

# Great Timing (Uh...almost)

## A tale of a leap before a look

by Linda Dangelo

TIMING IS EVERYTHING, especially when it comes to taking medication doses at prescribed intervals. Or creating a truly unique product at the right time for the right market. So, when an independent inventor approached engineer Guy Marsden to design a prototype for his great idea, a pill timer that could be incorporated into the cap of a prescription bottle, Marsden signed a non-disclosure agreement and began work. The cap would beep to remind people to take their medication and would automatically reset when replaced on the bottle. After some discussion, the men agreed that Marsden would make two prototypes—one that would work in actual “hours” and a demo unit that would simulate hours by using minutes, making it more effective for presentation purposes.

The design process was multifaceted. A regular digital clock display with four digits separated by a colon would have been ideal, but Marsden

couldn't locate a standard LCD (liquid-crystal display) component that would fit inside the bottle's cap.

Ultimately, a two digit display, representing only hours, was accepted by the client, and Marsden began to research batteries, battery holders, alarm speakers and other electrical components needed to drive the LCD and beeper.

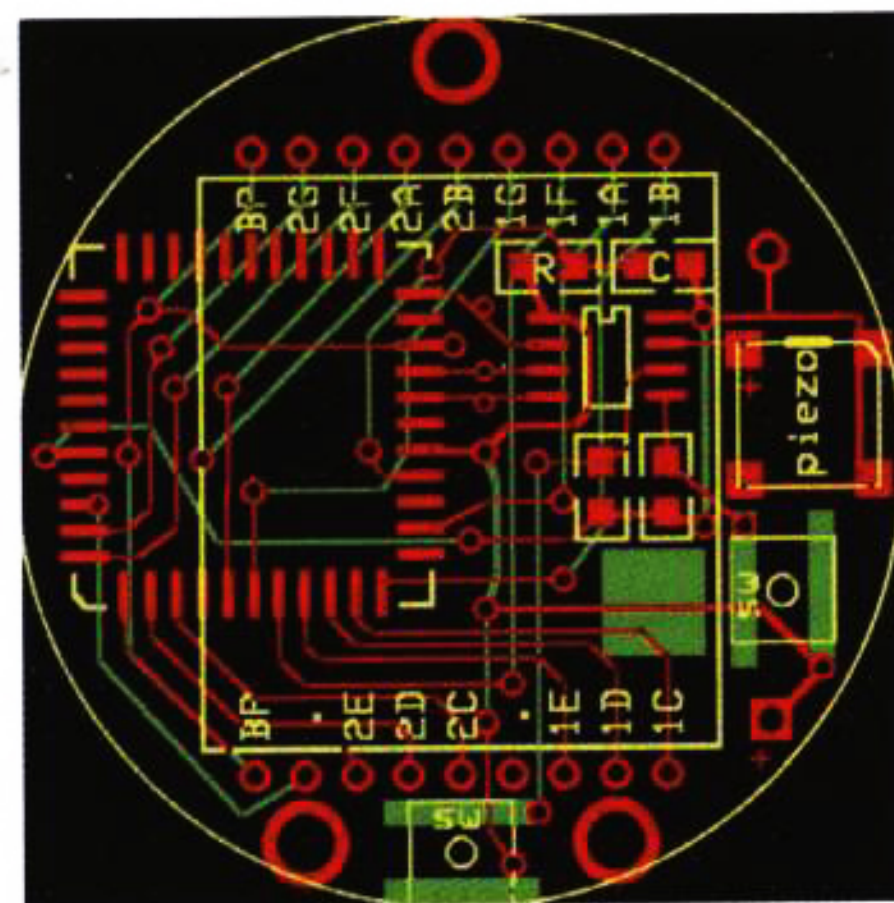
After designing the schematic, Marsden designed a PC circuit board on a CAD (computer aided design) program to hold all the electronic parts and create the electrical connections between them. He sent the design out to be fabricated and started work on

the firmware, which is the code incorporated into the microcontroller chip that would control the clock and sensor. He bolted the display circuit to the top and the battery board to the inside of the cap, then took a second cap, cut a hole in it for the LCD and glued it over the top circuit board to cover the electronics. The result? A pill-cap sensor that worked, with only two exceptions. The switch that should have sensed the cap on the bottle was unreliable when turned past the safety click, and the power draw on the battery was too high, leaving a dead battery after only four hours.

Marsden temporarily solved the sensor problem by gluing small pieces of plastic to the bottle to prevent it from clicking into a locked position. The client approved the change, allowing that the production unit would have the safety click and the prototype didn't really need to demonstrate that feature.

Also, he re-wrote the code to save power by removing the flashing period he had incorporated to indicate timing was in progress.

Marsden then completed his second



After designing the electronic schematic, Marsden designed a PC board on a CAD program



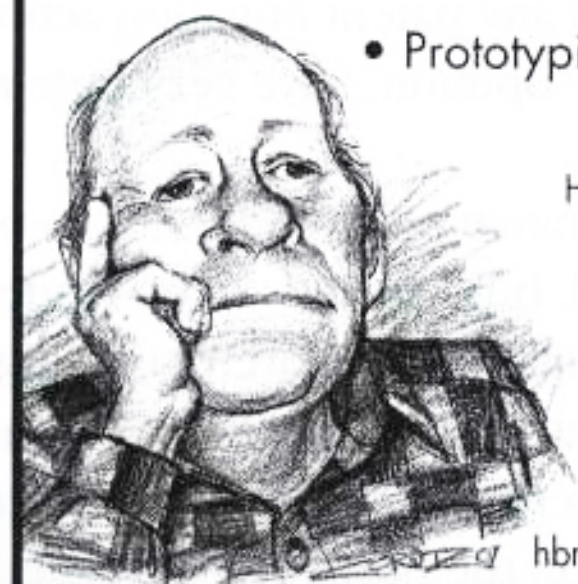
**Linda Dangelo** is *Inventors' Digest's* assistant editor. She combines 20 years experience in small business administration and organization with a degree in English and publishing to bring inventors' stories to life. She can be reached at [linda@inventorsdigest.com](mailto:linda@inventorsdigest.com)

OVER 50 YEARS OF EXPERIENCE

# See Your idea Come Alive

We can make a model of your invention

\*THINK ABOUT IT\*




- Prototyping • Tooling
- Molding

Herbert Ross Brown  
 Ross Enterprises  
 78 Bedford Street  
 Burlington,  
 MA 01803  
 (781) 272-0175  
 1-800-IDEAS-06  
 hbrown40@webtv.net

**FREE ESTIMATE!**

enlisting his services. He bought a unit and e-mailed an image of it to his client, then researched the patent and mailed him a copy of the front page.

His words of experience and caution to all inventors—**DO YOUR RESEARCH!** Engineers are not patent attorneys and are not responsible for making sure your ideas are original or not already patented. If you've done your homework before moving forward with your idea, you won't have to waste your time and money...or anyone else's. 

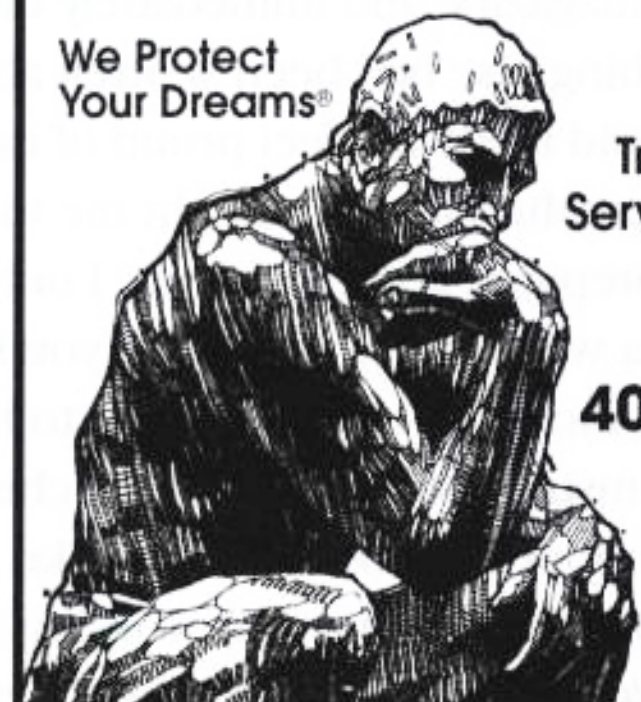
## Thinking of Using a Patent Professional?

Quality, affordable, reliable patent services including patent or trademark searches and applications. More than 30 years of experience.

We Protect Your Dreams®

Patent & Trademark Services, Inc.

Toll-Free  
**1-888-404-1999**

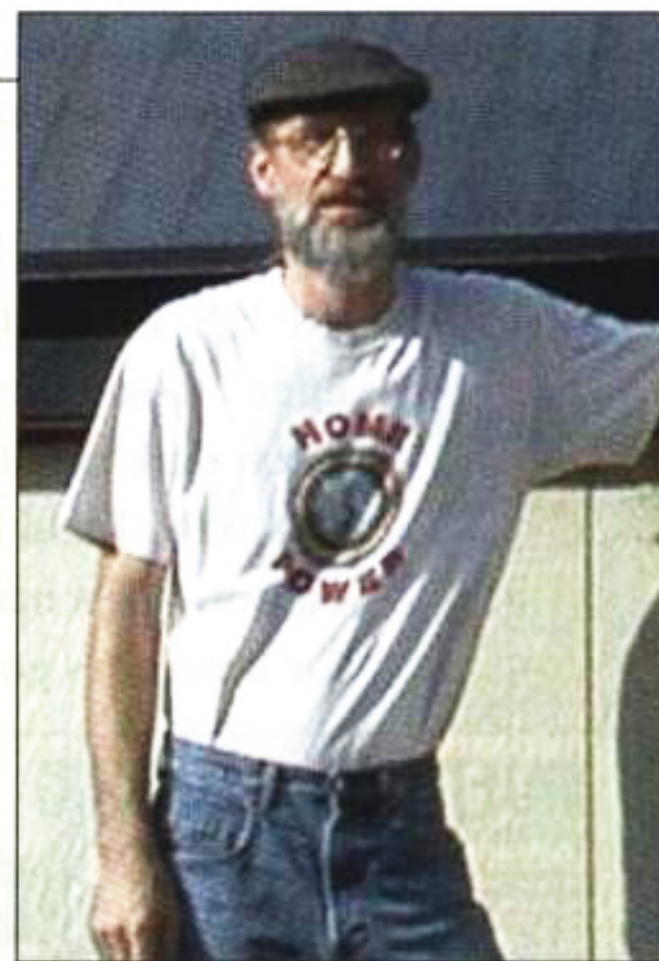


Guy bolted the display circuit board to the top of the cap (A) and the battery to the underside of the cap (B).

Completed prototypes of the pill timer (C). Marsden's prototype closely resembled the already manufactured item (D).

prototype, e-mailed all supporting documentation and products to the inventor, who paid him in full and thanked him for a job well done. End of story?

Well, not quite. Several weeks later Marsden's wife was shopping at her local pharmacy when she discovered...What do you think? You guessed it! A patented, nearly identical pill timer that was already on the market. Marsden was pleased that his prototype closely resembled the already manufactured item but shocked that his client had not performed a patent search prior to



### THE PROTOTYPER

Guy Marsden is president of ART•TEC, an industrial prototype design & development company located in Woolrich, Maine. He also works out of his solar heated barn workshop making wooden furniture and turned wood, engineering and electronic artwork. Visit his website [www.arttec.net](http://www.arttec.net) to view examples of his beautiful hand-crafted designs.

