Tim Bonerb & Associates

BUSINESS / R&D CONSULTING

Design / Engineering / Prototype Fabrication / Funding / Patents & Trademarks / Marketing

THE KNOWING IS IN THE DOING

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Introduction

Ever since I was young, I've had a passion for fixing, improving and building things. I think it started when I proudly strapped on my first tool belt at age seven and began building tree houses. Soon I was working on power equipment; then building small businesses from the ground up. It's now more than four decades later and I am basically doing the same thing - designing, solving, inventing and building. It's simply in my nature.

While growing up, I had the fortune of gaining valuable experience by working in my family's businesses. As a result, I was able to learn about the problems and shortfalls in the chemical and food processing industries, I was allowed and encouraged to work on solutions. The first new product solution I conceived was so exciting, it ended up being the subject of several Harvard Case Studies.

The natural by-product of my hands-on experiences has been the opportunity to learn by doing. Hence, I've become a welder, metal fabricator, and patent writer. I've also been intimately involved in preparing Patent & Trademark Licenses (understanding patent law), raising capital, marketing, graphic design and advertising. These have all been important and necessary crafts for which I've achieved an advanced level of proficiency as a skilled inventor. (see Case Studies #1 to #5 on pages 14 to 18 and the new products under development on pages 19 to 26.)

In the process of perfecting these crafts and skills, I've established many long-term relationships with other organizations and professionals. I continue to use their services and rely on their expertise for engineering, manufacturing, testing, control design, writing, computer modeling & animation, and legal counsel. I know the R&D process well and can provide accurate levels of predictability, skill and results.

In short, my life's work and experience has proven to me that ***The Knowing of Something*** really is in the ***Doing of It.*** This brochure is a synopsis of what I know and, more importantly, what I can do for you. For information, please visit my consulting website: www.timbonerb.com.

Sincerely,

Timothy C. Bonerb
President

Experience / Highlights

- Vice President of Manufacturing for US Sugar Company
- Founder / Developer of All-Flow Technology - subject of two Harvard Case Studies
- A-F Technology the subject of two Agibusiness Seminars at Harvard for Industry CEO's
- Helped arrange $26M IPO for A-F Technology
- Owner / Developer of SideFlo Technology - helped raise $2M in Venture Capital
- Owner / Developer of the Ice-Pro Technology
- Owner / Developer of the Flexair Technology
- Owner / Developer of Camp'n Sea
- Owner / Developer of QWK-Lift
- Owner / Developer of Quetas
- Invited Guest to London & Continental Bankers Conferences
- Invited guest to MIT Entrepreneurial Seminars
- Invited Speaker at the World Bank
- To date, I have filed approximately 100 Patents

From Concept to Preliminary Design & Engineering

"First comes thought, then organization of that thought into ideas and plans: then the transformation of those plans into reality. The beginning, as you will observe is imagination." - NAPOLEAN HILL

PRODUCT OUTLINE / GOALS

Before getting started on a design concept, it is vital that detailed goals are established to keep the R&D process on track. Having the end goal in sight is key to the success of the entire effort.

CONCEPT DEVELOPMENT TO PROTOTYPE

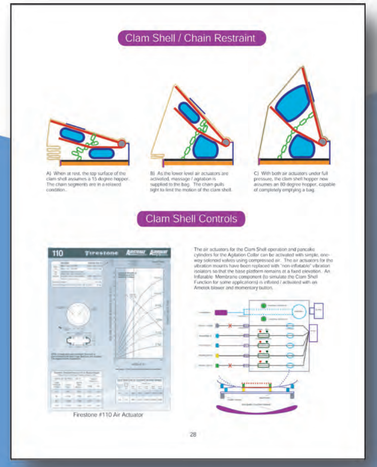
Despite the modeling and CAD software available today, it is still vitally important to build and test the product with a "hands-on" approach. It's only when a full scale prototype is built that it is possible for one to test and modify it. Moving, controlling and operating it makes it easier to identify problems and make the needed modifications.

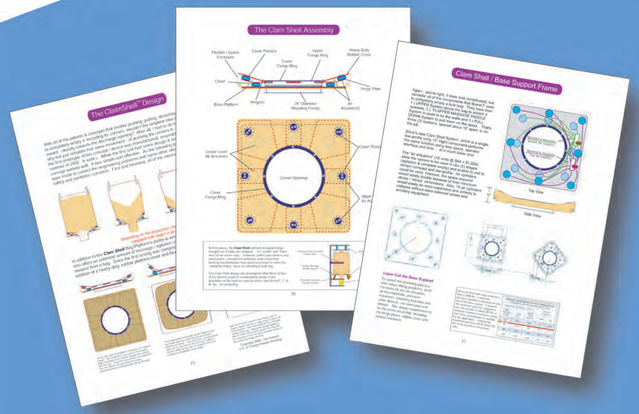
APPLICATION ENVIRONMENT / MATERIALS OF CONSTRUCTION

Typically, prototype equipment and electrical control systems can be produced out of inexpensive materials, such as carbon steel. (stainless steel or other types of materials might be required for the final design) A final bill of materials, including the appropriate electrical controls (Ex. NEMA 4X for wash down environments) will be provided during this process to ensure availability, compatibility and cost.

THE PATENT WRITING PROCESS

The concept stage is of critical importance to the task of writing patents. The patent writing process forces one to thoroughly examine the concept and/or product much in the same way that a business plan forces one to examine the details of a business. It is in the details that problems and/or opportunities can be found. The Concept, Prototype and Patent Writing stages are where we can provide the greatest expertise wtih unequaled value.





Prototype Fabrication & Testing

PRODUCT LAUNCH PLAN

To stay on the desired time line and budget, a detailed product launch plan must be prepared and followed. From the first concept outline to the final marketing plan, the launch plan should include all integral stages. (A detailed example of a Product Launch Plan may be found on our web site at www.timbonerb.com.)

FEATURES & BENEFITS VS. COST ANALYSIS

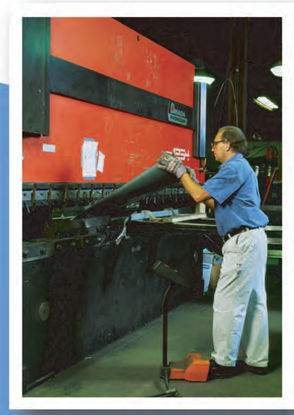
With the product launch plan in hand, a constant and routine review is required to be sure that the product evolves in the direction of (and hopefully surpasses) the customer's expectations. As the design moves forward, every effort will be made to simplify or remove unnecessary components adversely affecting costs of manufacturing.

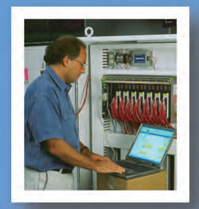
TESTING / CUSTOMER FEEDBACK

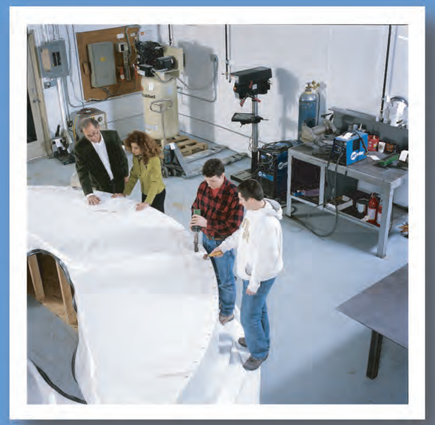
To demonstrate whether the product provides a value to the end customer, we involve a few prospective buyers at stages throughout the design process. Typically, product testing begins at the place of manufacturing or the test lab, and then graduates to actual "on-site" testing at a customer's production facility. Feedback and input from the eventual equipment operators, the safety and maintenance departments, as well as the accountants all have a critical place in the development process.

OUT-SOURCING OPTIONS

During the building and testing phase of the prototype(s), a coordinated effort will be implemented to source the various components and possible manufacturers (domestic & foreign) who will produce and deliver the product. In today's world, where the impact of global trade and labor costs are too significant to ignore, foreign manufacturing and shipping needs to be seriously considered to remain competitive.







Market Research

In the words of GE's Jack Welch, "If you can't compete - don't."

When General Electric determined they could no longer compete in the home appliance market (which they dominated for over half a century) they decided to get out of the business and more effectively apply their resources to other products in other markets.

A comprehensive and professional Market Research Report can be a valuable decision-making tool before and after marketing your products. It enables one to measure, validate, and if required, modify the Marketing Plan based on what has been discovered.

LET US DO THE RESEARCH AND PROVIDE YOU WITH THE FACTS

Competitive Analysis / Who's Who?

Accurate Pricing

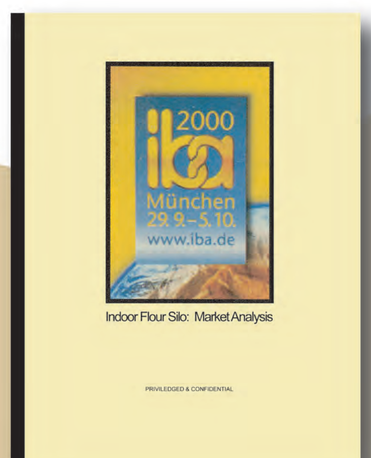
Estimated Cost Analysis

Target Customer / Market Niche

Customer Profile / Wants & Needs

Patent Search

Customer Feedback / Focus Groups



Marketing

A new product is the culmination of an idea. In order to sell the product, it needs to be persuasively sold. A shy product rarely succeeds, no matter how great the idea or how perfectly it satisfies a need.

STEPS TO FORMALIZE A MARKETING STRATEGY

Update & Finalize "Product Launch Plan"

Formulate a Media Plan (including Press Releases & Customer Application Articles)

Document & Prepare Case Studies on the Initial Customer Applications / Installations

Establish a Schedule to Gather Feedback from Customer/Industry Trade Associations

Provide Customer Testimonials

STEPS TO DESIGN & PRODUCE MARKETING MATERIALS

Product Logo Design

Professional Photography (including Beauty Shots & Cutaways)

Detailed Product Sales Brochure

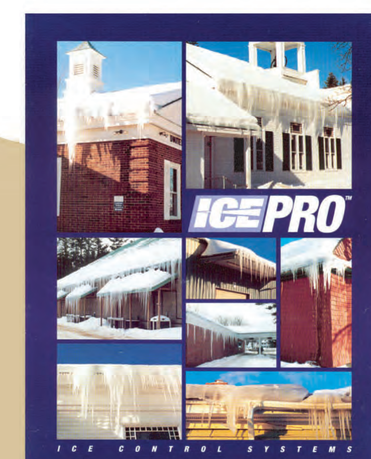
Product Spec Sheets & Operating Manuals

Web Site Design (Informational and/or E-Commerce)

Power Point Sales Presentations

Video / DVD Presentations (including Professional Production & Replication)

CD / DVD Animation & Product Modeling Presentations



Patents & Trademarks

PATENT PREPARATION & FILING

In 1996, as a result of the Gatt Treaty passing Congress, the patent laws were changed to allow inventors a year from the date of their first "provisional" application more time to study, test, and practice their inventions before a formal patent application is required. To enter into the patent process, we will provide text, drawings, and directions for filing your first "provisional" application. With the first "provisional" legally in place, we will then focus on updating the modifications that take place during the first year by adding the new information to the formal application. The application is completed by adding the claims and paying the filing fees.

In addition to filing approximately 65 patent applications, my experience in both patent litigation and patent prosecution has provided me with considerable knowledge and special insight into the realities of Patent Law and the proper licensing of Patents & Trademarks.

TRADEMARKS / DOMAIN NAMES

As part of our normal routine for filing and updating patents, we also have the capacity and skill to 1) perform trademark searches and registrations, and 2) source and manage domain names.

VENDOR, CONFIDENTIALITY & PATENT LICENSE AGREEMENTS

In protecting your invention as you move forward to commercialize it, we will provide the necessary confidentiality agreements to cover most business situations.

Funding / Raising Capital

INNOVATION & "START-UPS"

Early in my career as an inventor/entrepreneur, I realized that it would be unfortunate (after working on a project for a year or two) to run out of money right before the finish line. The reality is that funding (money) is easily available; being prepared with a solid Business Plan, knowing where to look and how to ask for it are key. Chances are excellent that if you have a compelling story and an inventive idea for a product that fills a need, we can help you find the funding to commercialize it.

LET US ASSIST YOU IN FINDING INVESTORS / CAPITAL

Business Plans

Venture Capital

Joint Ventures

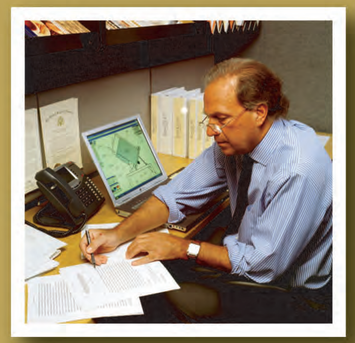
State & Federal Grants

Trade Credit

Vendor Solicitation

"Angel Investors"

Patent & Trademark Licensing



Engineering / Product Finishing Work

ENGINEERING
In addition to providing a reliable, competitively priced product, it is equally important (because of the real potential for litigation) that your product is engineered safely, reliably and in compliance with legal and industry standards.

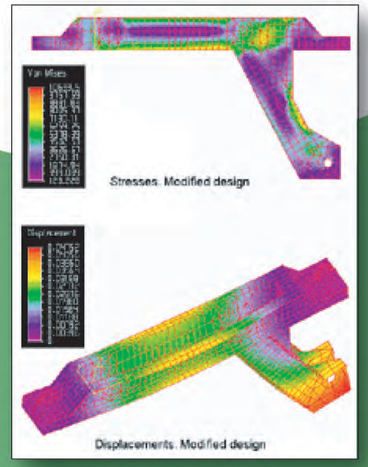
ELECTRICAL / CONTROLS
Almost any type of NEMA-rated control system can be made suitable for testing. The final design must have the proper NEMA rating and the UL Labs seal of approval rating to be marketed as a consumer product.

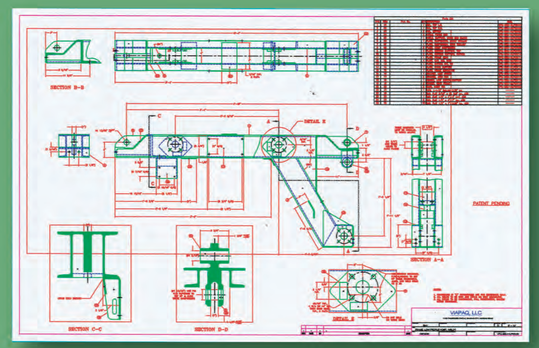
ERGONOMICS
Work place injuries (such a carpal tunnel syndrome, repetitive motion and back injuries) have become problematic, creating expenses for many manufacturing companies. Special consideration should be given to the study and practice of ergonomics in the production process.

USER-FRIENDLY FEATURES
Because CAD software modeling cannot actually interface with the piece of equipment being developed, it is during the "hands-on" testing stage where modifications are best made to improve "operator interface" and issues of maintenance / replacement parts.

COATINGS / FINISH
To ensure the longevity and intended life span of a product, careful consideration must be given to the type of coating(s) and materials of construction of a product.

OWNER / OPERATING MANUALS
As part of the product finishing stage, we can provide all of the necessary operating and safety manuals, MSDS sheets, the inclusion of foreign language definitions/descriptions, electrical requirements, and warning or hazard labels and descriptions which may be required.





Problem Solving & Special Projects

LET US HELP YOU SOLVE YOUR PROBLEM, THAT'S WHAT WE DO

Sometimes solutions to problems are considered as genius, "thinking out of the box" or even "dumb luck." The most important part of solving a problem is in the diagnosis and then imagination takes over and if enough passion and skill are applied - the solution can often times be a masterpiece.

WE CAN PROVIDE A FRESH AND OBJECTIVE LOOK AT THE ISSUES

On-Site Inspection & Diagnosis

Reevaluate & Validate Diagnosis with Internal & External Feedback / Review

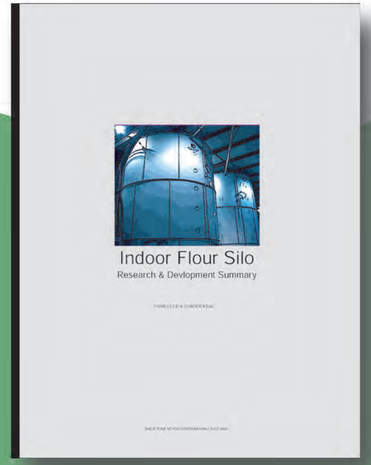
Preliminary Solutions / Concepts

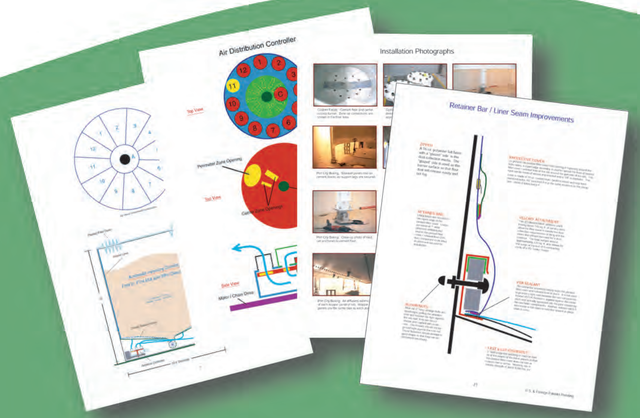
Working Prototypes / Testing

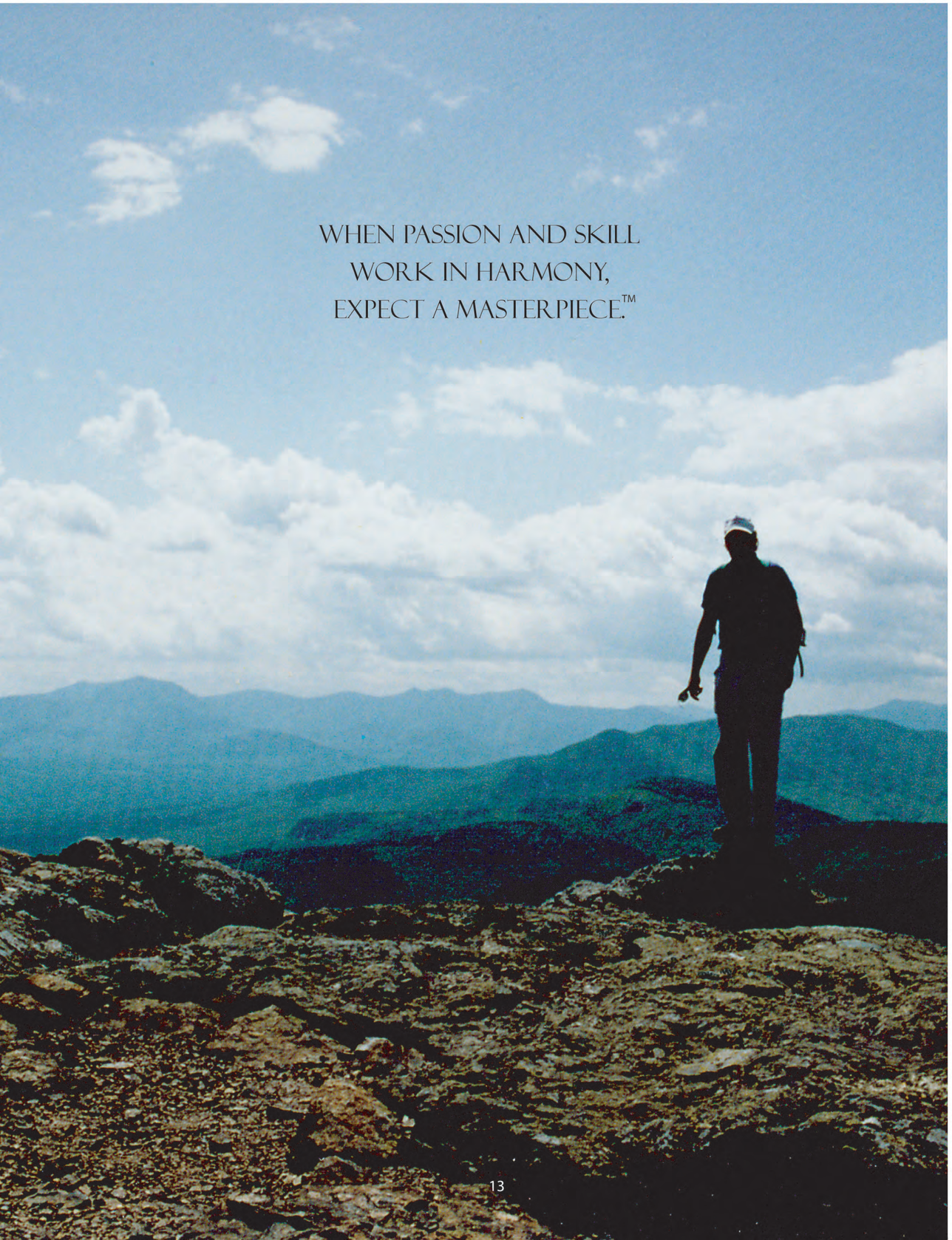
Project Outline / Installation & Start-Up

Detailed Budget & Time Line

Cost / Benefit Analysis





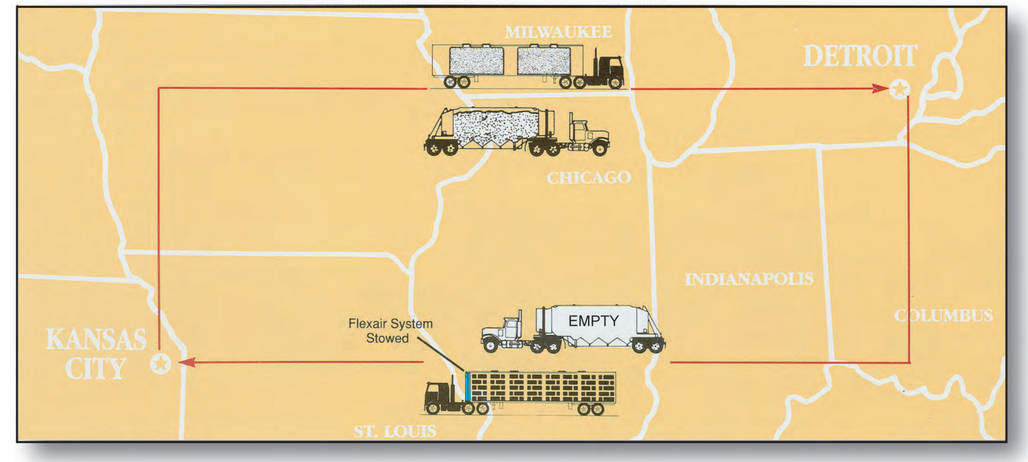


Flexair™

BULK TRANSPORT SYSTEM

ELIMINATES EMPTY BACK HAULS

PERMITS THE HAULING OF GENERAL CARGO
AND / OR BULK IN THE SAME TRAILER



Product Description

The Flexair Bulk Transport System provides a practical solution for eliminating empty back hauls (typically costing from $300 to $1,500) in bulk trailers serving the process industry. When stowed in the ceiling (taking up less than 10" of space) of a trailer, container or rail car, it allows the same compartment to haul a full return load of general cargo. When required to haul bulk, the operator simply lowers the bulk units from the ceiling to haul a full, legal load of 45,000 pounds of bulk material.

The Opportunity

I initially became aware of the "empty back haul" problem while growing up in my family's business - U.S. Sugar. With literally dozens of bulk tankers running empty every week, any reasonable solution could result in substantial freight savings. In 1980, I resigned as VP of Manufacturing of the business and began working on a solution. The Flexair System is basically the next generation of technology based on the All-Flow System I invented in 1982. Major improvements include a much simpler, lighter and less expensive frame system and the adaptability of using very inexpensive and disposable liners. The price of the liners required for each load is slightly more than the same as the cost for a tanker washing.

My Role / Funding

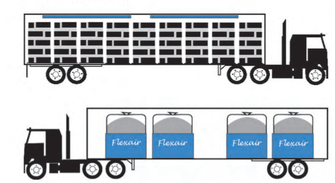
Inventor / developer of the Flexair System - financed through personal savings.

What I Learned / Highlights

First and foremost, patents are everything, and secondly, a strong trademark will help establish a brand in the marketplace. About two years after I began working on this concept (originally trademarked as All-Flow), I found myself at a podium at Harvard explaining it to a large group of Food Company CEO's. Shortly thereafter, the marketing rights to the All-Flow System were licensed to Fruehauf Corporation (the largest trailer manufacturer in the U.S. at that time). Today, the Flexair Technology is the subject of a new group of patents and ready for licensing.

WHY PAY ROUND TRIP RATES IF YOU ARE ONLY GOING HALF-WAY?

As shown in the illustration above, a supplier of resin located in Kansas City, makes four (4) bulk deliveries per week to a customer in Detroit. With a distance of 775 miles between the two cities, the "empty back haul" mileage amounts to 3,100 miles per week. With bulk freight rates averaging $2.45 per mile, the empty back hauls cost is $3,797.50 per week or $197,470 annually.

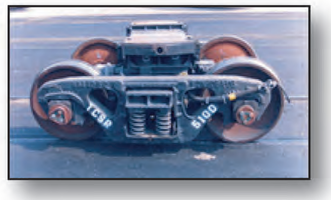


PATENTS PENDING

RoadRailer®

Product Description
RoadRailer is a state-of the-art transportation system that delivers the combined benefits of highway flexibility and rail efficiency. It's a unique, lightweight, dual-mode trailer that's equally effective arriving at a loading dock on tires or riding on train rails.

The Opportunity
In considering the tremendous amount of tractors and trailers on our highways today and the fuel requirement, one could question whether there was a more efficient way to transport them. The RoadRailer System enables one locomotive to do the same work as 100 over-the-road tractors. The savings in fuel and highway wear and tear is significant.



My Role
As the inventor of the All-Flow Technology (which enables any freight vehicle to haul both bulk and general cargo) a Patent License was granted to RoadRailer Systems (then referred to as RailMaster) in consideration for 50% ownership of the company.

Funding
Inventing a railroad car and testing it on the open rails is obviously complicated and costly. But because the technology offered significant savings in fuel, the New York State Department of Energy provided a grant of $1M. In addition to the grant, private funds were loaned to the effort, as well as the involvement of several railroad equipment manufacturers such as Lier-Sigler, Fruehauf, Morrison-Knudson, and American Brake and Dresser Industries, who supplied their engineering, equipment and expertise.

Summary
I learned that when developing technology capable of changing an entire industry, it was critical to involve the leading players from the start. Their experience, contacts and support was key to a relatively quick, efficient and successful research and development effort.

Customers
The RoadRailer System has been adapted by many freight and railroad companies throughout the United States and is now in use in Thailand, China, Europe and South America. (RoadRailer is a trademark of Wabash National)

ProSack®

Product Description
ProSack is the trademarked name for one of my client's bulk bag unloader. Bulk bags were introduced into the process industry in the late 1960's as a more cost effective method of shipping and handling granular / powder materials than using 50 and 100 lbs. bags. Daily there are millions of bulk bags in use around the world for handling chemicals, food, resins, plastics fertilizers, pharmaceuticals, cement and anything that is in a powder or granular form.

The Opportunity
With more than 20 manufacturers of bulk-bag unloading systems already on the market and an increasing demand, I developed for my client an unloading system that delivered greater value through price and performance in order to successfully compete. The challenge was to: 1) further simplify an already simple process, 2) reduce the manufacturing cost, 3) decrease the footprint (floor / isle space) requirements, 4) reduce the profile for low overhead applications, and 5) add more value than the competition.

My Role / Funding
I was contracted to design, engineer, build, patent (and trademark) and design the logo for the product as well as provide installation and "on-site" start-up supervision for the first two dozen units sold. Funding was provided by my client.

What I Learned / Highlights
With over 100 patents already issued for bulk bag unloader designs, I realized early on that some type of patent infringement of the new design would be difficult to avoid. However, after examining the purpose and actual use of the equipment, I found that most of the manufacturers had missed the mark on what the customer really wanted. As a result of my research, I was able to design a new unloader with simpler and fewer components. I am pleased to report that all of the claims on the international patent (PCT) have been allowed and the design is free from infringing on anyone else's patent.

Customers in Year 1

Gorton's Seafood	**Krispy Kreme**	**Smucker's**
M&M Mars	**McDonald's**	**MapleHusrt**
Kellogg's	**Folger's Coffee**	**Bama Foods**

U.S. & Foreign Patents Pending

ZoneFlo *AIR DISC*

Product Description

The ZoneFlo Air Disc is a device that is placed on the bottom of a silo to facilitate the discharging of fine powders, such as flour and starch. As high-volume, compressed air is forced through a tightly woven, heavy-duty membrane on the Air Disc, the material (flour) in it takes on a virtual liquid state - allowing it to flow almost like water for efficient discharge.

The Opportunity

The existing Air Disc design (approx. 35 years old) was expensive to manufacture, required constant maintenance, and typically failed within the first few years of use. By taking a fresh look at the method of its operation and the manufacturing process, I was optimistic that improvements could be made to lower the cost of manufacturing while improving function and performance. The R&D process took on the following steps:

1.) Gain a thorough understanding of the Air Disc's function and intended use.
2.) Review the reasons for each component and the method of its manufacture.
3.) Carefully review and inspect the amount of labor (and Why) involved in building a unit.
4.) Calculate the number of individual manufacturing operations, such as drilling, welding and grinding.

800 Welding & Grinding Procedures and ***70 Holes*** have been ***Eliminated.***

My Role / Funding

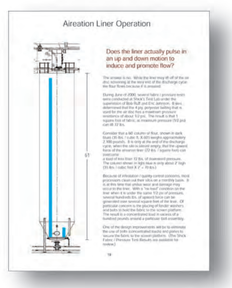
I was contracted to design, build, test, install and patent the product as well as to provide installation and "on-site" start-up supervision for the first few units sold.

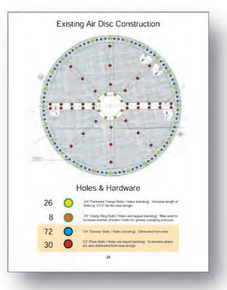
What I Learned / Highlights

Talking with in-house experts and customers proved to be invaluable for developing an accurate diagnosis of the problems to be solved. As a result, after months of testing, the new design is about 50% less expensive to build and all initial units have remained maintenance and problem free since 2001.

Customers

Rich Products	**Keebler**	**Newlywed Foods**
Papa John's Pizza	**Sara Lee**	**Gorton's**
Krispy Kreme	**Nabisco**	**Warner-Lambert**
Mrs. Smith's Pies	**Pfizer**	**McDonald's**
Hostess	**Kellogg's**	**Con Agra, etc...**





PATENT PENDING

ICE PRO 4™

Product Description

Ice-Pro is a flexible, waterproof and inflatable bladder that fits along the lower section of a roof. As ice and snow build up on the roof, forming an ice dam, the system is inflated - removing the ice and snow instantly. The roof stays clear of ice dams and the structure remains free from interior and exterior water damage.

The Opportunity

One day while living in North Conway, NH, I noticed a mother and her young child leaving a store when a large chunk of ice fell from the roof almost hitting them. Later, I read an article in USA Today stating that the cost of ice and snow damage from that winter's storms amounted to more than $2B (billion) in insurance claims. Based on these two events, I realized that a viable solution to safely remove ice and snow would have significant acceptance and financial success.

My Role / Funding

As the sole inventor / owner, the R&D effort and business start-up (Tuckerman Research, LLC) was financed with personal funds. Tuckerman Research, LLC sold, manufactured, installed and guaranteed the first 50 systems to be sure the product was free from any design and manufacturing defects and was indeed "market ready."

What I Learned / Highlights

What I enjoy most is solving problems, and Ice-Pro solves a very common and costly problem. It is sold based on its value and not its cost.

Customers

The product has been on the market since 1997 and is in use in most Snow Belt areas of the United States.

For more information, please visit: www.icepro4.com

SideFlo Bulk Bag System

Used for Dupont's Manzate *Fungicide* for the Banana Industry.

PRODUCT DESCRIPTION

In 1993, I developed a new type of bulk bag and unloading system that did not require overhead lifting. This new type of bulk bag (SideFlo) remains on a pallet from filling to unloading. Its contents are discharged through a large spout opening out the side rather than through a small spout on the bottom. To completely empty the bag of its contents, the bag can be tilted via the use of a dump style unloader platform or by use of an inflatable liner inside the bag.

THE OPPORTUNITY

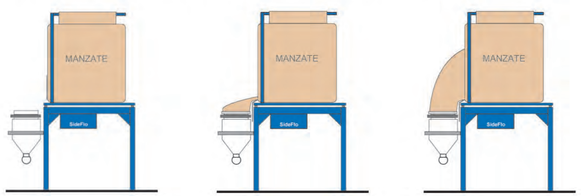
One of the more exciting aspects of this project / business was that this product fit the "razor and razor blade" business model. Once a customer purchased and installed our patented unloading equipment, they were committed to buying our bulk bags on a long term basis. Typical orders from DuPont were placed on a quarterly basis that consisted of 1,000 bags. Our vendor in Istanbul handled the shipping and billing process for us, minimizing our role of fullfilment.

MY ROLE / FUNDING

I spent about 15 months designing and making bags different sizes and styles of bags as well as three different types of unloading systems. Also, during this time, I wrote and filed several patent applications to protect the bag and unloader designs - all of which were granted. This project was funded from personal savings and royalty income from other products. With an 80% profit margin on the bags (with unlimited reorders), I was able to raise $1.8 in venture capital.

Highlights

My belief in th epatent process was further bolstered by the high profit margins and the ease in using contract manufacturing. Other customers include Ford, FMC, Proctor & Gamble, Pillsbury, etc...



The SideFlo Bulk Bag System consists of the bulk bag (2,000 lbs. capacity) and the unloader platform to accurately dispense the contents of the bag. For DuPont's "Manzate" application, the unloader was equipped with a scale, slurry mixing tank and automatic iris valves for controlling the amount of Manzate dispensed into the slurry hopper. Once the Manzate and water were mixed in the slurry tank on the unloader, it was then pumped to holding tanks. From the holding tanks, the slurry mixture was then pumped onto planes and helicopters for spraying the bananas.

All-Flow / Flexair Bulk Storage Systems

Product Description

By design, bulk storage silos for handling and storing dry granular and powder materials are limited to being tall and narrow with a cone bottom. As a result, they generally require heavy foundations to support the concentrated load around the cone or hopper bottom. In addition to the flow and discharge problems caused by the cone design, storing materials outside such as sugar, salt, plastics, chemicals, flour, etc... creates further flow and discharge issues because they are subject to temperature changes and high humidity.

The need for a low profile, flat bottom bulk storage silo (similar to a liquid tank) for handling poor flowing materials like sugar had existed in the grain and process industries for decades. One example is the use of sugar in Marlboro Cigarettes (Phillip Morris) as one of the main flavor ingredients. With the high humidity in Richmond, VA at Marlboro's main production facility, they wanted to keep the sugar inside and under climate control. As a result, they have been operating two (2) - 150,000 pound Flexair sugar silos since 1985.

The Opportunity

While in the position of Vice President of Manufacturing of U.S. Sugar (1980), I was involved in the design and building of a new production facility that would handle up to 1,000,000 pounds of sugar / day for our grocery sugar packaging operations. After considering all of the available silo designs, nothing met our requirements and as a result, I began searching for other ways to satisfy our bulk storage requirements. I began building scale models of a flat bottom / low profile design silo that utilized an "inflatable liner" to 1) guarantee an uninterrupted flow and 2) to completely discharge the contents.

My Role / Funding

As soon as the concept showed some promise during the initial testing, I resigned my position with U.S. Sugar and co-founded All-Flow, Inc with my father (owner of U.S. Sugar).

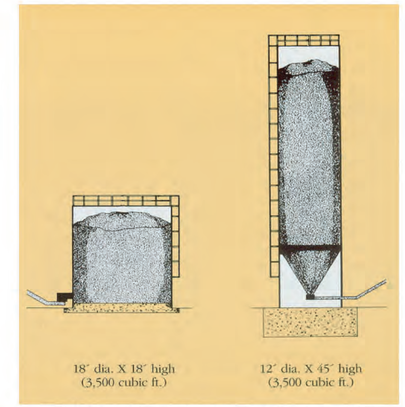
What I Learned / Highlights

I started out in a small $350 month industrial space and built several full-scale test silos using corrugated grain silos. I quickly learned that R & D is all about failure and learning new information. It took about a year to get the test units functional. In the process I was granted 8 patents and the resulting technology was licensed to five other companies.

Customers

Nestle	**Nabisco**	**Norton Plastics**
Hammermill Paper	**DuPont**	**US Gypsum**
McDonald's	**J.M. Huber**	**Chocolate Products**
Alpo Pet Foods	**Phillip Morris**	**A & R Pet Foods**
Spangler's	**Cascade**	**Erica Products**
Domino's Pizza	**Papa John's**	**Bruegger's Bagels**

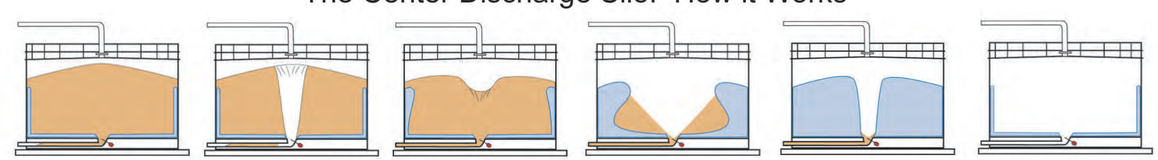
Tim Bonerb on-site during the installation of two (2) 150,000 lbs. sugar silos for Phillip Morris (Marlboro)



ALL-FLOW / FLEXAIR VS. CONVENTIONAL

Flour Installation at Mr. Goodcents / Quizno's

The Center Discharge Silo: How it Works



1.) The center-discharge silo can be designed wide and low for maximum capacity indoors.

2.) Even if a bridge or rat-hole forms, the probes senses an interruption in flow and inflates the liner - collapsing the bridge.

3.) The liner stops inflating once the probe is satisfied as flow is restored.

4.) Inflation of liner continues to discharge the material once gravity flow ends.

5.) The liner continues to inflate until the silo is 99% empty.

6.) At the end of the inflation, the liner deflates automatically for the next bulk shipment.

Camp'n See

PRODUCT DESCRIPTION

Camp'n See is a collapsible platform that can be attached to the roof of almost and type and size of vehicle. After set up, which takes less than five minutes, you have 100 sq. ft of general living space.

THE OPPORTUNITY

In 2007, after developing six new products in six years, I returned to Hawaii to take a break for a year. Within a few weeks of being back, I ventured up to the North Shore and picked a day when the surf was relatively small and headed out to the break. A few hours later, I paddled back to shore and was so exhausted that I decided to throw some towels on top of my SUV and take a nap for an hour or two. When I woke up the next morning and looked out over the ocean from the roof of my car, I thought it was interesting how just being 6' up from the ground provided such a unique view. Later that week, I found a remote beach on the North Shore to set up shop and I began building the first prototype. The most important part of inventing is to get started, do the best you can with the resources you have.

After building two prototypes (out of wood) on the beach, I returned back to my shop on the mainland and built an all aluminum prototype.

MY ROLE / FUNDING

I funded the entire project out of savings and other royalty income. A special thanks goes out the Haleiwa Police Department for helping lift the prototypes on and off my SUV as was I was testing the design.

WHAT I LEARNED / HIGHLIGHTS

If I had spent the time and money to search for shop space (and then equip it with tools and supplies), I would have missed out on a great experience. My mantra to "just get started and do the best you can with the resources you have" got me right to work. My shop on Kaena Point (below) worked out fine.

Conversion takes less than five minutes.
See the video at www.campnsee.com

Quetas is a New Solution for Emptying Grain Silos

Emptying Grain Silos Is A Dangerous and Expensive Business

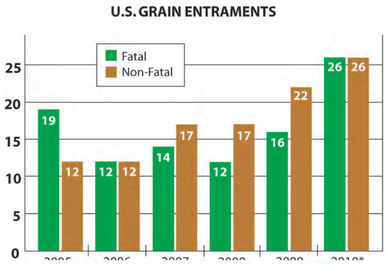
Most new grain silo installations around the world include a sweep auger unloading system to remove the grain left after gravity discharge is complete. However, the vast majority of existing grain silos require workers to enter the silos and use shovels and other dangerous methods / devices to empty the remaining grain. This procedure is known worldwide as "cell sweeping." Photo at right is a Cargill Grain Elevator in Kansas that I visited in preparation to install Quetas Systems. Quetas (pronounced "qway-tes") would provide a simple and cost effective solution for all 188 silos.

OSHA Sets Stricter Grain Silo Regulations In 2010

A Purdue University report showed 52 grain bin accidents last year, up 38% in 2009 and the most since tracking began in 1978 - 26 people died and five of them were children under age 16. The previous record for grain bin accidents was 42 in 1993.

The accidents prompted the Occupational Safety and Health Administration to send letters to 10,000 grain bin operators across the U.S. telling them they are responsible for preventing the deaths of their workers in grain silos.

"Too many people have been killed. Too many children have been killed," said David Michaels, assistant secretary of labor for OSHA. "It doesn't make a difference the size of the operation, the risk is serious."



*2010 figure is through November 2010 only.

Source: Purdue University

Quetās: A New Technology For Storing, Handling And Discharging Grain

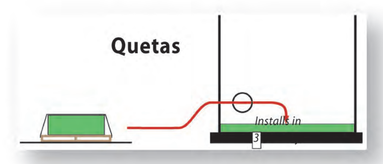
What began as an R & D Project for a grain company in Australia in 2008 actually ended in a failed attempt to use a "side-discharge" inflatable liner system. Although the liner system showed promise (see video at www.quetas.com) , it proved to be too expensive and too sophisticated for the application. However, six months after the project ended in Australia in 2009, a new R&D effort began to develop a solution to the "cell sweep" problem.

During the early stages of the R & D program to develop the Quetas System in 2009, an international patent search was conducted and it revealed that there was no relevant prior art on the invention and technology. As a result, the Quetas development work continued to completion with the initial patent applications being filed. Having grown up in his family's food business (U.S. Sugar Co.), I have been developing bulk storage and material handling systems for more than thirty (30) years and have been granted over thirty-five (35) patents in this field. Visit www.timbonerb.com to learn more about my inventions / achievements.

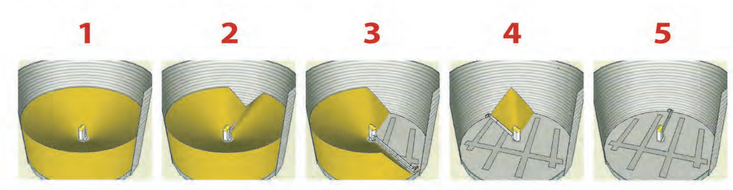
At the current time, the Quetas Technology will remain confidential while the business aspects (partnerships, licensing and other commercialization strategies) are investigated. However, we welcome interested parties to contact us and we will be pleased to disclose information on the Quetas products and technology via a Confidentiality Agreement. U.S. & Foreign Patents Pending

Fits Any Size, Any Configuration & Any Location

The average installation time to retrofit an existing 30' diameter grain silo is about 75 man hours. The Quetas System is easily installed on any floor surface - even directly on the ground. Also, no modifications are required to the silo - in fact, the Quetas System can be placed in the silo through the existing man-way opening.
After spending more than two months on-site at a grain elevator in Australia, a practical understanding was gained about the grain industry and it's strict "confined space" and other safety regulations. The Quetas System was partially born from the experience. As shown in the photographs to the right, Quetas can easily be installed in existing concrete silos, corrugated farm silos, in existing water and liquid storage tanks.



In addition to handling grain, Quetas can also effectively discharge cement, minerals, clay, salt sugar, coal and most other dry bulk materials.



Liquid Bulk Transport System

Project Description

I had always wanted to develop a product for transporting bulk liquids like I had for dry bulk materials several decades ago. My All-Flow Bulk Transport System, (see page 14) which I developed in the 1980's became the subject of several Harvard case studies and was eventually licensed to Fruehauf in 1985. Shipping liquids in bulk via bulk tanker trailers proves to be very expensive and wasteful mainly because the trailer is loaded only one way. On the return trip it is often empty and requires extensive cleaning at a certified truck washing facility to prevent contaminating the next shipment. In the trucking business this is know as "dead-heading."

The Opportunity

My thirty years of experience in the process industry and knowledge of methods to haul and discharge bulk materials in conventional van trailers made the development of this product relatively easy. Within a few weeks I produced an innovative and cost effective design and built a 1/4 scale working prototype of the liquid bulk system.

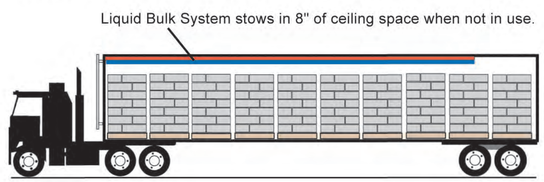
My Role / Funding

My investment of time and money was minimal, mainly due to the extent of my expertise in the field. The prototype and patent application were completed in about two months.

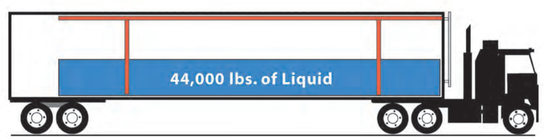
What I Learned / Highlights

One of the most important lessons I have learned in thirty years is the business model can sometimes be as or more important than the product itself. The Liquid Bulk System will be leased on a yearly basis without a buy out and the disposable, single poly liners will provide the business long term revenue. The savings in reducing "dead-head" miles and the elimination of tank washing will easily offset the cost of the liners.

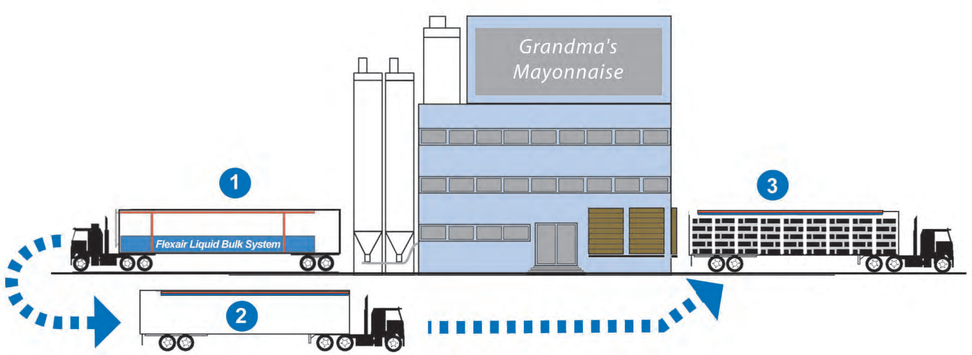
Construction in progress of a working, 1/4 scale prototype



Conversion from Cargo to Bulk Mode takes 10 minutes



How The Liquid Bulk System Works



1.) A full legal load of 44,000 pounds of bulk vegetable oil is delivered via a Flexair Liquid Van Trailer and is unloaded into one of the storage tanks inside the facility. 2.) Once the bulk unit is emptied, the operator simply moves the Flexair Trailer back into the ceiling. 3.) Now, the driver just pulls around to the front loading dock and picks up a load of finished, palletized product. Bulk vegetable oil in the front door and salad dressings and mayonnaise out the back door. As the Liquid Bulk Trailer continues in service, from job to job, its' ability to generate income is significantly increased. It is now capable of hauling virtually any type of liquid bulk or general cargo shipments.

Ice • Snow • Leaves

Self-Cleaning Gutter™

Product Description

The new Self-Cleaning Gutter system utilizes an inflatable and waterproof membrane, which is secured in the gutter as well as over several layers of shingles. With the press of a button, as the membrane inflates, ice, snow and leaves are removed in seconds. Patent Pending

Eliminates Costly and Dangerous Maintenance Work
Reduces Risk of Personal Injury and Property Damage from Falling Ice
Waterproof Membrane Prevents Ice and Water Damage
Keeps Entryways Safe and Dry

The Opportunity

IcePro was developed in 1995; throughout the years I came to realize that while the product was very effective in removing ice and snow from roofs, it did not stop the dripping that lands on walkways below and refreezes. The new gutter system does all of the above and also stops the dripping which make entryways and walkways unsafe and in need of regular maintenance and salting.

My Role / Funding

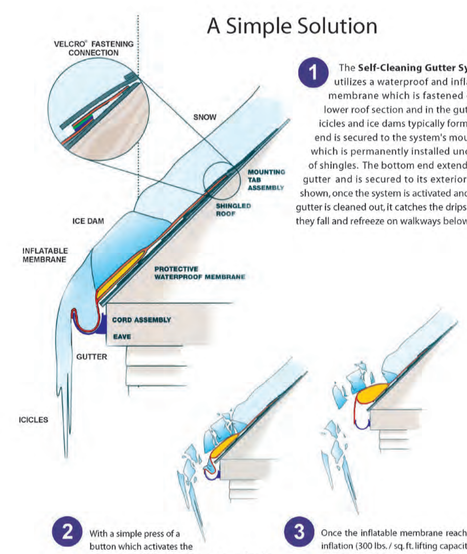
Although the technology is similar to IcePro4, the development of the Self-Cleaning Gutter was completed during the winter of 2013 to 2014.

Highlights

It is a safe, simple and cost effective solution to eliminating ice dams and icicles from forming on buildings. See the video at: selfcleaninggutter.com

Self-Cleaning Gutter™

A Simple Solution



1 The **Self-Cleaning Gutter System** utilizes a waterproof and inflatable membrane which is fastened over the lower roof section and in the gutter where icicles and ice dams typically form. The top end is secured to the system's mounting tab which is permanently installed under a row of shingles. The bottom end extends into the gutter and is secured to its exterior side. As shown, once the system is activated and the gutter is cleaned out, it catches the drips before they fall and refreeze on walkways below.

2 With a simple press of a button which activates the system's small blower, the ice and snow breaks away from the smooth and curved surface of the membrane as it expands.

3 Once the inflatable membrane reaches full inflation (300 lbs./ sq. ft. lifting capacity), the blower is turned off and the membrane automatically resumes its position in the gutter.

5

Benefits

Reduces Costly and Dangerous Maintenance Work
Put away your ladders, picks, axes and shovels and let your maintenance crew sleep in late this winter. The new Self-Cleaning Gutter System enables a property manager or homeowner to stay one step ahead of Mother Nature. Whether the system is operated once every morning or only when needed, ice and snow removal from your roof and gutters can be performed safely, quickly and without any damage to your roof.

Reduces Risk of Personal Injury from Falling Ice
No longer will chance determine when icicles will fall over your doorways or walkways. It's just so simple. With a press of a button - icicles, ice dams, snow (and leaves) are removed from your gutters in seconds. There's no waiting, no melting involved - ice is removed exactly when you want.

Reduces Risk of Personal Injury from Slippery Walkways
As soon as snow and ice accumulate on the lower roof and in the gutters over an entryway or driveway, the ice and snow can be removed quickly and then shoveled away. Put simply, when there is an absence of snow and ice in the gutter (Self-Cleaning Gutter), there isn't any dripping that can refreeze on walkways below.

Waterproof Membrane Prevents Ice & Water Damage
In addition to breaking up and removing ice and snow from the roof, the waterproof membrane keeps the lower roof, eave and gutter dry and protected all year.

Testimonials

- *"For the first time in 14 years, I felt confident that I no longer had to "fear" ice and water on my roof all winter. IcePro has allowed me to breath a sigh of relief and kept me off of my roof. David P. / Alden, NY*
- *"We had a blizzard. It worked perfectly dumping the snow and ice off." Pat D. / Baldwinsville, NY*
- *"Before we purchased IcePro, our gutter drains would plug up, causing ice to form on our gutters. It would eventually grow big enough to bond back on the exterior of the house, causing damage. After we bought IcePro, we have not had a problem, and this has saved us a lot in repairs!!! We are very happy to see someone stand behind their product!" Jim & Susan H. / Cheektowaga, NY*
- *"It works just as shown in the video, the ice breaks up and comes right off the roof." Nancy P. / Traverse City, MI*

6

Australia - Grain Silo R & D Project

Project Description

In the summer of 2008, I was contacted ABB Grain Ltd. in Australia. They were interested in finding a method for emptying their "flat bottom" grain silos after gravity discharge was complete, leaving 120 tons of grain remaining on the bottom. After a patent search on using inflatable liners to move bulk materials in silos, they found eight of my patents on the subject.

The Opportunity

I traveled to Australia to work on this application for ABB Grain as an R & D project. They are the largest grain company in Australia, exporting their crops worldwide, with more than a thousand silo installations spread across the country.

My first task was to find out if an inflatable liner could function to move 120 tons of wheat using only 1 PSI of air pressure in one of their 30' diameter silos. After calculating the layout and design of the liner system, the next step was to build a working scale model. Video of the scale model test was provided to ABB, which gave them the assurance to move forward with the project.

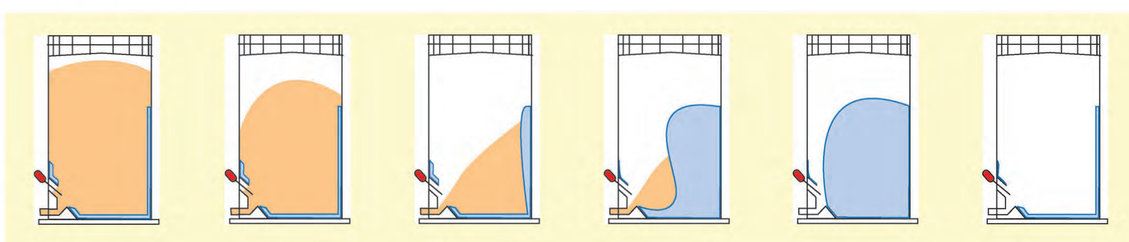
In addition to being the inventor of the liner system, I was the sole fabricator and used a special "RF" sealing machine (similar to microwave energy). The liner was shipped to ABB where it was installed and proved partially successful. Even though I knew from my experience and calculations that it would work, it was hard to comprehend that 1 PSI could discharge 120 tons of wheat.

My Role / Funding

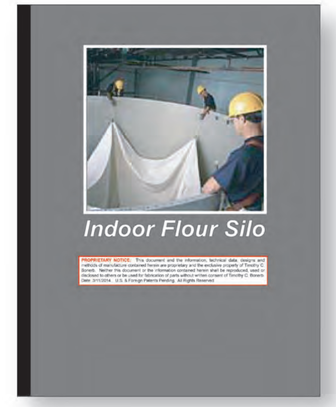
As part of our agreement, I owned all patents and designs and would be the exclusive supplier of the product. ABB underwrote the project and my fees; the total budget was $150,000.

What I Learned

For most of my life I believed the major market for the inflatable liner system was in the process industry. This experience quickly taught me that in addition to using the liner system in new grain silo applications, the biggest market is actually in retrofitting the existing grain silos which number in the hundreds of thousands - worldwide.



Product Development Projects from Start to Finish



25 PAGE DOCUMENT - DEVELOPMENT OF THE PROSACK UNLOADER
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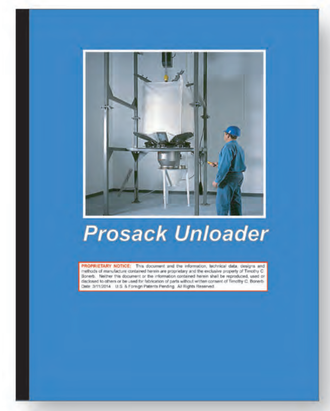

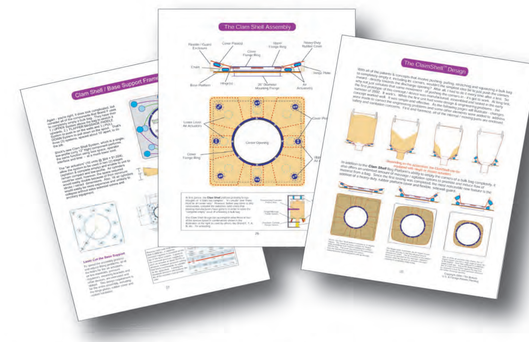

57 PAGE DOCUMENT - DEVELOPMENT OF THE INDOOR FLOUR SILO
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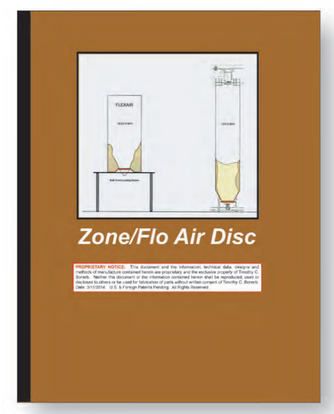
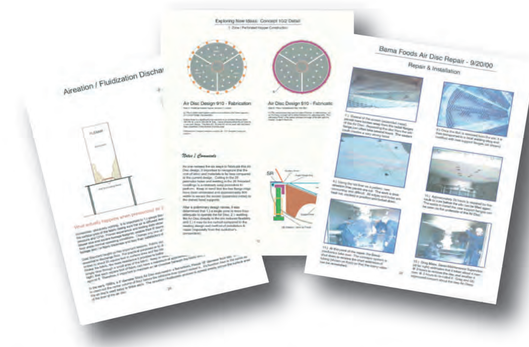
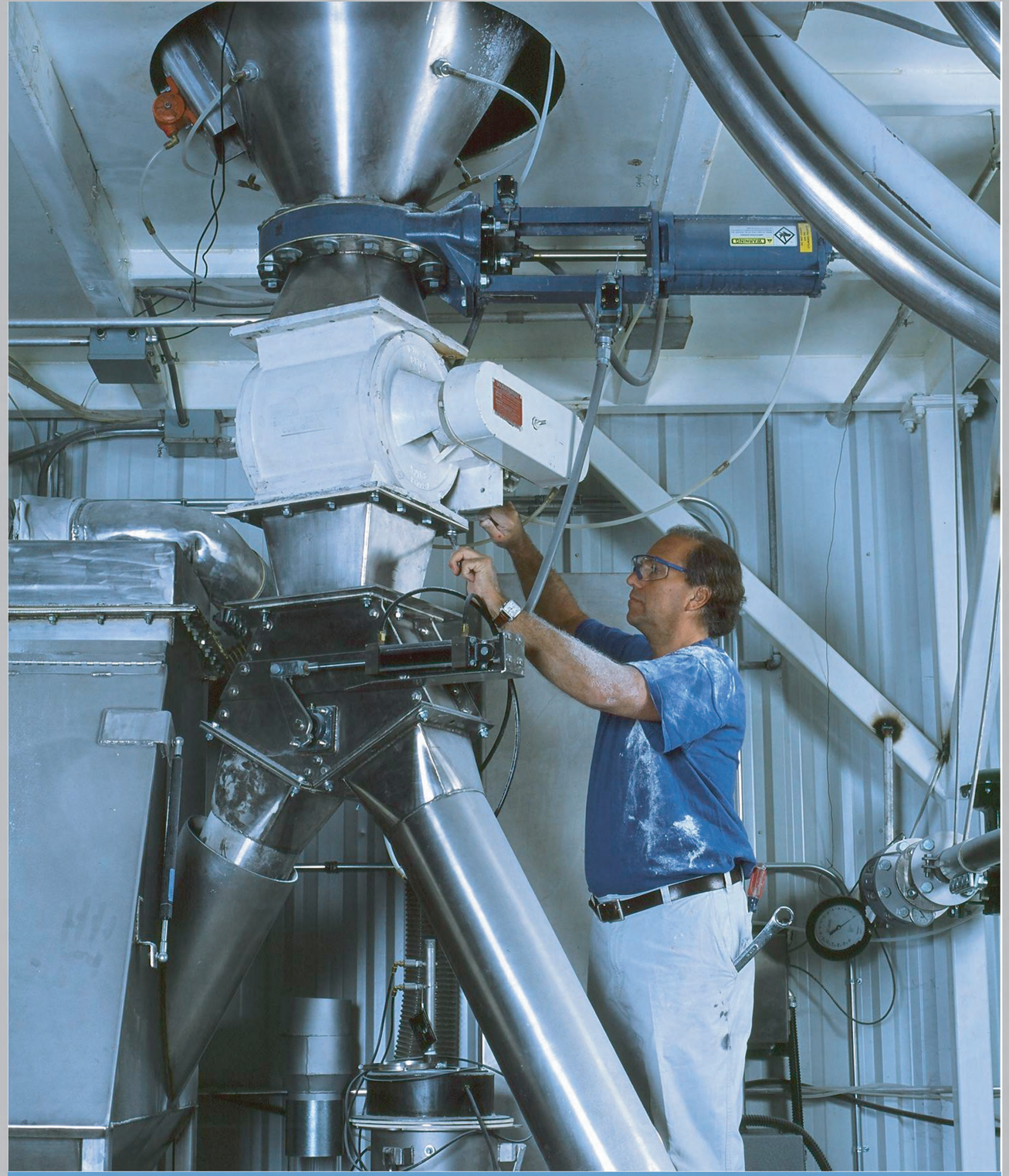




33 PAGE DOCUMENT - DEVELOPMENT OF THE ZONE/FLO AIR DISC
Go To: http://the-knowing-is-in-the-doing.com/uploads/Air_Disc_Report.pdf.



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