

Developing a new product from concept to reality

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www.richardson-assoc.com

Two categories of Inventions/Products

- Technology driven inventions.
- Market Driven Inventions

Technology Driven Inventions

- A way of making existing products better.
- Develop the technology.
- Patent the technology.
- Find the companies that will benefit.
- Prove the advantages.
- License.
- Consulting Contract.

Market Driven Inventions/products

- Discovering a hole in the market.
- Finding an unmet consumer/business need.

Assumptions for this talk

- You have a medium technology new product concept that is market driven.
- You have limited funds available but lots of energy.
- You have not yet filed for a patent.
- You have avoided the companies that advertise on TV.

How am I to profit from this concept?

- Develop and license it.
- Have it contract manufactured and market it.
- Manufacture and market it, then sell the business or the product.
- Find a company to partner with and develop it jointly.

When do I apply for a patent?

For market driven inventions: as late as possible.

By early filing the competition can be informed before you reach the marketplace. The application is published before the patent is issued.

You want to patent the design that is the most cost effective to manufacturer.

You will want to incorporate trade feedback before committing to manufacturing.

Do a patent search, identify the land mines, design around them.

File a provisional patent and prove that the concept is a business in one year.

Decide on a business strategy

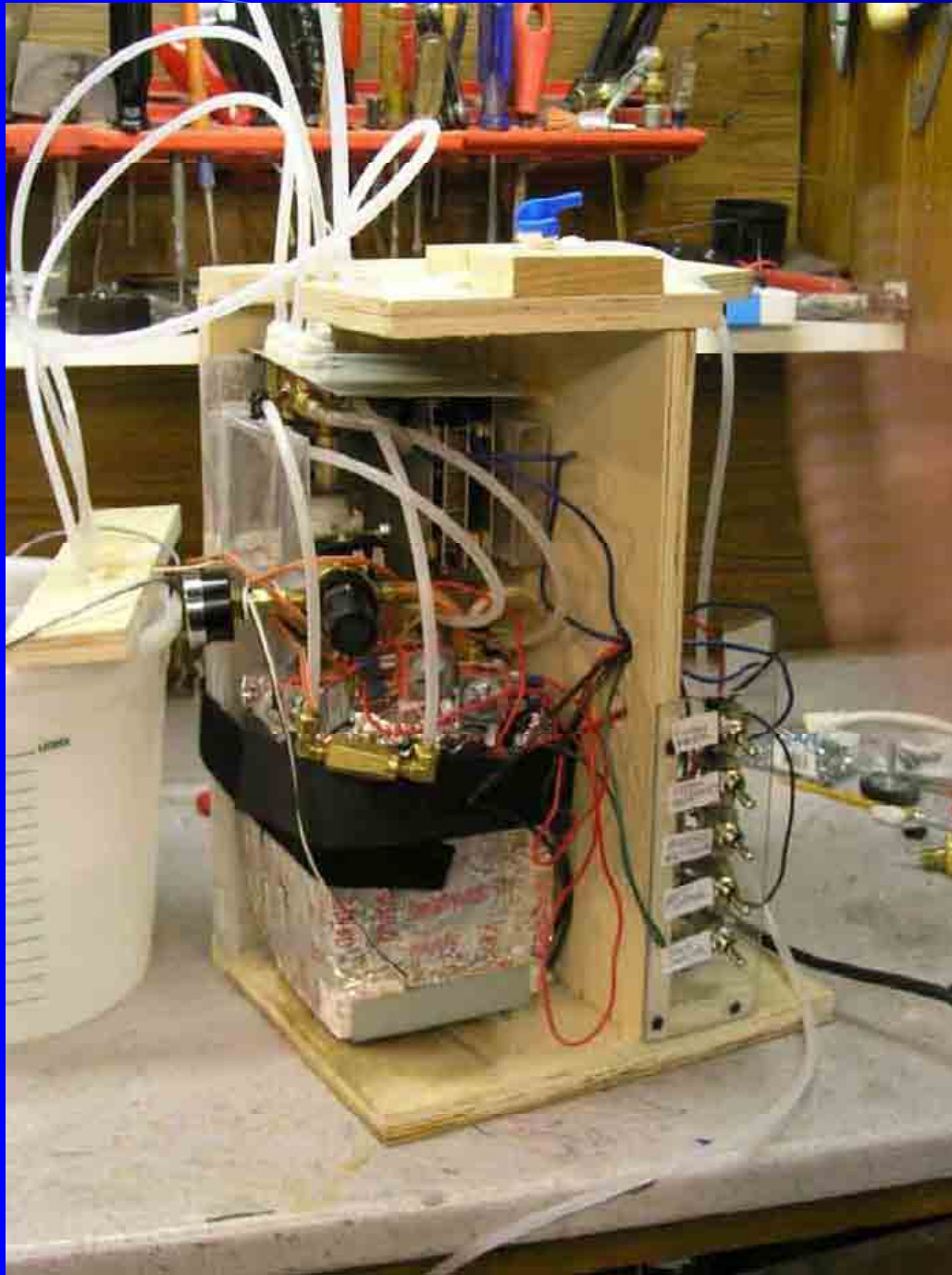
- Determine how much risk money is available.
- Plan a program that will allow you to test the marketability of the product within the risk money available.
- Catalog sheet market research; working prototypes; test market quantities; trade show introduction.
- Spend money on intellectual property protection in accordance with the level of exposure and the amount of risk capital available.
- Approximately 5% of patents issued to individuals are commercially successful. Apply for the patent as late in the process as possible.

To License a product you need to:

- Create it technically.
- Research the business and understand the pipeline and markups from manufacturer to retailer
- Establish your price-point.
- Understand the product introduction timing. (trade shows)
- Produce real working samples.
- Establish your manufacturing prices, trade markups minimum runs, tooling investment.
- Give the potential licensee samples for market research.
- Create a realistic win-win contract.

Developing a product is a linear process

- Start with a hypothesis.
- Write a product profile: wants, musts.. Etc.
- Prove the hypothesis by testing “proof of function” prototypes.
- Create the product in 3D modeling.
- Develop estimated manufacturing costs from the 3D modeled parts by calculation or preliminary quotations.
- Revise the design if necessary for manufacturing efficiencies.
- Produce a working sales or pre-production prototype through SLRs or other methods.

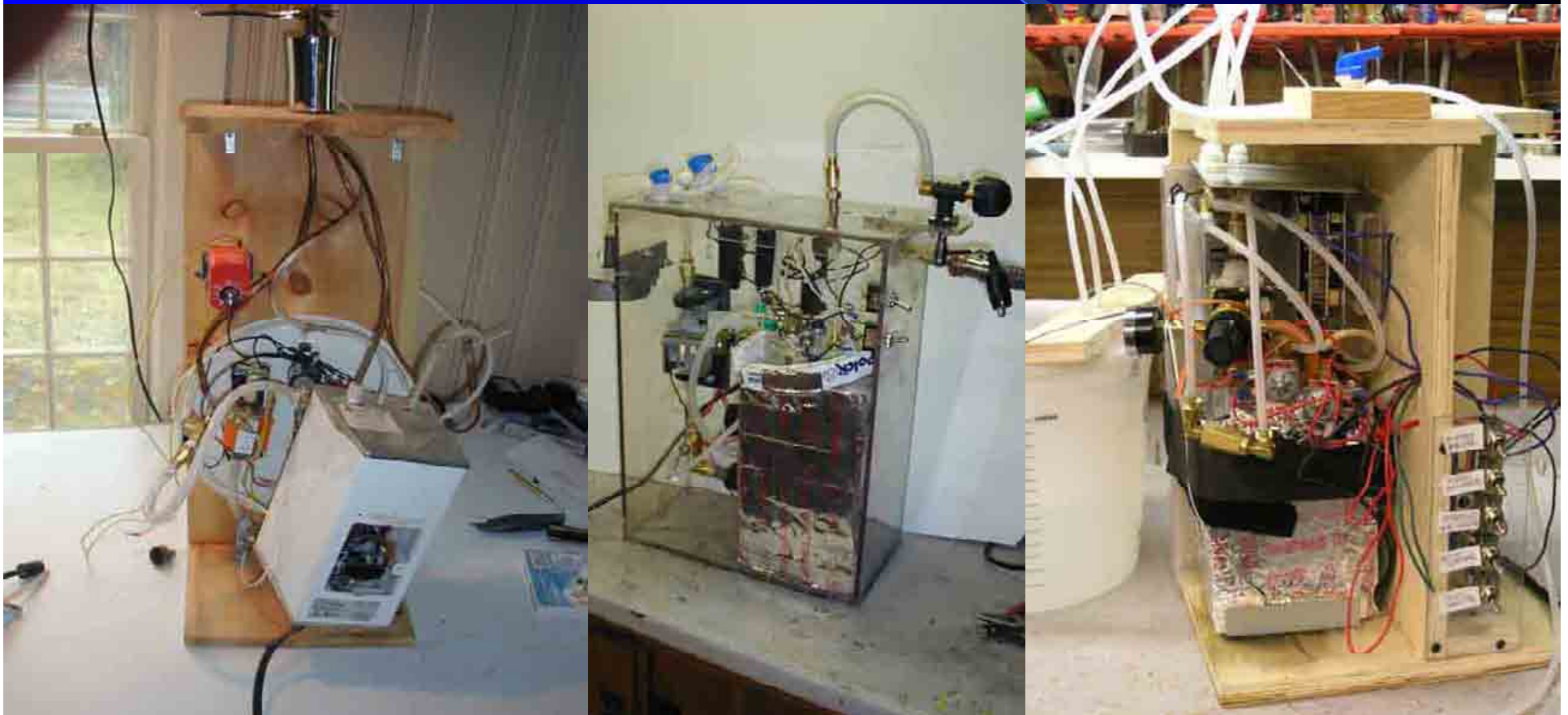


Examples of proof of function prototypes

test bed for an
electronically controlled
hot beverage center.

Proof of function prototype as a machined and purchased or scavenged parts assemblage.

*Project: New type of coffee machine, developed by proof of function prototyping.
Result: project dropped because of production costs.*





Proof of function
prototype
thermoelectric
coolers

Making molded plastic prototypes

- 3 D modeling to stereo lithography.(SLR)
- This allows you to prove the design and to produce a fully functioning sales prototype.
- SLR is affordable for small parts.
- It is not cost effective for large parts.
- They have many materials that match the look and function of most plastics.

Develop a consumer product to stir sauces on the stove top

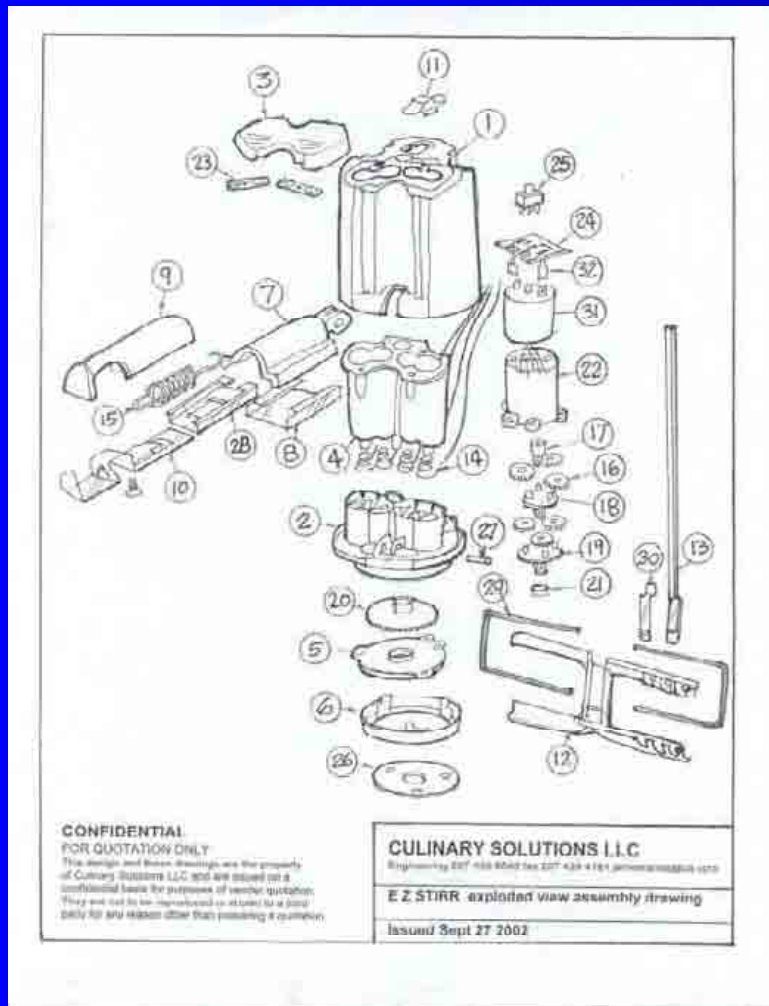
- Battery operated.
- Production cost of less than \$5. \$19.95 to \$24.95 retail
- Fits in the shallow kitchen drawer.
- Fits pots from 8 to 10.5 inches in diameter.
- To be introduced at the housewares show. 8 months

Build a series of POF prototypes using battery powered screwdrivers with paddles stuck into various stovetop cooking mixes.

- Black and Decker 6 volt screwdriver works.
- Defined motor specs, gear ratios and torque.
- Defined counter rotation force required.
- Defined price range of components.



Product modeled in 3D



- 32 custom parts
- 3 rounds of stereo lithography.
- Perfectly working models as sales samples.
- First production parts from China worked perfectly.
- Project initiated in May.
- Production parts shipped in January.

Preliminary parts sketch to work out the mechanism.

Stereolithography and the matching molded parts,



Stereolithography modeling proved the function and provided a working appearance prototype and catalog sheet to generate sales interest before committing to tooling.

Cordless with
Intermittent Setting

the "hands-free"
StirChef
saucepan stirrer



Automatically stirs
• Sauces
• Soups
• Beans
• Stews
• Puddings
• Custards
• Pastas
• Polenta
• Risotto
• Chili
• Rice
• Gravy
and any dish that
calls for continuous
or occasional
stovetop stirring.

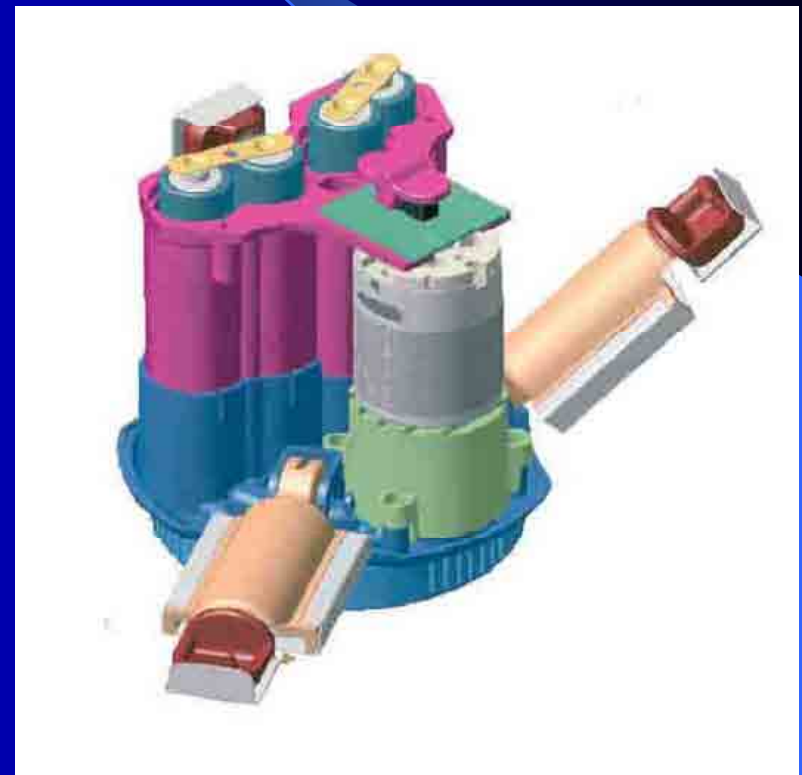
Stirs continuously. Stirs occasionally.

* Includes StirChef™ with removable stainless steel shaft.
• 3 heat-resistant paddles • 4 long-lasting AA batteries • StirChef™ Recipe Booklet.

StirChef™ is engineered with special design features to do all the work for you ... save you time ...
and extend the life of your cookware. Adjusts to fit 2" to 8 1/2" cookpans.



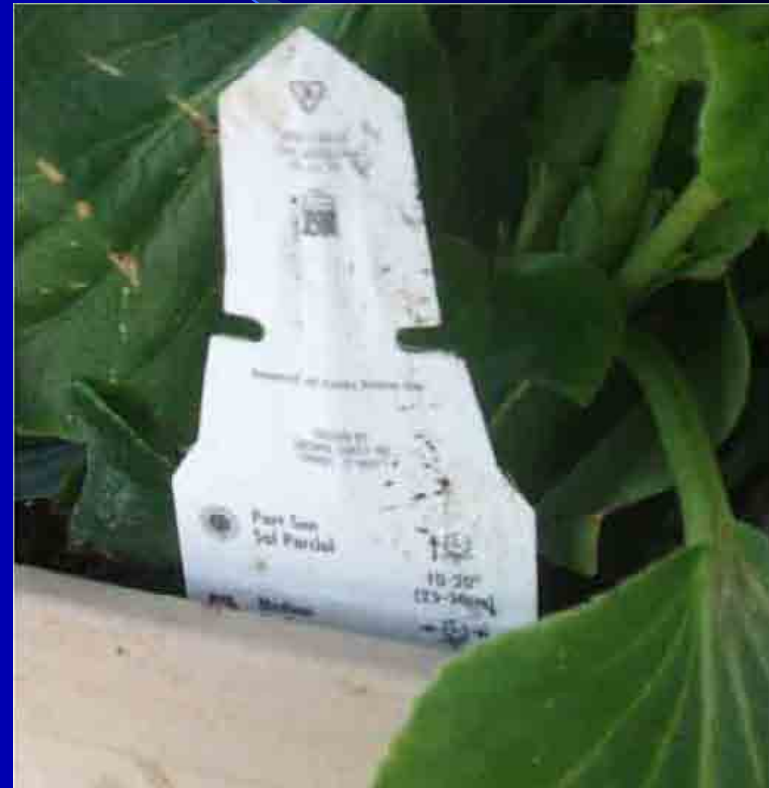
StirChef™ is engineered to fit 2" to 8 1/2" cookpans.
The stainless steel shaft is removable for easy cleaning.
StirChef™ is engineered with special design features to do all the work for you ... save you time ...
and extend the life of your cookware. Adjusts to fit 2" to 8 1/2" cookpans.



Project: to develop a sunlight measuring device.

An example of an unmet consumer need that was licensed

- Marketing partner bought an expensive plant with a sunlight requirement label.
- The plant needs partial sun.
- Where is partial sun on my property?

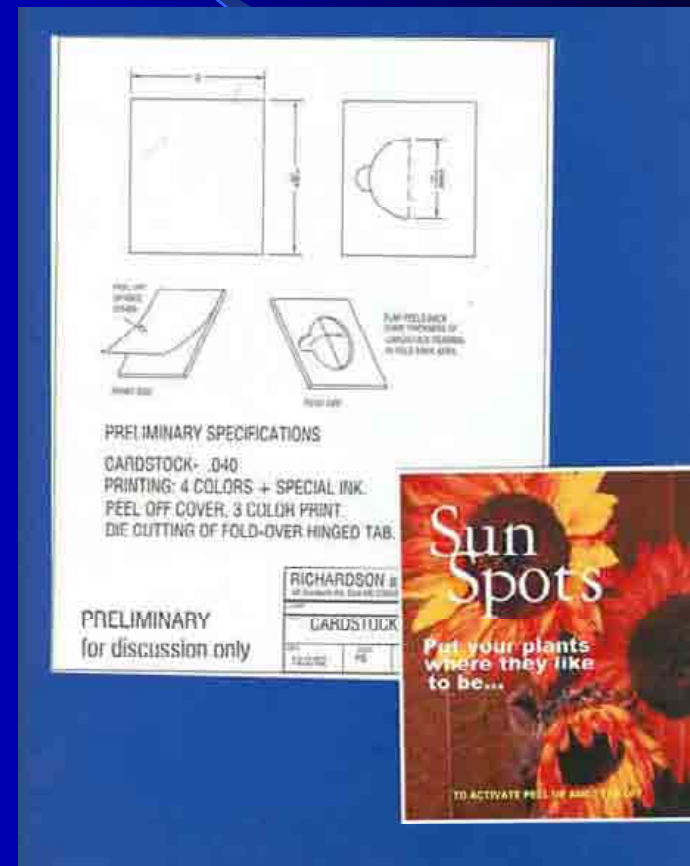


Two Approaches

- Fading light-sensitive ink.
 - Practical consideration: No tooling, inexpensive, can be produced locally.
 - We tried this first.
- Sampling and accumulating light meter with four thresholds.
 - Disadvantage:
 - Cost of electronic development by others and tooling.
 - Probably has to be made in China.

Fading Ink Method

- Found a research chemist who would moonlight.
- Ran samples and tests for 6 months.
- Results:
- Extremes OK.
- Middle categories unsatisfactory.
- Decision:
- Proceeded with electronic option.



Solid modeling creates a virtual product




Full Shade ☉ Partial Sun ☉ Full Sun ☉ Partial Shade ☉ Full Shade

Avoid Plant Failures

Protect your landscaping investment

The SUNLIGHT CALCULATOR

"Put your plants where they want to be"



What it Does!
Accurately measures the amount of accumulated light that falls on any specific location on your property giving you the ability to match a plants light requirements (full sun, partial sun, etc.) with the actual light conditions measured by the Sunlight Calculator.

Why do you need it?
Locating your plants under the wrong light conditions is the most common reason for plant failure. The Sunlight Calculator gives you an accurate light measurement over a 24 hour period so you can maximize your plants growing potential by placing them in the optimum locations.

Patent Pending

An electronic innovation to accurately select optimum planting locations. **Phototec**

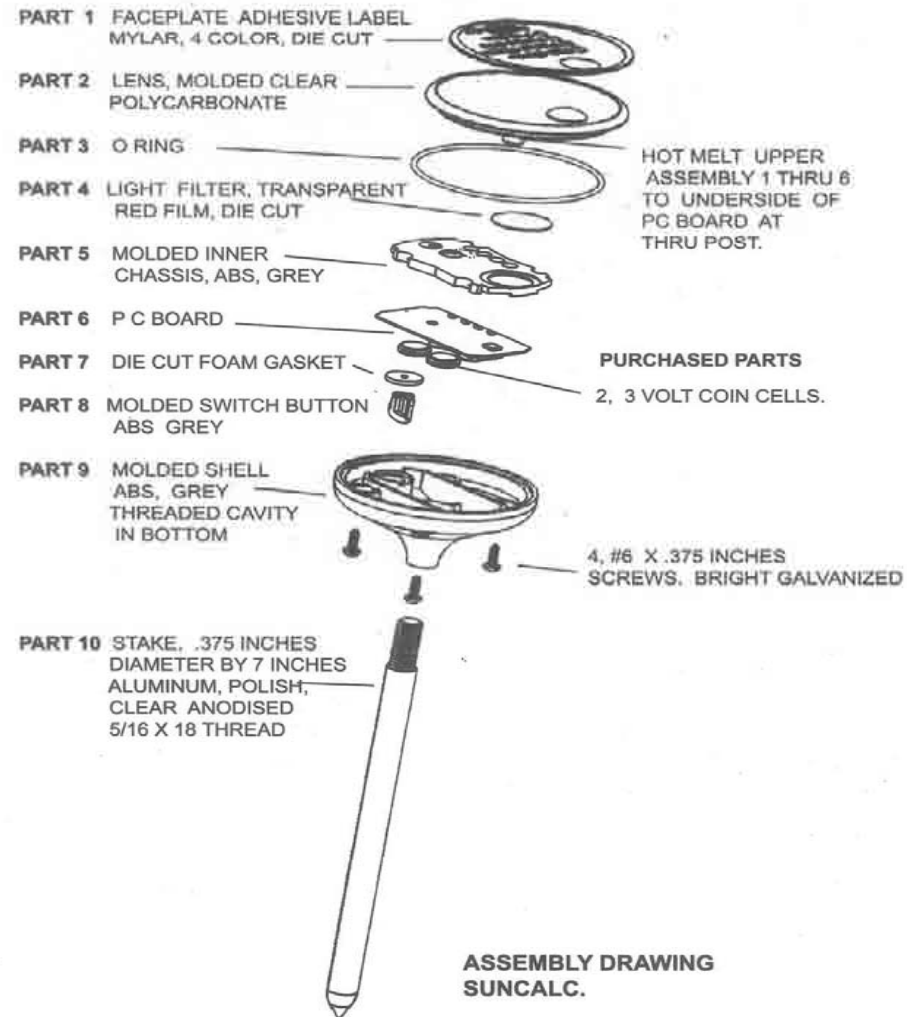
For More Information

Phototec
PO Box 25
Jefferson, Maine 04348

P • 207-549-3068
F • 207-549-3068
www.suncalc.com

- Make preliminary cost estimates.
- File a provisional patent.
- Research the industry.
- Apply the markups.
- **Make a fake catalog sheet.**
- Show it to the trade.
- Establish a price point.
- Decision to proceed.
- Start spending money.

Develop
electronics
and plastic
parts
simultaneously.



RICHARDSON & ASSOCIATES
PATENT PENDING 02/14/05

SunCalc Edrawing



We licensed the product to the first contact because:

- We identified the capital investment in tooling.
- We then obtained quotations on the complete part cost.
- We had third party endorsement.
- We gave the potential licensee a working product to let him do his own market research.
- We asked for a reasonable contract.

Licensing Contract

- No money down.
- Higher royalties for a limited number of units.
- Higher minimum yearly payments.
- Licensee defends the patent.



Put Your Plants Where They Want To Be!

Full Sun • Partial Sun • Partial Shade • Full Shade



- Patent Pending

Why Do You Need It?

Locating your plants under the wrong light conditions is the most common reason for plant failure. SunCalc, the sunlight calculator, gives you an accurate light measurement over the period of a day so you can maximize your plants' growing potential by placing them in the optimum locations.

What It Does!

Accurately measures the amount of accumulated light that falls on any specific location on your property, giving you the ability to match a plant's light requirements (full sun, partial sun, etc.) with the actual light conditions measured by SunCalc.

How It Works...

1. Choose a location on your property that you wish to evaluate for available sunlight. Select a day you can reasonably expect a full day of sun.
2. Start early in the day (between 7am - 9am). Insert SunCalc in a soil filled flower pot that can be placed at the desired location.
3. Press the power switch located on the side shoulder of the unit and turn on your SunCalc. The four LED lights on the faceplate will flash every 2 seconds to indicate that your unit is up and running and accumulating sunlight data. That's all there is to it!

Measurement Results:

After 12 hours of continuous operation, only one LED light will flash indicating the amount of sunlight available at that location.
Full Sun - Partial Sun - Partial Shade - Full Shade



Prototype for sales research

- The real Catalog sheet.

SunCalc
THE SUNLIGHT CALCULATOR
SunCalc Corporation
P.O. Box 1479 Pocket Knife Square
Lakeville, CT 06039
Ph 860.435.2973 • Fax 860.435.4558

SunCalc

For new small to mid sized products to be made in plastic

- You design in solid modelling.
- 3D modelling creates the part and assemblies in real dimensions in the computer. You can view fits, interferences, and esthetics before making anything.
- Anyone can view Edrawings in 3D via email.
- You can create an exact prototype using SLRs.
- You can create a catalog sheet for market research from photo realistic images, Edrawings or SLR models.
- You can get parts and tooling costs for production via email.

Calculating the costs of injection molded parts

The cost of the plastic material. For example HDPE = .80/ lb divided by the weight of the part.

The rate charged for the molding machine is based on the size of the press in tons. 150 tons = 50/hr.

The cycle time of the molding machine is based on the design and the wall thickness of the part. .080 wall, styrene = 40 second cycle time.

The number of cavities in the tool. 1 up, 2 up, 4 up etc.

The cost of secondary operations, assembly, ultrasonic welding, decorating.

Consider manufacturing in the US before outsourcing in China.

Injection molding tooling options

- **Least expensive, market test quantities.**
- Single cavity tools, aluminum or steel.
- Inserts in MUD frames.
- SLRs, rubber molds, urethane castings.
- Multi cavity base, one insert for market test quantities, expand the number of cavities for production.
- Tooling is made directly from 3 D modelling on computer controlled milling machines.

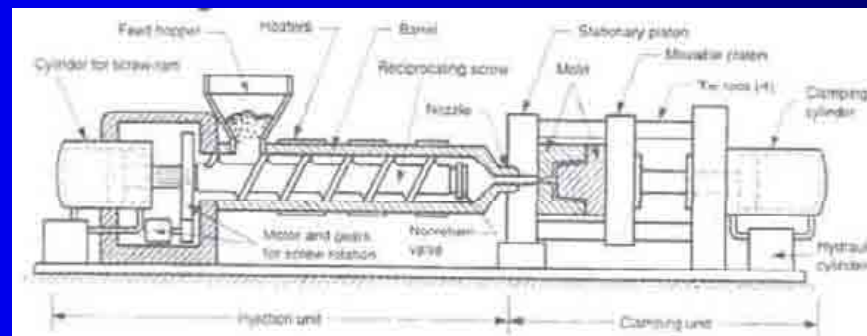
CNC milling



- Aluminum tool in pieces
typical CNC miller



- Injection molding machine



- There are injection molding companies that specialize in low cost short run tooling.
- This is one part for a low volume expensive specialty market product, typically selling only 500 units a year.
- It sometimes makes business sense to use inexpensive tooling and to pay 3 times as much for the part.
- This allows for the low cost production of test market and sales samples before committing to much more expensive production molds.
- Protomold.
- Mold: \$2,300
- Parts \$2.68 each at 50 parts
- Lead time : typically 3 weeks

proto mold
A Proto Labs Company

Print quote Print PDF
RAPID INJECTION MOLDING

HOME RESOURCES COMPANY CONTACT US LOCATION

PROTOQUOTE

9/25/2008
(rev 01)
4.9 in x 2.058 in x 0.765 in

1 Enter Specifications

Cavities: 1 cavity

A (green) side finish: PM-F1 (Low-cosmetic - most toolmarks removed)

B (blue) side finish: PM-F0 (Non-cosmetic - finish to Protomold discretion)

Sample Quantity: 25

Delivery: Sample parts ship in 15 business days (standard delivery)

Material: ABS, White (Lustran 248-013005)*

2 Review Issues

Required Changes (1)

The following illustrations indicate changes to the model which are required for compatibility with the Protomold process.

VIEW IN 3D

Changes Required
A new model is required. Contact Protomold for more information. Please see notes below.

ORDERS UP TO 100,000 PARTS
These price quotes are USD for the following material: ABS, white (Lustran 248-013005)

Enter lot size: 5000 to

Price/part: Quantity:

Setup charge:

Delivery premium:

Total USD:

Your Price

Tooling cost: \$2,310

Parts @ \$2.68: \$67

Delivery premium: \$0

Material charge: \$0

Total USD: \$2,377

Thank you for the opportunity to quote your parts. We look forward to working with you on this project. Should you have any questions, please do not hesitate to contact us at (763) 479-3688.

Thermoforming options

The sheet fed rotary and shuttle machines all take heavy gauge sheet material. .06 to .375+

Rotary machines are the fastest and so are generally the most cost effective production machines for long runs, large sizes. Tooling is in aluminum.

Single sheet shuttle machines are better for shorter runs and can use epoxy and in some cases wood tooling for pre-production samples.

In-line roll fed thermo-formers are for light gauge plastic formed parts, typically clear packaging.



Advantages.

Lower cost tooling.

Disadvantages

Higher cost parts.

Can only produce single surface parts.

Part design restrictions

Also RIM, structural foam molding, pressure forming.

Hollow plastic parts

Blowmolding

Cost effective hollow parts.
Limited esthetics with design constraints. Fast cycles.
Cast aluminum tooling.



Rotational molding.

Very strong durable large parts made from high density polyethylene.
Cast aluminum tooling.
Water tanks, playground equipment, industrial bins, kayaks, outdoor furniture.



A new product as a business opportunity.

R&A developed a line
Of inexpensive in-store
merchandiser/coolers
for ConAgra using an
imported TE unit and
plastic components.
Prototype was fabricated
from sheet plastic. HIPS

- Other potential applications:
- inexpensive keg beer cooler.
- AB developed a \$1,700 keg cooler, the distributors were unhappy with the price. There was an opportunity to develop a lower cost unit on spec.



Prototype of cooler with Thermoelectric Insert in lid area.



Build proof of function prototype

Familiar with Thermoelectric systems from China.

Built boxes with urethane insulation to test cooling.

Resolved technical issues.

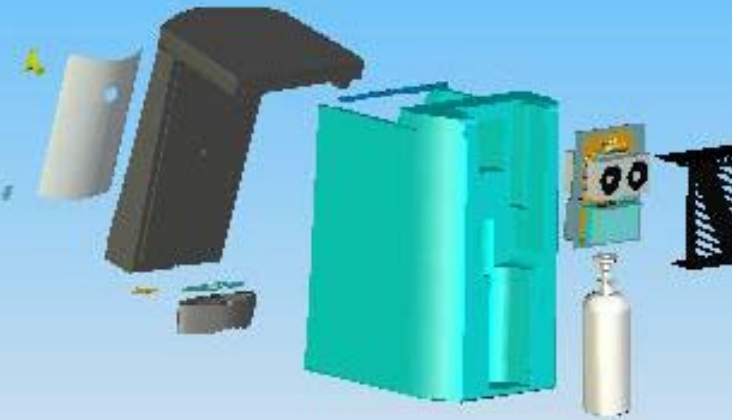
Designed options with input from rotational molder who would be molder/assembler.

A low cost keg cooler for AB

- Endless solid modeling designs to email to the client as E drawings.
- The client sees them as 3 D drawings that they can manipulate, remove parts, understand the construction, and can make esthetic decisions.

Technical and cost criteria

- Sell to AB for \$400
- AB pays for tooling
- Holds 10 gallon keg at 40F



8311 Draft Dispenser w/changeable panel L1R2

Develop the product with the customer.

Endless Design options



Floor Standing • 83 2201 CR Draft All Right Beerbox



- Features**
- Lightweight durable plastic housing is available in custom colors.
 - Two models available, counter top and floor model.
 - Can be sold with all hardware attached.
 - Multiple graphics are available.
 - Door panel can accept replaceable printed graphics.
 - Houses a 2.5 lb. refillable CO₂ cartridge that will dispense up to 24 (6) bottles.
 - 15" x 16" braided drip tray is secured to magnet for easy cleaning.
 - Frost-free 110V thermoelectric cooling keeps the beer cold at 38°F - 40°F.
 - Designed to accommodate a 12.25" x 12.25" x 20" beverage container.
- Weight: 34 lbs.



Counter Top Unit



Back View - Floor Unit



Open Front - Floor Unit





8311 Draft Dispenser w/changeable panel L1R2

Design options as E drawings



Final

The winner as an E drawing via email.

Tooling and parts cost are generated from these files.

AB committed to the cost of producing 2 working prototypes for an AB sales convention.

Working prototype for sales demos.



Separated the unit into thermoformed panels, built wood tooling, had parts formed, solvent welded the formed parts into shell of the body and door,

Foamed the insulation in place.

Attached hardware and TE unit.



Final product

KEG REFRIGERATOR Floor Model

FEATURES

- Lightweight, durable, rotomolded plastic housing is available in custom colors.
- Two models available: floor model and counter-top model.
- Can be sold with all hardware attached.
- 4" x 12" removable drip tray for easy dumping.
- Proprietary solid state 110V thermoelectric cooling keeps the beer cold at 39°F - 40° F.
- 12V cigarette lighter option for portability... tailgating... golf outings... tastings...
- Designed to accommodate a 1/6 and the new 1/4 barrel beverage container.
- Weight: 34 lbs.



Counter-top Model



GRAPHICS

- Side Panel accepts flexible graphic panels which are easily changed out.
- Front panel can accept brand decals.
- Optional pole banner mounts to top of unit.

Patent Pending • © 2005 CR Impact All Rights Reserved.



4500 40th Street, S
St. Petersburg, FL 33711
Sales: 777.866.8877
Production: 203.260.8323




Designed for a retailer, sourced in China. New method of prototyping a cooler. CNC machining HDPU foam and painting a skin. Project cancelled, product available.



Developing on speculation

Why Sell
Pitchers When
You Can Sell
The Whole Keg?



Introducing the MGD Ice Keg.[™]
Holds 64/76 oz. of beer and lots of profit potential.

Miller Genuine Draft Ice Keg is specially designed to help you maximize the value of your existing keg and pitcher and to provide you with the most efficient way to serve your customers. It's the only keg that has built-in dispensing capability. And since it's built with stainless steel, it's easy to clean and sanitize. So that you can always serve your customers with the best. The MGD Ice Keg. It's the only keg that's worth the investment.

TABLE SERVICE - BEER KEG DISPENSER

MGD ICE KEG: Designed, developed and contract manufactured by Richardson and Associates, Weston CT, for Miller Brewing Company.

Had the opportunity to Design and produce POP material for creative director at MBC.

Low margins but low upfront financial risk.

In store cut flower display

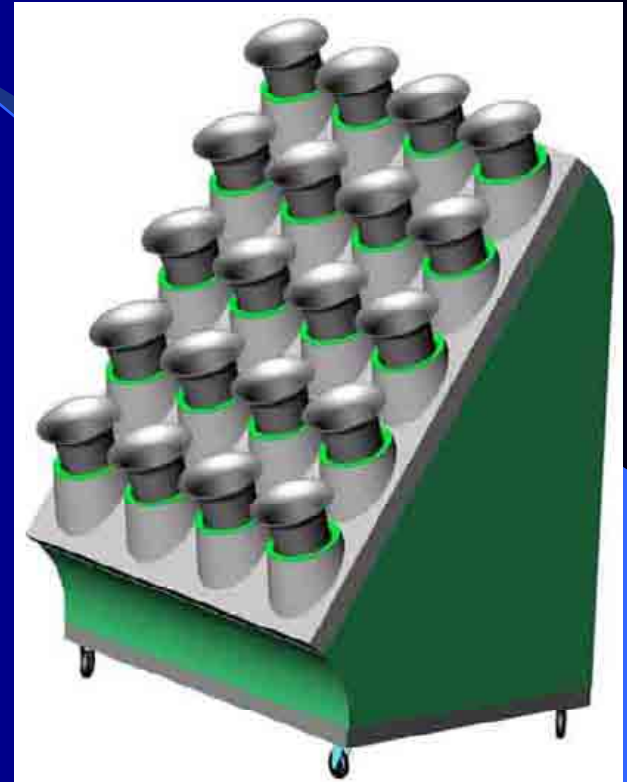
Problem: high wastage due to bacterial buildup in water.



Typical cut flower in store display, requires culling and daily service.



Imported refrigerated circulating and filtered water floral display. System uses large cascading bins and no insulation.



R&A approach: less costly. Interconnected vases, high R insulation. Smaller refrigeration system, less circulating water, UV and filtration

Prototypes made as proof of function and cost analysis.



vacuum formed and purchased components.

Some considerations

- Assuming you have limited resources.....
- Decide on probability versus profitability.
- Decide on a mass market product versus a specialty market product.
- A base hit business versus a home run business.
- Examine your financial resources. You have to prove that people will buy it with the money available to you.
- It will be next to impossible to get additional investment without having some sales.

Researching the idea

- Find out if it has been done before.
- Patent search on the Internet..... www.uspto.gov
- Google, store and catalog search.
- Check out a trade show.
- Find out how the business works, distributors, sales reps, mark ups and commissions.
- Establish your retail price point.
- Find alliances.

4 NOs

- Stay away from Detroit.
- Stay away from the FDA.
- Don't try to educate the consumer that they need your product. You don't have enough money.
- Don't plan to go to Wal-Mart first.

Financing

- Maine Technology Institute (seed grant)
- Friends and family
- The home equity loan.
- An angel investor. (a supplier?)
- Small business loans
- Supplier credit (not in China)
- Venture capital (to expand sales)
- **Build the business out of cash flow.**



TREADPAD A portable running-in-place exercise machine. Injection molded plastic housing with conductive rubber pads as switches. Electronic display shows speed, calories burned, and distance.
Developed by Richardson and Associates for TreadpPad Partners LLC.

“Run in place” exercise machine with electronic feedback.

Development and pre-production samples financed by angel investor.

Ran out of capital without doing any sales tests.

Featured In The New York Times,
Good Morning America, CBS News, USA Today,
CNBC TV, Cooking Light, Fine Cooking & more!

MISTO™

The Gourmet Olive Oil Sprayer™

Perfect for:

- Roasting
- Grilling
- Sautéing
- Salads & Pasta
- Healthy non-stick cooking
- For all your favorite oils

"It really works!"



"New stainless with color bands are the perfect entrée to multiple sales!"

Spray Your Own Olive Oil

Now in stainless steel with multiple color bands!

Just fill these beautiful, high quality sprayers with your favorite oils. Multiple color bands give your customers a MISTO for every flavor. Spray with fingertip ease on pasta, salads, pizza. Your customers will say,

"I love my MISTOs!"

And you will too! Food writers are praising the benefits of MISTO monthly, weekly, and daily. MISTO advertising and editorial are creating tremendous demand and increasing sales for you. Your customers will see the press and ask for MISTO. Call us now at 1-888-OIL-SPRAY, and discover the moneymaking magic of MISTO today.

"MISTO is the greatest selling product we've ever had in our store!"

-Warren Tuttle, The Complete Kitchen



"Every cook needs more than one!"

Now there's a stainless MISTO for every flavor!

Make more money with MISTO!

- Now in beautiful stainless steel
- Multiple colors mean multiple sales
- Refillable - works with any cooking oil
- Dripless sprayer eliminates messy cleanup and wasted oil
- Uses no chemicals or propellants
- Eliminates unsanitary basting brushes
- Makes a great gift • One year warranty
- E.U.R. Connecticut

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FAX orders to: 203-744-8845

Liquid Motion, Inc.

11 Troubridge Dr., Bethel, CT 06801
Visit us at www.misto.com

Produced first units using purchased parts.

Demoed at Housewares show and received first order.

Found investor to finance inventory. (supplier)

Used contract assembler in US. For Just-in-Time MFG.

Used trade show exhibits, trade PR, and commissioned sales reps.

\$10,000,000 in sales first year.

Final Thoughts

- Make alliances.
- Plan to make sales before trying to raise serious money.
- In some instances, with solid modeling you can produce functioning sales samples without tooling.
- Don't fall in love with the idea. If you have one you will probably have 20 more.
- People really do make a lot of money in this inventing business, it's just not easy to do.
- **Spend money only to increase certainty.**