



"Design Hub / Prototypical" - Case History.

Sarah Thorp – "End-Saver"

The process of new product development is one involving many facets, including:- inspiration, invention, protection, design, determination, finance, support, sales, etc and is not one to be undertaken by the faint-hearted. When the process is successful it demonstrates all the above attributes, plus many others, but sometimes even that is not enough and not all projects have a happy ending.

However, here is a story that does and it demonstrates determination and hard work in the pursuit of a "good idea". The inventor, Sarah Thorp, began this project (unwittingly) in December 1996, whilst getting frustrated when wrapping Christmas presents. As usual she kept losing the end of the adhesive tape on the roll and thought the classic line "there must be a better way of doing this". So she made; a simple, crude, but very effective prototype, which worked extremely well, illustrated in Fig 1.

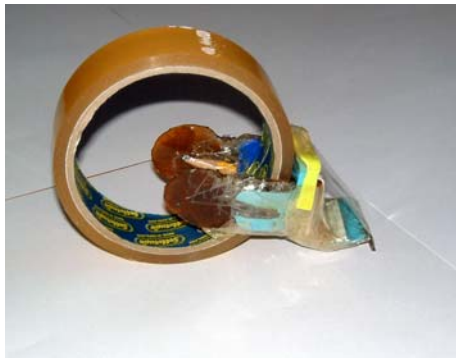


Fig 1

With this recent experience in mind, she went to the Patent Office in London (now called the UK Intellectual Property Office - www.ipo.gov.uk) to investigate the situation with regards to similar inventions. These initial investigations were discouraging, finding that more than 50 patent applications had been submitted over many years for related inventions. Although this was very off-putting, Sarah made simple "mock-up" versions of a couple of these examples of "prior art" and was pleased to note that they did not work at all well!

Years passed and her "working" prototype continued to be used, but only within her immediate family until 2004, when changes in circumstances allowed her the time and resources to do something with this very useful device realising that the invention needed to be protected. Using Yellow Pages she approached a few patent attorneys, but found them to be in general "stuffy and unapproachable". Thankfully she found Dr. Peter Wilson of ip21 Ltd in Norwich, who turned out to be "human". He put her in touch with his colleague Alan Eklid, who then ran the Norfolk Business Link contract to deliver Design and Innovation counselling throughout the county. Thus began, a long and happy relationship, which has resulted in Sarah signing a licence agreement with one of Europe's leading adhesive tape producers, viz; Sellotape (Henkel).

At the first meeting Peter explained the necessity to protect an idea properly and indicated that assuming it to be novel and once developed the "end saver" would be the type of device for which a patent could be granted. Therefore she should continue to keep her idea out of the public domain (secret) until the protection of her "Intellectual Property" was underway. However, before the patent application process should commence, there needed to be some development work to ensure that the document, once filed, would be an accurate representation of the device. Having met Alan for the first time and discussed the process of new product development, Sarah embarked upon the new product development process, beginning with careful study of the market situation for both adhesive tape and dispensers. She compiled a brief but adequate market research questionnaire, which she deployed to great effect, but without giving away any of the details of her device. This document is attached as appendices 1 & 1A.

With encouraging results from the market research in hand, she decided to pursue the project using sound design management techniques, recognising that a number of different and varying skills were needed. More meetings with Alan Eklid resulted in her deciding to use a professional design consultancy (Product Resolutions of Norwich) to develop the basic prototype and progress the project to the next stage. Before approaching any of the Design Hub short-list of product designers, ST and AE developed a "Design Brief" working along the lines of the guidance document prepared by the Design Hub (see appendix 2). The Design Hub has a carefully selected list of "local" design consultancies and ST used this to select "Product Resolutions" from the three companies that we met and briefed. The preparation and use of a design brief gets a project into context and perspective, bringing consistency and allows comparisons to be made thus enabling a reasoned selection to be made.

The product design consultancy (Product Resolutions) signed a non-disclosure agreement before this meeting following which, things moved very quickly to a priced work

schedule. PR progressed, via organised stages, starting with basic concept sketches (figs 2, 3, 4, & 5).

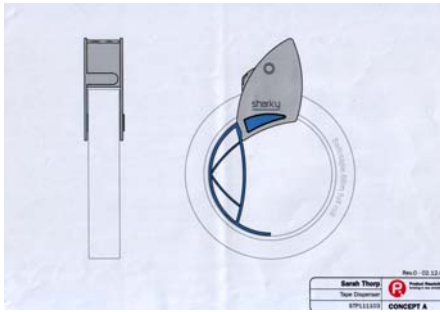


Fig 2

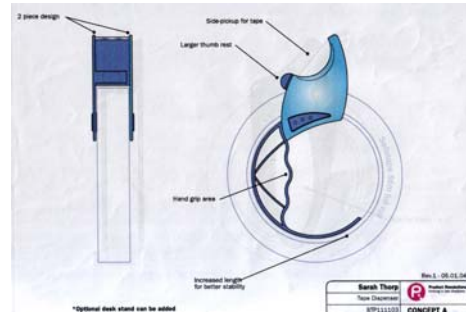


Fig 3

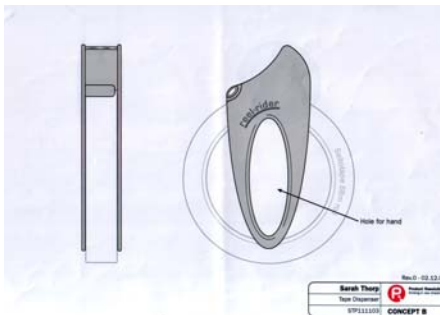


Fig 4

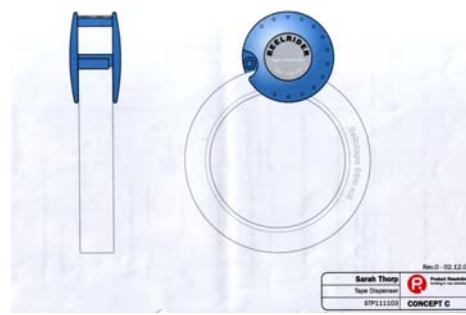


Fig 5

Development and selection of a range of these features led to Computer Aided Design diagrams (figs 6 & 7).

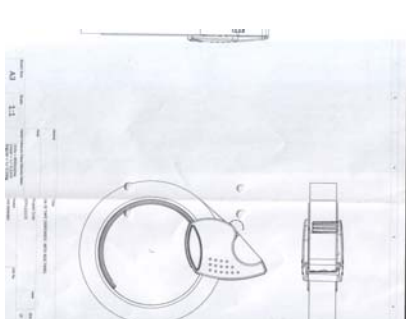


Fig 6

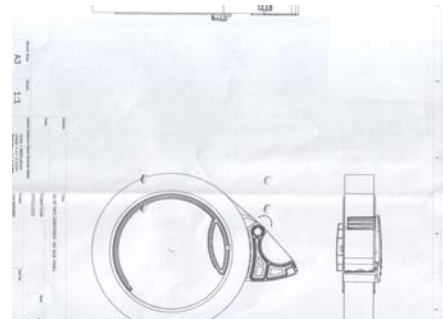
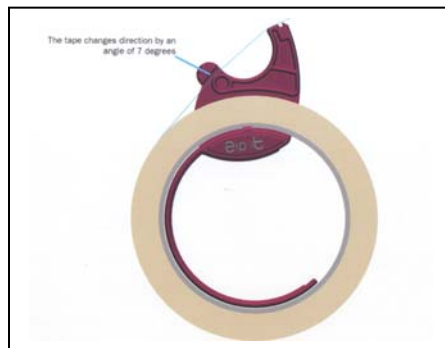


Fig 7

Once the basic format had been finalised, (CAD) 3D renditions were made, depicting how the device might look. These are shown in order of progress in figs 8 – 16 inclusive, the latter being rendered in the colours of Sellotape to show them possibilities. This sequence of images shows how the device evolved via a series of minor changes to include, e.g.; small locating lugs on

the inner curve, a change of angle for the emerging tape, etc. These steps are true design iterations and exemplars of how correct use of the “design process” leads to cost effective innovation and low wastage of time and money.



Figs 8 – 16 inclusive

Once “design freeze” had been reached, (July 2004) the UK patent application was drafted and filed by ip21 ltd. Whilst all of this was happening, Sarah was beginning to undertake other business steps such as; formation of limited company, negotiations with a sister company of Product Resolutions, viz Product Creations, with a view to forming an agreement for licensing / sales, etc.

The next phase was to produce a “Stereo lithographic” model (SLA), from the CAD drawings, once final dimensions and shape have already been determined and approved. The SLA process involves NO tooling and is one of a range of rapid prototyping techniques, (which began in the early 1990’s) and which allow delicate refinements to be made to a product before the expensive and time consuming process of tool making is begun. Tooling for plastics injection mouldings is expensive and once a metal mould has been made, modifications to the product are much more difficult, hence costly and take a great deal of time and skill.

These first models are shown in Figs 17 & 18, which was painted to give a realistic finish, with the plain version shown in 17. These models were used in trials with actual rolls of tape. Such practical trials led to a significant modification, to wit; a change to the emergent tape angle to improve usage and performance, thus illustrating once again the value of the prototyping process. Unfortunately, these early models were very fragile and became damaged with use.

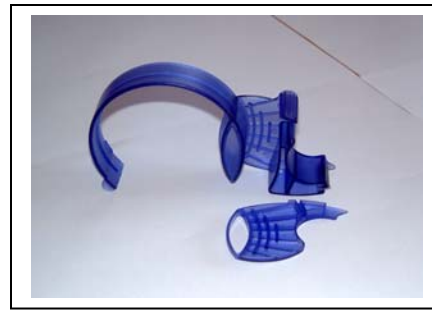


Fig 17



Fig 18

Nonetheless, the trials with these very early prototypes were a vital part of the design process and led to small changes and minor adjustments being made before the production of the injection mould tool (this cost over £6,000, in spite of using low cost suppliers in China, via Product Resolutions). The first impressions (see Fig19) made using this tool were inspected very carefully, as normal, so that minor adjustments could be made prior to authorising a production run. Fig 19 also shows the internal strengthening ribs and other details (including the cut-away to accommodate the emergent tape angle).



Figs 19 to 22 inclusive

Once the minor adjustments had been made a pre-production run was authorised to check final adjustments, stability and conformity, etc. Two of these pre-production impressions are shown in figs 20, 21 & 22 showing the use of both opaque and translucent polymers and the latter has been fitted with a tape reel for trials purposes. These trials (and by now we are in September 2004) were very successful and ST made the big decision to order a full trial batch run of 1000 pieces for sales direct to the public and local retailers.

Packaging had to be addressed at this stage, together with issues surrounding the production of simple instructions and diagrams, bar code, etc. Fig 23 shows an initial version and early sales comments indicated that customers would prefer the end saver to come with a reel of tape already fitted and the incorporation of that change resulted in encouraging sales figures locally.

Concurrent with these steps, (late 2004) the first attempts were made to begin to contact potential licensees, e.g. Sellotape and 3M (Scotch tape), etc. Unsurprisingly, this proved to be a very long and tortuous process, with many blind alleys and increasingly frustrating delays. It has since taken over three years to reach a satisfactory licence agreement with Henkel, owners of the Sellotape® brand. Throughout the whole of this time ST was in receipt of counselling support from Alan Eklid of ip21 under the auspices of The Design Hub (funded by Norfolk County Council).

During the licence negotiations with Henkel, the "end saver" was compared with one of Henkel's own new developments, i.e. the "small reel easy start" using a focus group of their choosing. ST was encouraged by the very positive comments made about her product. In early 2005, the initial UK patent application moved into the PCT phase, whereby international options are maintained for 18 months to allow for marketing and licensing work to be pursued before the final choice of "nationalisation" has to be made. In January of 2007 decisions had to be made with regards to the countries chosen for the nationalisation of the patent. Sarah selected the following jurisdictions after a great deal of advice, consideration and market research, i.e. Europe, USA, Canada, Australia and New Zealand.



Figs 23 & 24



All through 2007 ST continued to negotiate with Henkel and in April 2008 a licence agreement (drafted by ip21) was finalised, allowing them to produce the "End Saver", now called the "Easy Start" for sale in the UK and Eire see Fig24. The first batch of retail product was delivered to TESCO in late April 2008! This is a considerable success for Sarah and proves the value of using sound design management processes and a range of design and business professionals. There remains a long way to go and Sarah, who shows no likelihood of resting on her laurels, has embarked upon the next phase, to extend her product into other parts of the world, working with Philip Ingham of Wayfair Ltd.

Many individuals and organisations have been involved with Sarah working on this project, e.g.; ip21, Design Hub (originated by ip21 and funded by Norfolk County Council), Business Link for Norfolk, Product Resolutions, Henkel Ltd., Wayfair Ltd., and not least of which is her husband Clive, family and friends. Most of all Sarah should be congratulated not only for her original idea but her considerable determination and hard work, not to mention the significant sums she has spent on the project. The final figure (25) shows the progression from prototype to the product now on sale.



Adhesive Tape Survey

1. What size adhesive tape reels do you buy?

Large (75mm core)
Small (30mm core)

2. Do you keep your adhesive tape on any sort of dispenser?

Yes if yes, what type? Desktop
Sleigh/Snail
Other

No if no, where do you keep it in your home?

3. How many reels would you use in a year?

4. Do you have more than one reel of tape in your home?

Yes if yes, what size? and where do you keep it

No

5. Do you ever find loosing the stuck down end a problem?

Yes

No

6. What influences the type of adhesive tape you buy?

Price/Value for money

To fit the dispenser you own

Brand

Other reason Selotape, Scotch, Duck or other

7. Do you ever buy easy tear tape?

Yes

No

Male

Female

Market Research Condensed Results

13% only use small core reels

30% used both large and small core reels

57% use only large core reels

87% have a large core reel in their home

22% of them have a desktop type dispenser

78% of people with large core reels experience the problem of losing the cut end. (65% of the population)

18.75% purchased Selotape

10% purchased Scotch tape

5% purchased Duck brand tape

62.5 had no brand preference

60% of the people canvassed were female

40% of the people canvassed were male

49% were 45 and over

51% were between 20 and 44