identified and quantified to determine their influences on collar drafting. Combining fabric and seaming qualities to collar drafting should automatically instil the correct allowances in the collar pattern, resulting in a better quality end-product. Each collar design will then be automatically 'tailor made' for every situation without recourse to producing a great number of 'trial and error' production toiles.

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Appendices

Appendix A.1 Collar draft diagrams

The drafting diagram examples (Source: M. Campbell) are:

| | |
|--|-----|
| A1.1 (1) Mandarin collar (Basic rectangle). (2-3) Mandarin collars (Shaped). (4-5) Stand and fall collars (Concave neck lines). | 266 |
| A1.2 (6-7) Stand and fall collars (Concave neck lines) (8-9) Stand and fall collars (Convex neck lines). | 267 |
| A1.3 (10-11) Shirt collars (One piece). (12-13) Shirt collar (Two piece). (14-15) Prussian collars (Two-piece). | 268 |
| A1.4 (16) Overcoat collar (Two piece Vertical split). (17-18) Prussian collars (One piece). | 269 |
| A1.5 (19-21) Jacket step collars (One piece). | 270 |
| A1.6 (22-24) Jacket step collars (One piece). (25) Convertible collar (One piece). | 271 |
| A1.7 (26) Overcoat collar (Two piece). (27) Overcoat collar (Two piece Vertical cut). (28) Overcoat collar (One piece). | 272 |

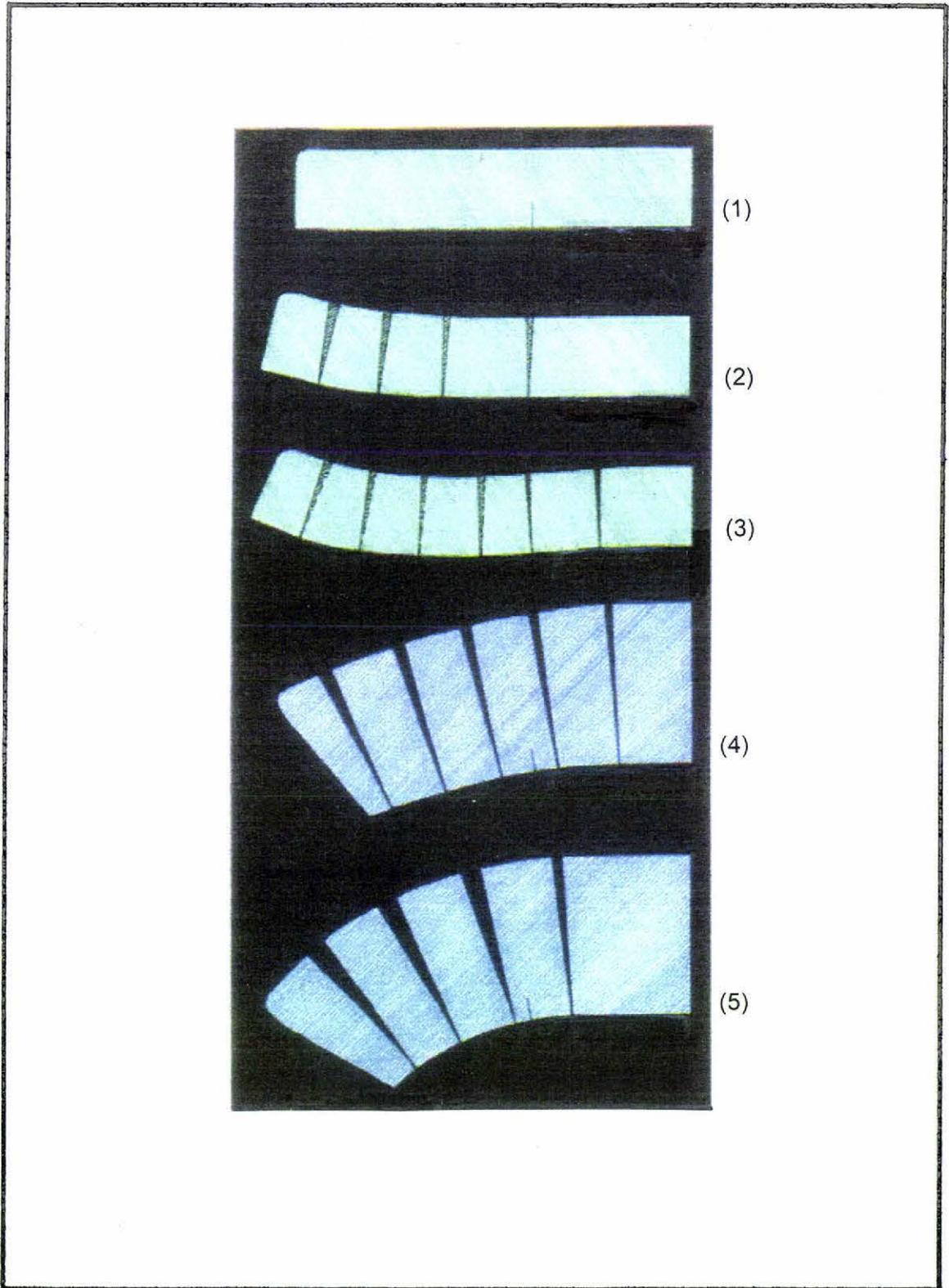


Figure A1.1 Collar: Draft diagrams.

(1) Mandarin collar (Basic rectangle). (2-3) Mandarin collar (shaped).

(4-5) Stand and fall collars (Concave neck lines).

(Source: M. Campbell)

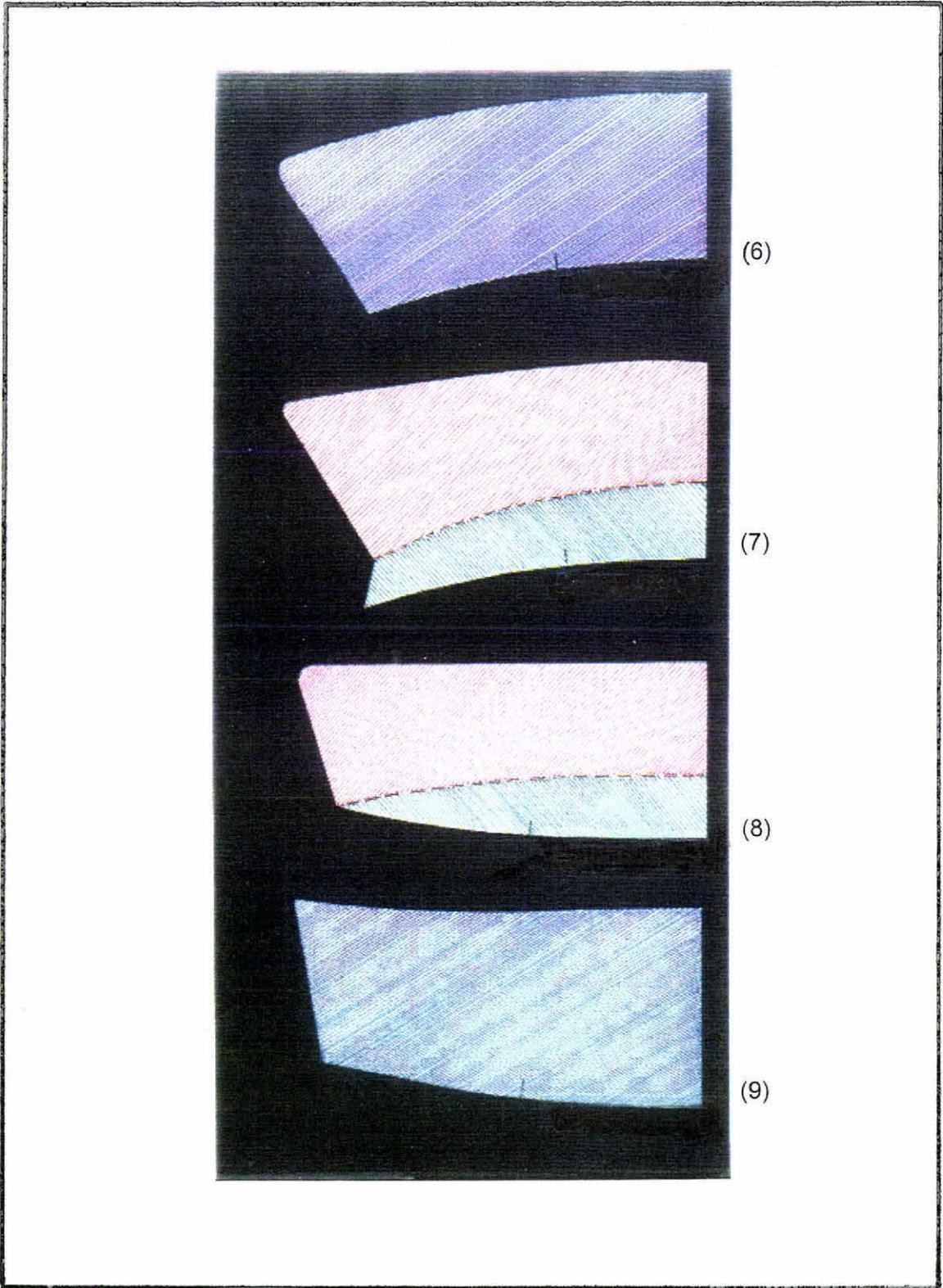


Figure A1.2 Collar: Draft diagrams.

(6-7) Stand and fall collars (Concave neck lines).

(8-9) Stand and fall collars (Convex neck lines).

(Source: M. Campbell)

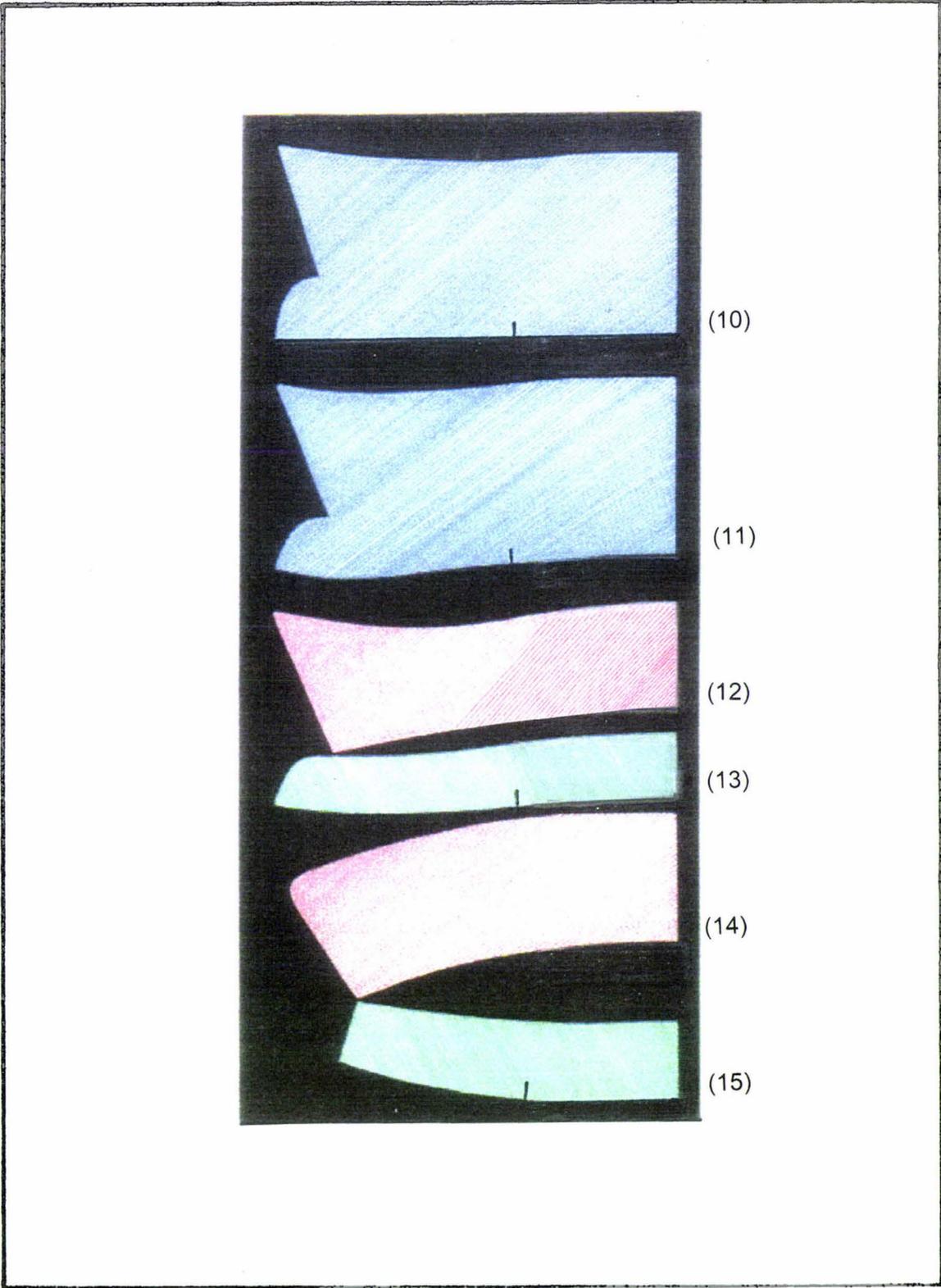


Figure A1.3 Collar: Draft diagrams.

(10-11) Shirt collars (One piece). (12-13) Shirt collars (Two-piece).

(14-15) Prussian collars (Two piece).

(Source: M. Campbell)

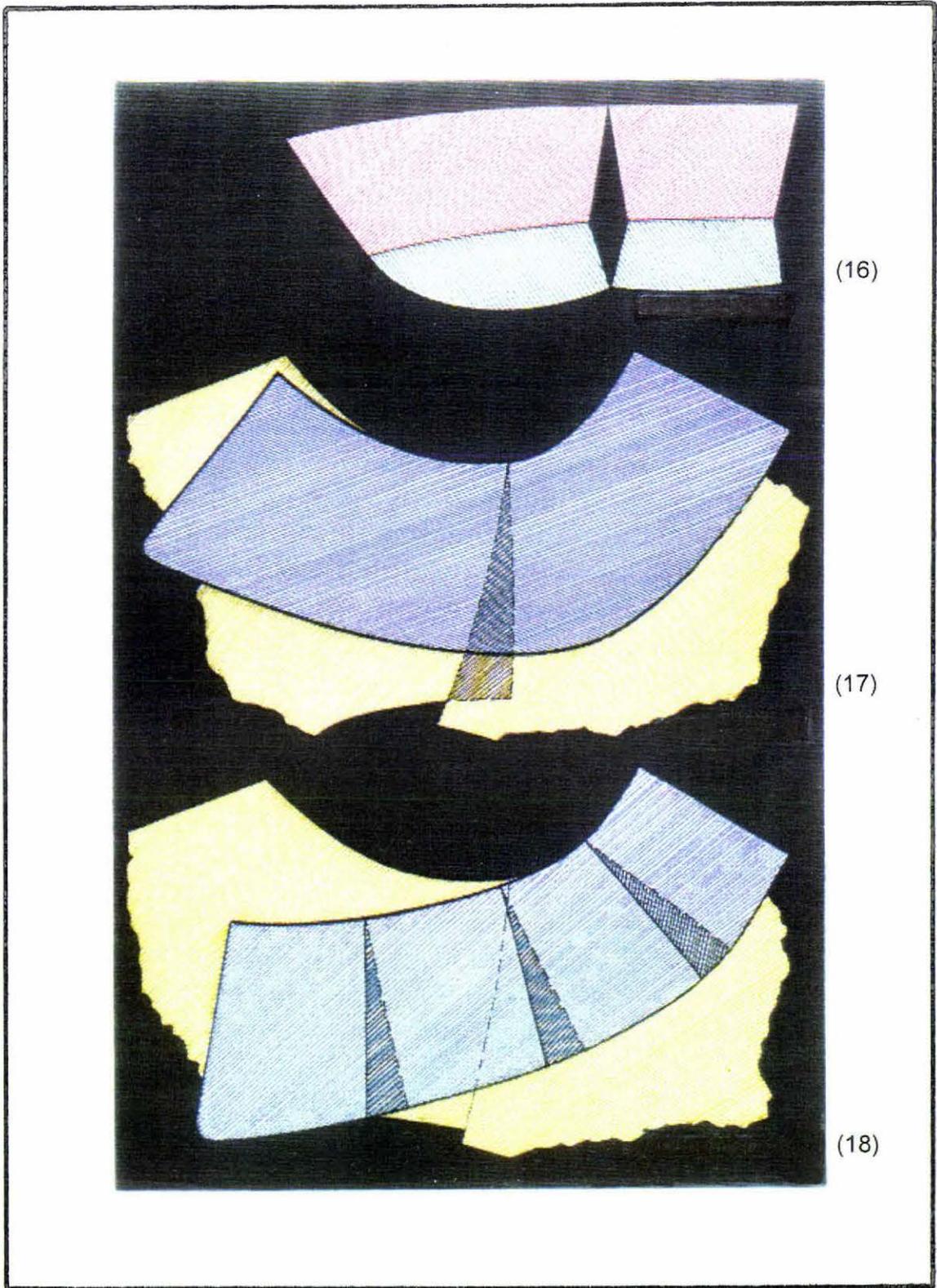


Figure A1.4 Collar: Draft diagrams.

(16) Overcoat collar (Two piece Vertical split)

(17-18) Prussian collars (One piece).

(Source: M. Campbell)

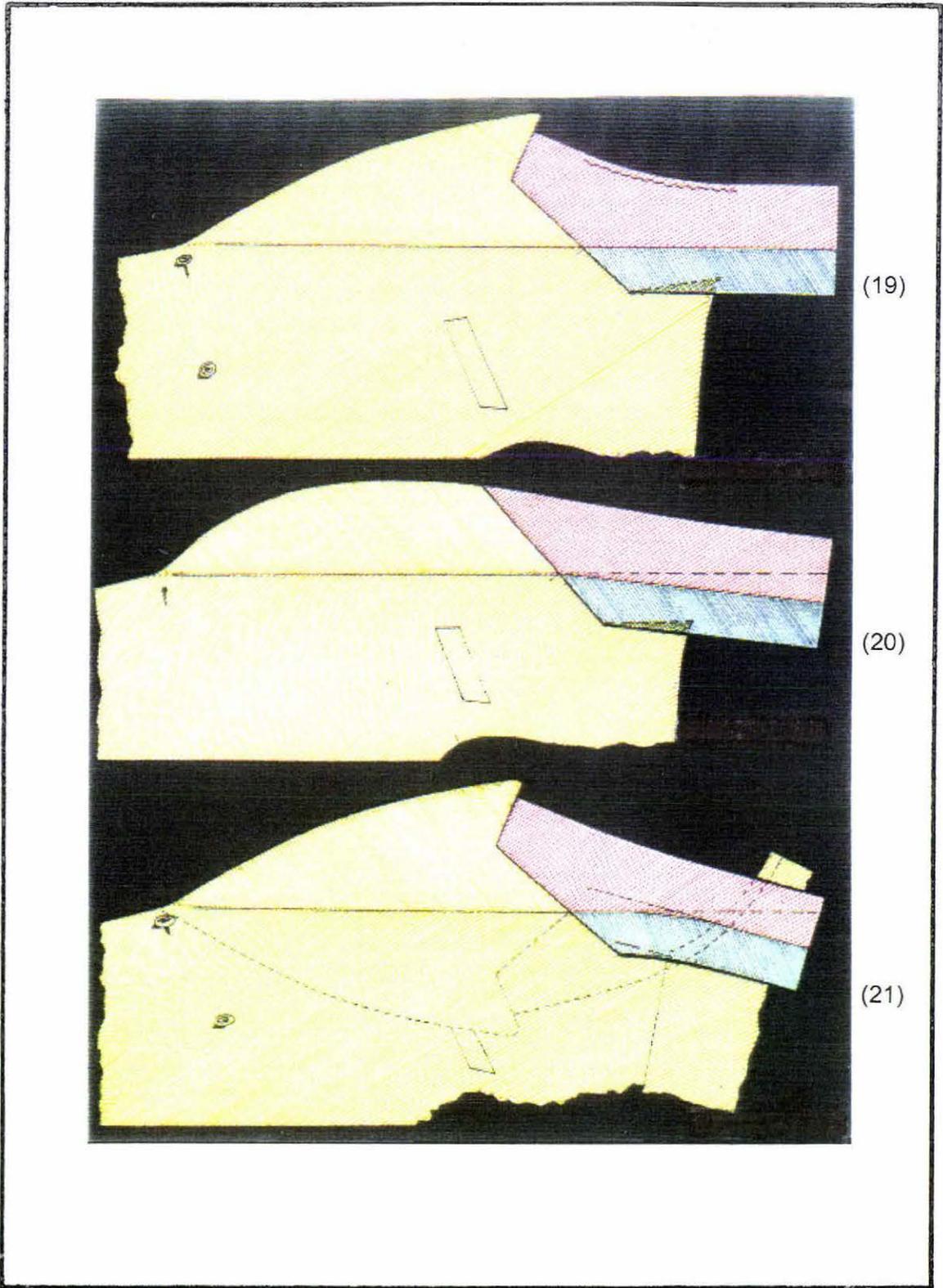


Figure A1.5 Collar: Draft diagrams.

(19-21) Jacket step collars (One piece).

(Source: M. Campbell)

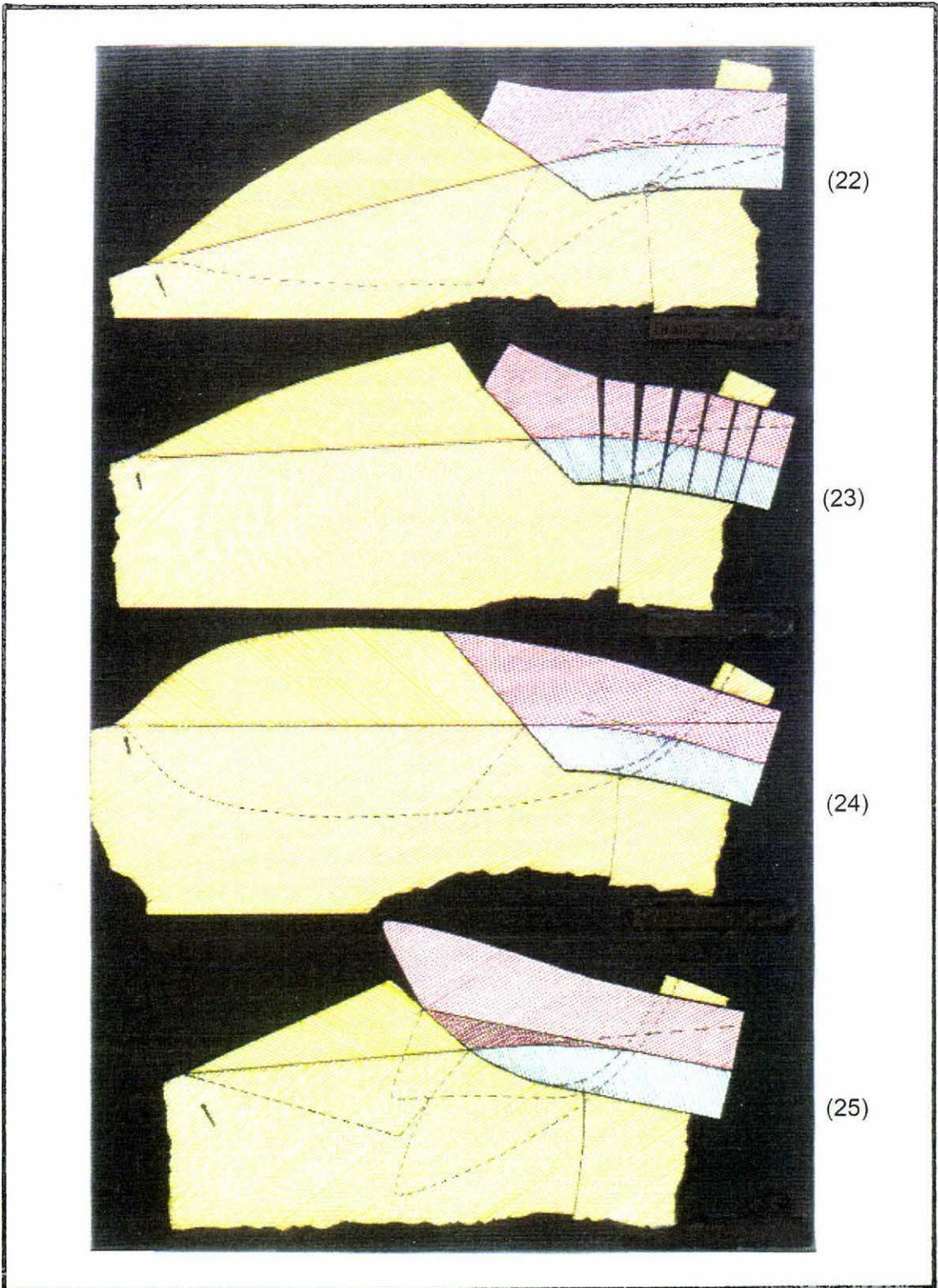


Figure A1.6 Collar: Draft diagrams.

(22-23) Jacket step collars (One piece). (24) Jacket shawl collar (one piece). (25) Convertible collar (One piece).

(Source: M. Campbell)

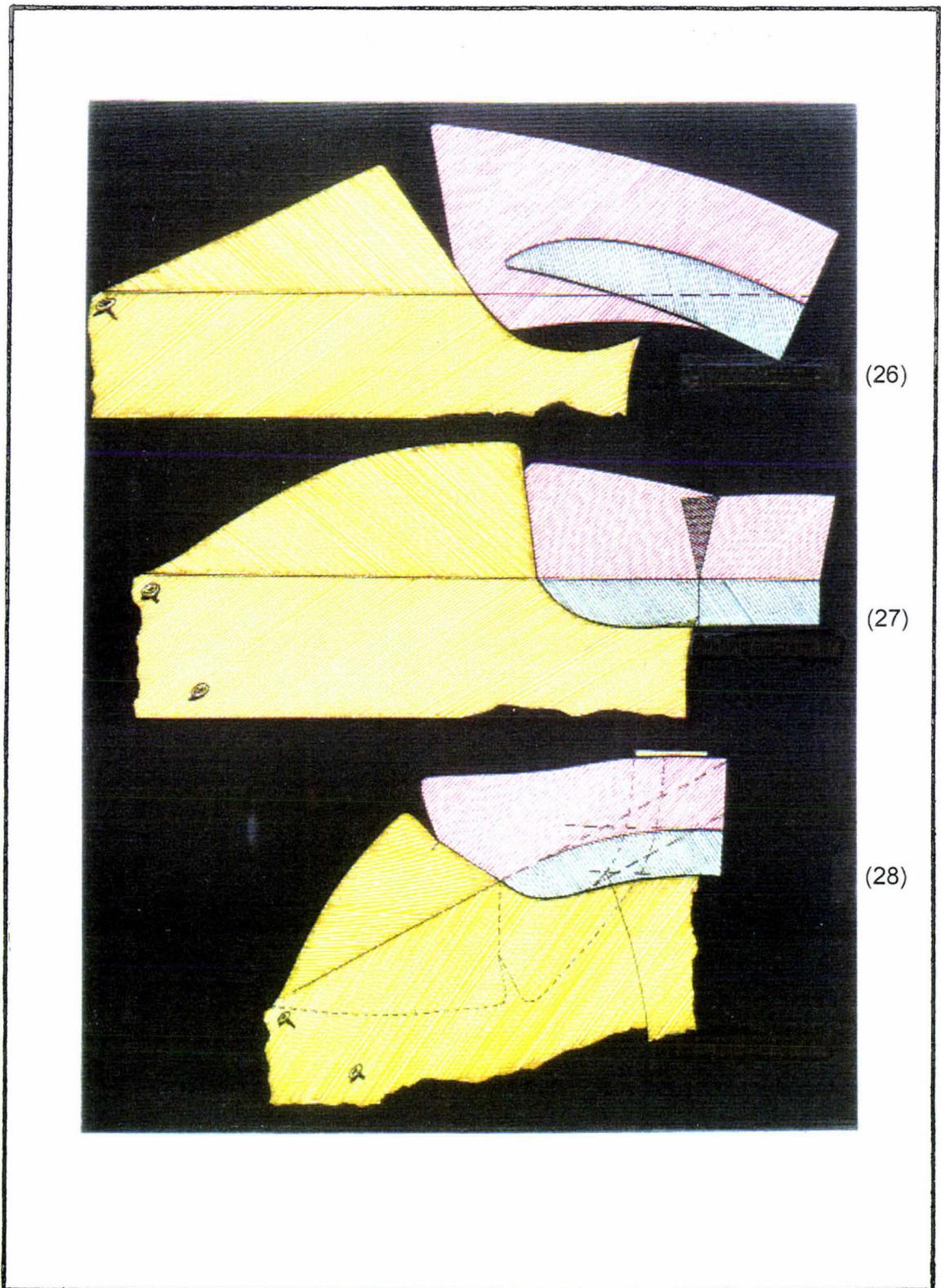


Figure A1.7 Collar: Draft diagrams.

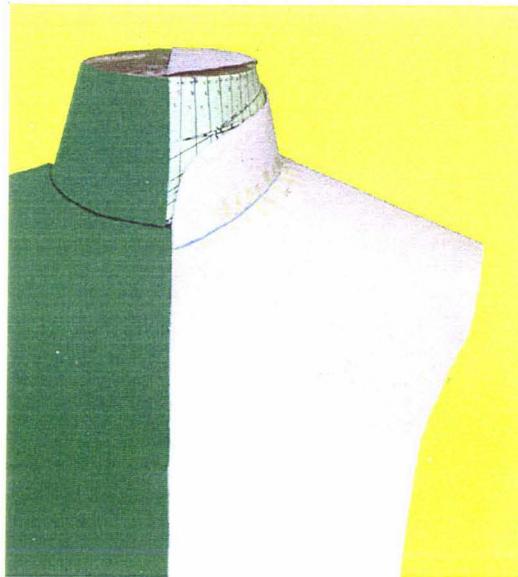
(26) Overcoat collar (Two piece). (27) Overcoat collar (Two piece Vertical split). (28) Overcoat collar (One piece).

(Source: M. Campbell)

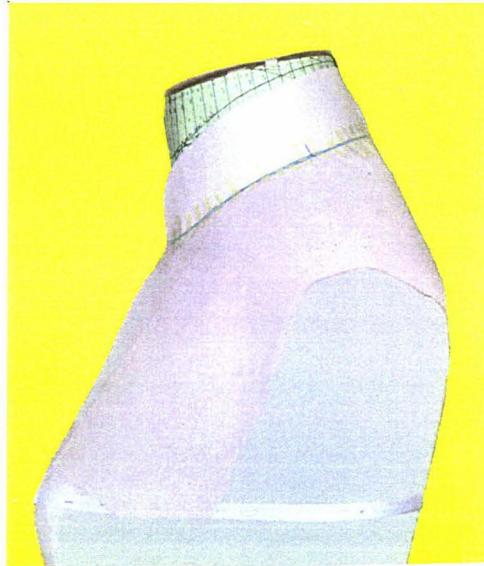
Appendix B.1 Composite collar photographs

Photographs of the design toiles made from the composite collar drafting and design system (Source: M. Campbell) are:

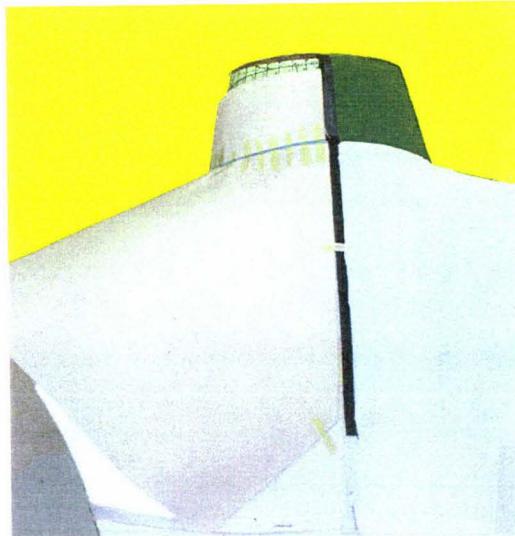
| | |
|--|-----|
| B1.1 Mandarin collar (one piece). | |
| (a) Front view. (b) side view (c) back view. | 274 |
| B1.2 S. B. Shirt collar (one piece). | |
| (a) Front view. (b) Front diagonal view. (c) Side view. (d) Back view. | 275 |
| B1.3 S. B. Shirt collar (two piece). | |
| (a) Front view. (b) Front diagonal view. (c) Side view. (d) Back view. | 276 |
| B1.4 S. B. Jacket collar (one piece). | |
| (a) Front view (b) side view (c) back view. | 277 |
| B1.5 S. B. Jacket collar (two piece). | |
| (a) Front view (b) side view (c) back view. | 278 |
| B1.6 S. B. Jacket convertible collar (one piece). | |
| (a) Front view (b) front diagonal view (c) side view (d) back view. | 279 |
| B1.7 D. B. Ulster Overcoat collar (two piece). | |
| (a) Close front view (b) back view (c) front view. | 280 |
| B1.8 D. B. Regency Overcoat collar (two piece). | |
| (a) Front diagonal view (b) side view (c) close front diagonal view. | 281 |
| B1.9 S. B. Prussian Overcoat collar (one piece). | |
| (a) Front view (b) front diagonal view (c) side view (d) back view. | 282 |
| B1.10 S. B. Prussian Overcoat collar (two piece). | |
| (a) Font view (b) back diagonal view (c) back view. | 283 |



(a)

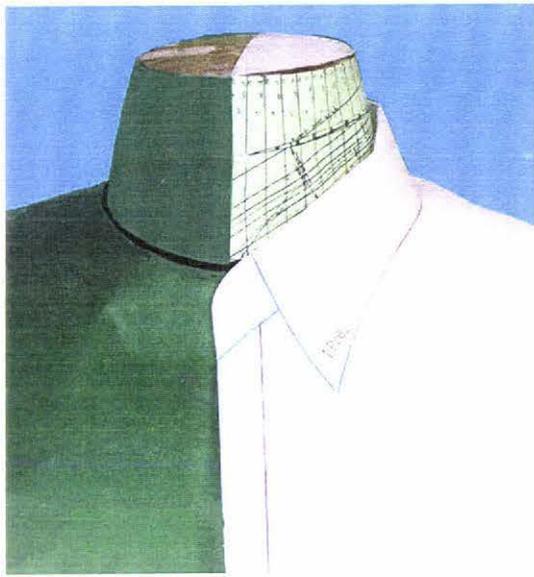


(b)

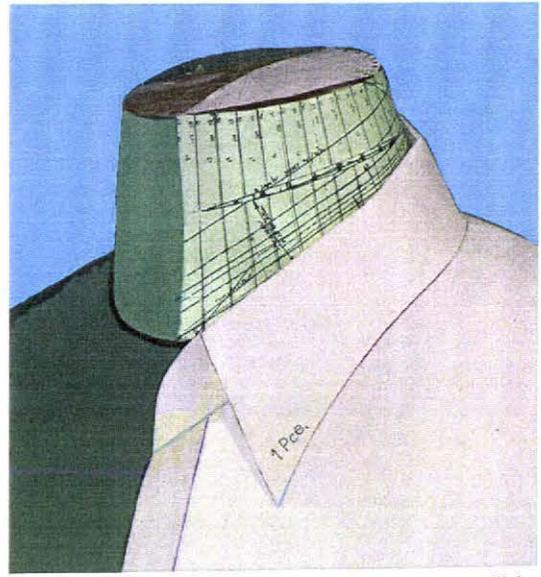


(c)

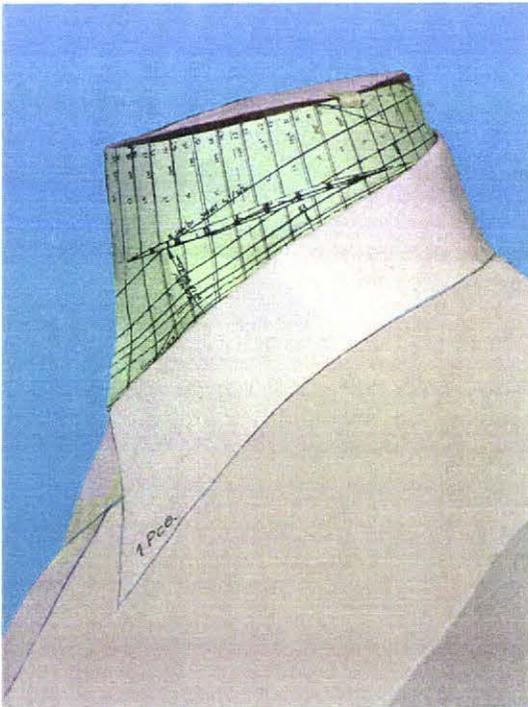
Figure B1.1 Composite collar: S. B. Mandarin collar (One piece).
(a) Front view (b) Side view (c) Back view.
(Source: M. Campbell)



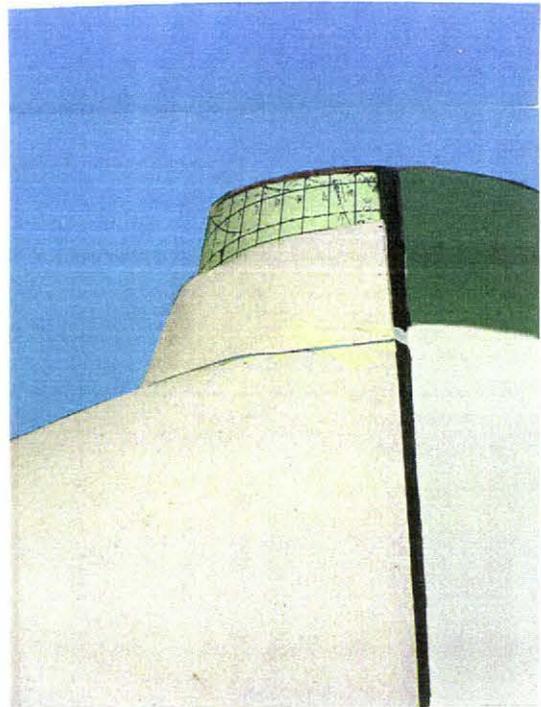
(a)



(b)

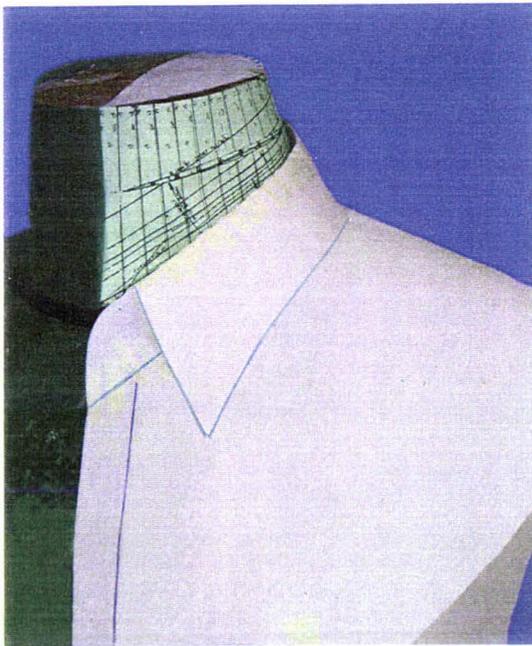


(c)

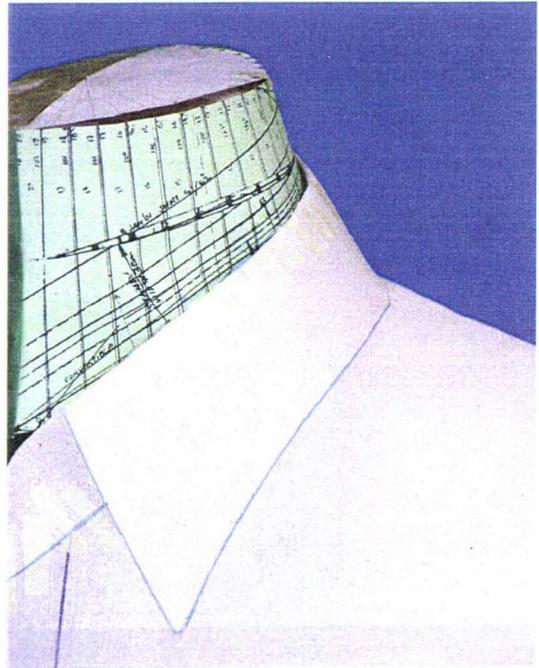


(d)

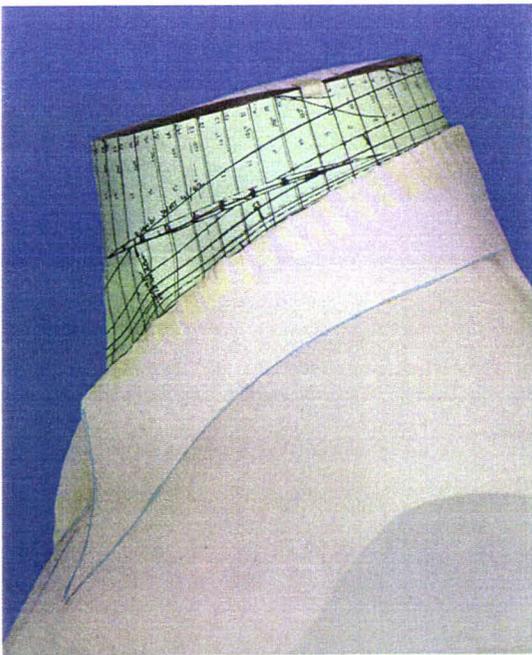
Figure B1.2 Composite collar: S. B. Shirt collar (One piece).
(a) Front view (b) Front diagonal view (c) Side view (d) Back view.
(Source: M. Campbell)



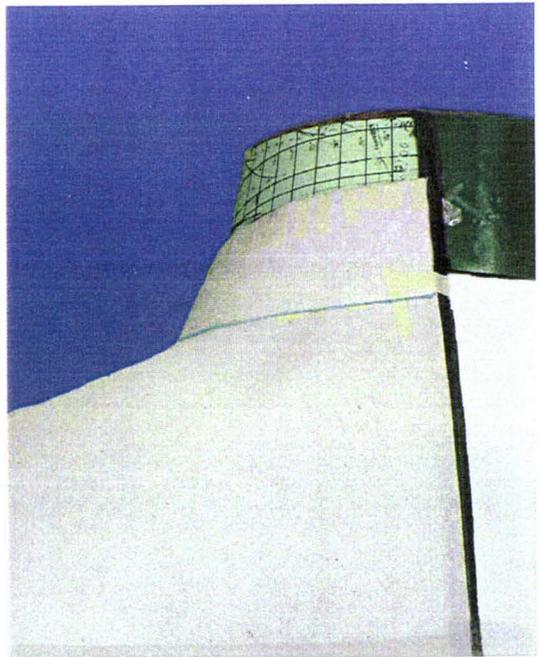
(a)



(b)

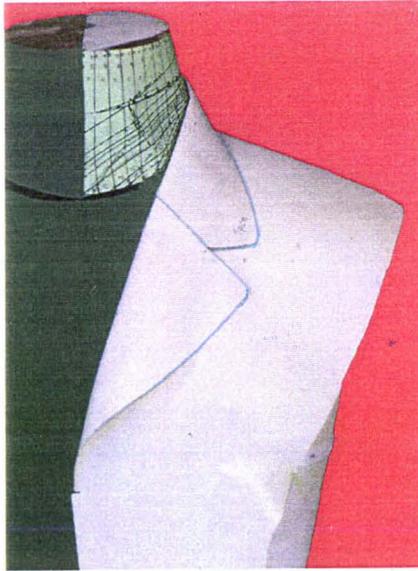


(c)

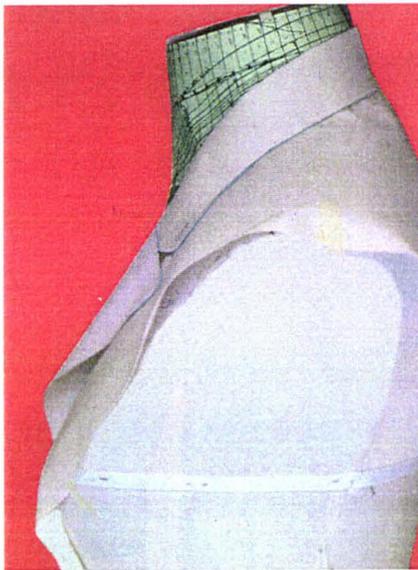


(d)

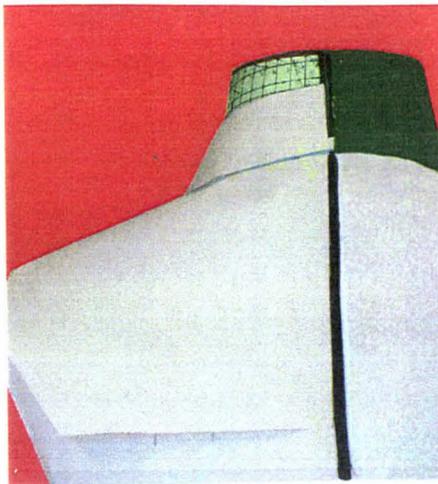
Figure B1.3 Composite collar: S. B. Shirt collar (Two piece).
(a) Front view (b) Front diagonal view (c) Side view (d) Back view.
(Source: M. Campbell)



(a)

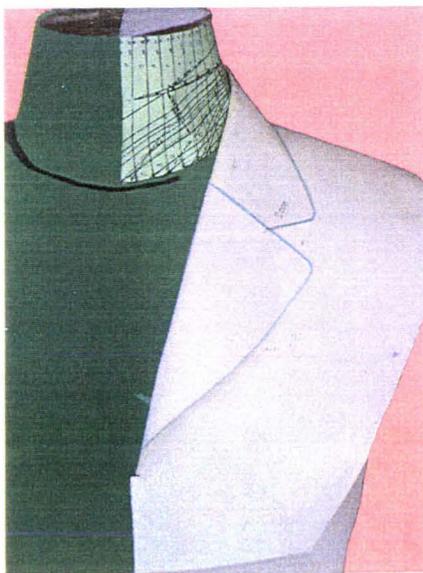


(b)

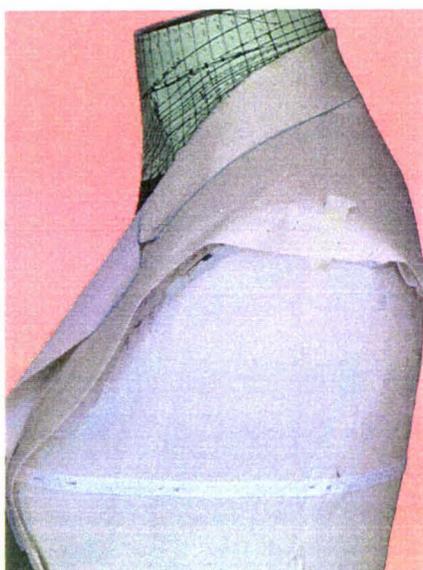


(c)

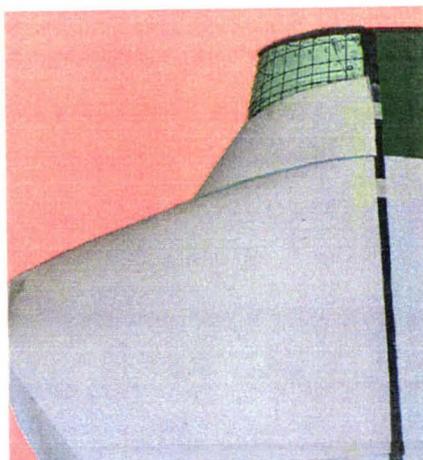
Figure B1.4 Composite collar: S. B. Jacket collar (One piece).
(a) Front view (b) Side view (c) Back view.
(Source: M. Campbell)



(a)



(b)

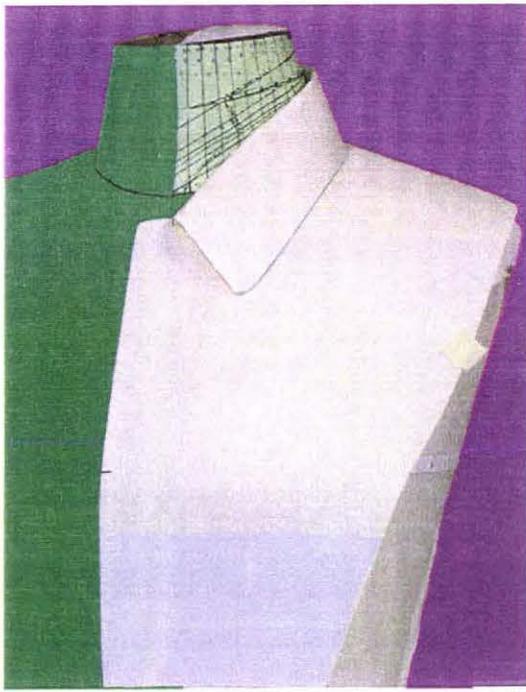


(c)

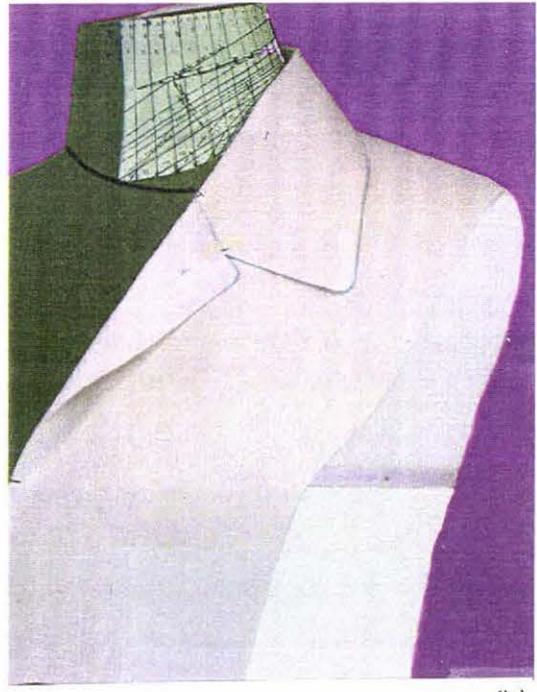
Figure B1.5 Composite collar: S. B. Jacket collar (Two piece).

(a) Front view (b) Side view (c) Back view.

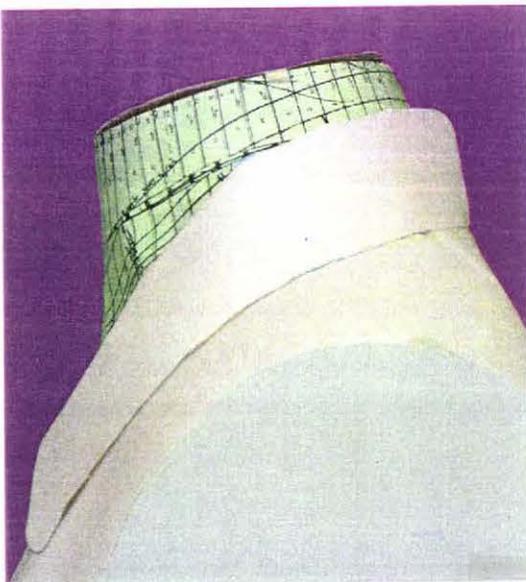
(Source: M. Campbell)



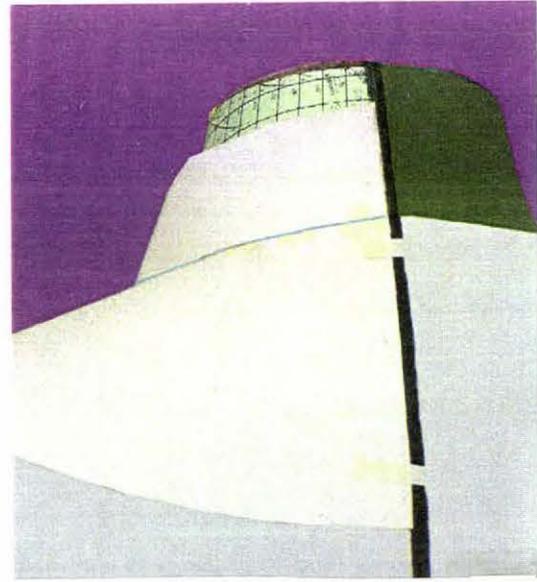
(a)



(b)



(c)



(d)

Figure B1.6 Composite collar: S. B. Jacket Convertible collar (One piece).
(a) Front view (b) Front diagonal view (c) Side view (d) Back view.
(Source: M. Campbell)

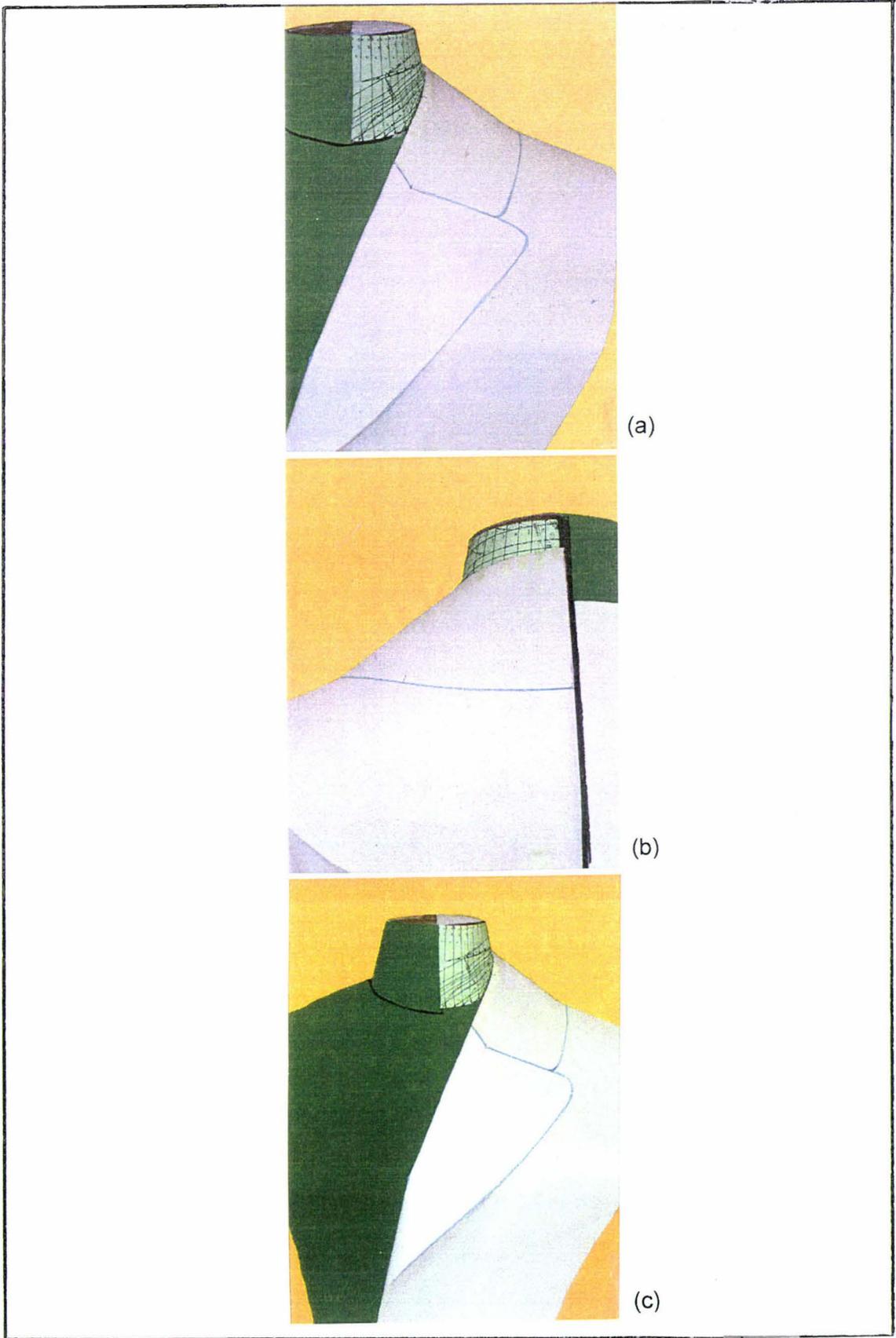


Figure B1.7 Composite collar: D. B. Ulster Overcoat collar (Two piece).
(a) Close front view (b) Back view. (c) Front view.
(Source: M. Campbell)

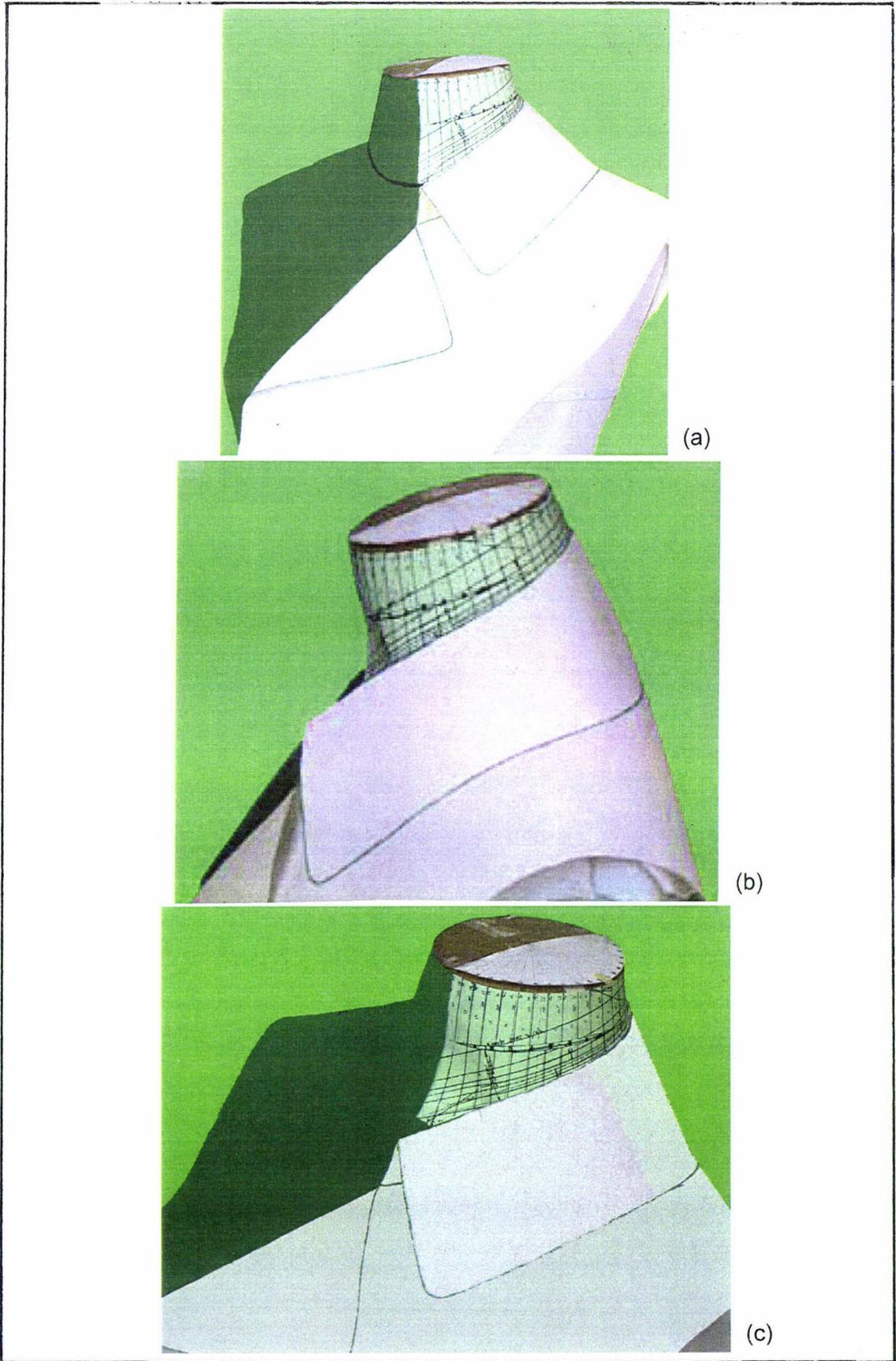


Figure B1.8 Composite collar: D. B. Regency Overcoat collar (Two piece).
(a) Front diagonal view (b) Side view (c) Close front diagonal view.
(Source: M. Campbell)

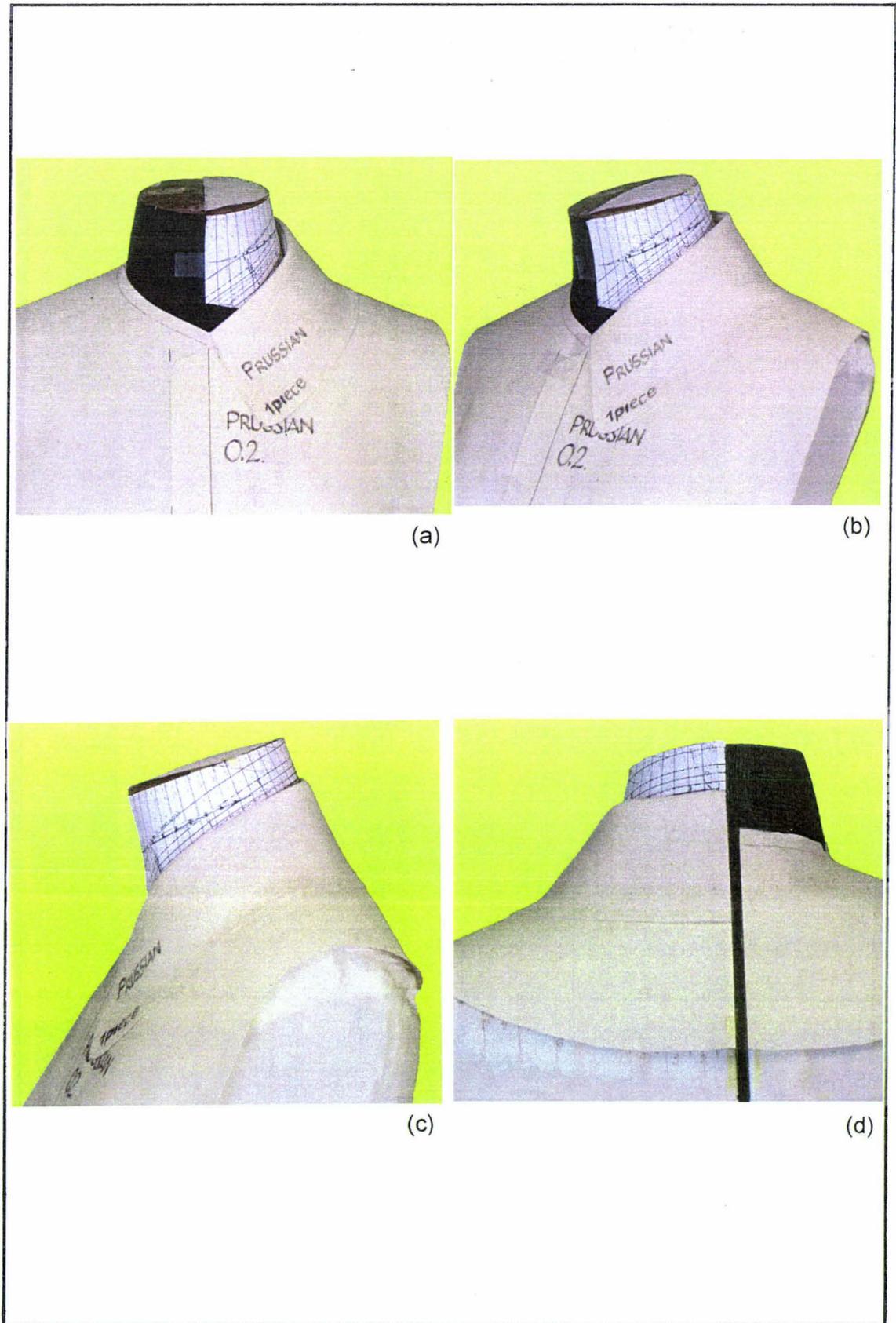
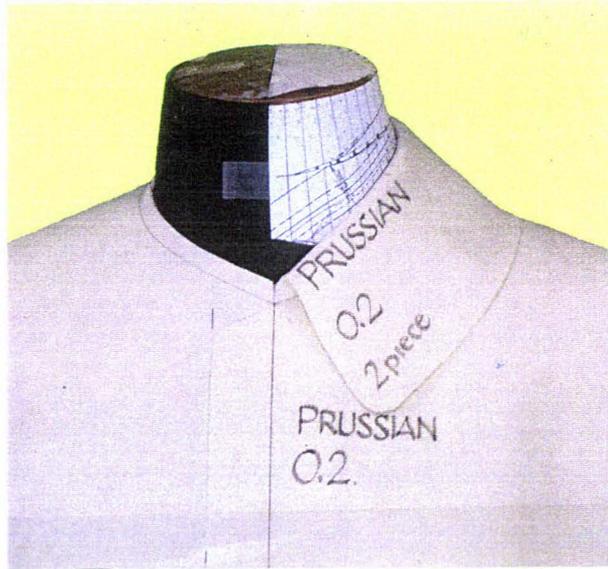
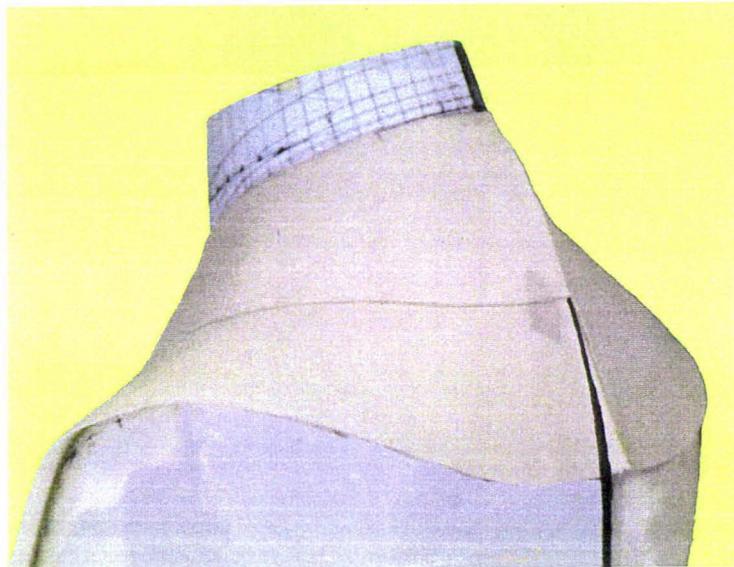


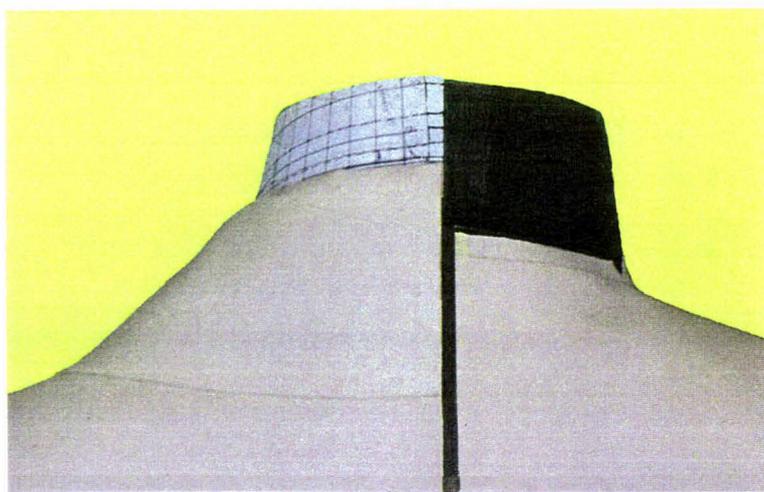
Figure B1.9 Composite collar: S. B. Prussian Overcoat collar (One piece).
 (a) Front view (b) Front diagonal view (c) Side view (c) Back view.
 (Source: M. Campbell)



(a)



(b)



(c)

Figure B1.10 Composite collar: S. B. Prussian Overcoat collar (Two piece).
(a) Front view (b) Back diagonal view (c) Back view.
(Source: M. Campbell)



DECLARATION

Author's Name: Morris Campbell

Title of Thesis: Development of a Composite Collar Drafting System.

(For All Principal Collar Types and their Variations).

Degree: Master of Design.

Year: 2005

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