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A NEW BREED: WIRED FOR SUCCESS

Redefining the possibilities of solar powered electric fence energizers

Nicholas. R. Marks

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Abstract

Gallagher, world renowned for their electric fencing innovations, requested ways to develop their solar powered energizer range. The intent of this project was to work with Gallagher product specialists to identify key market gaps and use them to develop a conceptual design proposal for a new solar charged, battery powered electric fence energizer.

Industrial design literature investigations provided a foundation for this project and specific methods were used to identify and utilize key information from the Gallagher product and energizer range and Gallagher's competition. Other strategic research areas included; context of energizer use, common energizer issues, market gaps/opportunities, ergonomic principles, safety aspects, manufacturing guidelines and relevant state of the art technologies. The core research methods used to support the investigation and consider industrial design and business requirements were; market analysis, ethnography, surveys, informal expert interviews and focus group meetings with Gallagher departmental managers. Structured concept generation, test rigs, mock-ups, models, iterated design development and CAD renderings ensued.

A potential market gap was discovered through these explorations where isolated farm blocks needed electric fencing, but had no mains power. The unit needed to be semi-portable, yet had to have the potential power to supply the equivalent of mains powered energizer capabilities. Solar powered technology has widened the scope for design to solve this scenario, which provided the starting point for initial design concepts.

The product was required to solve issues and objectives (functionality), be intuitive, easy to use and practical (usability), and appeal to the target market (desirability). The final design proposal is a modular energizer unit which allows the end user to customize the system to suit their individual needs. This investigation aimed to fulfil Gallagher's brief to expand their solar powered energizer range, and uncover any other potential product opportunities in the market.

Keywords: Animal management, Electric fence, Modular, Energizer, Solar, Desirability, Functionality, Form, Aesthetics, Usability, User experience, Branding, Ergonomics, Industrial design

Acknowledgements

Throughout this journey, I have found that it's not about how much you know or how well you can design. It is about listening to people, especially the ones who know more than you do. In this case, the feedback, comments and support from others around me are what defined the project and end result.

This exegesis is the result of many conversations with key people associated with this industrial design project along with friends and family. Without these influences, the result would have been extremely different. I would like to extend my gratitude to these people, and emphasize how valuable their input was throughout this year long Masters Degree.

First and foremost, I would like to thank Callaghan Innovation; for funding not only my own, but many projects across New Zealand. Without the generous financial assistance, it could not have been achieved.

I have been blessed to have been given the opportunity to accomplish my Masters Degree within a New Zealand company; Gallagher Group. I wish to

identify how extensively Gallagher has helped this project, in an effort to express my appreciation. They have provided a significant brief to work on, an environment to work in, personnel time, resources and shared sensitive knowledge. The effect of these factors has been extremely beneficial to the final outcome and I thoroughly appreciate the positive attitude and friendly atmosphere I encountered when on site.

I wish to thank my mentor, Byron Arnold (Business Manager of Energizers) and Mark Harris (Marketing Manager of Animal Management Systems), who have had executive oversight throughout the project. As well as taking me under his wing and showing me the ropes, Byron has guided me through the project from start to finish, becoming a role model I looked up to when I was uncertain, confused or lost in the process. Thank you for putting up with my lack of knowledge while learning about the industry; I'm sure it was frustrating at times.

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Glossary of terms

Energizer: An energizer is a component required for an electric fence setup. It is an intelligent control system which converts power from the battery into a high voltage pulse or shock.

Solar Energizer: An energizer which uses a solar panel to help maintain full battery charge.

Modular system: A system which can accommodate many different types, sizes and powers of components, providing variability.

Grounding: Electrical energy always tries to return to its source. Grounding may be used as part of that return path. An animal becomes part of the circuit as it touches the fence whilst also standing on the ground.

Joule (J): The work required to produce one watt of power for one second ie 1 Joule. This derived unit is used to rate an energizers' power output.

Output (J): The output, measured in joules, of the energizer is the power rated for each product.

Amp Hours (Ah): A unit of charge measured in amps (current flow) per hour and used to describe the output of batteries.

Watts (w): A unit of power defined as one joule per second, measures the rate of energy conversion or transfer eg A solar panels output to a rechargeable battery.

Territory Manager: A Gallagher Territory Manager is an experienced sales professional, who knows and understands the Gallagher product range. Using this knowledge, the TM assists the customer to choose the most suitable product for his/her needs, offers solutions to specific problems, and promotes Gallagher products with the aim of increasing Gallagher sales in a specific region or area by building trustworthy relationships with the customer.



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