

GLOVE SAVER  
A BUSINESS PLAN

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of  
California State University, Stanislaus

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of the Requirements for the Degree  
of Master of Business Administration

By  
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CERTIFICATION OF APPROVAL

GLOVE SAVER

A BUSINESS PLAN

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## DEDICATION

The penultimate dedication of this project belongs to my father, who passed from this life into the next during my time in this program. He will always be remembered for his appreciation of excellence and higher education. Ultimately, this project is dedicated to my loving partner, Kristin. Without her, this would not have been possible. My wife, my rock, my keel during the storm of profound loss.

## ACKNOWLEDGEMENTS

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## TABLE OF CONTENTS

	PAGE
Dedication .....	iv
Acknowledgements.....	v
List of Tables .....	vii
List of Figures .....	viii
Abstract.....	ix
CHAPTER	
I. Introduction and Background .....	1
History and Current State.....	2
The Problem.....	2
Product Goals and Objectives.....	2
II. Product Overview .....	3
Product Description .....	3
Proof of Concept.....	6
Market Strategy.....	6
Competition.....	7
Manufacturing.....	7
Initial Investment .....	8
Organization and Location.....	8
III. Financial Evaluation .....	10
Consumer Incentive .....	10
Return on Investment.....	11
IV. Implementation Plan .....	13
Patent Search.....	13
V. Conclusion .....	15
References.....	17

## LIST OF TABLES

TABLE	PAGE
1. Initial Capital Investment.....	8
2. 100-Bed Hospital Volume Analysis .....	11
3. Return on Investment.....	11
4. National Hospital Volume Analysis .....	12

## LIST OF FIGURES

FIGURE	PAGE
1. First Iteration Box Context Prototype .....	4
2. Measured Prototype.....	5

## ABSTRACT

Disposable gloves represent a \$4 billion global market, spanning multiple industries.

While the uses and benefits of disposable gloves continue to grow, the method of manufacturing and packaging them contributes to inherent weaknesses in dispensing.

The purpose of this project was to develop a business plan for a product designed to mitigate the waste associated with the use of disposable gloves.

## CHAPTER I

### INTRODUCTION AND BACKGROUND

#### **History and Current State**

During the early 1900s it is estimated that approximately 50% of all surgical patients died. Most of these deaths are attributed to lack of hand hygiene. In 1889 the first surgical glove was developed by a physician at Johns Hopkins. 70 years later, in 1965, the first pair of disposable sterile medical gloves was created and sterilization of the gloves occurred through the use of gamma irradiation (Ammex, 2016).

In 1992 the Blood-borne Pathogens Standard was published by the Occupational Health and Safety Administration (OHSa) in response to HIV and Aids. This immediately increased the number of gloves used in the healthcare field by mandating the provision of personal protective equipment by employers and required use of gloves in many healthcare applications including phlebotomy, the drawing of blood.

During the mid-1990s a chemical-resistant, synthetic form of rubber known as nitrile was implemented in glove manufacturing. Nitrile is hypoallergenic, mitigating the risk associated with exposure to latex allergy in the healthcare setting.

While the example highlighted above speaks to the healthcare settings, the recent use of disposable gloves has shifted to safety uses in the sanitation-janitorial, automotive, and food service industries. According industry experts “in 2012 the industrial market reported the same glove revenue as the medical industry, with most

coming from the use of nitrile gloves” (Ammex, 2016). The market for disposable gloves continues to grow, with the Constant Annual Growth Rate (CAGR) for the disposable glove market projected at 6% from 2016 to 2024 (Grandview Research).

Most disposable gloves available in the world are manufactured in Asia. The Global Industry Analysis Report indicates the United States is the largest utilizer of disposable gloves, with the Asian market following closely behind. The disposable glove market is projected at \$4 billion for 2017. Growth is attributed to the increasing “emphasis on health, occupational safety and hygiene among health care workers” (OR Today, 2017).

### **The Problem**

The manufacturing, packaging, and dispensing process of disposable gloves contributes to a waste rate of at least 25% per box. This is a very high rate of waste and impacts not only the financial bottom line of the department, hospital, or business but also contributes unnecessarily to the 35 pounds of waste generated per patient per day during a hospital stay. The monetary impacts of this waste will be discussed later in this plan.

### **Product Goals and Objectives**

The proposed Glove Saver solution will fulfill the following objectives:

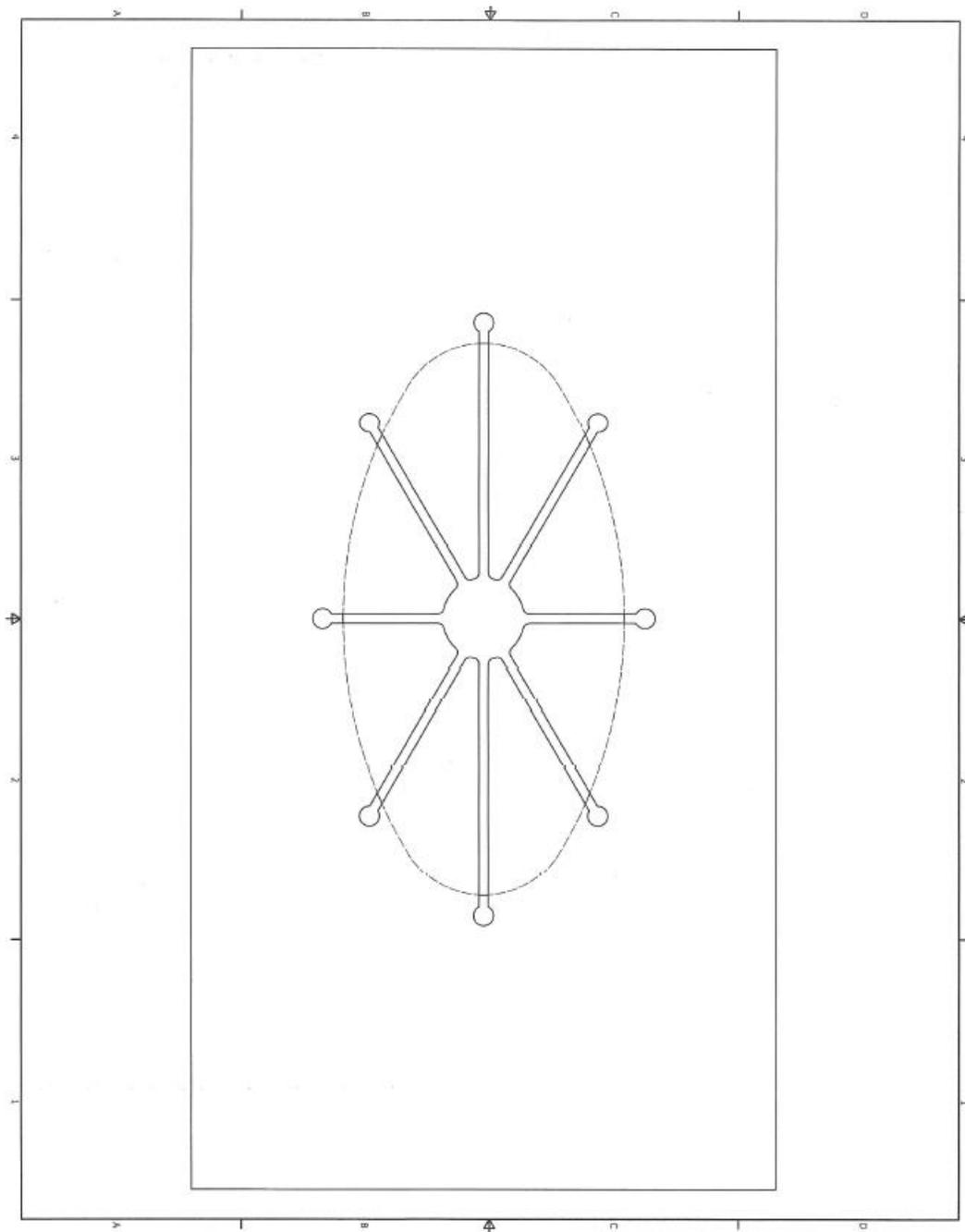
- Reduce waste in the glove industry
- Reduce the amount spent on medical supplies
- Reduce risk of cross-contamination and spread of disease.

## CHAPTER II

### PRODUCT OVERVIEW

#### **Product Description**

Over the last decade this author, who is also the owner-operator of the Glove Saver solution, has worked more than 20,000 hours in the healthcare industry, both at the bedside caring for patients and in leadership roles with budgetary responsibilities. Over the duration of this career caring for patients, gloves have always been falling unused and needlessly on the floor, begging for a solution. The Glove Saver solution is composed of a durable solid surface material that when applied acts as a filter between a box of gloves and the end user. Figure 1 is the computer automated design illustration of the initial filter pattern selected for the Glove Saver solution. Figure 1 provides the context view of the Glove Saver pattern in relation to the oval opening of a standard disposable glove box.



*Figure 1.* First Iteration Box Context Prototype

After pattern efficacy was confirmed through proof of concept, the product as illustrated in figure 4 was revised to include specific measurements that provide



## **Proof of Concept**

The Glove Saver concept has been tested at two different hospitals in 3-month trials. In 2013, the Glove Saver was utilized at a local hospital in Modesto, California. In 2014, it was tested at a medical center in Salinas, California. Glove usage and volumes were tracked daily over a 3-month period in six rooms of varying acuity. The product was well received by staff utilizing the device. On average, gloves were used at a rate of 40 boxes per patient room per month. In all six rooms where the Glove Saver was implemented a three to four box per week decrease or 15 box per month decrease in box refill was noted.

The initial product functioned well, opportunities for improvement were noticed, and design and pattern revisions were undertaken immediately (See Figure 5) resulting in improved performance and increased satisfaction of the end user including continued reduction in glove waste and the reduction of over distribution of gloves.

## **Market Strategy**

The potential to utilize the Glove Saver exists across the entire glove industry – healthcare and non-healthcare, domestically, and worldwide.

To launch the product, the Glove Saver will be initially deployed to a small number of hospitals in Northern California. This will allow the opportunity to establish a feedback loop with customers and create foundational sales upon which to build the company.

Initial customers will be targeted utilizing customer lists from Medline and Cardinal Health. Medline is targeted as a regional distributor in Northern California and Cardinal Health as one of the largest medical supply distributors. Hospitals on customer lists will be chosen based on freestanding (no system affiliations), small healthcare systems, and bed size.

The global market will not be targeted until a strong foothold has been established in the U.S. market.

### **Competition**

Research into current suppliers has yielded no similar product currently available for purchase; nor have boxes of gloves with “glove saver” label affixed to the box been found. As a consumer of the glove industry, the author has seen no like product in the market. In fact, this product will create the market. Market creation usually requires heavy promotional funding. However, because the author does not have these means he will leverage existing relationships within the industry who have already indicated interest in the Glove Saver solution. The initial product launch will take place in a small number of hospitals in the Northern California market. This will provide opportunity to establish a feedback loop with customers upon which a foundation for improvements and company expansion and scaling can be achieved.

### **Manufacturing**

The solid surface material for the Glove Saver is low density polyethylene. A steel-rule die, also known as a cookie cutter die, will be used for cutting materials

such as plastic. The cutting surface of the die are strips, known as steel rule. A steel rule die will be used to cut and shape the glove saver pieces. The die will be made to process one 24 x 48-inch sheet of polyethylene. The die will fit into a second-hand hydraulic press operated by a single operator. The press will cut 23 pieces from one sheet at a rate of 276 pieces per hour. Manufacturing will be completed by the owner operator until the volume of orders necessitates outsourcing or the hiring of additional employees. Initially, he will not need to quit his existing employment as the time to manufacture pieces can be allocated after standard work hours.

### **Initial Investment**

The entire initial capital requirement for the manufacturing equipment outlined in manufacturing will be auto-financed by Mensonides Enterprises LLC.

Table 1 summarizes the initial capital requirement.

Table 1

#### *Initial Capital Investment*

<b>Item</b>	<b>Per Piece</b>
Steel Rule Die	\$450
Hydraulic Press	\$1,500
Patent	\$4,500
<b>Total</b>	<b>\$6,450</b>

### **Organization and Location**

The Glove Saver 2000 will be manufactured and sold through Mensonides Enterprises an already existing limited liability company. The business address is a post office box in Napa, California. Manufacturing will initially take place in the garage associated with the owner's home, where there is enough square footage to

accommodate the materials and equipment. All major shipping companies provide daily service via the shipping center located at the front of the owner's community, providing easy access.

CHAPTER III  
FINANCIAL EVALUATION

**Consumer Incentive**

On average, a healthcare worker uses 15 pairs of disposable gloves each day. For a 100-bed hospital employing approximately 300 nurses that equals 1,188,000 pairs of gloves used per year, or 5,940 boxes of gloves. Table 2 summarizes the annual usage of glove boxes and the related costs of a 100-bed hospital. However, research has demonstrated that at least 25% of each box is wasted through the process of dispensing. Factoring that 25% - which is equivalent to 1,485 boxes of waste - back into the number of gloves used, results in the initial volume of glove boxes purchased at 7,425. A box of disposable gloves on average costs \$9.00. For a 100-bed hospital the annualized cost of gloves at \$9.00 per box for 7,425 boxes is \$66,825.00. The calculated waste of 1,485 boxes, multiplied by the cost at \$9.00 per box reflects the annualized waste in dollars at \$13,365. The demonstration of savings and the reduction of waste will be used in customized sale presentations developed for each customer based on their specific needs.

Table 2

<i>100 Bed Hospital Volume Analysis</i>	
Annual Purchased Glove Boxes	7,425 Boxes
Annual Wasted Gloves (25%)	1,485 Boxes
Annual Required Glove Boxes	5,940 Boxes
Annualized Total Glove Cost	\$66,825.00
Annualized Cost of Waste	\$13,365
Annualized Glove Saver Cost	\$7,425
<b>Annualized Cost Savings</b>	<b>\$5,940</b>

### **Return on Investment**

The price point for Glove Saver, was determined by calculating the average price of a box of gloves at \$9.00 and factoring in the cost of 25% waste per box at \$2.25. When determining a price point for a potentially single-use product, the author considered the price the consumer (hospital) would be willing to spend to reduce the waste, while retaining savings on supply expense, arriving at the amount of \$1.25 to allow for \$1.00 of supply reduction cost for the hospital and a healthy contribution margin for the product as summarized in the return on investment on table 3.

Table 3

<i>Return on Investment</i>	
<b>Estimated Net Revenue</b>	
Net Revenue per hour @ Sales price \$1.25 / unit	\$345
Machine capacity per hour	276
<b>Operating Expenses</b>	
Material Cost per piece	\$0.13
Labor Cost (\$10/per hour)	\$10
Total Cost per piece	\$0.17
Total Operating Expenses	\$46.92
<b>Contribution Margin</b>	
Contribution Margin per piece	\$1.08
Contribution Margin	\$298.08
Contribution Margin %	86.4%

The customer price of the Glove Saver is calculated by taking 25% of the total number of purchased glove boxes and multiplying by the Glove Saver unit price of \$1.25. For a 100-bed hospital this total is \$7,425. Subtracting the customer price of the Glove Saver from the total amount of waste in dollars, the forecasted annualized savings for a 100-bed hospital is \$5,940.00.

There are 897,961 staffed hospital beds in the United States. Carrying forward the same ratio as that used for the 100-bed hospital, there are approximately 2,693,883 nurses caring for the patients in those hospitals. These nurses utilize approximately 10,667,776,680 pairs of gloves each year or 53,338,885 boxes. Table 4 summarizes national annual usage of glove boxes, related waste and costs.

Table 4

*National Hospital Volume Analysis*

Annual Purchased Glove Boxes	66,673,606 Boxes
Annual Wasted Gloves (25%)	13,334,721 Boxes
Annual Required Glove Boxes	53,338,885 Boxes
Annualized total Glove Cost	\$600,062,456.25
Annualized Cost of Waste	\$120,012,491.25
Annualized Glove Saver Cost	\$66,673,606.25
<b>Annualized Cost Savings</b>	<b>\$53,338,885</b>

CHAPTER IV  
IMPLEMENTATION PLAN

**Patent Search**

Through the business plan development, a patent search was conducted and Patent US 20170057731 A1 (filing date 24 Aug 2016, publication date 2 Mar 2017) was located for a disposable glove dispensing system. The abstract for the patent states,

A disposable glove dispensing system is provided. The disposable glove dispensing system embodies a mountable filter dimensioned and adapted to circumscribe a dispensing opening of an existing glove box, improving the reliability of dispensing only a single disposable glove there through. The mountable filter forms a filtered opening, wherein the mountable filter is mounted to an existing glove box so that the dispensing opening of the glove box is circumscribed and/or overlapped by the filtered opening, thereby preventing the dispensing of more than a single disposable glove from passing through the filtered opening (U.S. Patent No. 20170057731 A1, 2017) (Campbell & Hagan, 2017).

Locating this existing patent publishing demonstrates the need for the Glove Saver solution in the market.

Work on this project and patent search began in 2010. As no earlier patent exists, a patent application will be filed demonstrating the 2010 date to precede the above-mentioned patent. The costs associated with patent acquisition are summarized in table 3

## CHAPTER V

### CONCLUSION

The author originally set forth on this project with the intent to fix an everyday nuisance found in hospitals across the globe. Nurses and ancillary staff in hospitals everywhere will attest to the fact that the over distribution of gloves is commonplace. Through study and the application of invention to remedy this nuisance the volume of waste generation became increasingly evident and the scope of the solution grew. Through rapid cycle testing and improvements made from real time end user feedback the Glove Saver was born and evolved into an ideal product that meets the customer and end user needs. By sourcing low cost material and equipment and developing a simple and efficient process for manufacturing, costs are low. The cost mitigation strategy has created opportunity for good margins. The healthcare industry is a significant market rich with waste and cost cutting initiatives. The Glove Saver is positioned to take advantage of these measures. Entrepreneurial business owner and multimillionaire Kevin O’Leary is credited with saying “The best products do two things, they solve a problem and they save money.” The Glove Saver does both.

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## REFERENCES

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