

WATERPROOF DRESS:
AN EXPLORATION OF DEVELOPMENT AND DESIGN
FROM 1880 THROUGH 1895

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Doctor of Philosophy

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The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

WATERPROOF DRESS:
AN EXPLORATION OF DEVELOPMENT AND DESIGN
FROM 1880 THROUGH 1895

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a candidate for the degree of doctor of philosophy,

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WATERPROOF DRESS:
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ABSTRACT

Waterproof dress had an important role in the late nineteenth century. Heretofore little research has been done to examine the development and design of this apparel sector. The three types of waterproofing techniques used and developed in the nineteenth century included oil or paraffin, chemical, and rubber solutions. The rise leisure and consumption contributed to the growth of waterproof dress allowing people of all classes to benefit from the protective apparel.

This research explored the technology and design of waterproof dress by collecting related patents between 1880 and 1895. These patents were compared with catalogs and periodicals from the same time period to better understand what innovations made their way to consumers. The patents helped to identify the problems with waterproof apparel that manufacturers sought to resolve. In addition, the patents assisted with clarifying the target consumers for specific apparel types. The research also revealed the longevity of the gossamer or lightweight rubber garment that experienced at least two decades of success. Overall, this research emphasized that waterproof dress was very important in the lives of many consumers toward the end of the nineteenth century.

CHAPTER 1

INTRODUCTION

Waterproof garments played an important role in the everyday lives of real people who counted on them for protection; however, minimal consideration has been given to the technology and development of these goods in the late nineteenth century. Until now, little research has been done to investigate the design and role of waterproof apparel that not only made people more comfortable in wet weather, but kept them dry, preventing illness and hypothermia.

I stumbled on the topic while reading letters written by Ida and Mary Saxton during their European tour in 1869. The Saxton's were a well-to-do, prominent family in Canton, Ohio throughout much of the 19th Century. On the sisters' trip through Europe, they frequently wrote of wearing waterproofs. Ida Saxton recorded on August 12, 1869, "the wet weather does not keep us in the house, we wear our rubbers, water proofs and take our umbrellas, then start out, and go all day, we can not loose the time to wait for pleasant weather."¹ The letters indicated that the sisters wore these garments frequently. While trying to discover what was meant by "waterproofs," I found that little information was available.

To discover how "waterproofs" were created I have investigated patents issued in the United States between 1880 and 1895, when more styles of waterproof dress became available to the public. The time frame I selected was after the major discovery of vulcanization, which was used to cure rubber in the first half of the century. Mid-century, the number and style of waterproof garments increased greatly. By the late

century, inventors were creating more patents to improve the multitude of styles available.

The research focus was on patents that illustrated what was being invented, as well as on catalogs that delineated what made its way to consumers. The catalogs helped to better understand what was being utilized from the patents and incorporated into products offered in their pages. Images provided by the apparel patents were compared with illustrations and descriptions from the catalogs to better determine what was being adopted for consumers. Additional supplementary publications used for this research included magazines and newspapers.

Technology related to waterproofing techniques increased quickly during the second half of the nineteenth century. Three waterproofing techniques were available including the use of chemicals, oils, and rubber. Each method had room for improvement and each had advantages and disadvantages from the other methods. The patents and catalogs help to identify the problems and efforts for improvement.

Several of the patents examined in this research appear to have directly influenced the garments that were offered to the public. The most useful information retrieved from the patents was the description of the stated improvement as it helped to enlighten the existing problems being dealt with by consumers. Another emerging idea was the rise and fall of the gossamer rubber garment. The gossamer was a lightweight rubber garment that was developed in the mid-1870s and continued to be offered through the mid 1890s. The garment offered a light and inexpensive solution for people who needed protection from wet weather. This type of garment, along with other information

discovered during this research, provided light into the lives, occupations, and recreation of people in the United States between 1880 and 1895.

¹ Henry S. Belden III, ed., *Grand Tour of Ida Saxton McKinley and Sister Mary Saxton Barber, 1869* (Canton, Ohio: The Reserve Printing Co., 1985), 181.

CHAPTER 2

METHODS

Finding sources of information for the nineteenth century waterproof clothing industry can be a challenge. Artifacts are difficult to locate as coatings such as rubber and paraffin break down and disintegrate over time.¹ Other treatments such as oil and chemicals also degrade with use and may be overlooked as they leave little visual evidence of the waterproof technique. Very few scholars have taken up the challenge to unearth the rich history of the nineteenth century waterproof industry. Information, however, can be found within a variety of periodicals and other documents.

Sources of information include journals, diaries, letters, catalogs, news papers, business directories, congressional records, and patents. Some of these sources provide the name and address of companies, which facilitates further exploration for more detailed information, such as business correspondence. Government records also provide information concerning inventions, imports, and exports of waterproof goods and compounds.

This research utilized patents as the primary data source. Patents are a great source of information concerning the rubber industry as they provide the name of the inventor, the city in which he or she lived, and often the name of the company with which he or she was associated. Also, patents provide a good source of information to determine the ideas being generated and the problems the inventors were trying to solve with their inventions. Catalogs, ladies' magazines and other sources were used as supplementary information to determine which patents were being adopted for consumption.

Data Analysis Methods

Patents and Terminology

Patent numbers are required in order to locate patents from the nineteenth century. In order to identify patent numbers for this research, I systematically searched through the *Official Gazette of the United States Patent Office* which was a publication that was provided by the United States Patent and Trademark Office (USPTO) for more than a century. The publication included abstracts of the patents, designs, and re-issued patents from several months at a time. I looked through bound paper copies of these publications to identify patents relevant to this research. During this process, I identified relevant patents based on whether they included at least one of the following factors: 1) the patent must be for an apparel item that incorporated a waterproof feature as part of the design; 2) the patent described a waterproofing compound or technique. Key terms formed an important part of the identification process.

Before conducting research, key terms were identified for each type of waterproof technique as well as the terms used for waterproof apparel in the nineteenth century. These terms were identified through conducting preliminary research. Those associated with oil coating are oil-skin, oil-cloth, paraffin, gum, and fail-cloth. Rubber coatings had a variety of names based on where the rubber plant was grown. Caoutchouc and India-rubber were rubber products from plants grown in South America whereas gutta-percha referred to rubber grown in Malaysia and surrounding areas.²

Terminology concerning waterproof dress also posed some concern. The phrase “waterproof dress” is problematic as it does not clearly define the type of garment or

dress. The word “waterproof” was used to describe all garments that had been treated by any of the waterproofing methods. Many of the garments adopted the name of their creator. The garment known as a mackintosh had two different spellings. The garment was named after its creator, Charles Macintosh, but was modified to the current spelling of “mackintosh,” which contains a “k,” during the mid-to-late nineteenth century. Other garment names included oil-slicker, pommel-slicker, gossamer, and storm-ulster.

By the 1890s, many terms were used for waterproof and outdoor clothing. It became common for waterproof garments to be identified by the name of its manufacturer, as in Gossamer, or Pluette. With the popularity of travel and outdoor garments, new names appeared. Merchants began adding the term ‘storm’ to an outdoor garment or fabric. One particular woolen fabric appropriate for outdoor wear received the name “storm serge.” Some storm serges were treated to render them waterproof, but others may have not received any treatment.

Other problems arise when looking for artifacts. Unless the heritage of an item is known, it would be unlikely for a researcher to know whether a garment had been chemically treated unless tests were run on the fibers. Researchers of rubber history are frustrated because the lack of knowledge of rubber items in the nineteenth century causes many artifacts to be overlooked or misdated.³ In addition, rubber disintegrates with age leaving few examples of rubber garment from the nineteenth century.⁴

Content Analysis

Once selected patents were identified, I obtained the full patent information which is available from the USPTO website and conducted a content analysis of each patent. Information from each patent was coded and categorized so as to gain a better

understanding of the emerging themes. The patents were divided initially into two main categories consisting of “waterproof compounds” and “waterproof apparel.” The category “waterproof compounds” contains patents that reference the composition or process for waterproofing goods. The category “waterproof apparel” consists of patents related to the design of waterproof garments. Once the patents were divided into these two categories, I determined codes or subcategories to organize the data, which facilitated analysis. I analyzed the data primarily using a narrative approach with rich descriptions. To assist with data illustration, I used numbers descriptively in the form of tables to help support my findings. Illustrations collected during the data selection process were incorporated with their categorized written descriptions. All of the patents for waterproof apparel included images which further enhanced the written descriptions as well as contributed to the comprehension of how waterproof garments were used.

The waterproof compounds category provided background information on the types of waterproofing processes that were available from 1880-1890. The patents were coded using the following codes or subcategories: patent number, patent date, patent authors, company, author location, patent title, type of waterproofing technique, category, reference to past patents, reference to past processes, past problems, stated improvements, patent points (or summary), chemicals and measurements, process, and fibers/articles. The categories that provided the richest information were past processes, past problems, and stated improvements as these categories illustrated the purpose of the patent and intended improvement on waterproof products.

The waterproof apparel category provided a rich source of information and the codes include the following classifications: patent number, patent date, patent author,

company, author location, patent title, image included (description), type of garment, type of waterproofing technique, patent points (summary), stated improvements, special characteristics, reference to occupations, past problems, and reference to other garments. The apparel category was used to compare to images of waterproof apparel located in catalogs from the same time period.

Catalogs

Few catalogs were published consistently between 1880 and 1895. *Montgomery Ward* is the only known catalog that was published consistently during period; however, efforts to locate a complete collection of early *Montgomery Ward* catalogs proved unsuccessful for this research. Using one catalog could have advantages in establishing an evolution of waterproof goods in one dry goods catalog; however, incorporating only one catalog in this research would not provide a complete picture of the waterproof apparel industry. In order to locate a broader range of waterproof garments, multiple catalogs were utilized. The catalogs consisted of dry goods catalogs, rubber goods catalogs, and oiled apparel catalogs. One difficulty with this research was being able to view or obtain copies of the catalogs printed between 1880 and 1895 as they are old and fragile and many are too delicate to handle. Also, the catalogs are scattered and it would be difficult to view all of the catalogs available without extensive travel to a variety of libraries, historical societies, archives and private collections.

Credibility

An important key to credibility is prolonged engagement.⁵ When using documentary information, prolonged engagement is translated into a researcher's immersion in data. Being fully immersed in the information allows the researcher to be

familiar with the topic and the context of the overall case being studied.⁶ As the sole collector of data, I was fully immersed in the information, thus ensuring credibility. By working with the data consistently, I was able to gain an understanding of the information as well as familiarity with the underlying contexts associated with the data.

Another assurance of credibility is triangulation. Triangulation was achieved through the use of multiple sources, and methods of collecting data.⁷ In my study, the data was triangulated by analyzing the *Official Gazette of the United States Patent Office*, full patent information, and merchandise catalogs, as well as incorporating supplementary information provided by contemporary newspapers, magazines, and other sources.

Dependability

According to Neuman, a qualitative scholar, a researcher using historical documents must authenticate his or her sources.⁸ In this case, the *Official Gazette of the United States Patent Office* is a government based document, which infers dependability and authenticity. The full patent information is a government record, and therefore dependable in depicting what was submitted to the government. The accuracy of the garment performance described in the patent information is difficult to determine unless the garment was manufactured and sold to or used by the public. The merchandise catalogs are a form of advertisement for the manufactures and, therefore, may be more subjective than the patent information. The catalogs, since they offered a physical product to the consumer, assisted in triangulating the data and determining dependability gathered from the patents.

The patents combined with the catalogs and other resources provided a rich description of information that helped to better understand what problems people were

trying to resolve in regard to waterproof apparel and what types of apparel were available for consumption between 1880 and 1895. Criticism of waterproof dress assisted in understanding the achievements of technology, design, and function.

¹ Sarah Levitt, *Victorians Unbuttoned: Registered Designs for Clothing, their Makers and Wearers, 1839-1900* (London: George Allen & Unwin, 1986), 180.

² Mike Woshner, *India-rubber and Gutta-percha in the Civil War Era: An Illustrated History of Rubber & Pre-plastic Antiques and Militaria* (Alexandria, VA: O'Donnell Publications, 1999), 3.

³ Woshner, 6.

⁴ Levitt, 180.

⁵ Yvonna S. Lincoln and Egon G. Guba, *Naturalistic Inquiry* (Thousand Oaks, CA: Sage Publications, Inc, 1985), 301-302.

⁶ W. Lawrence Neuman, *Social Research Methods: Qualitative and Quantitative Approaches*, 2d ed. (Boston: Allyn and Bacon, 1994), 321.

⁷ Lincoln, 305-307.

⁸ Neuman, 322.

CHAPTER 3

REVIEW OF LITERATURE

Currently, little research has been done on waterproof apparel due in part to the unique nature of the combination of the terms waterproof and apparel. “Waterproof” is a term that signifies technology in both the creation of goods and people’s need for protection from the elements. The term “apparel,” having several signifiers including fashion, has heretofore been overshadowed by the prefix waterproof. Three main methods were available to waterproof fabric in the nineteenth century. As technology expanded, more waterproof goods became available to supply the rising demand for waterproof recreational and occupational apparel.

Waterproofing Methods

There are many ways by which a textile can be waterproofed including coatings of oils, waxes, chemicals, gums, or rubber. In addition, a textile can be considered waterproof by natural qualities of particular weaves or felting processes. It was not until the second quarter of the nineteenth century that these waterproofing techniques became available to the public. Although each method was different, it would have been difficult to study one without the other. It is possible that each method stemmed from an older process of waterproofing that included the use of oils or paraffins.¹

Oil and Paraffin Cloth

Fabric treated with oils or paraffins was the oldest known technique for creating waterproof apparel. As early as the Roman Empire, the wealthy had access to waterproof fabric. A dialog included in a Greek-Latin book that records one person’s haggling reveals that waterproof apparel was available and that it was considerably more

expensive than ordinary goods.² The process for making oiled-skin cloth published in the 1849 *Scientific American* used linseed oil as the gum or coating and solidified the coating using metals and sulfur compounds to create a flexible waterproof surface upon the textile.³

Chemicals

The journal *The Philadelphia Medical Museum*, 1806, claimed, “it is well known that for some years past several methods have been tried to render cloth impermeable to water, and the inventors of this process kept the discovery a mystery.”⁴ The article went on to discuss how Mr. Vauquelin, a chemist, having obtained a sample of a waterproof solution, attempted to decipher the contents. Mr. Vauquelin found that the solution consisted of soap, glue, alum, and weak sulfuric acid.⁵ His findings were likely a variation of the oil-cloth because by his definition, some of the ingredients he used were oil based, but the chemicals he found and the reaction they made are related to the chemical processes that later became available to the everyday housewife. It was not until the second quarter of the century that these waterproofing techniques became available to the public.

One British company, Burberry, became well known for their waterproof goods that used the chemical process. The company developed in 1856 by Thomas Burberry began as a small clothing shop that primarily supplied outdoorsmen. In 1879, Thomas Burberry made additional strides in the business by creating weather-proof cloth that was claimed to breathe as well as keep out the elements. He patented a fabric called “gabardine” that he used for his coats. These coats later became known as “Burberry”⁶ endorsed by the British royal family as well as the military. By World War I, the

company had successfully branded themselves and their waterproof products became known internationally.⁷

Although the chemical process was being used by British companies, such as Burberry, it did not appear to have made the same strides in the United States. Recipes were frequently republished over and over again. When alternative methods were mentioned, they were often cited as having originated from England or France.⁸

An 1855 *Scientific American* produced an article called “New Waterproofing Process” that described a chemical process patented by Henry B. Barlow of Manchester England. It outlined the multiple salts such as acetate, nitrate, or chloride of copper, acetate and nitrate of lead, or nitrate and acetate of bismuth, and other chemicals used to make a bath in which fabric would be immersed. Once saturated and dried, the fabric was resistant to water.⁹ One year later an article in the *Saturday Evening Post* provided a simplified waterproof solution or bath containing water, sugar of lead, and alum in order to waterproof cloth.¹⁰

The typical simple recipe consisted of a combination of water, sugar of lead, and alum. The alum ($\text{KAl}(\text{SO}_4)_2$) compound was a double sulfate combined with aluminum and potassium. The sugar of lead ($\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 3\text{H}_2\text{O}$) reacted with the alum to form lead sulfate, a salt, which, at that time, was the chemical that scientists believed to be rendering the fabric waterproof.¹¹ In 1859, *Scientific American* promoted this composition as “ventilated waterproof cloth” with the following comment, “this preparation enables the cloth to repel moisture like the feathers of a duck’s back, and yet allows the perspiration to pass somewhat freely through it, which is not the case with gutta-percha or india-rubber cloth.”¹² They further discussed the past use of such

chemically treated articles when they stated that the French army used 20,000 tunics waterproofed by the same method, in their war with Russia in 1853-56 known as the Crimean War.¹³

This same recipe was recommended in the May 1861 *Scientific American* for waterproofing garments for soldiers and travelers during the Civil War.¹⁴ The explanation for making the solution was more detailed and “tweed cloth” was recommended as the appropriate fabric.¹⁵ The composition continued to be explained in periodicals; however, the target market changed after the Civil War to include people interested in recreational activities.¹⁶ Also, an altered version of the chemical process was used by people involved in agriculture to create a water-resistant as well as pest-resistant cloth to cover grain and other goods.¹⁷

In 1881, *Scientific American* published an article on waterproofing that outlined several processes. Each used slightly different chemicals and some incorporated soap, resin, tallow, glue, or linseed oil.¹⁸ After this article was published, individual processes were selected from this article and reprinted in other publications.¹⁹ Another less practical method was introduced in an 1894 *Scientific American* that recommended soaking cloth in a bath of hot sulfuric acid to parchmentize the fibers together, which would seal the openings between the fibers. Afterward the fabric was rinsed with an alkali to counteract the acid.²⁰ According to the article, this method would not alter the texture of the cloth; however, working with a dangerous acid such as sulfuric acid would not have been ideal unless the person was knowledgeable about the substance.

The chemical method for waterproofing garments most likely remained constant because unlike rubber or oil-cloth, chemically treated cloth allowed the body to breath.

The simplest chemical mixture continued to be published throughout the remainder of the century and reappeared as late as 1906 when it was printed in the housekeeping department of *Pictorial Review*.²¹ It was a simple solution that many women could use to waterproof their own cloth or garment, which would have added to the value of the recipe. The chemically treated garments; however, were more water-resistant than waterproof which is likely why very few of such garments were advertised in existing catalogs.

Rubber

According to British historian, Levitt, “The utilization of rubber was one of the major technological achievements of the nineteenth century.”²² In the early 1800s, rubber was a “South American curiosity” and got its name because it was used to rub out pencil marks.²³ The initial and primary use for this new substance was to coat fabric, rendering the surface waterproof.²⁴ The rubber treatment was similar to the process used for oiled-skin cloth because it is a type of gum that was applied to the fabric to form a waterproof coating. It is important to note that rubber was referred to by several names including India-rubber, caoutchouc, and gutta-percha. The early rubber that came from South America was known as India-rubber or caoutchouc. As more rubber was needed to satisfy demand, some manufacturers turned to gutta-percha which was imported from Malaysia and India. Other terms were used, such as para rubber for commerce purposes, gum-elastic for the more flexible rubber items and ebonite for the hard rubber pieces.²⁵ Three men were instrumental in making and marketing usable rubber for protection from rain and other uses. These men were Charles Macintosh and Thomas Hancock of Britain, and Charles Goodyear of the United States.

Origins of Rubber Goods

According to writings from travelers, rubber was introduced to Europeans in the sixteenth and seventeenth century, when Spanish explorers recorded that South American natives played games with an elastic ball made from a substance obtained from trees. French explorers brought back the substance where it was used in French and British experiments in 1731-36. English chemist, Priestly, is credited with discovering its use for rubbing out pencil markings.²⁶

In South America, the caoutchouc plant grew to a height of about six feet with branches only at the top part of the tree. The rubber was gathered by tapping the tree which was done by making a narrow gash in the bark of the tree. A white sap-like substance or latex flowed from the gash and was collected in a bucket. The latex was smoked over a fire and the liquid layered so that it coagulated into a thick slab. It was then laid in the sun to dry where it obtained the dark brown color people associated with rubber. The rubber was then shipped in this crude state.²⁷

Gutta percha referred to the Gutta tree that grew in South East Asia, particularly Malaysia, which came to the attention of Europeans in 1845. This plant was different than caoutchouc in that the substance obtained from these trees would solidify into a plastic when exposed to the air. Many waterproof manufacturers believed gutta percha to be better than caoutchouc claiming that gutta percha had better waterproof qualities and was more stable than caoutchouc since it did not become sticky in warm weather or brittle in cold weather. In addition, oil and other fatty substances were known to injure caoutchouc by causing the rubber to decompose; whereas, gutta percha was unaffected by coming into contact with oil.²⁸

The earliest known patent for rubberized apparel was taken out in 1791 by Samuel Peal of Brittan for waterproof clothing, boots, and shoes.²⁹ Charles Macintosh came to work with rubber through a business deal he made in 1819. It was then that he purchased Glasgow's entire output of coal tar for the purpose of extracting the ammonia to produce purple dye. Extracting ammonia left the by-product naphtha. With little known uses for naphtha, Macintosh chose to experiment with naphtha as a solvent in the rubber manufacturing process. He spread the rubber mixture between two layers of cloth, a process known as double texture, to create fabric for waterproof coats. In 1823, Macintosh patented this double texture method.³⁰ He joined with the Birley brothers to create Charles Macintosh & Co. in 1824.³¹ The company initially made clothing for sailors as well as waterproof coats for the public.³² It is unlikely, however, that the company manufactured any significant quantities of waterproof garments before 1832.³³

Thomas Hancock began experimenting with rubber around 1819. His first patent dealt with using rubber much like elastic—to keep clothing close at the wrists. Thomas Hancock then purchased a license to produce waterproof coats from Macintosh in 1825. Hancock made several improvements to the rubber manufacturing process including inventing a machine called a masticator that enhanced the mixing process as well as reduced the smell of the garment when he altered the solvent solution used to soften the rubber. With these changes, Hancock was able to create a better product that outsold Macintosh.³⁴ Due to his success, Hancock was invited to produce goods directly for Charles Macintosh & Company. By 1832, Hancock had become the business manager and became sole manager of the company.³⁵ Under his supervision, the company began

making garments which required special tailoring skills since the seams had to be sealed where the needle pricked the rubber.³⁶

The waterproof garment known as a mackintosh saw a peak popularity during the 1830s in Britain. The coat became popular when officers of the guards began to wear “light drab cambric capes.”³⁷ In fact, the traditional khaki beige color of today’s raincoats with the tartan lining are inspired from the coats worn in the 1830s when there was a fashion for anything Scottish.³⁸ The mackintosh flourished among the public thanks to the visibility of the officers and the reputation of coats for their waterproof qualities. The mackintosh fad, however, did not last for long due to continuing problems with the stability of the rubber, the garment’s inability to breathe when worn, and the unpleasant odor associated with rubber goods.³⁹ Also, changing transportation from the stagecoach to the railway hastened the demise of the mackintosh.⁴⁰ The mackintosh garment, however did not disappear completely and over the years it experienced changes and improvements to become a standard well-known raincoat by the end of the century.

Vulcanization

Throughout the 1830s, Charles Goodyear, in America, and Thomas Hancock, in England, worked on a process to make rubber more practical and stable. Charles Goodyear’s obsession with rubber began in the early 1830s. He hoped to invent a better rubber product in order to earn money for his family.⁴¹ Goodyear did not have a chemical background and therefore experimented with rubber by trial and error.⁴² Goodyear frequently tried to manufacture his experiments before they were fully tested, which lead to multiple failed projects, skepticism from his friends, many unpaid debts, and years of living in poverty. He relied on charity and his ability to convince

businessmen to fund his cause. Goodyear was more of a dreamer and artist than a businessman.⁴³

It was not until 1839, after a financially disastrous manufacturing effort, that Goodyear discovered the vulcanization process for which he is famous. This delicate process, however, would take him many more years to perfect. Because of his tarnished reputation, he waited to take out a patent until he could find financial backers. This hesitancy allowed Thomas Hancock to determine Goodyear's process and eclipse Goodyear in the rubber manufacturing industry.⁴⁴

Thomas Hancock, in England, had more experience with rubber than Goodyear and had six British patents by the time Goodyear began experimenting in 1834. Rubber had more success in Britain, prior to the vulcanization process, because the country did not experience the drastic weather changes that gave rubber manufacturers so much difficulty in America. Because there was marketability for rubber products in Britain, Hancock did little experimentation to improve the qualities of rubber.⁴⁵ It was not until Hancock was shown examples of Goodyear's successfully vulcanized rubber that he conducted his own experiments and patented a vulcanization method almost simultaneously with Charles Goodyear.⁴⁶

In 1839, both Goodyear and Hancock patented a method for waterproofing cloth which used sulphur⁴⁷ and lead to improve the properties of rubber.⁴⁸ The real success for rubberized clothing came in 1844 when both men patented a vulcanization process which proved to revolutionize the rubber industry.⁴⁹ Vulcanization was a chemical treatment process applied to the crude rubber in order to make the compound more stable, flexible, and stronger. By 1845, Charles Goodyear was offering an array of rubberized objects

including ladies' aprons, mechanics' aprons, traveling bags, carriage cloth, overcoats, cloaks, capes, leggings, suspenders, tents, air mattresses, gloves and mitts, and camp blankets.⁵⁰ The fabric was rendered waterproof by either applying a sheet of rubber using a gum or by coating the fabric directly with softened rubber. Goodyear's brother-in-law, DeForest, owner of a woolen mill in Naugatuck, benefited from the new vulcanization process and created the Goodyear Metallic Rubber Company and the Naugatuck India Rubber Company which became the United States Rubber Company, later Uniroyal.⁵¹

Other patents emerged that grew out of Goodyear and Hancock's patents. As inventors began to experiment with plants grown outside of South America, they created new and improved patents for vulcanization. John Rider, patentee for the North American Gutta Percha Company, patented a vulcanization process in 1852 for gutta-percha, a substance which, at the time, was considered to have differing properties than India-rubber or caoutchouc.⁵² Samuel Bishop patented a process for waterproofing cloth in 1868 by using balata gum, which was in the same family as India-rubber, but had not been used in rubber apparel manufacturing previously.⁵³

The Manufacturing Process

In 1855, reporters from *The United States Magazine of Science, Art, Manufactures, Agriculture, Commerce, & Trade* were permitted to tour the factory of the North American Guttapercha Company in New York. The company was formerly an India-rubber company owned by the Rider Brothers. The factory was powered by a steam engine which not only helped to run the machinery, but was used for heating the gutta-percha as well. The gutta-percha was first cut into shavings, boiled for cleaning

purposes, dried, and weighed. Appropriate chemicals were added, the mixture was ground into a loaf, and then it was heated to reach a doughy consistency. After mixing the soft rubber, it went through a “calender” and as it passed through the rolls, it was adhered to a strip of fabric. The “calenders” had different purposes. Some were used for clothing fabric, some for shoes.⁵⁴

After the rubber fabric was made, it was sent to the “Making Up” room which was dedicated to the making of garments. It was here where women primarily formed the fabric into various waterproof garments. According to the article, the girls in the factory were paid by the piece and earned an average of \$4 to \$5.50 per week. The seams were joined and sealed using adhesive cement. After the garments were assembled they were sent to a special heated room to be vulcanized. The rubber was lightly coated with flour or other substances to keep it from adhering in undesired locations and then heated to cure the rubber. When the process was complete, the garments had a glossy black appearance, were pliable, and elastic. The garments were then washed, inspected, stamped, and sent to the warehouse.⁵⁵

In Manchester, England, 2,214 men and 1,355 women were employed in the rubber goods manufacturing industry in 1891. A tour of the Greengate & Irwell Rubber Company in Britain revealed women working on ladies’ garments, men working on the heavier gentlemen’s garments and a sales and show room where young ladies had duties to try on the mantles when finished to assure quality.

Waterproof Apparel

Once the vulcanization process was discovered, textile and apparel manufactories began to adjust to incorporate waterproofing techniques into apparel. Due to the unique

properties of rubber, many textile mills were forced into manufacturing of apparel. The waterproof coating was often compromised by tailors because the needles used to sew garments left permanent holes at the seams where water could penetrate. Even after the company created a rubber solution to seal the seams, the tailors remained ignorant and unwilling to change their method of construction.⁵⁶ Hancock determined that if Charles Macintosh & Company wanted to provide quality products to the public, they would have to create the garments themselves. Since the waterproof garments were primarily ready-made, waterproof manufacturers sought to make the garments loose fitting so as to fit a multitude of body types.⁵⁷ Some entrepreneurs, however, sought to increase popularity for the outer garments by offering more fashionable alternatives.⁵⁸

Waterproof garments were available to the general public in the 1850s, 60s, and 70s, and during the Civil War, rubber items were a practical purchase for some of the soldiers.⁵⁹ In England, the mackintosh was the most common name for waterproof coats. Another popular English product that was registered in 1851 was the Janus coat, a thin, light weight waterproof coat that could fit in a pocket book. A similar English garment, the pocket simphonia was said to be used by gentlemen on picnics.⁶⁰ In the United States, men and women could wear similar lightweight garments in the United States beginning in the 1870s called gossamers.⁶¹ Heavier garments, such as the mackintosh, peaked through the 1880s and 1890s in England. During this time, people of all stations and employment could afford a mackintosh.⁶² In the United States, the mackintosh surged in popularity in the 1890s, a time when the variety and types of waterproof coats were prevalent. To create differentiation, manufacturers began to improve the appearance of their products through different colors and fabrics.

Around the turn-of-the-century, rubber garments began to lose their appeal in fashionable circles and other waterproof garments began to rise. Garments from British companies such as Burberry and Aquascutum who promoted “chemically treated showerproof overcoats” became more popular.⁶³ The technology of vulcanization led to new uses of rubber such as tires and exercise equipment which began to overshadow the use of rubber for apparel.

Early Catalogs

In the United States, several catalogs appeared containing waterproof apparel after the discovery of the vulcanization process. In 1844, S. C. Smith & Son published the *Wholesale and Retail Caoutchouc Warehouse* catalog. The catalog included a history of caoutchouc focused on its use for shoes. The products offered in the publication included ladies’ and gentlemen’s rubber over shoes, mackintosh coats, cloaks and capes, ponchos, pantaloons and overalls, wading pantaloons (for Baptist clergymen performing baptisms), riding leggins, and life jackets. Even in 1844, the description for the waterproof coats claimed that “for traveling they are invaluable.”⁶⁴

In 1853, the Reed, Brothers & Co. Clothiers offered a description of the “new” ready-to-wear apparel industry for men’s and boy’s clothing as well as some insight into the popularity of India-rubber clothing. Their description claimed that India-rubber clothing was in general use throughout the country at the time the catalog was published and the company was “well furnished” with plenty of good quality rubber goods. The catalog offered the following rubber clothing: overcoats, capes, leggins, overalls, and pea jackets.⁶⁵

The E. M Punderson & Co. catalog published in 1854 contained an assortment of products for the outdoors. The catalog offered oiled silk, and cambric fabric as well as India-rubber men's sandals and slippers, ladies slippers and sandals, gaiters, boots and buckskins, and misses and boys shoes. In terms of rubber clothing, they offered sack and pea coats suitable for pilots, sea captains, farmers, engineers, and stage drivers. In addition they offered reefing jackets for seamen, firemen's capes, overalls, palo alto coats with capes for soldiers, ponchos or Spanish cloaks for mounted men, physicians' riding capes with sleeves, fishermen's pants with attached boots, baptizing pants, and drab ducking coats for sportsmen. The Mackintosh coats in the catalog claimed only to weigh six ounces and were durable gear for physicians, rail road conductors and any exposed to the weather for summer or winter traveling.⁶⁶

The 1855 Gutta Percha Catalogue for the North American Gutta Percha Company provided a description of the industry as well as a catalog of rubber goods.⁶⁷ Gutta-percha rubber from Asia was a newer product than the caoutchouc from South America. Some manufacturers promoted gutta-percha as a higher quality rubber than caoutchouc or India-rubber. Enough interest was generated by the North American Gutta Percha Company for one periodical to publish a two-part article on the manufacturing process. The first article explained the harvesting of gutta-percha as well as a tour of the manufacturing facility.⁶⁸ The second article described the production of the rubber apparel and its uses, the warehouse, and the shipment of goods. Among their shipments, the company claimed to have received orders for the United States and British governments for garments to be worn in the Crimean War. The article included

comments from various military officials and outdoorsmen complimenting the quality of the rubber goods.⁶⁹

The Samuel Matthews and Son catalog from 1866 was a British catalog that claimed to have been established by Charles Macintosh & Co. in 1827. The catalog contained rubber inflatable boats as well as apparel. Extended descriptions were provided for the Cloak Boat, the Knapsack Boat, the Canvas India-rubber Boat, and Portable Inflating Punts. The Cloak Boat was a waterproof coat that could be converted and inflated for water transportation. The description quotes a traveler in Africa who said that the Cloak Boat was an invaluable tool for traveling.⁷⁰ The rubber apparel goods were made using the double texture methods and were available in a variety of fabrics. Besides military coats, men's apparel included coats and capes for riding, driving, walking, or shooting. Ladies garments came in capes, riding jackets, bonnet hoods, and tweed showerproof coats. Additional gear for outdoorsmen included leggings for walking, riding or shooting, riding aprons, ditto knee wrappers, traveling rugs, fishing boots, stockings, trousers, and yachting trousers. Besides India-rubber goods, the catalog included several leather goods that use a non-rubber waterproofing product introduced in 1857.⁷¹

Social Changes

Waterproof garments were meant to be worn outdoors, so necessarily they were commonly used for travel. Ida and Mary Saxton found waterproof garments essential for their grand tour of Europe in 1869 because they did much hiking as well as other outdoor activities. In a letter dated September 16, 1869, Ida Saxton discusses the necessity of

these items when she and the other ladies she was with were forced to return down a mountain in the pouring rain.

After debating for some time we concluded to start, first putting on rubbers pinning up dresses and skirts, putting on water proofs with the hoods over our heads, with our staffs in one hand and our umbrellas in the other, we flattered our selves we made a very good appearance. We were as wet in ten minutes as we could get. My feet were as wet as if I had no rubbers on, my stockings were wet and mud up to the top, and my skirt was brown half way up. I managed to keep my dress dry, but my water proof was all mud as it dragged all the way coming down.⁷²

Travel

Travel and transportation were important aspects of everyday life in the nineteenth century. Due to the nature and modes of transportation available, the upper-class had the most mobility. Men of means were no strangers to travel since they frequently traveled for both business and pleasure. By the middle of the nineteenth century, young men of prominent families commonly took a Grand Tour of Europe as the capstone of their education. Less frequently, women of similar means occasionally took Grand Tours as well. These trips involved visiting prominent cultural destinations, such as galleries and cathedrals, and involved much travel and hiking through all types of weather within Europe. While traveling in this capacity, men and women required appropriate attire, which included waterproof garments.⁷³

As the nineteenth century proceeded, women began to travel more. According to *The Chautauquan*, August 1895, “everyone possessing a bank account considers travel of some sort imperative.”⁷⁴ Waterproof clothing was especially needed when traveling on a body of water or on a steamer. A lady was often recommended to wear a gossamer and a man a mackintosh. The gossamer was boasted to be of lighter weight than a mackintosh,

though by the end of the century, it was acceptable for both sexes to wear the mackintosh. According to *Manners, Culture, and Dress of the Best American Society*, an etiquette manual published in 1891, “a waterproof and a warm woolen shawl are indispensable in traveling.”⁷⁵

There is evidence that waterproof garments were important to ladies across the social classes. Waterproof clothing was very practical and often necessary when a lady wanted to travel. There were patterns and illustrations for children’s clothing as well as for ladies. A column written by Pipissiway Pots in the December 1875 *Arthur’s Home Magazine* described a mother using the chemical process to waterproof her children’s circulars in order to keep them dry on their walk to and from school.⁷⁶

Modes of transportation greatly affected travel and apparel. Railroads became an important form of travel in the second half of the nineteenth century. By 1869, railroads linked the East and West coasts of the United States. Railroads not only provided people with alternate, more desirable modes of transportation, but also sped up the shipment of goods.⁷⁷ As transportation systems improved, so did the dissemination of goods. The establishment of the railroad system contributed to the success of mail-order catalogs and helped people living in rural areas and the West to gain access to various goods. A number of merchandise catalogs containing waterproof goods were capable of reaching a wide consumer base. Toward the end of the nineteenth century, the railroads gave people access to more specialized goods, including waterproof apparel, which could have been used for travel or leisure.

Leisure

Veblen, an economist in the late-nineteenth and early-twentieth century, was best known for his book *The Theory of the Leisure Class*. He wrote this book during a time when people were gaining discretionary income and the wealthy were encouraged to spend more money on numerous lavish objects to evoke their status. He argued that fashion was for the wealthy who did not have to work or participate in labor activities. Fashion was created in such a manner that those who followed fashion could not work due to the extravagant and restrictive nature of the apparel, for example, the corset. Veblen also introduced the term conspicuous leisure and consumption.⁷⁸

Conspicuous leisure existed not only in dress, but how the upper-class conducted their lives. Since people of the upper-class did not have to work, they could take part in more sports and recreational activities. As many of these activities took place outdoors, special apparel was designed for each activity. Though society had been accepting of men participating in sports and outdoor activities, women were not provided with appropriate and acceptable dress for such activities until the late-nineteenth century.

Before the late-nineteenth century, horseback riding was the primary form of recreation for women and was reserved as a privilege of the upper-class. This costume consisted of a tailored jacket and a full, but plain skirt.⁷⁹ Women began to participate in ice skating and croquet, which required slightly shortened skirts by the middle of the nineteenth century.⁸⁰ During the last fifteen years of the nineteenth century, women, primarily upper-class, began to participate in more recreational activities. Women's participation in recreation became more acceptable as society placed a greater emphasis on health and exercise. Women began to wear the full trousers and short skirts for

bicycling and sea bathing. The encouragement of physical education introduced women to the concept of separates, or the pairing of a loose blouse with a simple skirt for ease of movement.⁸¹ Some female seminaries added crew, baseball, and basketball to their physical education. These types of sports required a “gym suit” which consisted of full trousers and a skirted dress or blouse.⁸² Toward the end of the nineteenth century, women began to tailor these types of garments for other activities such as yachting, golf, tennis, roller skating, hiking, and mountain climbing.⁸³ Certain activities, such as yachting and mountain climbing often recommended the use of waterproof apparel.

Further evidence indicates that while the upper-class enjoyed a larger variety of clothing for leisure, the lower-classes benefited as well. Once different types of protective dress became commonplace among the wealthy, less expensive versions of protective apparel became available for the working-class. A study of coats by Meyer and Wilson revealed that rubber waterproof coats and other apparel were available to frontiersmen, particularly miners and other laborers, through early transportation systems.⁸⁴

Advertisements became prevalent for waterproof and outdoor wear. A lady could even purchase waterproof cloth to sew into a garment for traveling and the outdoors. As one ad enforces, waterproof garments were useful for many activities including yachting, bicycling, picnicking, canoeing, and camping. According to the August 1889 *Outing*, “women are beginning to learn that there is health as well as fun in an active out of door life,” which the magazine believed to include lawn tennis, croquet, walking, camping, canoeing, fishing, and mountain climbing.⁸⁵ A lady’s recommended dress for camping consisted mostly of wool garments and waterproof cloth. Standard waterproof supplies

could consist of rubbers, a gossamer waterproof, and a rubber blanket. By the end of the century, many fashion columnists argued that every lady, no matter her station, should have had a waterproof garment in her wardrobe.⁸⁶

Consumerism

According to McCracken, consumption is a cultural phenomenon. As fashion became commercialized, the speed of diffusion increased which led to a higher turnover in styles. McCracken attributes the beginning of the “consumer revolution” to the 1690s when the British could obtain cheap calico muslins from India. Prior to these Indian fabrics, the British only had access to more expensive fabrics made within their country. The consumer revolution came to fruition in the eighteenth century.⁸⁷

With consumerism came capitalism. As capitalism overtook the feudal system, people gained more opportunities and a middle-class began to develop. As more luxury goods became available, luxury became a form of decency among the upper-class, and decency became a necessity. Consumer goods became a method for the rising middle-class to enter upper-class circles, which created conflicts between the old and new upper-class.⁸⁸

Clothing played a role in the rising consumer culture. McCracken viewed clothing as a set of codes. People assign cultural meaning to clothing giving it a symbolic property. When advertising a consumer good, such as clothing, the advertisers must reflect the existing consumer culture in order to successfully reach their target market.⁸⁹ Garments intended to appeal to the upper-class tended to emphasize fashion whereas advertisements for garments marketed to the middle- and lower-classes emphasized function and price.

Consumer goods also had a great impact on economic transformation in many countries. Toward the end of the nineteenth century, we saw the rise of the department store. The department store offered a new marketing environment that provided convenience and entertainment for the consumer. Department stores first arrived in urban areas. To accommodate people in rural areas, entrepreneurs offered mail-order catalogs. Mail-order catalogs created a consumer revolution by providing people in rural areas access to an array of goods which were previously not available.⁹⁰

The birth of mail order catalogs is attributed to Aaron Montgomery Ward, a traveling salesman who decided to better reach his rural customers through a catalog, *Montgomery Ward*, in 1872. His biggest competition came in 1886 when Richard Sears created his mail order catalog, *Sears Roebuck & Co.* By 1896, goods purchased through mail order catalogs were delivered directly to each residence in rural areas.⁹¹

Toward the end of the nineteenth century, wealth was power. People could display their wealth through an accumulation of goods. People of all classes were falling prey to the rise of consumer culture which was accompanied by the desire to acquire and display objects. As industrialization brought down the cost of goods, people began to demand more goods. Happiness and prosperity became defined by material goods.⁹²

More research must be done to unravel the mysteries and complex array of waterproof clothing. Waterproof apparel has the potential to contribute in several dimensions. The inventive nature of technology paved the way for future products and innovations. Also, the nature of being waterproof contributed to a better way of life for many people. Protection from the elements is a primary concern within a society's structure. By providing people with protection from the elements, they gained other

opportunities, such as the ability to travel or the ability to perform various types of work in comfort. The role of these garments may have assisted in the ease of travel and leisure which were contributing factors to social change toward the end of the nineteenth century.

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³ "French Waterproof Cloth or Silk," *Scientific American* 5, no. 14, 22 December 1849, 105 [database online]; available from American Periodical Series Online.

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⁶ Jeffrey Banks and Doria de la Chapelle, *Tartan: Romancing the Plaid*, (New York: Rizzoli, 2007), 149.

⁷ Matt Haig, *Brand Royalty: How the World's Top 100 Brands Thrive & Survive*, (London: Kogan Page, 2004), 135.

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¹⁰ "Useful Receipts," *Saturday Evening Post* (Philadelphia), 5 April 1856, 8 [database online]; available from American Periodical Series Online.

¹¹ Paul G. Stecher, ed., *The Merck Index: An Encyclopedia of Chemicals and Drugs*, 8th ed., (Rahway, New Jersey: Merck & Co., 1968), 46, 612; "Ventilating Waterproof Cloth," *Scientific American* 4, No. 21 (25 May 1861): 327 [database online]; available from American Periodical Series Online. These chemicals were the same or similar to those used to weight silk.

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²³ Ibid., 51.

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- ⁸⁵ Emily A. Thackvay, "Camps and Tramps for Women," *Outing, An Illustrated Monthly Magazine of Recreation* 14, No. 5 (August 1889): 333.

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⁸⁷ Grant D. McCracken, *Culture and consumption: new approaches to the symbolic character of consumer goods and activities* (Bloomington: Indiana University Press, 1988), 5, 22.

⁸⁸ *Ibid.*, 17.

⁸⁹ *Ibid.*, 79.

⁹⁰ Ann Smart Martin, “Makers, Buyers, and Users: Consumerism as a Material Culture Framework,” *Winterthur Portfolio* 28, no. 2/3, (1993): 149.

⁹¹ Robin Cherry, *Catalog: An Illustrated History of Mail-Order Shopping* (New York: Princeton Architectural Press, 2008), 11.

⁹² Simon J. Bronner, “Reading Consumer Culture,” in *Consuming Visions: Accumulation and Display of Goods in America, 1880-1920*, ed. Simon J. Bronner (New York, Norton, 1989), 13, 25.

CHAPTER 4

THE SEARCH FOR IMPROVEMENT

Since little research has been completed concerning waterproof apparel, information must be obtained from a variety of sources in order to gain a better picture of the waterproof apparel industry between 1880 and 1895. Patents offer great insight into the problems faced by the consumers of the apparel and the solutions inventors sought to create to remedy those problems. Catalogs provide information concerning what garments were being sold to the consumer. Magazines, journals, and other periodicals provide consumer information in the form of advertisements, recommendations, and consumer comments.

Waterproof Compounds Results

Patents in the category “waterproof compounds,” consisted of improvements on the substances applied to the surface of fabric to render it waterproof. Research revealed eighty patents from 1880-1895 that incorporated waterproofing compounds or techniques. A chart of the patents by year shows that more patents were being produced in the 1880s and began to drop off in the early 1890s. The most patents were identified in 1881 with twelve patents during that year. In 1888 and 1893 no patents were produced for improvements in waterproofing compounds (see table 1).

Another chart illustrates the patents divided into categories based on the type of waterproofing technique used (see table 2). Rubber was the most common waterproof technique with thirty patents; oil or paraffin finishes were second with twenty-five patents; chemical compounds were third with seventeen patents; and the remaining eight patents combined multiple techniques in order to achieve waterproof capabilities.

Table 1. Number of waterproof compounds per year between 1880 and 1895.

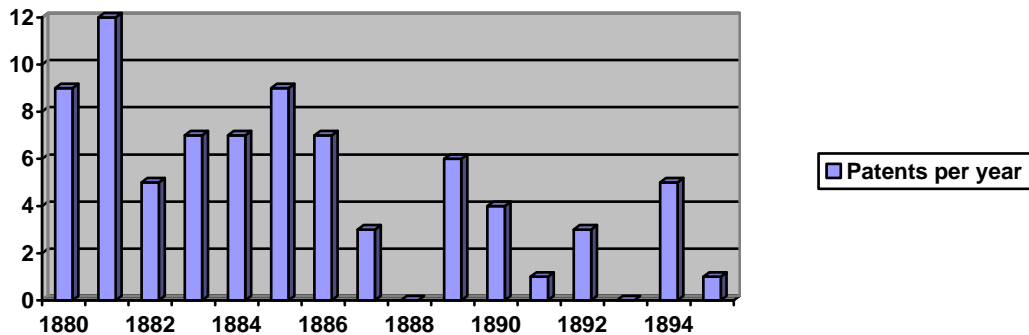
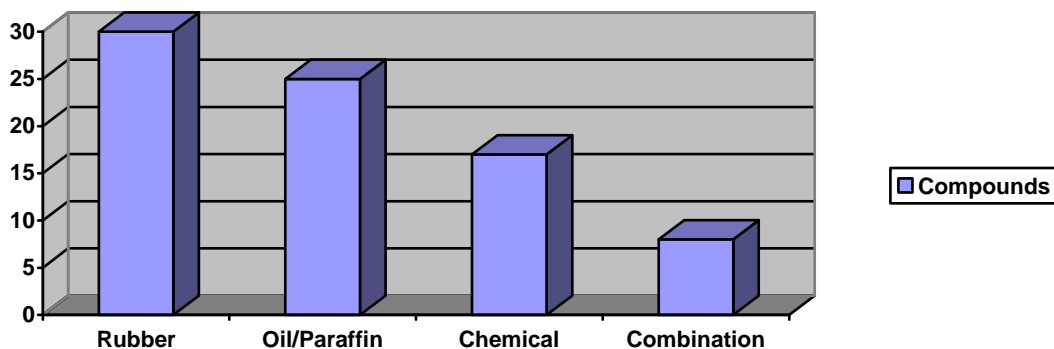


Table 2. Number of waterproof compound patents divided by waterproofing method between 1880 and 1890.



Some of the most useful information concerning patents of waterproof compounds included the data in the codes or subcategories of “reference to past processes,” “past problems,” and “stated improvements.” “Reference to past processes” contained descriptions of contemporary or previously used processes to waterproof apparel or other goods. The classification “past problems” frequently cited common problems with waterproof goods that were subject to public criticism. “Stated improvements” was the statement given in each patent that summarized the goal of the patent. These codes brought to light some of the concerns manufacturers and consumers

had with existing waterproof clothing and what was being done to improve the problems. Also, these codes offered information as to what waterproofing processes were commonly used in the past.

Some examples in the code “reference to past processes” are: 1) a patent involving the improvement of embossing and decorating rubber goods to look like non-waterproof fabrics mentioned that the only method practiced to ornament rubber goods through embossing was to make the fabric look like watered silks.¹ 2) A process that included the use of multiple, sometimes colored, coatings to create surface texture on rubber goods.² The past process classification also brings light to how rubber and fabric were combined as in patent 286039 where it references a process of cementing a thin sheet of rubber onto a fabric backing before vulcanizing the rubber.³ Patent 331298 indicated how rubber goods were colored by grinding colors into the waterproof compound, which was expensive, or adding the color to the surface later with a varnish.⁴

The classification “past problems” often references quality control issues as in patent 223874 that claimed that rubber could crack or lose its texture if it was folded during the vulcanization process.⁵ Many patents also reference problems with the odor emanating from rubber goods.⁶ Patent 236198 argued that resin lasted longer as a coating than paraffin and did not evaporate or wash out as quickly.⁷ Patent 286039 claimed that the past process used to make rubber was not sufficient to keep the flocking used on rubber goods from easily rubbing off.⁸ Patent 327813 claimed that the use of brushes to apply a waterproof compound would not allow the compound to saturate the fibers and; therefore, the coating would crack over time, exposing the fabric to which it had been applied.⁹ Several patents discussed the common criticism that waterproof

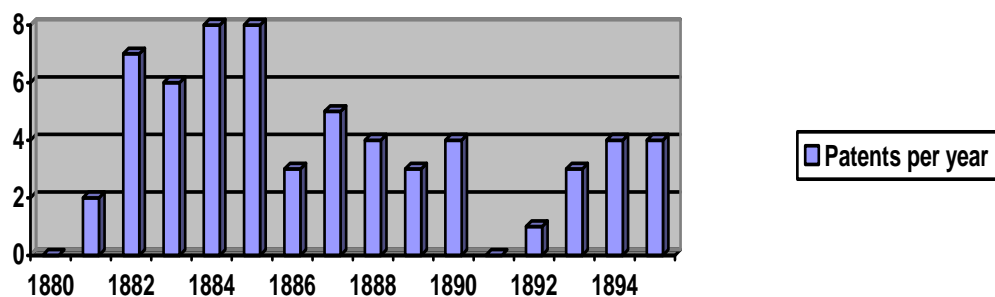
garments, particularly those utilizing rubber or oil, would have a tendency to become sticky when hot and brittle when cold.¹⁰

The classification “stated improvements” provided similar information, but specified what each patent was attempting to address. Common themes were whether or not the goods would remain pliable and soft,¹¹ was colorless,¹² and/or was odorless.¹³ The patents for waterproof apparel provided further information concerning waterproof improvements.

Waterproof Apparel Results

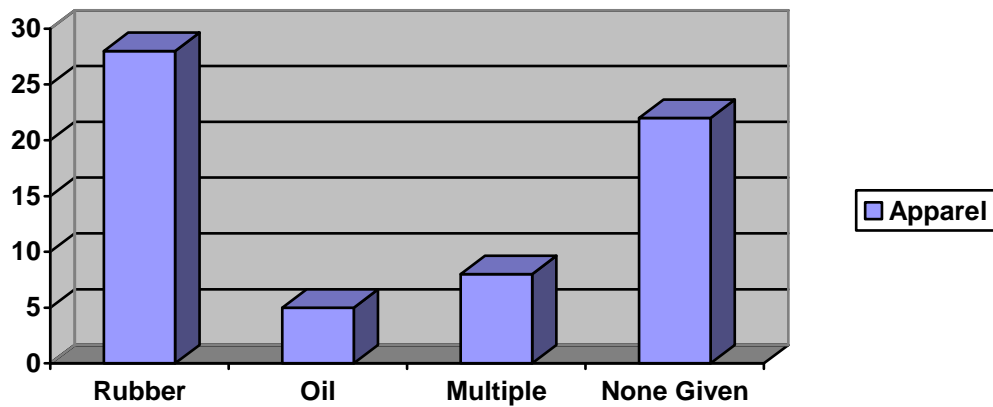
Patents in the category “waterproof apparel” primarily addressed the design and function of waterproof garments. Sixty-two patents were identified referencing waterproof apparel between 1880 and 1895. A table of patents per year revealed that the number of patents produced for apparel peaked during the mid-1880s and was similar in distribution to the chart of compound patents per year (see table 3). The years 1884 and 1885 produced the most patents for apparel, eight for both years. Both 1880 and 1891 produced no patents for apparel.

Table 3. Number of waterproof apparel patents per year between 1880 and 1895.



Many of the apparel patents referenced the type of waterproofing method to be used for the garment design. The most common waterproofing technique mentioned for the apparel designs was rubber and consisted of twenty-eight patents (see table 4).

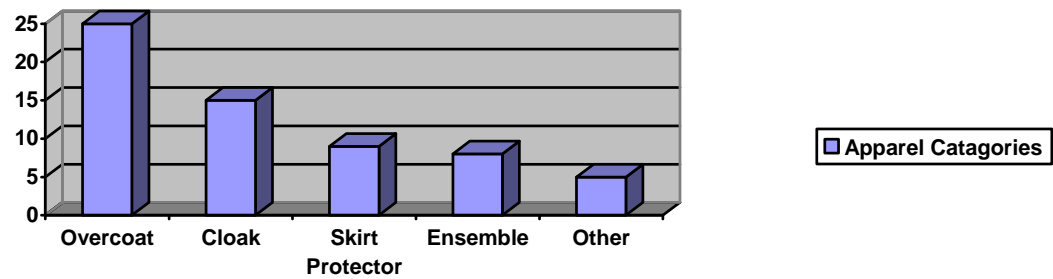
Table 4. Number of waterproof apparel patents divided by waterproofing method between 1880 and 1890.



Other methods included the use of an oil coating with five patents and eight apparel patents claimed that they could be used for either rubber or oil coatings (labeled as multiple). The twenty-two remaining patents did not specify what type of waterproof technique should be used for their apparel.

The data on waterproof apparel was also broken down by garment type (see table 5). The apparel type that occurred most frequently was the overcoat and the cloak. Additional articles that occurred with frequency included the skirt protector, and the ensemble or suit (included multiple pieces of a garment). Other miscellaneous items consisted of an attached rubber knee pad, detachable sleeves, ventilated shoulder pieces, and a shirt front.

Table 5. Number of waterproof apparel patents divided into apparel categories.



Many of the patents primarily addressed one specific design detail on the garment while others included the entire design of the garment. The following patents primarily consisted of coats or overcoats: eight patents were dedicated to ventilation, eight included coats that were able to envelope the wearer's legs, six discussed covering both the horseback rider and his saddle, two incorporated a trough device to carry away the water, and two discussed preventing leaks through construction or improved seams. Most of the cloaks involved improvements in detachable sleeves or reinforcement of stress areas including the armhole opening. The skirt protectors were either overskirts or contained a device to envelope the hem of the skirts. Other miscellaneous patents included coats that would cover the rider and bicycle, a ladies' coat that was adjustable for the changing fashion silhouettes, a cloak that also served as a life preserver with an inflatable vest, and a cloak with an attached container that could hold the cloak.

Several codes within the category of "waterproof apparel" proved to provide more information than others. The more insightful codes included "stated improvements," "special characteristics," "reference to occupations," and "past problems." The code "stated improvements," as with the waterproof compounds patents, was a description

provided in each patent that illuminated the patent's goal. "Special characteristics" was a code for the description of the particular feature of each garment that assisted with its improvement. "Reference to occupations" was a code to record any occupations for which the particular garment was designed. The code "past problems" discussed previous issues with waterproof garments that were potentially being solved by the existing patent.

The code "stated improvements" addressed such problems as ventilation, reinforcement, protecting lower extremities, protecting both the rider and a saddle, protecting ladies skirts from mud and moisture, and arm protection. The code "special characteristics" brought to light interesting features inventors added in an attempt to improve waterproof goods. Not all patents contained information for the code "reference to occupations;" however, those that did offered insight into the people who wore the waterproof garment designs. Some of the occupations for which the garments were designed included horseback riders, miners, teamsters, car-drivers, and hackmen. Other garments were designed for sailors, fishermen, and those in other sea occupations.

Some garments were designed for recreational purposes rather than occupational use. Ladies' skirt protectors that enveloped the skirts were described as useful when traveling or walking.¹⁴ Bicycling was a recreation that was becoming more popular by the 1890s so it was not surprising to find several patents for waterproof garments that could be worn without inhibiting one's ability to ride a bicycle.¹⁵ One garment held claim of being versatile as either a cloak or a knee rug and could have been used for such occupations as an opera cloak, a garment for shooting, riding, driving, fishing, hunting, or the military, and used as ground cover when camping.¹⁶

The classification “past problems” primarily focused on the inability for garments to protect the body in one way or another. Many of the coats did not button below the waist and therefore left the wearer’s legs exposed. Several garments added detachable sleeves that could be added to a cloak to protect the arms. The patents addressing reinforcement were due in part to the susceptibility for garments and their waterproof coatings to tear at certain stress points. The designs that incorporated ventilation were created to address the complaint that waterproof goods, particularly those made of rubber, did not allow enough air circulation. One patent was created to address the ever changing fashion silhouette and attempted to create a garment that could be adjusted to fit the current fashionable shape.¹⁷

Catalog Results in the United States

A variety of catalogs provided supplementary information for this research. Catalogs primarily containing rubber goods included the 1881 Goodyear Rubber Company, the 1883 Goodyear Rubber Company, the 1885 Goodyear Rubber Curler Co., the 1885 Paxton, Comfort & Co., the 1885 Summit Rubber Clothing Company, the 1895 American Rubber Company and Para Rubber Shoe Co., an 1890s Anderson, Anderson, & Anderson, an 1890s Goodyear Rubber Company, an 1890s C. J. Bailey and Co., and an 1890s F. C. Howlett and Company Rubber Goods. Catalogs that contained oiled goods as their primary form of waterproof clothing consisted of the 1883 Denver Manufacturing Co., 1891 L. Frank Illustrated Catalog, 1895 L. D. Stone & Co. Saddle, and the 1892 Joseph H. Rowe & Co. Dry goods catalogs that contained a large variety of good including waterproof apparel included the 1886 Bloomingdales Brothers, 1891 Jordan, Marsh & Co., and an 1895 Montgomery Ward.

Rubber Catalogs

Several catalogs were published with the Goodyear name between 1880 and 1895. In the 1881 *Goodyear Illustrated Rubber Trade Journal*, rubber clothing was offered in either luster or dull finish and some items came in colors other than black including white and tan. The styles included sacks, officers' coats, reefing jackets, ponchos, talmas, and capes. The catalog also offered special apparel for fishermen, firemen, miners, and lumbermen. Fine rubber garments were made, often utilizing the double texture method, in fine cashmere, serge, or checked Silesia.¹⁸ The catalog also offered a large array of light rubber garments known as gossamers as well as some oiled clothing. Additional rubber garments included inflatable life vests, ice aprons, diving armor and the Goodyear storm coat that consisted of a coat that could be buttoned around the legs for protection. The catalog also included "crack proof" rubber boots praised by several letters written by merchants who raved at their customers' satisfaction with the product.¹⁹

A *Goodyear Rubber Company Price List* published in Chicago in 1883 provided a similar range of goods as the previous Goodyear catalog. Luster and dull finish clothing continued to be offered in similar styles. The fine clothing included colored sack coats, officers' coats, and capes as well as reversible and non-reversible plain, checked, or plaid Silesia. Additional clothing included rubber pants and aprons and Cape Ann brand oiled clothing. The gossamer clothing was again offered for men, women and children, but the garments had additional names including the "Western," which appears to be the least expensive gossamer, and the "Newport," which was a ladies garment with an added cape to better protect a lady's arms in bad weather.²⁰

Goodyear's Rubber Curler Co. Illustrated Price List from 1885 continued to offer apparel; however, the number and type of goods had increased greatly and included a section on "Goodyear's Pocket Gymnasium" featuring products for use in home exercise.²¹ The apparel being offered had not changed much from the 1881 and 1883 catalogs. Fine clothing as well as the luster and dull finish apparel remained similar. The term "featherlight," however was used in place of the term gossamer for lightweight goods that could be easily folded up and stored in small spaces. They were said to be made of gingham fabric and only weighed around ten ounces. The men's "featherlights" added a herdsman's coat to the list which was adapted for riding on horseback.²² Interestingly, the rubber umbrellas in the catalog referenced using gossamer rubber cloth. The price list also included a section for sportsmen's fishing and hunting outfits, some consisting of mackintosh fabric. This particular price list appears to serve for educational purposes and went as far as to calling itself a manual of rubber goods as it included information on the history of rubber, Charles Goodyear, rubber machinery, and gutta-percha.²³

The price-list of rubber goods from Paxton, Comfort & Co. catalog in 1885 offered both gossamer and plain rubber clothing. The price list offered gossamer styles called "Prince Albert" for men and the "Princess" and "Empress" for women claiming that their garments were the best quality among gossamers offered at a medium price level. The plain rubber clothing came in either luster or dull finish and in similar styles to that of the Goodyear catalogs.²⁴ The Summit Rubber Clothing Co. also published a price list in the Spring of 1885. The styles of their garments were similar to those in the Goodyear and Paxton, Comfort & Co. catalogs, but the garments had different names.²⁵

E. G. Stearns & Co. produced a catalog of rubber goods in 1895 with the American Rubber Company and the Para Rubber Shoe Co. as agents. This catalog had a listing of a variety of double texture mackintosh coats as well as single texture invernenses for men, women, and children. The garments came in a variety of fabrics such as wool serge, colored checks, or tricot. The catalog also offered ladies' gossamer invernenses and circulars called the "Peruvian" and "Pacific Electric." The catalog also offered other familiar garments such as men's and boy's lustre (sic) and dull finish heavy rubber clothing in mountaineer and officer coats. Other specialty garments included firemen's coats, drivers' and farmers' coats, and wine-colored coats. The catalog also offered a selection of "Pilot," "Lone Fisherman" and "Ranch" brand oil slickers and other clothing in black and yellow.²⁶

A Goodyear Rubber Company Illustrated Catalogue and Price List published in the 1890s placed a new emphasis on mackintoshes. Men's double texture coats were available in a variety of fabrics and could have a velvet collar or a cape. Women had access to comparable style of coats with a velvet collar or a cape. Officers' and firemen's coats were still available in addition to coats for motormen, teamsters, saddle coats, and canvas shooting coats. The catalog also offered a selection of oiled clothing including slickers, jackets and apron pants.²⁷

C. J. Bailey and Co. offered a catalog in the 1890s that included a wide array of rubber goods. Many of the items offered were household goods or surgical tools; however, the catalog also offered ladies and men's mackintoshes. The men's coats were wool lined and the ladies' coats were offered in silk and could have an attached military cape.²⁸

F. C. Howlett & Co., manufacturers' agents and jobbers, published a catalog in the 1890s. This catalog included women's invernenses and two cape cloaks in cashmere and other fabrics. The catalog also included men's and boy's cape and box coats as well as service coats that were made especially for doctors who put extra wear and tear on their coats. As with the other catalogs, men's and boy's luster and dull finish coats as well as driver and fire coats were available. The catalog also offered Excelsior Oil Dressing in yellow or black to be applied to oiled clothing. Oiled clothing was also available in driver's or motormen's coats as well as officer's long coats, jackets, and overall apron pants.²⁹

In comparison, *An Illustrated Catalogue of Waterproof Articles* manufactured by Anderson, Anderson & Anderson published in London, England in the 1890s offered a similar array of waterproof articles to those available in the United States. This catalog offered many items listed as Army regulation including an Army cloak and an Admiral's waterproof for naval officers. The catalog also offered men's and ladies' hunting waterproofs, coats and aprons for drivers, footmen and grooms, waterproofs for golfing, cycling waterproofs, fishermen rubber and oilskin waterproofs, shooting coats, ladies waders, yachting waterproofs and a variety of coat styles for men, women and boys.³⁰

Oiled Clothing Catalogs

Many of the rubber goods catalogs contained some oiled clothing; however, a catalog surfaced from the New England area that was entirely dedicated to oiled clothing and provided clothing primarily for fishermen and horsemen. The *Catalogue and Price List for Joseph H. Rowe & Co.* consisted of oiled clothing. The brand they manufactured was the Mother Ann brand. The catalog contains a brief history of the Mother Ann brand

and their second quality Anchor brand. The Mother Ann brand was named after Cape Ann in Massachusettes, dubbed “Mother Ann” after Princess Ann of Denmark. The clothing they offered consisted of fancy long and short coats, fishermen’s jackets, fishermen apron pants and seamen’s string pants. The oiled clothing, as was typical, came in either yellow or black. The catalog also offered men’s and boy’s slickers, wagon covers, and boots.³¹

Saddlery and leather goods merchants and manufacturers developed catalogs to serve horsemen in the West which offered oiled clothing for their waterproof goods. *The Illustrated Catalog of the Denver Manufacturing Company* in 1883 offered oiled leather goods, such as chapperajoes as a waterproofed garment.³² Other catalogs, such as the *L. Frank Illustrated Catalog* in 1891 offered oiled pommel slickers for horseback riders including the Fish Brand, Shield Brand, and Herder’s Brand.³³ Some saddlery catalogs offered a larger variety of waterproof clothing, such as the 1895 catalog from *L. D. Stone & Co. Saddle*. The catalog offers the oiled pommel slickers or saddle coats along with oiled string pants, jackets, sack coats, and long coats. In addition, the catalog also offered a selection of rubber goods including the storm coat for riding, ponchos in lustre (sic.), dull and white, and a storm coat that buttoned around the lower legs, again promoted for horseback riding.³⁴

Dry Goods Catalogs

Dry goods catalogs offered a wide range of merchandise in order to reach a broad audience. These catalogs frequently included a variety of waterproof goods. A reprint of the *Bloomington’s Illustrated 1886 Catalog* included rubber coats for men, women and children. The selection of men’s rubber coats included gossamer coats, dull finish coats

that could be reversible with a checked back, and heavy rubber storm coats. Ladies' gossamer coats came in a variety of styles including circulars (long cape-like garments), Newports (which included a cape), and doleman style coats, which were advertised as a new style. Misses and girl's rubber coats were offered as a circular, Newport, or Mother Hubbard style.³⁵

Another dry goods merchant that offered a catalog was Jordan, Marsh and Company. Eben Jordan and Benjamin Marsh opened a small wholesale business in 1851. Their catalog published in 1891 contained a selection of rubber goods for men and women. One full page was dedicated to women's and children's waterproof garments. The descriptions indicate that the goods were imported English mackintoshes and included a range of qualities such as lightweight gossamer rubber goods and showerproof garments which may have referred to chemically treated garments. Jordan, Marsh, and Company emphasized recreation since they offered a variety of waterproof riding habit clothes that could be purchased plain or in a variety of plaids, stripes, and other fabric styles.³⁶

The back of the Jordan, Marsh and Company catalog contained advertisements for rubber goods as well. G. Kutnow, an agent for B. Birnbaum & Son of London, England offered ladies' and men's odorless waterproof garments. The garments were advertised to have a patented ventilator under the arms. Another advertisement was placed by the American Rubber Co. which promoted its line of rubber boots and shoes.³⁷

The Spring and Summer *Montgomery Ward & Co. Catalogue and Buyer's Guide* of 1895 offered both rubber and oiled goods. The catalog offered a large selection of ladies gossamer and mackintosh coats as well as men's mackintoshes and heavy rubber

clothing. These rubber goods were also available in a selection of coats for misses and boys. The catalog also offered an array of yellow and black oiled clothing including jackets, coats, apron pants, string pants, and hats.³⁸

Women's Periodicals

Several magazines and journals included waterproof clothing in their publications. This information included descriptions, illustrations, criticism, and recipes for waterproof cloth and apparel. Some of the publications that included recipes for waterproofing in the home were *Scientific American* and *Saturday Evening Post*. Advertisements for ladies' waterproof garments appeared in publications such as *The Ladies' Home Journal*, *Arthur's Home Magazine*, *Peterson's Magazine* for Pluette brand rain-proof storm serge garments and gossamer garments from the Gossamer Rubber Clothing Co. In addition, ladies' magazines including *Arthur's Home Magazine* and *Godey's Lady's Book* included illustrations and descriptions of waterproof garments. *Ehrich's Fashion Quarterly* included a price list for its ladies gossamers in 1885.

The magazines, journals, and newspapers provide additional valuable supplemental information to help illustrate the consumer opinions and clothing trends involving waterproof apparel. Combined with the information from the catalogs and patents, the ladies magazines and other publications provide a well rounded picture of the types of waterproof apparel that was available and the problems people were attempting to overcome as they sought to improve the design and composition of waterproof dress.

Criticisms of Waterproof Apparel

Some of the criticisms of waterproof products were due to the nature of the compounds, such as rubber, rather than flaws in the design. One of the biggest criticisms

was the inability for the apparel to breathe; however, when a breathable compound was used, the product was not completely waterproof.

Many recipes for chemically treated fabric boasted that the fabric was a breathable form of waterproof garment. This was an important factor given that rubber and oil coated garments were consistently criticized for their lack of ventilation, causing the wearer to perspire profusely. The price, however, for creating a breathable fabric was that the garments were only water-resistant and in a heavy rainstorm, the garment would eventually become saturated. By the 1890s, the debate between the waterproof garment (rubber or oil) and the ventilated garment (chemical or otherwise) became an important question in terms of hygiene.

Based on patents identified for waterproof compounds and apparel, rubber appeared to be the most popular compound used to waterproof apparel. Between 1880 and 1895, waterproof apparel continued to be made using oils and chemical compositions; however, rubber was a new technology discovered in the early nineteenth century. The properties of rubber made it appear as though it might hold the solution to creating the ideal waterproof apparel. The discovery of vulcanization to stabilize rubber in 1839 greatly increased the potential for apparel and other products. Even vulcanized rubber, however, had its problems. The success of the garment relied on a number of factors including: the proper vulcanization of the rubber, the attachment of the rubber to fabric, and the proper use of assembly techniques to prevent leakage. In addition, garments that were truly waterproof did not allow the circulation of air around the body and caused the wearer to perspire.

Several publications addressed consumer concerns about the use and ventilation of waterproof goods. An article called “The Function of Clothing” in an 1894 *Scientific American* gave the most concise advice when they said:

Waterproof clothing is very valuable under certain conditions. It protects against cold, rain and wind; but it is an exceedingly hot dress, for it prevents evaporation and condenses and retains the perspiration. Save for very short periods, it should never be worn by persons taking active exercise. For those, however, who are not exercising their limbs to any great extent, but are exposed to wet and cold, waterproof materials are an excellent protection. Woolen clothing should be worn underneath in order to absorb perspiration, and the waterproof should be taken off as soon as the necessity for it has passed away. Ventilating waterproofs are sometimes offered, but a real combination of this kind is an impossibility. If a garment let out air and perspiration, it will let in wind and wet. If thoroughly waterproof, it will not admit any true ventilation.³⁹

Rubber goods were not the only type of waterproof apparel that did not allow air circulation when wearing the garment. Oiled clothing suffered from the same air-tight abilities. An article describing appropriate apparel to be worn in the Yukon, recommended high quality oilskin or slicker suits. The author, however, made the following warning:

It has, however, a disadvantage in that the trousers in warm weather often make the garments beneath as wet from perspiration as they would have been from rain. All waterproof clothing sweats a man when exercising, and personally I would rather wear good cloth in anything but the heaviest downpours.⁴⁰

The 1885 catalog published by Goodyear’s Rubber Curler Co. contained consumer information regarding the ventilation of their rubber coats. To prevent consumers from returning merchandise out of “ignorance,” they incorporated an article called “Does the Coat Leak.” They emphasized that rubber coats were prone to sweating just like that of an ice pitcher. When a rubber coat was fastened around the body, it retained the warmth of the wearer. If the coat came in contact with cool air, moisture

would condense on the inside of the coat, dampening the garments underneath. They provided the following example:

During the political campaign of 1880, the wearers of oil uniforms, in torchlight processions, after a march, frequently found the oil coats quite wet inside, although it had not rained. The possibility of leakage is here precluded, positively demonstrating the fact that moisture condenses inside of the coats, as has been stated.⁴¹

After this explanation, the catalog offered a description of how to test a waterproof coat for leakage.

The Goodyear catalog provided further recommendation for preventing leakage by ordering the thin rubber coats in larger sizes. Wearing the thin rubber coats too tight could lead to perspiration and eventual leakage of the garment.⁴² Gossamers and other thinly coated rubber garments were likely susceptible to wear and tear due to the thin waterproof coating. Many people liked these coats for their lightness, but they were not intended for heavy usage.⁴³ Oiled clothing, like rubber, also had problems with wear and tear. One patent claimed that oiled clothing often lost its waterproofing ability over time and with washing and exposure to the elements.⁴⁴

Another common criticism associated with rubber garments was the unpleasant odor associated with the rubber. Many chemicals were added to rubber during the vulcanization process, particularly sulphur,⁴⁵ which left the rubber with a distasteful smell. Several patents tried to remedy this problem through deodorizers or by attempting to neutralize the chemicals causing the odor. Some patents, as with 224297, attempted to prevent odor by replacing or supplementing the rubber with paraffin, thereby changing the chemical composition of the waterproof coating.⁴⁶ Other patents, such as 340501 and 441502, provided a composition for a perfume used to coat the rubber, canceling out the

sulphur odor.⁴⁷ Another patent, 226017, attempted to remove the odor by identifying the proper chemical balance.⁴⁸ Other problems could arise from using too much sulphur when vulcanizing rubber. An excess of sulphur could cause the surface of the rubber to “bloom” disrupting the smooth surface of the goods as well as degrading the quality.⁴⁹ An advertisement in the back of the 1891 Jordan, Marsh & Co. catalog promoted odorless waterproof garments for ladies and men. The coats also included ventilators underneath the arms.⁵⁰

The Summit Rubber Clothing Co. promoted their double texture cashmere coats as vulcanized and therefore better in quality to the solarized goods made in black and seal brown. The statement likely referenced either the cold vulcanization process that used chemicals instead of heat to cure the rubber, or the patents suggesting that rubber could be cured through exposure to the sun for a specified period of time.

Before vulcanization, rubber had a tendency to become sticky, especially in warm weather. In spite of this problem, merchants were still able to sell rubber products because oiled cloth had a similar problem, and therefore was not superior to rubber. After the discovery of vulcanization, inventors continued to seek solutions to the improvement of oiled goods. Patents 339463 and 517927 attempted to directly address this issue by experimenting with different oils. An article in a periodical also addressed these concerns and claimed that consumers should only purchase the highest quality oiled garments stating, “cheap oilskins are sticky, or else they are not waterproofed.”⁵¹

The critiques gained from the patents help to better understand the problems inventors were attempting to solve. The patents also provide insight into the designs people created to remedy these problems and make everyday life easier. Several patents

were created to help in occupational situations and some were a direct result of the rising interest in recreation and travel.

¹ Frances Brigham, Wilbur F. Brigham, S. Myron Hewitt, and William F. Prusha, 1880, *Water-proof Fabric*, US Patent 226031, filed 4 March 1880, and issued 30 March 1880.

² Charles A. Evans, 1881, *Manufacture of India-rubber and Gutta-percha Cloth*, US Patent 238496, filed 5 February 1881, and issued 8 March 1881.

³ Brunswick Antimony Company, 1883, *Water-proof Cloth*, Thomas J. Mayall (assignor), US Patent 286039, filed 19 March 1883, and issued 2 October 1883.

⁴ Edward H. Harral, 1885, *Method of Making Water-proof Fabrics*, Theodore Hawley (assignor), US Patent 331298, filed 3 August 1885, and issued 1 December 1885.

⁵ Charles Y. Beach, 1880, *Manufacture of Rubber or Other Gum Cloth and Compositions Thereof*, US Patent 223874, filed 29 November 1879, and issued 27 January 1880.

⁶ Charles Y. Beach, 1880, *India-rubber and Other Gum Compounds for Surfacing Cloth and for Other Purposes*, US Patent 226017, filed 21 January 1880, and issued 30 March 1880; Ella Mary Freely, 1886, *Vulcanized Rubber and Textile Fabric*, US Patent 340501, filed 2 October 1885, and issued 20 April 1886; Goodman Charles Mandleburg, Henry Lesser Rothband, and Samuel Lawrence Mandleburg, 1890, *Process of Manufacturing Rubber Goods*, US Patent 441502, filed 5 February 1890, and issued 25 November 1890; Goodman Charles Mandleburg, Henry Lesser Rothband, and Samuel Lawrence Mandleburg, 1890, *Process of Manufacturing Rubber Goods*, US Patent 441503, filed 5 February 1890, and issued 25 November 1890.

⁷ Peter H. Vander Weyde, 1881, *Method of Waterproofing Textile Fabrics, Leather, &c.*, US Patent 236198, filed 15 June 1880, and issued 4 January 1881.

⁸ Brunswick Antimony Company, US Patent 286039.

⁹ Thomas J. Martin, Edwin Martin, and William Martin, 1885, *Waterproofing Fabric*, Frank S. Mitchell (assignor), US Patent 327813, filed 24 July 1885, and issued 6 October 1885.

¹⁰ Carlos Delattre, 1886, *Waterproofing and Preservation of Fabrics*, Marie Verginie Piron (assignor), US Patent 339463, filed 23 November 1885, and issued 6 April 1886; Ernest John Knowlton, 1894, *Compound for Waterproofing Fabrics*, US Patent 517927, filed 29 March 1892, and issued 10 April 1894; Hermann Cohrs, 1895, *Process of Waterproofing Textile Material*, US Patent 540636, filed 13 June 1894, and issued 11 June 1895.

¹¹ Daniel M. Lamb, 1880, *Waterproofing Compound*, US Patent 224295, filed 17 June 1879, and issued 10 February 1880; Charles P. Orne and Morris F. Whitton, 1881, *Composition for Waterproofing Cloth*, US Patent 242147, filed 25 March 1881, and issued 31 May 1881; Erasmus B. Collins and William K. Swallow, 1881, *Compound for Rendering Cloth Water-proof*, Curt August Fischer (assignor), US Patent 248299, filed 2 August 1881, and issued 18 October 1881; John A. Titzel, James C. Titzel, and John Lynch, 1882, *Waterproofing Compound or Paint*, US Patent 266223, filed 7 March 1882, and issued 17 October 1882; Frank F. Terramorse, 1883, *Water-proof Fabric for Making Waterproof Clothing*, US Patent 284514, filed 23 January 1883, and issued 4 September 1883; The New York Insulated Wire and Vulcanite Company, 1884, *Manufacture of Rubber Compositions*, John Joseph Charles Smith (assignor), US Patent 308209, filed 7 April 1884, and issued 18 November 1884; Martin, US Patent 327813; Adam Schmitt, 1885, *Oil Compound for Leather*, US Patent 329960, filed 30 July 1885, and issued 10 November 1885; Ernest J. Wimmer, 1886, *Process of Making Leather Water-proof*, Joseph A. Dietz (assignor), US Patent 334518, filed 29 December 1884, and issued 19 January 1886; Ferdinand Kreutzer, 1887, *Waterproofing Compound*, US Patent 370545, filed 6 July 1887, and issued 27 September 1887; Robert Hutchison, 1894, *Gutta-percha or Rubber Compound*, US Patent 518817, filed 1 August 1893, and issued 24 April 1894.

¹² Lamb, US Patent 224295; Daniel M. Lamb, 1882, *Compound for Treating Goods to Render them Water-repellent*, US Patent 256108, filed 29 December 1880, and issued 4 April 1882; Conrad L. Weimann and John Weimann, 1883 *Waterproofing Compound*, US Patent 275738, filed 8 March 1883, and issued 10 April 1883; Martin, US Patent 327813; Charles F. Hime and John H. Noad, 1891, *Process of Waterproofing and Preserving Textures and Other Materials*, US Patent 456821, filed 22 October 1889, and issued 28 July 1891.

¹³ Daniel M. Lamb, 1880, *Moth and Water Proofing Compound*, US Patent 224297, filed 17 June 1879, and issued 10 February 1880; Beach, US Patent 226017; Terramorse, US Patent 284514; Edward Mize, 1883, *Process of and Compound for Rendering Cloth Impervious to Water*, Erasmus B. Collins (assignor), US Patent 285734, filed 24 August 1883, and issued 25 September 1883; Jacob Wallace, 1885, *Preserving, Strengthening, Waterproofing, and Glossing Textile Fabrics, Including Paper*, US Patent 328956, filed 23 May 1885, and issued 27 October 1885; Freely, US Patent 340501; Charles T. Snedekor, 1884, *Waterproofing Compound*, US Patent 396622, filed 6 October 1888, and issued 22 January 1889; Goodman Charles Mandleburg, Henry Lesser Rothband, and Samuel Lawrence Mandleburg, 1890, *Process of Manufacturing Rubber Goods*, US Patent 441501, filed 5 February 1890, and issued 25 November 1890; Mandleburg, US Patent 441502; Mandleburg, Patent 441503.

¹⁴ Gilbert Baker, 1883, *Dress and Skirt Protector*, US Patent 282254, filed 2 January 1883, and issued 31 July 1883; Charlotte A. Gandil, 1885, *Lady's Skirt-Protector*, US Patent 319477, filed 1 December 1884, and issued 9 June 1885.

¹⁵ Martha C. Geldowsky, 1894, *Dress-skirt*, US Patent 529828, filed 23 August 1894, and issued 27 November 1894; John Wade Orr, 1895, *Waterproof Cape*, US Patent 531695, filed 9 March 1894, and issued 1 January 1894.

¹⁶ John Henry Smalpage, 1892, *Combined Rug and Cloak*, James Alfred Shelton (assignor), US Patent 471903, filed 26 December 1891, and issued 29 March, 1892.

¹⁷ Harriet Judson, 1887, *Water-proof Garment*, US Patent 373895, filed 18 October 1887, and issued 29 November 1887.

¹⁸ Goodyear Rubber Company, *Illustrated Rubber Trade Journal: Prices of Rubber Clothing, Boots ad Shoes, Gloves, Mittens, &c.* (New York: privately printed, 1881).

¹⁹ *Ibid.*, 7-8.

²⁰ Goodyear Rubber Company, *Price List of Heavy and Gossamer Rubber Clothing*, (Chicago: privately printed, 1883).

²¹ Goodyear's Rubber Curler Co., *Illustrated Price List*, (New York: privately printed, 1885).

²² *Ibid.*, 16-21.

²³ *Ibid.*

²⁴ Paxton, Comfort & Co., *Price-list of Rubber Goods*, (Philadelphia: privately printed, 1885).

²⁵ Summit Rubber Clothing Company, *Summit Rubber Clothing Company*, (New York: privately printed, Spring 1885).

²⁶ E. G. Stearns & Co., *Rubber Goods: Boots and Shoes, Tennis Shoes, Mackintoshes*, (Boston: privately printed, Spring 1895).

²⁷ Goodyear Rubber Company, *Mackintoshes, rubber and oil clothing, ect.: Illustrated Catalogue and Price List of the Goodyear Rubber Company*, St. Paul, MN: privately printed, 1890s.

²⁸ C. J. Bailey & Co., *C. J. Bailey & Co.: Everything in Rubber Goods* (Boston: privately printed, 1890s).

²⁹ F. C. Howlett, *F. C. Howlett and Company Rubber Goods*, Buffalo, NY: privately printed, 1890s.

³⁰ Anderson, Anderson & Anderson, *An Illustrated Catalogue of Indiarubber & Waterproof Articles* (London, privately printed, 1890s).

³¹ Emerson & Adams, *Catalogue and Price List Joseph H. Rowe & Co. Manufacturers of Genuine Cape Ann Oiled Clothing, Horse and Wagon Covers, Sou' Westers and Oiled Hats*, (Bangor, ME: privately printed, 1892).

³² Denver Manufacturing Company, *Illustrated Catalogue of the Denver Manufacturing Company, Tanners, Manufacturers and Wholesale Dealers in Leather, Leather Goods, Whips, Lashes, and Saddlery Hardware* (Denver, CO: Daily Times Steam Printing House, 1883).

³³ L. Frank, *Illustrated Catalogue* (San Antonio, TX: privately printed, 1891).

³⁴ *L. D. Stone & Saddle Co. Saddle*, San Francisco, CA: privately printed, 1895.

³⁵ Bloomingdale Brothers, *Bloomingdale's Illustrated 1886 Catalog* (1886; reprint New York: Dover Publications, 1899).

³⁶ Jordan, Marsh & Co., *Jordan, Marsh Illustrated Catalog of 1891*, (Private publication

1891; reprint New York: The Athenaeum of Philadelphia and Dover Publications, 1991).

³⁷ Ibid., 97, 104.

³⁸ *Montgomery Ward & Co. Catalogue and Buyers' Guide*, (Spring and Summer 1895; reprint New York: Dover Publications, 1969).

³⁹ Dr. Robson Roose, "The Function of Clothing," *Scientific American* 70, no. 1, (6 January 1894): 10 [database online]; Available from American Periodical Series Online.

⁴⁰ J. B. Burnham, "Yukon Notes,--IV," *Forest and Stream; A Journal of Outdoor Life, Travel, Nature, Study, Shooting, Fishing* 50, no. 20 (May 14, 1898): 383 [database online]; available from American Periodical Series Online.

⁴¹ Goodyear's Rubber Curler Co..

⁴² Ibid.

⁴³ Paxton, Comfort & Co.

⁴⁴ Weyde, US Patent 236198.

⁴⁵ Although sulfur is currently the accepted spelling in scientific publications; the spelling sulphur is an older form of the term used throughout the nineteenth century. Pamela B. DeVinne (ed.), *Webster's Illustrated Encyclopedic Dictionary*, (Pleasantville, New York: Tormont Publications, 1990), 1656.

⁴⁶ Lamb, US Patent 224297.

⁴⁷ Freely, US Patent 340501; Mandleburg, US Patent 441502.

⁴⁸ Beach, US Patent 226017.

⁴⁹ Franz Wilhöft, 1885, *Vulcanized Soft Rubber and Process for Making the Same*, US Patent 321410, filed 9 April 1885, and issued 30 June 1885.

⁵⁰ Jordan, Marsh & Co., 97.

⁵¹ Burnham, 383.

CHAPTER 5

DESIGN AND FUNCTION

Waterproof apparel patents as well as catalogs and other resources helped to demonstrate improvements in the design and function of waterproof dress between 1880 and 1895. The designs illustrated in the patents not only assisted in identifying needed improvements, but helped to break down the apparel patents into apparel groups. The garment illustrations seen in the patents could be easily compared with consumer goods in catalogs and magazines. This comparison was useful in examining what types of inventions were being adopted by merchants and consumers.

Waterproof Apparel Design

The apparel patents often focused on a specific design detail to improve the waterproof ability of the garments. The types of garments primarily consisted of coats, ensembles, skirt protectors, or other devices as outside protection for the clothing underneath. The patents illustrated that each inventor could use a different approach to find a solution to certain design problems.

The Horseman

Several patents addressed the need for apparel that could be worn as a protective garment while riding as well as dismounted. Many of these patents specified that the coat was intended to be an oiled waterproof garment worn by horsemen whose occupations included herding cattle. An 1882 patent created by Abner J. Tower for a coat created with an additional flap to cover the saddle as well as the rider described its purpose as the following:

The object of the invention is to provide a storm-flap, which when the wearer of the coat is on horseback, lie over and in front of the pommel of the saddle in such a manner that, although the body of the coat is necessarily spread apart, the person's clothing and saddle are thoroughly protected from the rain, which otherwise could drive in and saturate the saddle and clothing, and be likely to chill and drench the person of the wearer at that point, often causing serious trouble.¹

The patent contains illustrations of two modifications to achieve this goal. One coat had a single flap that could be buttoned in an expanded position while riding and the other coat used two flaps that could be buttoned out to go over the saddle or buttoned flat for walking (see fig. 1 & 2).

The same inventor continued to improve upon his design in 1884 and 1885. The 1884 invention modified the flap extensions so that they began from the top of the coat and extended nearly to the bottom of the coat. As with the previous patent, the flaps allowed the coat to be expanded while on horseback and buttoned flat when walking. The new style of flaps enabled the coat to not only cover the pommel in the front of the saddle, but cover the back of the saddle as well (see fig. 3).² In 1885, the invention incorporated a "crotch-shaped extension" or triangular gusset that could be attached in the front of the coat for expansion over the saddle. The extension was attached by buttons and could be removed when walking, allowing the coat to button as an ordinary coat (see fig. 4).³ The extensions of Tower's earlier patents were often detracting from the design of the coats. As his patents evolved, the outside appearance of riding coats conformed to the traditional appearance of an overcoat.

An invention patented by the Standard Oiled Clothing Co. in 1885, created a riding coat that incorporated similar ideas as those used by Tower. This coat, instead of

(No Model.)

A. J. TOWER.

2 Sheets—Sheet 1.

COAT.

No. 267,729.

Patented Nov. 21, 1882.

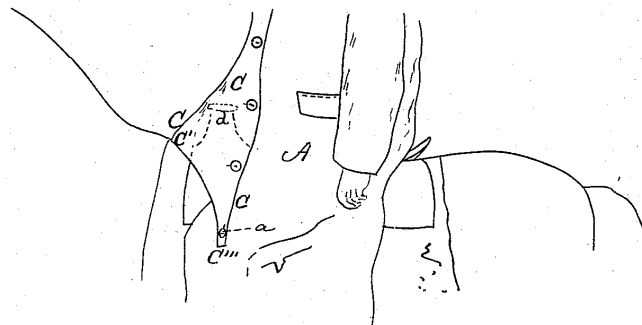


Fig. 1.

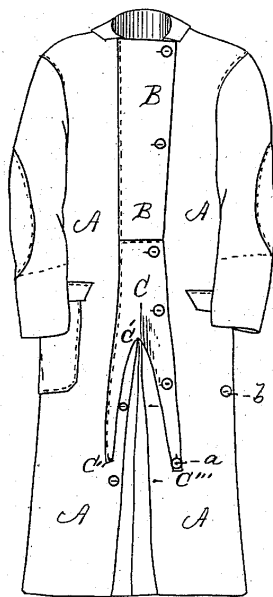


Fig. 2.

WITNESSES

Joseph Ashbaugh.
Irving H. Baker.

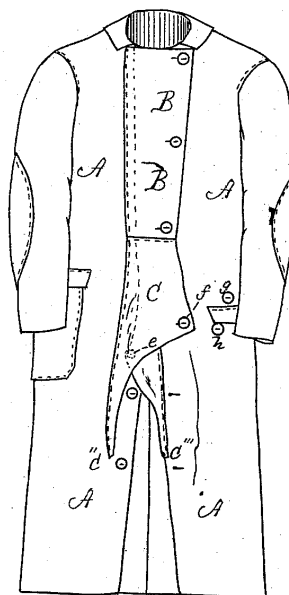


Fig. 3.

INVENTOR

Abner J. Tower,
By his Atty.
Henry W. Williams.

N. PETERS' Photo-Lithographer, Washington, D. C.

Fig. 1. Pommel coat with flap extension. Image from Abner J. Tower, 1882, *Coat*, US Patent 267729, filed 17 July 1882, and issued 21 November 1882.

(No Model.)

A. J. TOWER.

2 Sheets—Sheet 2.

COAT.

No. 267,729.

Patented Nov. 21, 1882.

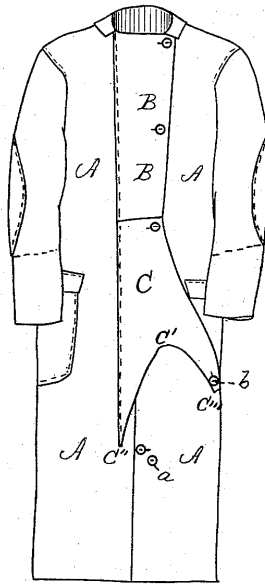


Fig. 4.

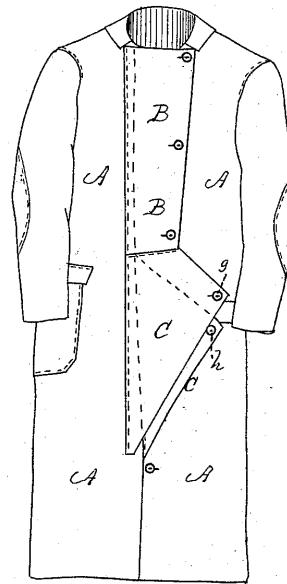


Fig. 5.

WITNESSES

Joseph Ashbaugh.

Erving H. Baker.

INVENTOR

Abner J. Tower

By his Atty.

Henry W. Williams

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig 2. Pommel coat with modified flap extension. Image from Abner J. Tower, 1882, Coat, US Patent 267729, filed 17 July 1882, and issued 21 November 1882.

(No Model.)

A. J. TOWER.
OVERCOAT.

No. 310,095.

Patented Dec. 30, 1884.

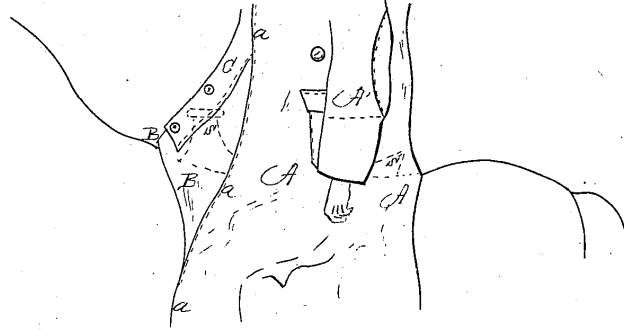


Fig. 1.

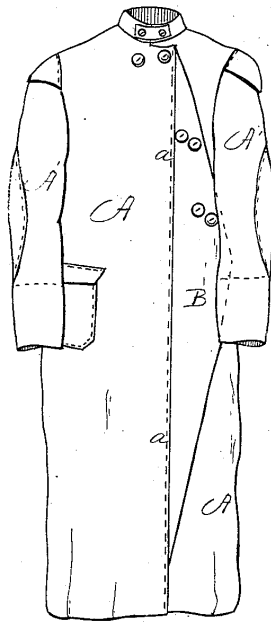


Fig. 2.

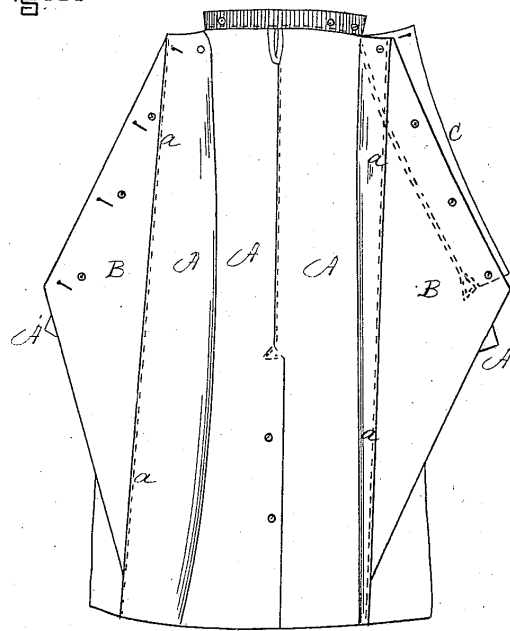


Fig. 3.

WITNESSES

Joseph Ashbaugh
Irving H. Baker

INVENTOR

Abner J. Tower
By his Atty.
Henry W. Williams

N. PETERS Photo-Lithographer, Washington, D. C.

Fig. 3. Pommel Coat with side flap extensions. Image from Abner J. Tower, 1884, *Overcoat*, US Patent 310095, filed 26 February 1883, and issued 30 December 1884.

(No Model.)

A. J. TOWER.
HORSEMAN'S COAT.

No. 313,130.

Patented Mar. 3, 1885.

Fig:1.

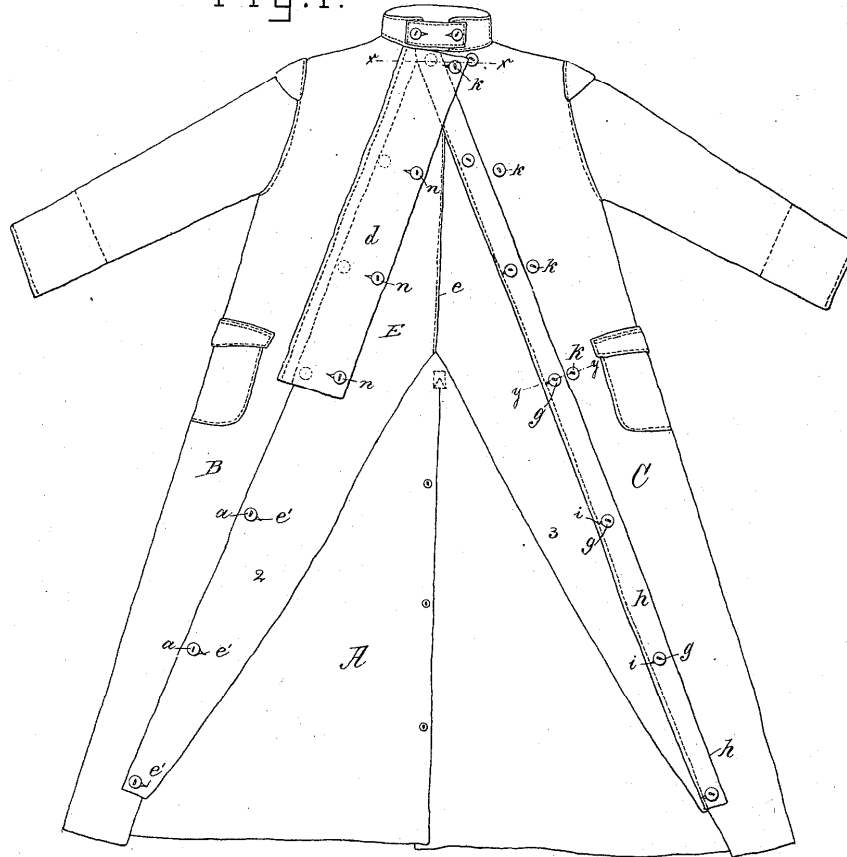


Fig:2.

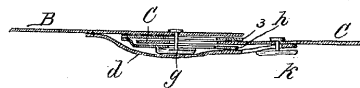


Fig:3.



Witnesses.

Arthur Lippertson.
Geo. P. Livermore

Inventor.

Abner J. Tower.
by Crosby Gregory
Att'ys.

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 4. Pommel coat with removable front gusset extension. Image from Abner J. Tower, 1885, *Horseman's Coat*, US Patent 313130, filed 28 July 1884, and issued 3 March 1885.

utilizing extensions, cut the front of the coat in such a way that when single buttoned, the shape of the coat was wide enough to cover both the saddle and the wearer. When walking, the rider could overlap the front of the coat, giving the closure an asymmetrical appearance (see fig. 5).⁴

Inventor Moses S. Lorsch also sought to protect both the rider and the saddle in his 1885 patent. His approach, however, was different than Tower or the Standard Oiled Clothing Co. in that his extensions and fullness were placed in the back of the coat. The back of the coat was cut full and graduated out toward the hem in order to have enough width to cover the saddle. When walking, the fullness could be contracted using a buttoned strap in the back to obtain the appearance of a normal coat. This coat also incorporated flaps inside the coat that could be buttoned around the legs for added protection since the skirts of the coat were frequently “displaced by the motion of the horse and by the wind.”⁵

In 1887, John F. Carter created a patent with a similar idea to that of Lorsch. His riding coat contained an extension in the back of the coat. Unlike Lorsch, his coat incorporated a gore so that the coat could be unbuttoned in the back, exposing the gore, which allowed the coat to lay properly over the wearers legs while still protecting the back of the saddle. When the wearer was walking, the back of the coat was buttoned closed, hiding the gore. The coat also had the ability to form a combined coat and trousers by buttoning the side pieces around the legs for protection.⁶ The patent went on to clarify that although the term “pommel slicker” was generally used to describe garments with the triangular front extension, his coat with the back extension would fall within this category.

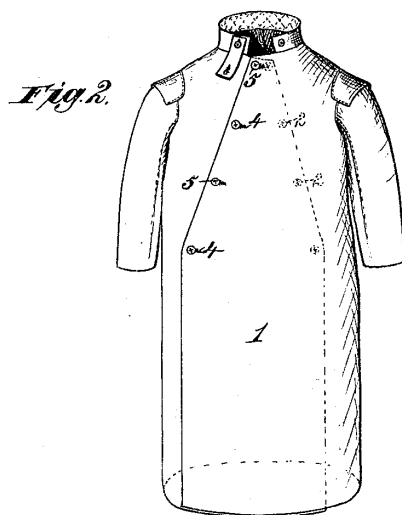
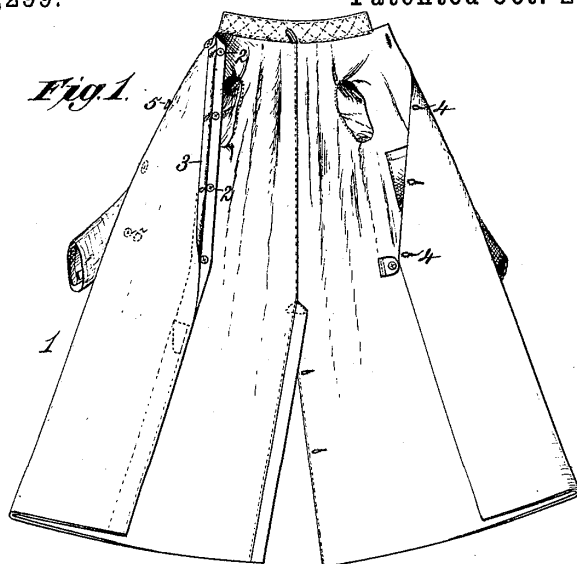
(No Model.)

H. EMANUEL.

POMMEL COAT.

No. 329,299.

Patented Oct. 27, 1885.



Witnesses.

Robert Everett,

J. William Rea.

Inventor.

Henry Emanuel.

By

James L. Norris.

Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 5. Asymmetrical pommel coat. Image from Henry Emanuel, *Pommel-coat*, US Patent 329299, filed 19 June 1885, and issued 27 October 1885.

According to the explanation in the 1892 Joseph H. Rowe and Co., oiled clothing catalog, “slickers differ from the ordinary coat only in that they are opened up the back from 20 to 30 inches.” This description referenced the importance for the back of the coat to expand, but did not specify how or if the coat was intended to cover and protect the saddle, making it unlikely that any of the patents for slickers were utilized.⁷ The 1895 E. G. Stearns & Co. also offered a selection of slickers including “Ranch” brand standard slickers and pommel slickers. The pommel slickers most likely used one of the methods described in the patents of covering the saddle; however, the catalog did not illustrate or explain the garments.⁸

L. Frank’s 1891 *Illustrated Catalogue* offered several pommel slickers including the Fish Brand, Shield Brand and Herder’s Slicker (see fig. 6). There is little explanation provided with these garments.⁹ The Fish Brand Slickers appeared to be similar in design to Tower’s patent 313130 and Carter’s patent 360851 and could have been influenced by these designs.¹⁰ The 1895 L. D. Stone & Co. Saddle catalog also offers pommel slickers and saddle coats, but they offer little description beside the fact that the coats had flannel collars and elasticized inner sleeves.¹¹ The 1895 Montgomery Ward catalog also offered yellow and black pommel slickers with the simple description that they could be worn while either riding or walking.¹²

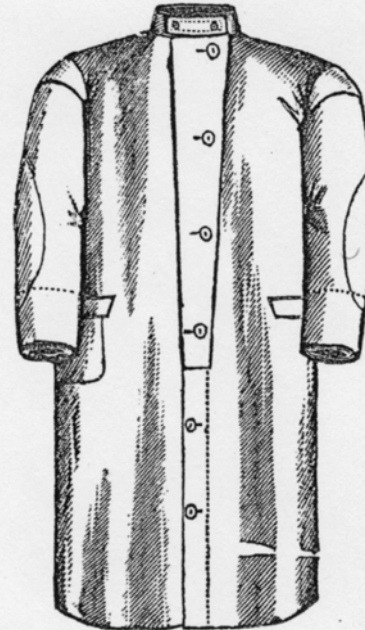
The 1890s Goodyear Rubber Co. catalog provided better imagery and explanation for their riding garment, called the Badger Saddle Coat.¹³ The image of the coat appeared to be similar in design to the patent submitted by the Standard Oiled Clothing Co. in 1885.¹⁴ The coat was cut in the front so as to cover the pommel of the saddle.

Slickers.



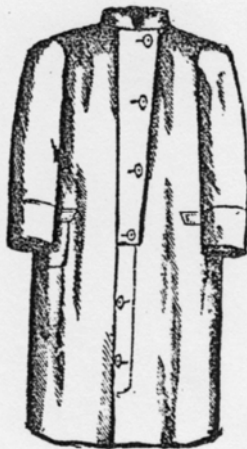
Pommel Slickers.

- No. 1.....
 No. 2.....
 No. 3.....

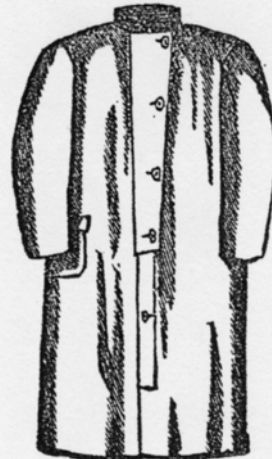


Fish Brand Slickers.

Packed 1 Dozen in Box, Assorted Sizes.



Shield Brand Slicker



Herder's Slicker.

Fig. 6. Pommel slickers in the L. Frank catalog. Image from L. Frank, *Illustrated Catalogue*, San Antonio, TX: privately printed, 1891, 145.

Additional patents may have been incorporated into this product as the description also included “patent reversible elastic inside sleeve” and “patent brass eyeleted metal buttons.”¹⁵ The catalog also offered oiled slickers, but provided no further information about these garments.¹⁶

Riding coats were not the only classification of garment that included leg protection as part of the coat design. Inventor Henry Emanuel created an overcoat in 1882 with detachable leg protectors (see fig. 7). Removable rectangular pieces could be buttoned to the lower sides of the coat in order to prevent the exposure of the wearer’s legs to wind or rain. This garment was intended primarily for rubber coats.¹⁷ Another similar coat patented in 1884 with Henry Emanuel as the assignor to David Heineman and Salomon Lorsch, featured a “pocket” permanently attached to the lower insides of the coat (see fig. 8). The sides of the pocket were secured to the coat while the top and bottom were left open so the wearer could slide his legs through the openings for protection from wind and rain. This improvement was intended to decrease the expanse of the coat while maintaining useful function for the consumer.¹⁸

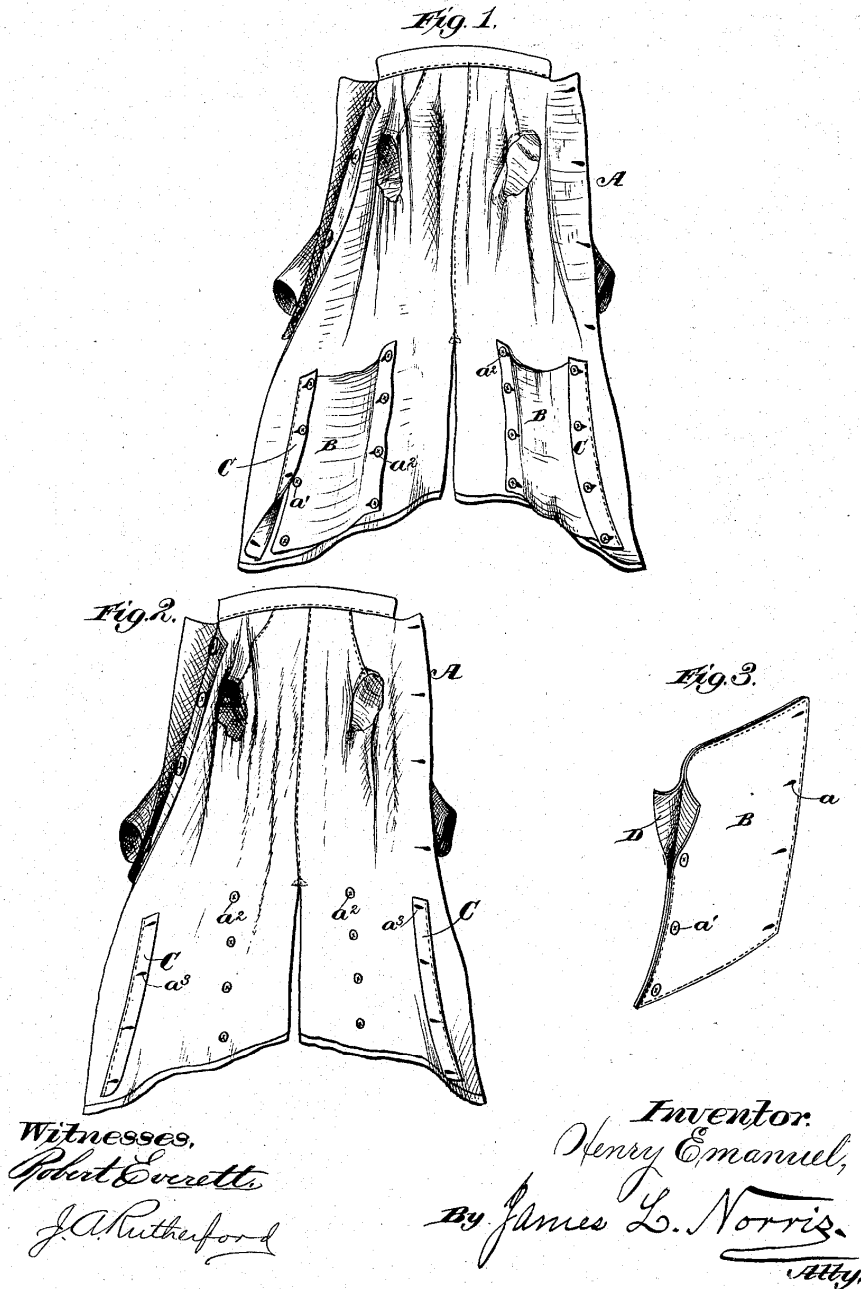
In 1885, Tower addressed leg protection specifically intended for riding coats. His invention created a slit and bound opening in the lining of the coat through which the leg could pass. In the bottom of the coat, the lining remained either fully or partially unattached where a stirrup was sewn (see fig. 9). The stirrup helped to secure the coat in place around the legs while on horseback.¹⁹ Benjamin F. Gassaway also sought to protect the legs of a rider when he created his coat with combined leggings (sic.) in 1894. His improvement was to attach flaps to the inside of the lower sides of the coat. Unlike any other patent, however, his leggings contained a section that was stitched to the coat

(No Model.)

H. EMANUEL.
OVERCOAT.

No. 265,043.

Patented Sept. 26, 1882.



N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 7. Detachable leg protectors. Image from Henry Emanuel, 1882, Overcoat, US Patent 265043, filed 12 July 1882, and issued 26 September 1882.

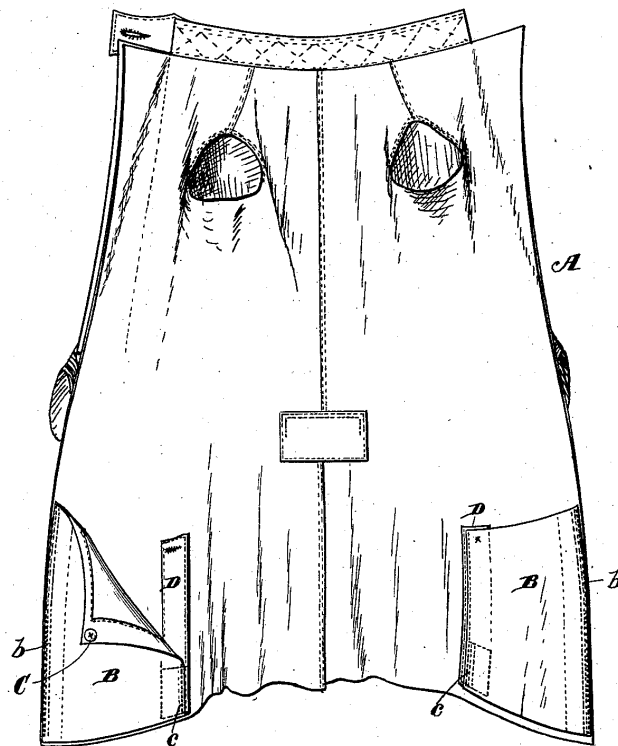
(No Model.)

H. EMANUEL.

OVERCOAT.

No. 294,599.

Patented Mar. 4, 1884.



WITNESSES

Robert Everett
Vinton Coombs

INVENTOR

Henry Emanuel
By *James L. Norris*
ATTORNEY

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 8. Pocket leg protectors. Image from David Heinman and Salmon Lorsch, 1884, *Overcoat*, Henry Emanuel (assignor), US Patent 294599, filed 20 April 1883, and issued 4 March 1884.

A. J. TOWER.

COAT.

No. 310,922.

Patented Jan. 20, 1885.

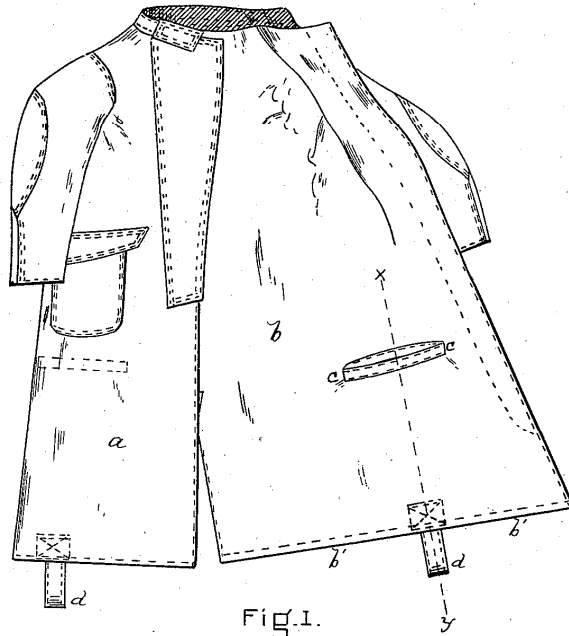


Fig. 1.

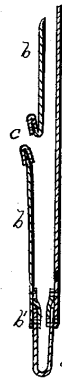


Fig. 2.

WITNESSES

James M. Reid Jr.
George P. Mallon

INVENTOR

Abner J. Tower

By his Atty.

Henry W. Williams

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 9. Coat with pocket and stirrup leg protectors. Image from Abner J. Tower, 1894, Coat, US Patent 310922, filed 12 January 1880, and issued 20 January 1885.

as well as a loose flap that could be buttoned around the legs (see fig. 10). Previous patents would have placed strain on the coat by attempting to button a flap flat over the legs. This patent allowed the flap to shape to the legs rather than the sides of the coat. When not in use, the loose flap could be buttoned flat to the inside of the coat.²⁰

One of the more intriguing patents promoting leg protection was the 1882 patent by George B. Thomson who developed a rubber coat with tails that could be converted into a type of leggings or trousers (see fig. 11). The coat had the typical front opening and the back opened half way from the bottom. The side pieces, rather than being buttoned together to form the standard overcoat could be buttoned around the legs giving the coat a trouser appearance. Straps near the hem of the coat fastened around the ankles to help secure the coat. This design held the claim that it left no opening for rain to enter. This design was particularly intended for rubber coats and appeared to have been successful since similar designs were found in multiple catalogs.²¹

The 1881 catalog published by the Goodyear Rubber Co. offered a coat that was almost identical in image to Thomson's 1882 patent. In the catalog, the coat was called the Goodyear Storm Coat and Leggins Combined (see fig. 12).²² It is likely that this was the same invention; however, with no description of the garment in the catalog, it was difficult to determine if it was exactly the same design. The 1885 Goodyear's Rubber Curler Co. offered a Herdsman's coat in the featherweight rubber goods that was described as being adapted for horseback riding; however the catalog contains no image of this garment to determine the design.²³

The same image that appeared in the 1881 Goodyear Rubber Co. catalog appeared once again in the 1895 L. D. Stone & Co. Saddle catalog (see fig. 13). The image was

(No Model.)

2 Sheets—Sheet 1.

B. F. GASSAWAY.
OVERCOAT.

No. 519,670.

Patented May 8, 1894.

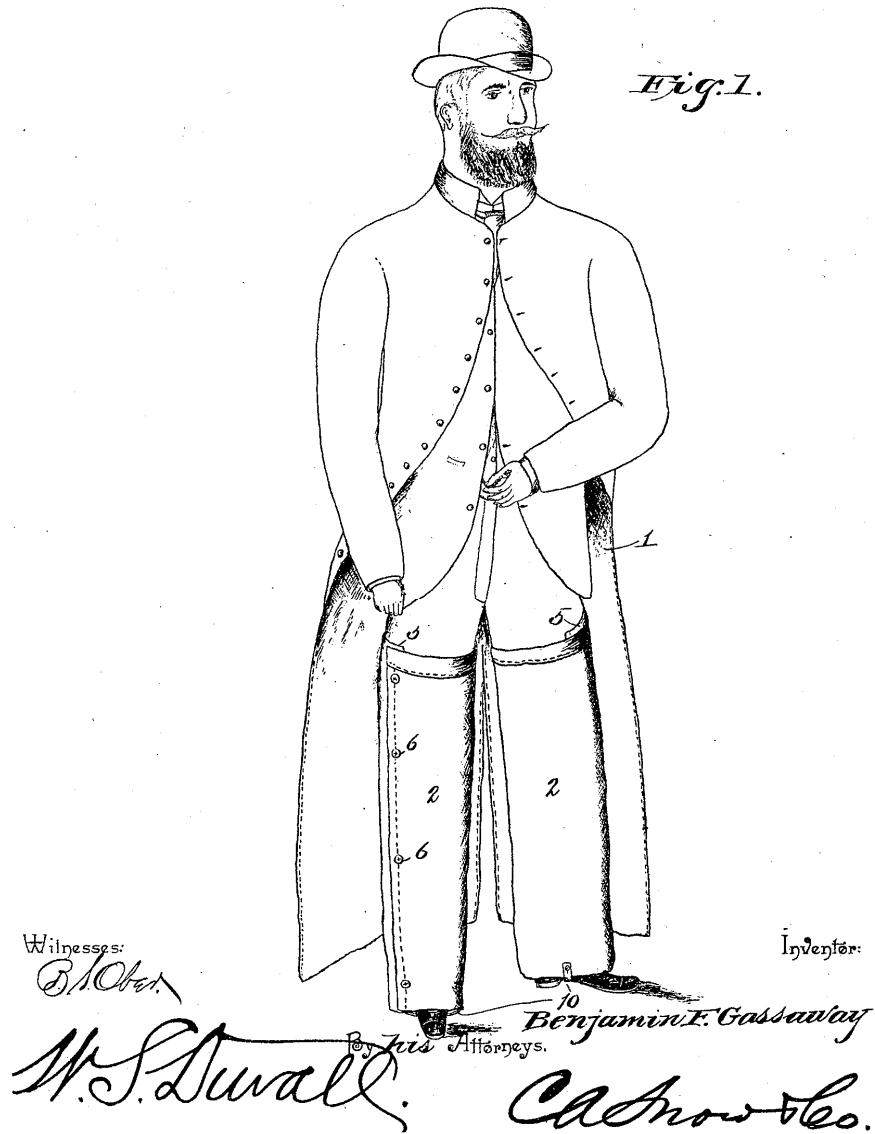


Fig. 10. Overcoat with attached leg-protectors. Image from Benjamin F. Gassaway, 1894, *Overcoat*, US Patent 519670, filed 22 May 1893, and issued 8 May 1894.

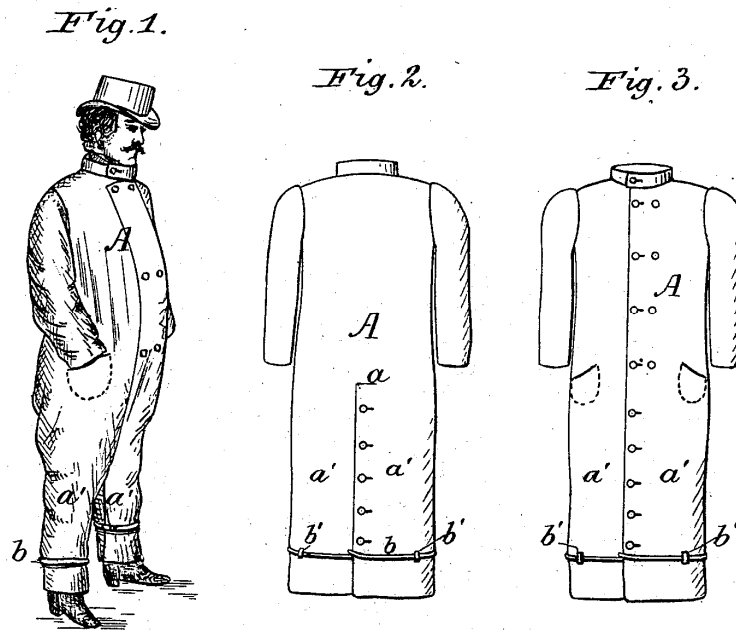
(No Model.)

G. B. THOMSON.

RUBBER COAT.

No. 267,120.

Patented Nov. 7, 1882.



Witnesses:
E. E. Masson
C. J. Hedrick

Inventor:
George B. Thomson
by A. Pollok
his attorney.

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 11. Convertible overcoat. Image from George B. Thomson, 1882, *Rubber Coat*, US Patent 267120, filed 11 August 1881, and issued 7 November 1882.



Fig. 12. Goodyear storm coat and leggings combined. Image from Goodyear Rubber Company, *Illustrated Rubber Trade Journal: Prices of Rubber Clothing, Boots and Shoes, Gloves, Mittens, &c.*, New York: privately printed, 1881, 6.

170 L. D. STONE & CO., SAN FRANCISCO, CAL.

22. Storm Coat.
Extra long, for riding or walking.
Each.....\$8.00

PONCHOS.

96. Lustre Ponchos Sheeting, each	\$5.00
97. Dull " " "	6.00
98. White " " "	10.00

23. Storm Coat.
Ex. long, adj. for horseback riding
Each.....\$9.00

Fig. 13. L. D. Stone & Co. storm coat. Image from *L. D. Stone & Saddle Co. Saddle*, San Francisco, CA: privately printed, 1895, 170.

exactly the same, but in this instance simply called a Storm Coat. The only information accompanying this image is the statement that the garment was extra long and adjusted for horseback riding.²⁴ Nearly fifteen years after the garment style was patented, it either continued to be made over this period of time or was reinvented for different purposes as this is the first known occasion for the garment to be recommended for horseback riding.

Some of the patents created may not have been adopted due to design flaws or because their appearance was unnatural and may not have been socially acceptable. An 1882 patent with Peter J. Oberst as the assignor to Thomas B. Farrington, attempted, much like other patents to create an overcoat that could be converted to cover the extremities and keep out moisture (see fig. 14). This garment was designed with straps to envelope the tails of the coat around the wearer's legs. The sleeves were tightened using adjustable buttons. The collar of the coat was designed higher than normal and contained a series of button holes on which to fasten a hood to protect the head.²⁵ This garment has yet to be located in any catalog or magazine. It likely was never produced because the number of buttons made it impractical. Also, the appearance of the garment when closed about the wearer had the facade of a diving costume rather than an overcoat.

Skirt Protectors

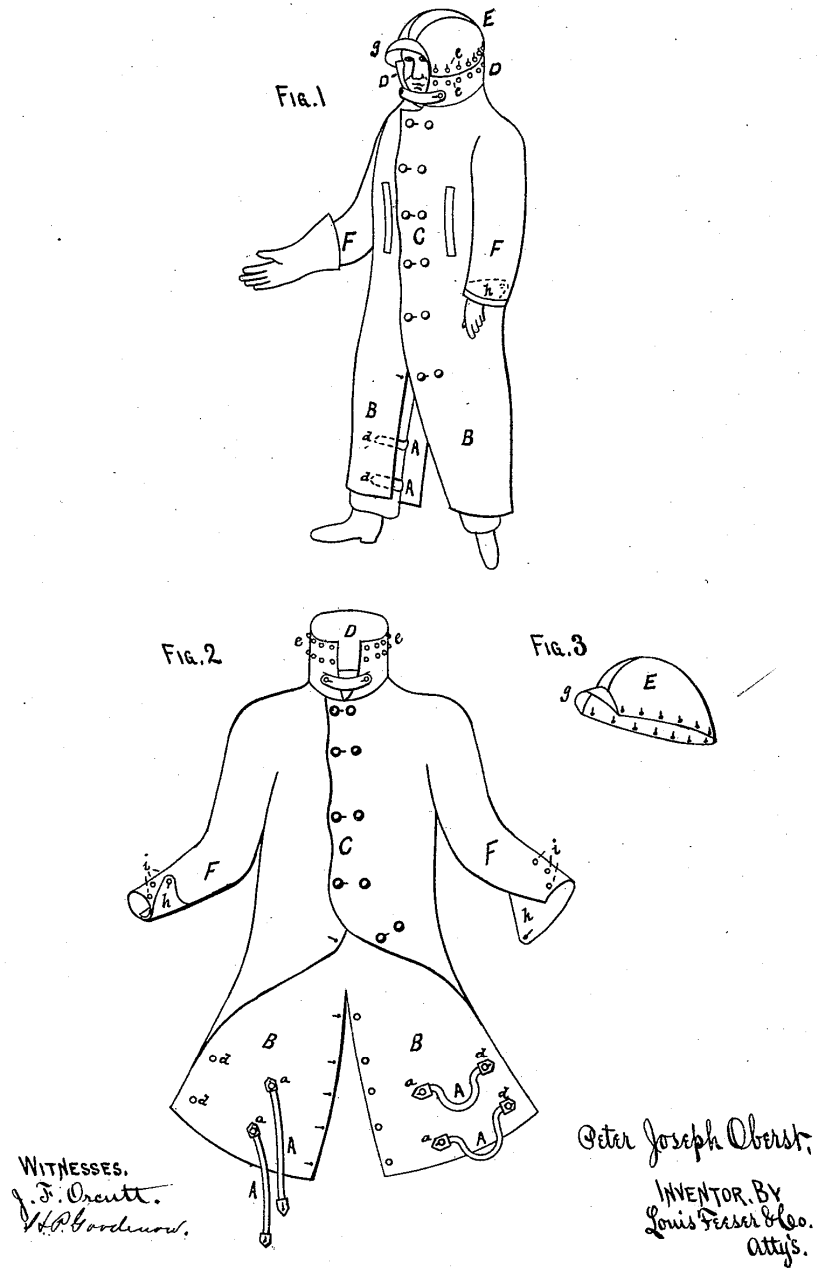
Many patents were developed for ladies skirt protectors to prevent the hems of their skirts from becoming muddied or soiled from rain. Some inventions sought to create an overskirt, while others simply covered the hem of the skirt. An 1883 patent by George A. Blanchard formed an overskirt. Inside of the overskirt was a fold of fabric that

(No Model.)

P. J. OBERST
OVERCOAT.

No. 265,536.

Patented Oct. 3, 1882.



N. PETERS. Photo-Lithographer, Washington, D. C.

Fig. 14. Protective waterproof overcoat. Image from Thomas B. Farrington, 1882, *Overcoat*, Peter J. Oberst (assignor), US Patent 265536, filed 24 July 1880, and issued 3 October 1882.

was to encase the wearer's skirts and attach at the knee to prevent the skirts from touching the ground.²⁶ Another overskirt patented in 1884 consisted of an inner and outer skirt that was designed to encase the wearer's skirts between the two layers (see fig. 15). The bottom portion of the skirt was made of rubber, which would prevent the hem of the skirt from getting damp or muddied.²⁷ This design was claimed to be easier to make and use and likely would have been less conspicuous since the whole skirt was not made of rubber. The appearance, however, still may not have been considered very fashionable with the rubber exterior.

The over-skirt technique was used again in an 1885 patent. This design was similar to previous skirt-protectors in that it consisted of an outer skirt that folded underneath to envelop the wearer's skirts. The difference was that the inner skirt of this skirt protector was detachable at the hem using buttons. Also, the inner skirt reached only to the knee where it could be attached to straps hanging from a waistband. The garment was designed with a jacket that had a detachable hood and sleeves.²⁸

A patent created in 1887 combined the idea of a cloak and a skirt-protector. The skirt of the cloak turned under and attached around the limbs using elastic straps about the knee to encase the skirts of the garment. The garment could be drawn in at the waist with a belt. The belt allowed the wearer to undress the upper portion of the garment from the shoulders when riding in cars or seated in a dwelling or store, but kept the lower portion in place.²⁹ A skirt protecting garment patented in 1889 also protected the upper body. The bottom of the garment had a folding attachment that was designed to envelop the skirts underneath. This flap was hinged and attached to cords on the inside that extended the full length of the garment.³⁰

(No Model.)

M. L. CUMMINGS.
SKIRT PROTECTOR.

No. 308,879.

Patented Dec. 9, 1884.



Fig.1.

Fig.2.

Witnesses
H. E. Runkel.
L. J. White.

Inventor.
Mary L. Cummings,
Per C. A. Shaw,
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 15. Skirt-protector that encases the skirt with a rubber hem. Image from Mary L. Cummings, 1884, *Skirt-protector*, US Patent 308879, filed 21 April 1884, and issued 9 December 1884.

A skirt-protector created in 1893 also utilized the hinged hem protecting attachment (see fig. 16). Unlike previous patents, the protector was attached to straps that hung from a waistband and folded to the outside of the skirt, so that only the hem of the skirt appeared to be covered. The hem-protector was held in place by the fact that it was cut with a smaller circumference at the top.³¹ A skirt-protector patented in 1895 consisted of an outer skirt cover that folded inwardly enclosing the skirts and fastened about the legs near the knee (see fig. 17).³²

Another form of skirt protection was to encase only the hem so as not to detract from the appearance of the skirt. An 1883 patent by Charles P. Nicolson used a long piece of gossamer rubber fabric that was to be folded around the hem of the skirt and fastened using a series of clips.³³ Although the idea had merit, the problem with this type of protection was ensuring that the device stayed on the skirt. Another skirt-protector that focused on the hem was created in 1885. This device was a circular piece of rubber or other waterproofed fabric that attached to the skirt using spring clamps and had an elastic band on the inside to help keep it in place (see fig. 18).³⁴

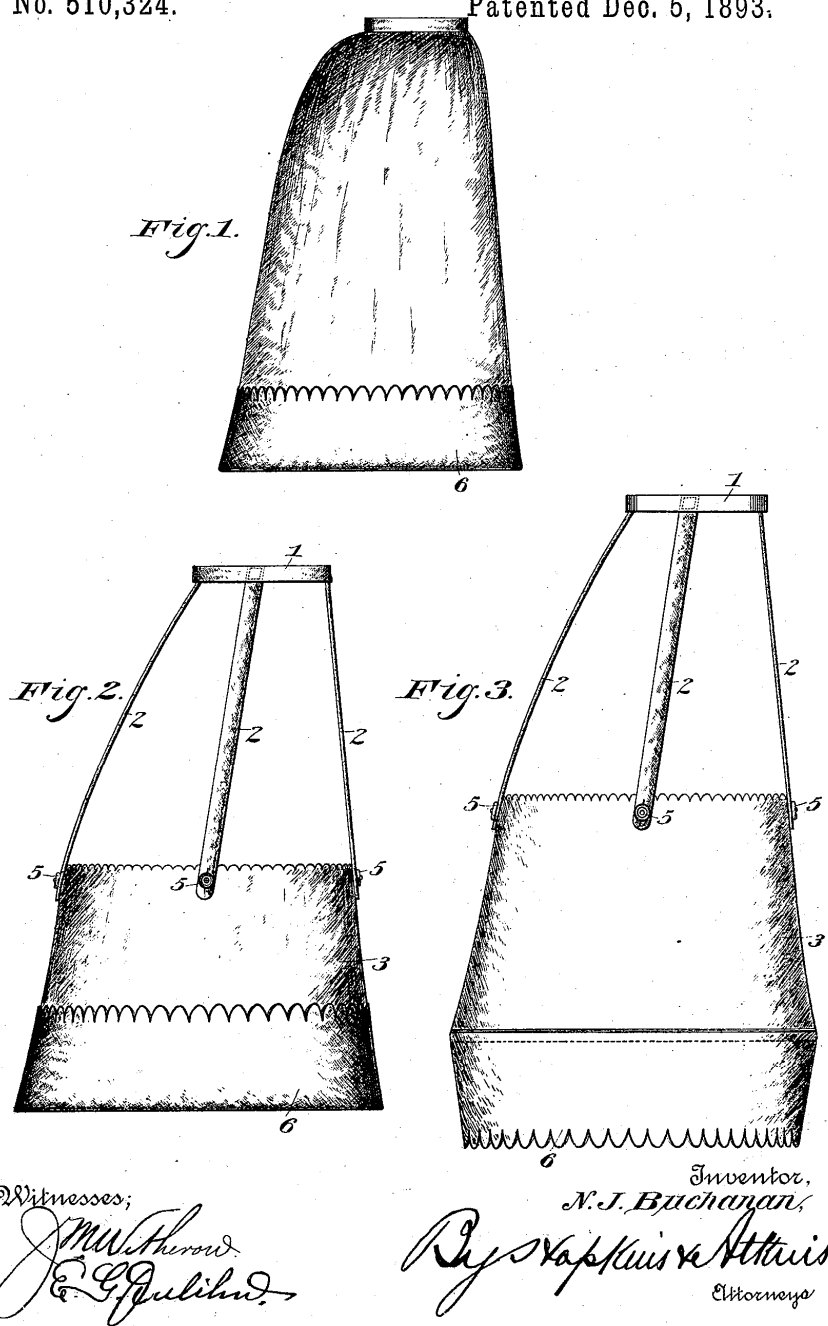
None of these skirt protectors were identified in the catalogs. Their design may have simply been too impractical or unappealing to wear. One such garment that might have created a spectacle was an 1883 patent by Gilbert Baker. The skirt-protector was created in the shape of a large bag and was to be worn by sliding the feet through the elasticized openings in the bottom and fastening the top opening around the waist (see fig. 19).³⁵ It certainly had the potential to protect the skirt, but probably looked ridiculous in the street.

(No Model.)

N. J. BUCHANAN.
SKIRT PROTECTOR.

No. 510,324.

Patented Dec. 5, 1893.



THE NATIONAL LITHOGRAPHING COMPANY
WASHINGTON, D. C.

Fig. 16. Hem-protector with attached support from the waist. Image from Nancy J. Buchanan, 1893, *Skirt-protector*, US Patent 510324, filed 16 March 1893, and issued 5 December 1893.

(No Model.)

M. BATES.
SKIRT PROTECTOR.

No. 540.225.

Patented June 4, 1895.

Fig. 1.

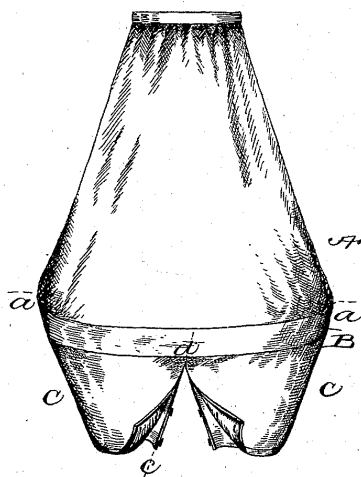
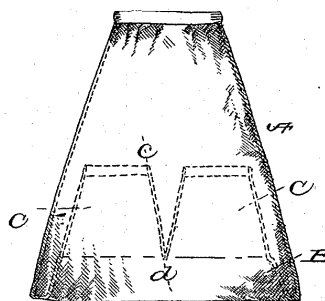


Fig. 2.



Witnesses
John D. Smith
Thos. E. Robertson

Inventor
Mary Bates
By *T. J. W. Robertson*
Associate Attorney

THE NORRIS PETERS CO. PHOTO-LITHO. WASHINGTON, D. C.

Fig. 17. Skirt-protector that attaches at the knees. Image from Mary Bates, 1895, *Skirt-protector*, US Patent 540225, filed 19 July 1894, and issued 4 June 1895.

(No Model.)

C. A. GANDIL.

LADY'S SKIRT PROTECTOR.

No. 319,477.

Patented June 9, 1885.

Fig. 1.

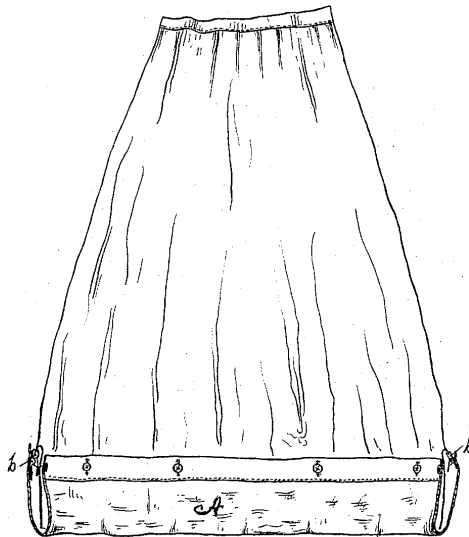
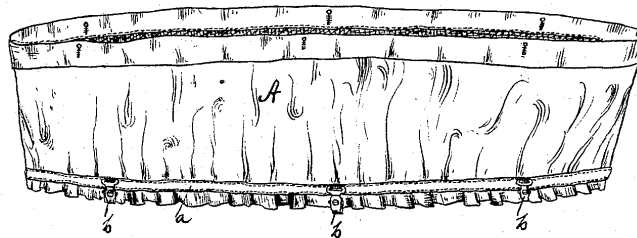


Fig. 2.



Witnesses:
Charles D. B.
A. G. Mervin

Inventor
Charlotte A. Gandil
by J. P. Leitch
his Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 18. Hem-protector attached with clamps and an elastic band. Image from Charlotte A. Gandil, 1885, *Lady's Skirt-protector*, US Patent 319477, filed 1 December 1884, and issued 9 June 1885.

(No Model.)

G. BAKER.

DRESS AND SKIRT PROTECTOR.

No. 282,254.

Patented July 31, 1883.

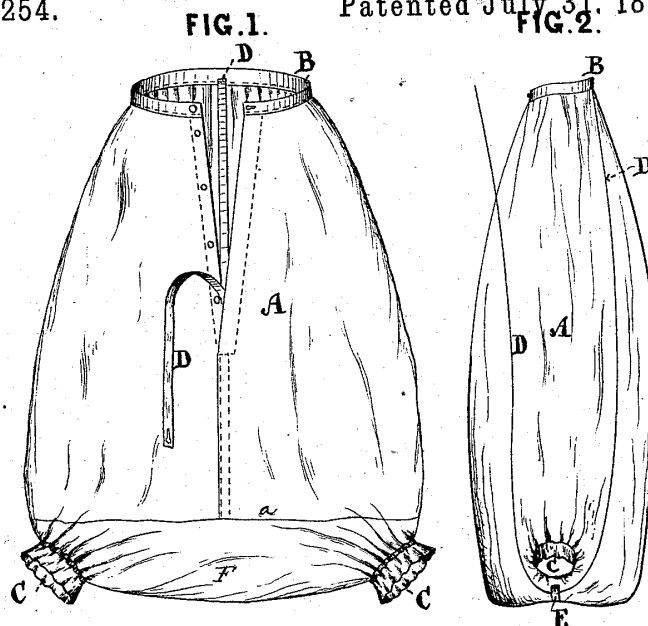


FIG. 3.



Witnesses.
E. Blanta.
H. H. Moore.

Inventor
Gilbert Baker,
by Jos. H. Adam
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 19. Skirt-protecting pantaloons. Image from Gilbert Baker, 1883, *Dress and Skirt-protector*, US Patent 282254, filed 2 January 1883, and issued 31 July 1883.

Full-body Garments

In 1884, a patent was created for a suit of rubber clothing. The suit consisted of pants with attached boots and a coat (see fig. 20). The pants had a fly to keep moisture out and the garment fastened together using buckles. The design of the garment was intended to be easily donned as well as easily removed.³⁶ Other men's suits were created in 1893. The goal was to produce a more close-fitting garment that would keep out water. One of the patents created pants that attached to the body of the garment in such a way that the garment formed a water-excluding seam (see fig. 21). Flaps over the shoulders fastened with buttons. And the sleeves had elastic bands at the wrist. The legs had straps that passed under the boots.³⁷ The next patent was similar. The jacket was attached to the pants with the jacket flap attached through the fly so that the jacket could have a more conventional appearance on the outside. A diaphragm existed where the jacket and pants connected in the front to help keep the suit water-tight (see fig. 22). The wrists had an elastic piping band. The legs could be permanently attached to the boots that were partly encased by the pants.³⁸

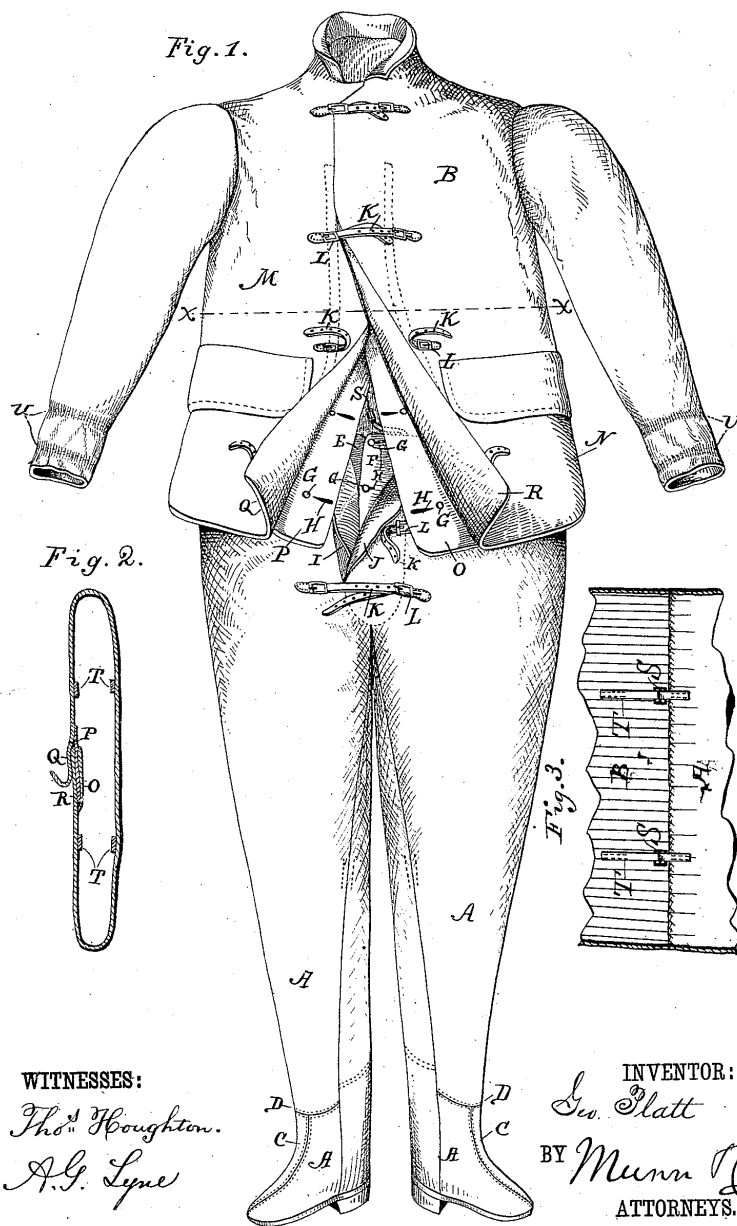
A full-body waterproof garment created for a woman in 1885 was far less practical. The garment consisted of a rubber skirt, chest piece, cape, and umbrella apparatus to cover the head (see fig. 23).³⁹ This garment would have been awkward to wear and probably was uncomfortable, which is likely the reason it did not appear in fashion magazines or catalogs. Another garment equally as impractical was patented in 1895. The garment had a combined cape and hood with a drawstring. The wrists were tight to the body to prevent the entrance of air and moisture. The skirt was shorter and

(No Model.)

G. PLATT.
RUBBER CLOTHING.

No. 291,854.

Patented Jan. 8, 1884.



N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 20. Rubber suit with attached boots. Image from Patrick A. Largey, 1884, *Rubber Clothing*, George Platt (assignor), US Patent 291854, filed 26 July 1883, and issued 8 January 1884.

(No Model.)

O. VAN OOSTRUM.
WATERPROOF SUIT.

No. 492,643.

Patented Feb. 28, 1893.

Fig. 1

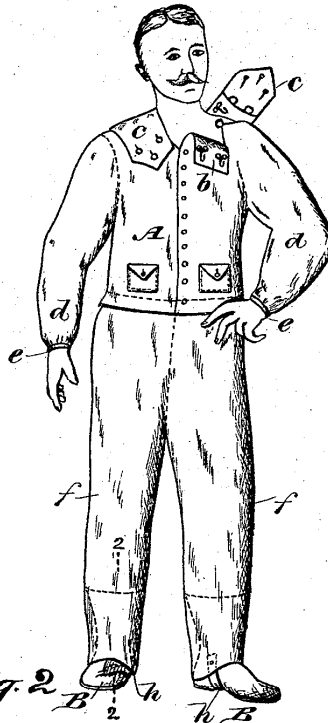


Fig. 2

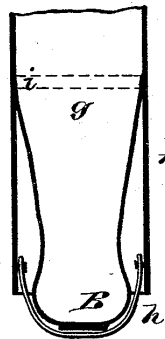


Fig. 3



WITNESSES:
J. A. Bergstrom
C. Sedgwick

INVENTOR
O. Van Oostrum
BY *Munn & Co*
ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

Fig. 21. Waterproof suit with water excluding seams. Image from Otte Van Oostrum, 1893, *Waterproof Suit*, US Patent 492643, filed 29 September 1892, and issued 28 February 1893.

(No Model.)

O. VAN OOSTRUM.
WATERPROOF SUIT.

No. 507,466.

Patented Oct. 24, 1893.

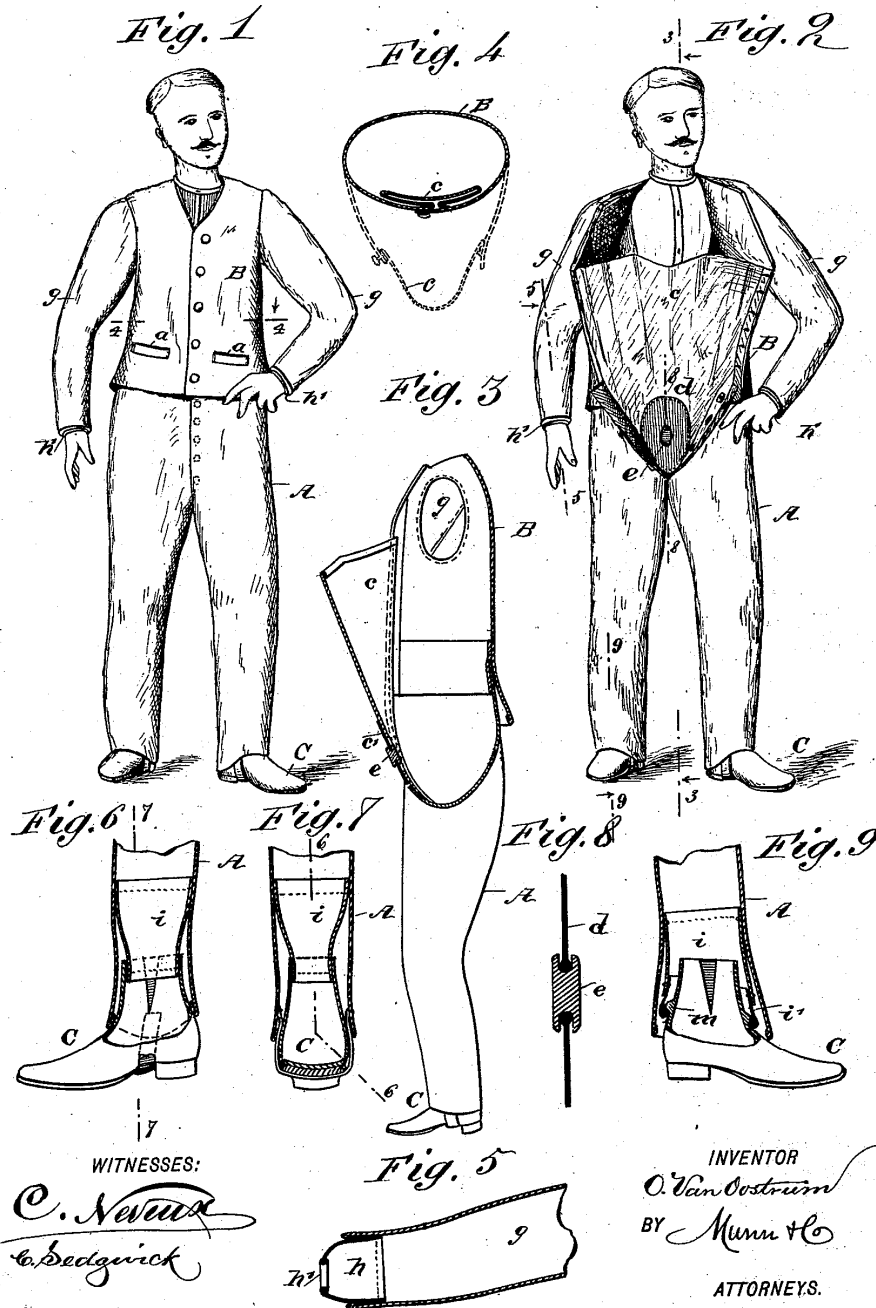


Fig. 22. Waterproof suit with diaphragm. Image from Otte Van Oostrum, 1893, *Waterproof Suit*, US Patent 507466, filed 14 April 1893, and issued 24 October 1893.

(No Model.)

M. BOYD.

COMBINED STORM SHIELD AND OVERDRESS.

No. 318,538.

Patented May 26, 1885.

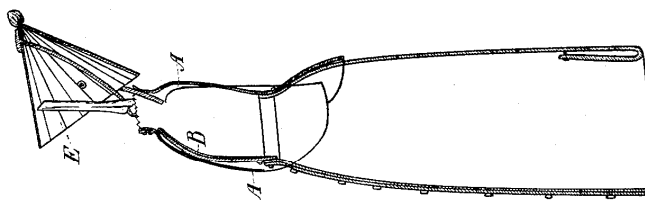


Fig. 2.

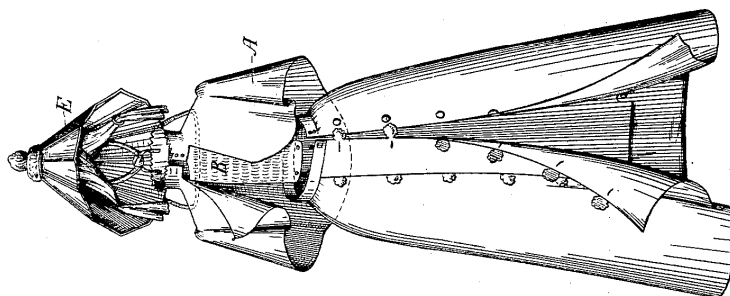


Fig. 1.

Witnesses,
Geo. H. Strong,
J. H. Strong

Inventor
Maggie Boyd
By
Devey & Co.
Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 23. Ladies' waterproof overdress. Image from Maggie Boyd, 1885, *Combined Storm-shield and Overdress*, US Patent 318538, filed 27 October 1884, and issued 26 May 1885.

was made to fold and encase the skirts underneath. Leggings were created as a continuation of the skirts with elastic at the bottom.⁴⁰

Following the Fashions

The design of waterproof coats and cloaks were slow to change; however, certain styles were adapted to conform to current fashions. Several patents were created to combine fashion with function. In 1882, Hermann F. Bindseil created a reversible cloak. The cloak could be worn with the appearance of a standard ladies cloak with the silk exterior and fur or quilted lining. The lining could be unfastened and reversed to expose a waterproof cover to be worn on the outside during stormy weather.⁴¹

Other inventors sought to create designs that would conform to the silhouette of the current garment styles. One such garment was created in 1886 (see fig. 24). The garment consisted of a waterproof skirt attached to a waist (made of heavy lining fabric). A jacket was worn over the waist and was only attached at the shoulders and neck so as not to injure the waterproof abilities of the fabric.⁴² The design was intended to create a garment that could be easily taken on and off and would conform to the style of the dress being worn.

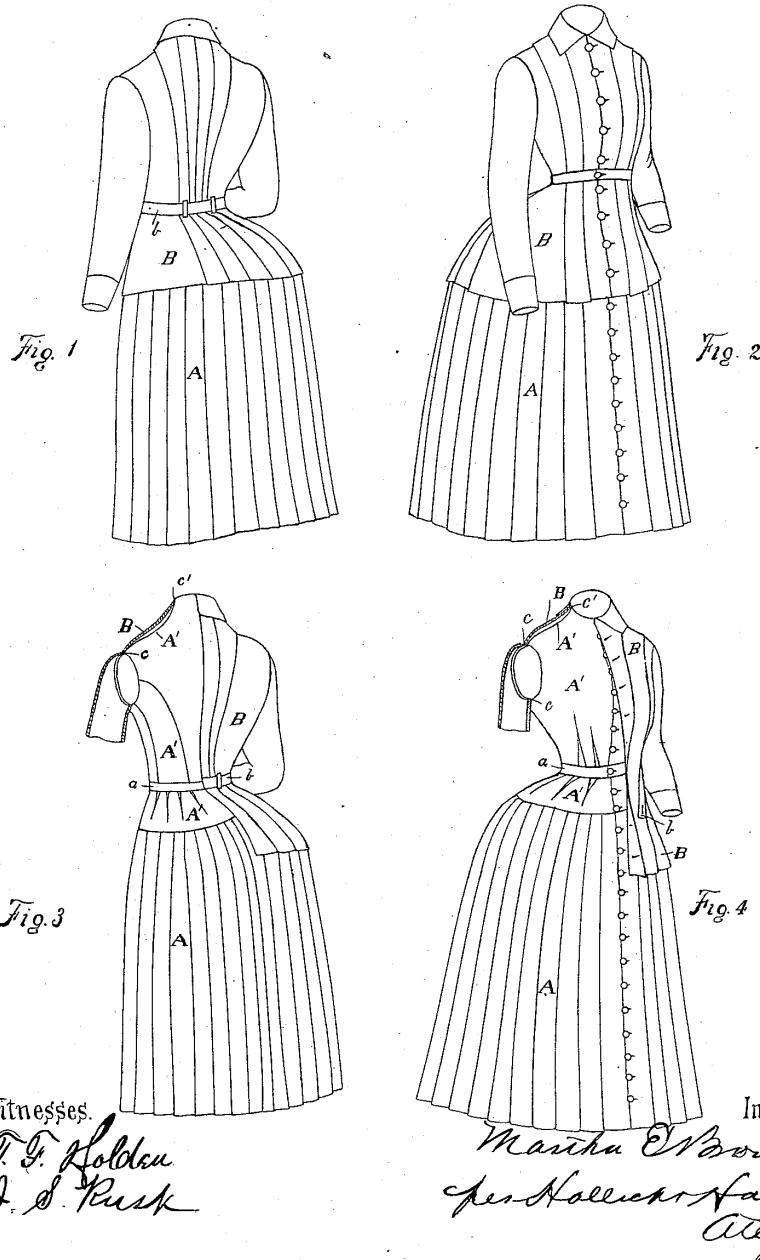
In 1887, another garment was created for its versatility. This ladies' garment was cut full in the sleeves to accommodate the varying sleeve styles. It was also cut full in the back and had lacing on the inside so that the garment could be pulled in according to the prevailing silhouette.⁴³ The 1890s F. C. Howlett catalog contained an image of the "women's newmarket" waterproof costume (see fig. 25). Although the image does not directly resemble a specific patent, the garment illustrates how waterproof garments were adapted to the current fashions.⁴⁴

(No Model.)

M. E. BROWN.
WATER PROOF OVER GARMENT.

No. 343,698.

Patented June 15, 1886.



N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 24. Waterproof over dress. Image from Martha E. Brown, 1886, *Water-proof Over-garment*, US Patent 343698, filed 10 February 1886, and issued 16 June 1886.



WOMEN'S NEWMARKET.

To Special Order Only.

A stylish, up-to-date garment, made either single breasted, single breasted fly front or double breasted. Hood is silk lined, with either plain or plaid, and is detachable. Collar $\frac{3}{4}$ velvet. Can be supplied with one or two capes if desired.

This garment will cost 30% net over a regular two cape garment. Capes are \$1.50 to \$3.50 additional.

Write for Discounts.

Fig. 25. Women's Newmarket waterproof garment. Image from F. C. Howlett, *F. C. Howlett and Company Rubber Goods*, Buffalo, NY: privately printed, 1890s, 14.

Preventing Leakage

A patent created by William P. Dodge in 1883 was for a coat that had an inner flap underneath the center front button closure to prevent water and wind from seeping through the front closure.⁴⁵ A garment patented in 1895 sought to prevent the leakage of rubber garments around the seams by designing a garment that used lapped seams to reduce the seam bulk. Once the lining was sewn in this manner, the outside of the garment could be coated with rubber.⁴⁶

Several patents attempted to restrict water from entering the opening at the sleeve hem. If the garment did not conform to the wearer's wrist, water and wind were able to enter. An 1884 patent taken by Salomon Lorsch as the assignor to David Heineman focused on the sleeve opening. Their patent specified that the inner sleeve would have an adjustable chord at the wrist that could be pulled, shirring the inner sleeve so that it was tight against the wrist.⁴⁷ Another overcoat patented in 1884 sought to prevent leakage at the neck opening by including a "bosom guard" underneath the opening. The garment also had straps to tighten around the wrist at the bottom of the sleeves. In addition, the garment had ventilation through perforations underneath the cape in the back.⁴⁸

The Rubber Clothing Company had a patent in 1884 that was intended to improve the function of the garment known as a circular, a type of cape. Their improvement was to provide protection for the arm openings by allowing the cape to be buttoned at the center front, covering the arms.⁴⁹

Water Drainage

Several of the apparel patents incorporated drainage systems into their design in an effort to improve comfort. A patent in 1883 was the design for a waterproof coat that

contained a trough at the hem of the coat to assist in carrying away water from the wearer (see fig. 26). According to the patent, as water ran down the coat, it often dripped onto the wearer's legs causing annoyance. This coat used a trough of stiffened fabric at the hem with a spout jutting out from the trough to ensure that the water would not dampen the legs of the wearer.⁵⁰

A patent created in 1890 focused on draining water from the sleeves. The hem of the sleeve had a stiffened trough that directed the water to specific openings in the trough, preventing the water from dripping over all edges of the sleeve edge.⁵¹ Another garment patented in 1890 incorporated a series of troughs or channels that run along the outside of the garment, directing water toward the center back where the water is allowed to drain (see fig. 27).⁵²

Ventilation

Garments that were truly waterproof did not allow for air circulation. Inventors sought to remedy this by providing ventilation in the garments. Ventilation was attempted using several methods due to the fact that if openings were placed in the wrong location, the garment was prone to leakage. Theodore Hawley's 1881 patent sought to create ventilation by leaving openings in the coat beneath capes (see fig. 28). The idea was that the air could flow from beneath the cape, but as long as the cape was fastened down, the water would not be able to enter the garment.⁵³

Other inventors sought ventilation through the use of special devices that could be placed under the arm or in the back of the garment. Edward Landstreet and Jay F. Towner developed a ventilating device to be used under the arm in 1882. Their coat

(No Model.)

J. MAGUIRE.
WATERPROOF COAT.

No. 273,115.

Patented Feb. 27, 1883.



Fig. 1.

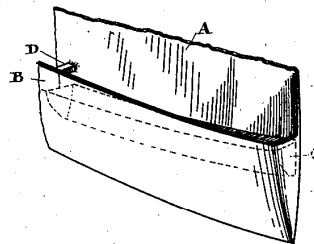


Fig. 2.

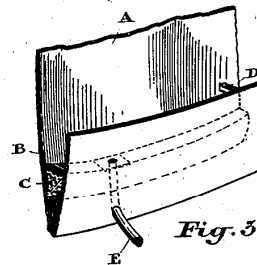


Fig. 3.

Witnesses.

Levin Toulinson

J. B. Feltner

Inventor.

John Maguire

by Donald C. Ridout & Co.
Attorneys

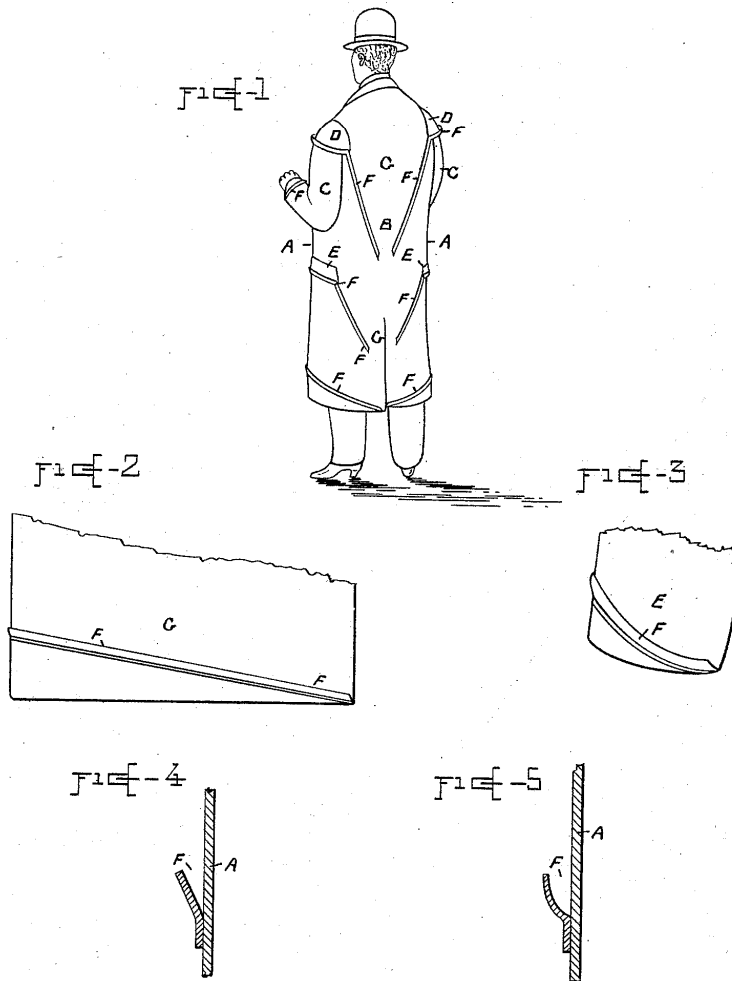
Fig. 26. Overcoat with water troughs at the hem. Image from William McGuire, 1883, *Waterproof Coat*, John McGuire (assignor), US Patent 273115, filed 15 April 1882, and issued 27 February 1883.

(No Model.)

A. F. CHASE.
WATER PROOF GARMENT.

No. 422,917.

Patented Mar. 11, 1890.



Witnesses

Chas. L. Fitch
J. Marshall

Inventor

Amos F. Chase
by his Attorneys
Brown Bros

N. PETERS, Photo-Lithographer, Washington, D. C.

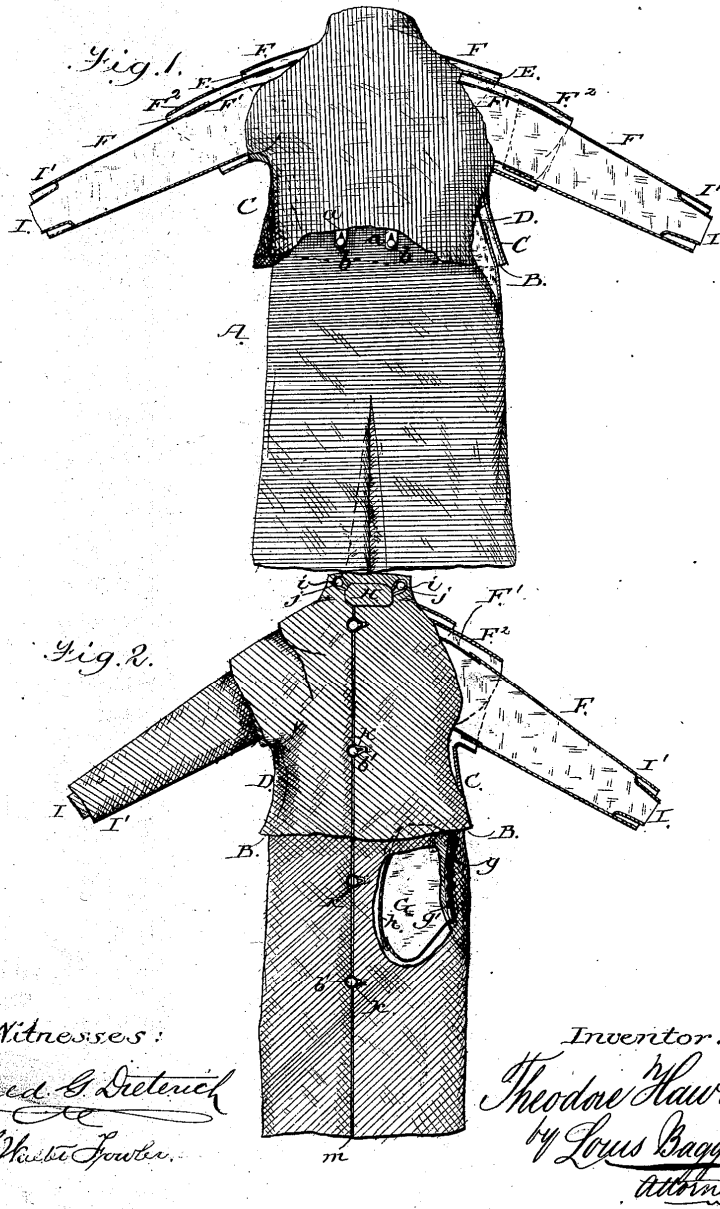
Fig. 27. Overcoat with troughs for water drainage. Image from Amos F. Chase, 1890, *Waterproof Garment*, US Patent 422917, filed 3 October 1887, and issued 11 March 1890.

(No Model.)

T. HAWLEY.
Water Proof Wearing Apparel.

No. 236,807.

Patented Jan. 18, 1881.



H. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

Fig. 28. Coat with ventilation underneath a series of capes. Image from Theodore Hawley, 1881, *Water-proof Wearing-apparel*, US Patent 236807, filed 17 May 1880, and issued 18 January 1881.

utilized an opening covered with a flap that was stiffened into an extended position, therefore allowing air to pass through.⁵⁴

Some garments sought to provide ventilation through perforation. The previously mentioned patent created to prevent leakage also provided ventilation in the back using perforation which was covered by a cape.⁵⁵ In an 1886 patent, the perforation was provided in the shoulders of the garment and then covered with epaulettes to prevent moisture from entering the garment.⁵⁶ Another garment that used perforated ventilation was created in 1887. This garment incorporated perforation in the top portion of the coat underneath the cape. Unlike previous patents, the perforation was accompanied by vertical lines of ribbing that held the cape away from the perforation, therefore allowing the air to better circulate (see fig. 29).⁵⁷ The same inventor created another patent the same year using the combination of perforation and ribs. His improvement was to place ventilation at the top of the cape as well which was covered by an additional flap.⁵⁸ Other garments utilized the idea of perforation in 1888 by perforating either under the arm or in the back then covering the ventilation with a flap.⁵⁹ The catalog image of “the cyclone,” a coat for motormen and teamsters, had a similar appearance to the ventilated coats described in the patents (see fig. 30). The description of the coat, however, does not specify whether or not the coat is ventilated.⁶⁰

Occupations and Garment Function

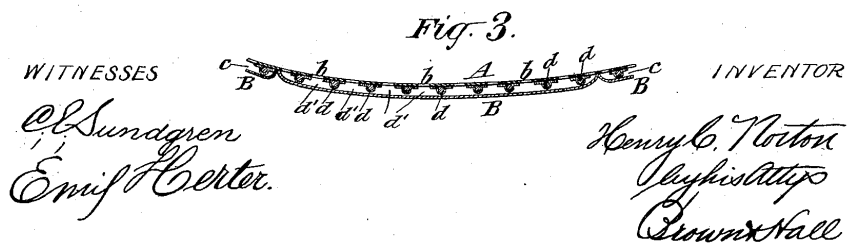
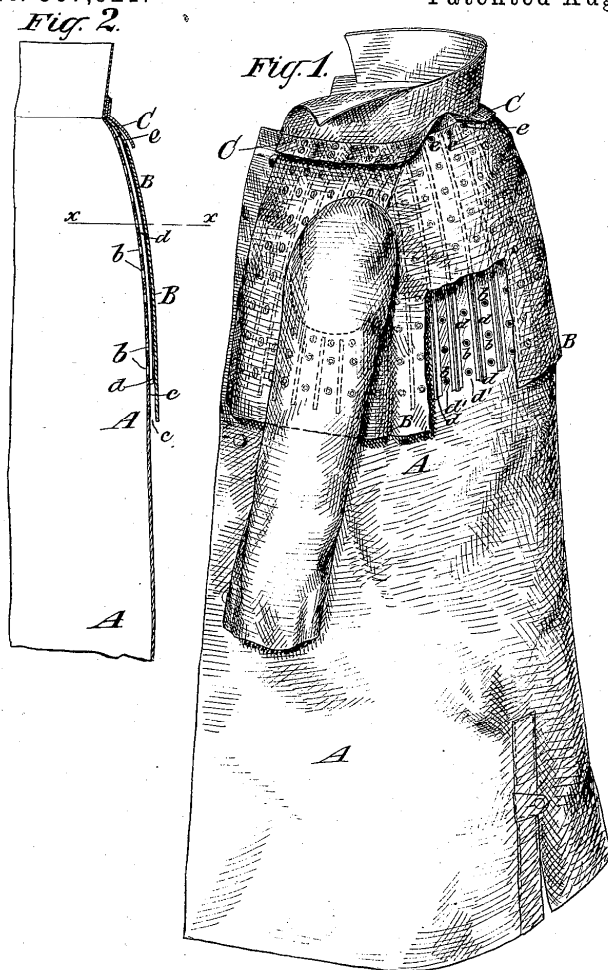
The patents help to understand the occupations and types of recreation for which waterproof apparel was created. Some of the occupations mentioned in the patents included miners, teamsters, car-drivers, hackmen, conductors, military officials and seamen. One patent was created specifically for miner’s overalls, this garment

(No Model.)

H. C. NORTON.
WATER PROOF GARMENT.

No. 367,921.

Patented Aug. 9, 1887.



H. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 29. Coat ventilation through perforation and raised ribs. Image from Henry C. Norton, 1887, *Water-proof Garment*, US Patent 367921, filed 5 February 1887, and issued 9 August 1887.



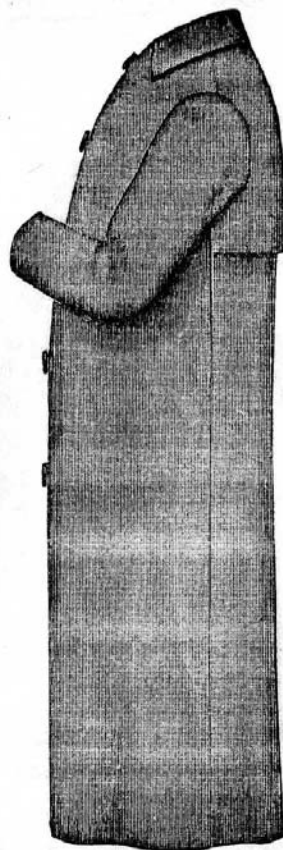
GOODYEAR RUBBER CO.



THE CYCLONE.

Goodyear Double Back Duck Coat.
52 INCHES LONG.

FOR MOTORMEN AND TEAMSTERS.



Made on Heavy Brown Duck with Duck Side Out.
Ball and Socket Buttons. Double Breasted
Especially adapted to Drivers, Motormen and Miners.
Price, each.....\$3 65
Discount from this list 5 per cent.

Fig. 30. A garment called The Cyclone with a cape in the back. Image from Goodyear Rubber Company, *Mackintoshes, rubber and oil clothing, ect.: Illustrated Catalogue and Price List of the Goodyear Rubber Company*, St. Paul, MN: privately printed, 1890s, 17.

added pads to the knees of regular overalls used by miners. Hermann Heynemann, the inventor explained why this improvement was important:

In many kinds of work, and more especially in mining in low tunnels and drifts, it is necessary for the workman to kneel upon the rocks or floor of the drift while using the pick and other tools, and this position, besides wearing the clothes rapidly at the knees, soon causes great pain and discomfort to the wearer.⁶¹

This patent states that the pads can be created using cotton batting, but that rubber pads may be desired to make the fabric waterproof at the knees. A patent created in 1894 was intended for fishermen and men with other sea occupations. The patent was for a life-preserver that doubled as a cloak-style garment. Underneath the cloak, the waist could be inflated and used as a life saving garment in the water.⁶²

Many of the catalogs featured garments to be used for specific occupations. The rubber goods catalogs include garments for firemen and officers. The Rowe oiled clothing catalog provided clothing for other occupations including fishing, mining, riding and other sea-related jobs. In fact, according to the Rowe catalog, oiled clothing came about due to the needs of fishermen. Drivers and farmers were other occupations mentioned in the catalogs. In addition, the catalogs offered ice aprons, packing house aprons, and baptismal pants.⁶³

Several catalogs offered coats or slickers for horsemen.⁶⁴ These garments were likely used by men involved in the cattle trade. The importance for cowboys to have a waterproof garment is illustrated in the following excerpt from a poem:

When the rain' pourin' down, my slicker I'll wear
And not have it lying 'round camp,
For riding without one when fall rains are on
A cowboy most always feels damp.⁶⁵

Travel and Recreation

Some of the recreational activities for which garments were created included traveling, walking, bicycling, shooting, riding, driving, fishing, hunting, and camping. A patent created in 1892 attempted to create a versatile garment that could be used for multiple purposes related to travel and recreation. The garment was a simple circular style cloak. The patent both illustrated and claimed that the garment could be used as a knee rug for man or woman, which was used to cover one's legs while seated, it could be used as an opera-cloak, shooting-garment; for riding, for driving, for fishing, for hunting, as a military cape, or as ground cover while camping (see fig. 31).⁶⁶

The Jordan, Marsh & co. 1891 catalog advertised a traveling costume for ladies that covered the entire garment and resembled some of the patents for ladies garments.⁶⁷ The catalog also offered garments for horse riding and hunting. The catalog emphasized travel and recreation in their catalog. In fact, the title of the ladies waterproof page was "For Traveling and Outing."⁶⁸

Patents for waterproof clothing included those intended for bicycle riders. One such patent created in 1894 was for a ladies' dress-skirt. The design was for a divided skirt that could be worn when on the bicycle but was not as conspicuous as bloomers. The skirt had front and rear vertical slits with elastic fastenings to help the skirt fall on either side of the wheels. The skirt was faced with rubber or thin leather for easy cleaning. Leggings could be worn up to the knee with the garment.⁶⁹ Another patent created for the bicycle was a cape. The cape was conical in shape to encase the entire body extending from the neck of the rider (see fig. 32). The garment could be arranged over the handlebars to help prevent the entrance of rain while riding. The side of the

(No Model.)

2 Sheets—Sheet 2.

J. A. SHELTON.
COMBINED RUG AND CLOAK.

No. 471,903.

Patented Mar. 29, 1892.

Fig. 3.



Fig. 4.

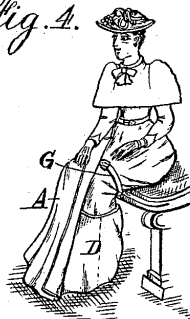


Fig. 5.

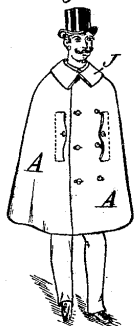


Fig. 6.



Fig. 7.

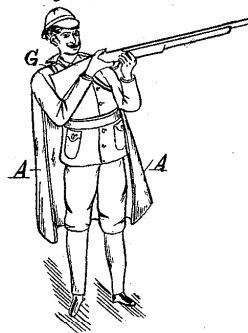


Fig. 8.



Witnesses:

J. A. Rutheford
Robert Consett

Inventor:

James Alfred Shelton
By James L. Norris,
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

Fig. 31. Versatile waterproof cape. Image from John Henry Smalpage, 1892, *Combined Rug and Cloak*, US Patent 471903, filed 26 December 1891, and issued 29 March 1892.

(No Model.)

J. W. ORR.
WATERPROOF CAPE.

No. 531,695.

Patented Jan. 1, 1895.

Fig. 1.

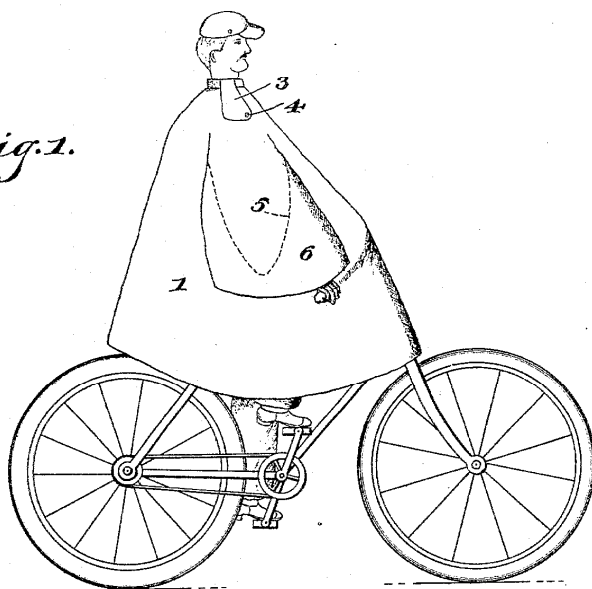
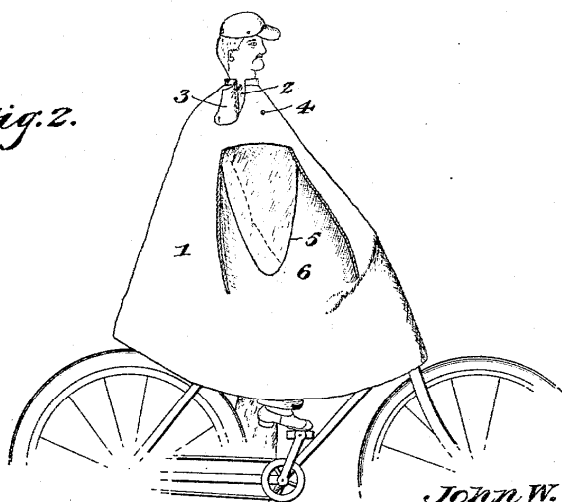


Fig. 2.



Witnesses

B. L. Orr
J. W. Orr

By *his* Attorneys.

John W. Orr,

Chas. W. Orr,

Inventor

THE MORRIS PETERS CO., PHOTOLITHO., WASHINGTON, D. C.

Fig. 32. Waterproof bicycling garment. Image from John Wade Orr, 1895, *Waterproof Cape*, US Patent 531695, filed 9 March 1894, and issued 1 January 1895.

garment had elliptical arm openings that covered the arm openings to prevent the entrance of moisture.⁷⁰

Each of the patents for waterproof apparel provided insight into the importance of design and function of waterproof dress between 1880 and 1895. Inventors continued to search for solutions to enhance the comfort and wearability of this functional type of dress. The patents also help our understanding of special apparel needed for certain occupations, travel, and recreation. One category of dress emerged from the designs and was able to withstand two decades of use: the lightweight gossamer garment.

¹ Abner J. Tower, 1882, *Coat*, US Patent 267729, filed 17 July 1882, and issued 21 November 1882.

² Abner J. Tower, 1884, *Overcoat*, US Patent 310095, filed 26 February 1883, and issued 30 December 1884.

³ Abner J. Tower, 1885, *Horseman's Coat*, US Patent 313130, filed 28 July 1884, and issued 3 March 1885.

⁴ Henry Emanuel, *Pommel-coat*, US Patent 329299, filed 19 June 1885, and issued 27 October 1885.

⁵ Moses S. Lorsch, 1885, *Water-proof Garment*, US Patent 317812, filed 30 August 1884, and issued 12 May 1885.

⁶ John F. Carter, *Water-proof Garment*, US Patent 360851, filed 20 September 1886, and issued 12 April 1887.

⁷ Emerson & Adams, *Catalogue and Price List Joseph H. Rowe & Co. Manufacturers of Genuine Cape Ann Oiled Clothing, Horse and Wagon Covers, Sou' Westers and Oiled Hats*, Bangor, ME: privately printed, 1892, 18.

⁸ E. G. Stearns & Co., *Rubber Goods: Boots and Shoes, Tennis Shoes, Mackintoshes*, Boston: privately printed, Spring 1895, 24.

⁹ L. Frank, *Illustrated Catalogue*, San Antonio, TX: privately printed, 1891, 145.

¹⁰ Tower, US Patent 313130; Carter, US Patent 360851.

¹¹ L. D. Stone & Saddle Co. *Saddle*, San Francisco, CA: privately printed, 1895, 170.

¹² *Montgomery Ward & Co. Catalogue and Buyers' Guide*, (Spring and Summer 1895; reprint New York: Dover Publications, 1969), 297.

¹³ Goodyear Rubber Company, *Mackintoshes, rubber and oil clothing, ect.: Illustrated Catalogue and Price List of the Goodyear Rubber Company*, St. Paul, MN: privately printed, 1890s, 19.

¹⁴ Emanuel, US Patent 329299.

¹⁵ Goodyear Rubber Company. *Mackintoshes*. 19.

¹⁶ *Ibid.*, 20.

¹⁷ Henry Emanuel, 1882, *Overcoat*, US Patent 265043, filed 12 July 1882, and issued 26 September 1882.

¹⁸ David Heinman and Salmon Lorsch, 1884, *Overcoat*, Henry Emanuel (assignor), US Patent 294599, filed 20 April 1883, and issued 4 March 1884.

¹⁹ Abner J. Tower, 1894, *Coat*, US Patent 310922, filed 12 January 1880, and issued 20 January 1885.

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- ²⁰ Benjamin F. Gassaway, 1894, *Overcoat*, US Patent 519670, filed 22 May 1893, and issued 8 May 1894.
- ²¹ George B. Thomson, 1882, *Rubber Coat*, US Patent 267120, filed 11 August 1881, and issued 7 November 1882.
- ²² Goodyear Rubber Company, *Illustrated Rubber Trade Journal: Prices of Rubber Clothing, Boots ad Shoes, Gloves, Mittens, &c.*, New York: privately printed, 1881, 6.
- ²³ Goodyear's Rubber Curler Co., *Illustrated Price List*, New York: privately printed, 1885, 14.
- ²⁴ L. D. Stone & Saddle Co. *Saddle*, 170.
- ²⁵ Thomas B. Farrington, 1882, *Overcoat*, Peter J. Oberst (assignor), US Patent 265536, filed 24 July 1880, and issued 3 October 1882.
- ²⁶ George A. Blanchard, 1883, *Skirt-protector*, US Patent 275014, filed 15 January 1883, and issued 3 April 1883.
- ²⁷ Mary L. Cummings, 1884, *Skirt-protector*, US Patent 308879, filed 21 April 1884, and issued 9 December 1884.
- ²⁸ Loretto Cory, 1885, *Water-proof Garment*, US Patent 316245, filed 29 July 1884, and issued 21 April 1885.
- ²⁹ Manning R. Yeomans, 1887, *Water-proof Garment*, US Patent 365036, filed 5 January 1887, and issued 14 June 1887.
- ³⁰ Wilfrid D. Stearns, 1889, *Skirt-protecting Garment*, US Patent 418082, filed 7 November 1889, and issued 24 December 1889.
- ³¹ Nancy J. Buchanan, 1893, *Skirt-protector*, US Patent 510324, filed 16 March 1893, and issued 5 December 1893.
- ³² Mary Bates, 1895, *Skirt-protector*, US Patent 540225, filed 19 July 1894, and issued 4 June 1895.
- ³³ Charles P. Nicolson, 1883, *Skirt-protector*, US Patent 289020, filed 2 May 1883, and issued 27 November 1883.
- ³⁴ Charlotte A. Gandil, 1885, *Lady's Skirt-protector*, US Patent 319477, filed 1 December 1884, and issued 9 June 1885.
- ³⁵ Gilbert Baker, 1883, *Dress and Skirt-protector*, US Patent 282254, filed 2 January 1883, and issued 31 July 1883.
- ³⁶ Patrick A. Largey, 1884, *Rubber Clothing*, George Platt (assignor), US Patent 291854, filed 26 July 1883, and issued 8 January 1884.
- ³⁷ Otte Van Oostrum, 1893, *Waterproof Suit*, US Patent 492643, filed 29 September 1892, and issued 28 February 1893.
- ³⁸ Otte Van Oostrum, 1893, *Waterproof Suit*, US Patent 507466, filed 14 April 1893, and issued 24 October 1893.
- ³⁹ Maggie Boyd, 1885, *Combined Storm-shield and Overdress*, US Patent 318538, filed 27 October 1884, and issued 26 May 1885.
- ⁴⁰ Mary J. Foxworthy, 1895, *Garment-protector*, US Patent 537281, filed 24 February 1893, and issued 9 April 1895.
- ⁴¹ Hermann F. Bindseil, 1882, *Reversible Cloak*, US Patent 258697, filed 24 April 1882, and issued 30 May 1882.
- ⁴² Martha E. Brown, 1886, *Water-proof Over-garment*, US Patent 343698, filed 10 February 1886, and issued 16 June 1886.
- ⁴³ Harriet Judson, 1887, *Water-proof Garment*, US Patent 373895, filed 18 October 1887, and issued 29 November 1887.
- ⁴⁴ F. C. Howlett, *F. C. Howlett and Company Rubber Goods*, Buffalo, NY: privately printed, 1890s, 14.
- ⁴⁵ William P. Dodge and John Cummings, Jr., *Coat*, US Patent 289236, filed 9 July 1883, and issued 27 November 1887.
- ⁴⁶ John R. Farrell, 1895, *Waterproof Coat*, John Thomas Taylor (assignor), US Patent 543662, filed 9 June 1894, and issued 30 July 1895.

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- ⁴⁷ David Heinman, 1884, *Garment-sleeve*, Saloman Lorsch (assignor), US Patent 297526, filed 24 January 1884, and issued 22 April 1884.
- ⁴⁸ John A. C. Hamill, 1884, *Overcoat*, US Patent 301118, filed 16 November 1883, and issued 1 July 1884.
- ⁴⁹ The Chicago Rubber Clothing Company, 1884, *Waterproof Circular*, Lyndon C. Lawton (assignor), US Patent 305011, filed 18 February 1884, and issued 9 September 1884.
- ⁵⁰ William McGuire, 1883, *Waterproof Coat*, John McGuire (assignor), US Patent 273115, filed 15 April 1882, and issued 27 February 1883.
- ⁵¹ Carl Heavenrich, Louis A. Bourbonnais, Louis Mautner, 1890, *Water-proof Garment*, US Patent 422814, filed 21 September 1889, and issued 4 March 1890.
- ⁵² Amos F. Chase, 1890, *Waterproof Garment*, US Patent 422917, filed 3 October 1887, and issued 11 March 1890.
- ⁵³ Theodore Hawley, 1881, *Water-proof Wearing-apparel*, US Patent 236807, filed 17 May 1880, and issued 18 January 1881.
- ⁵⁴ Edward Landstreet and Jay F. Towner, 1882, *Water-proof Coat*, US Patent 257024, filed 10 November 1881, and issued 25 April 1882.
- ⁵⁵ John A. C. Hamill, US Patent 301118.
- ⁵⁶ Joseph A. Buyers, 1886, *Ventilated Water-proof and Other Garments*, US Patent 346087, filed 16 April 1886, and issued 27 July 1886.
- ⁵⁷ Henry C. Norton, 1887, *Water-proof Garment*, US Patent 367921, filed 5 February 1887, and issued 9 August 1887.
- ⁵⁸ Henry C. Norton, 1887, *Waterproof Garment*, US Patent 375504, filed 25 August 1887, and issued 27 December 1887.
- ⁵⁹ Daniel W. Crosby, 1888, *Ventilated Garment*, Ellis S. Helwitz (assignor), US Patent 385306, filed 21 January 1888, and issued 26 June 1888; Daniel W. Crosby, 1888, *Ventilated Garment*, US Patent 394558, filed 23 July 1888 and issued 18 December 1888; John Sidney Goldsmith, 1889, *Ventilated Garment*, US Patent 397543, filed 29 August 1887, and issued 12 February 1888.
- ⁶⁰ Goodyear Rubber Company, *Mackintoshes*, 17.
- ⁶¹ Herman Heynemann, 1881, *Overalls*, US Patent 246674, filed 17 May 1881, and issued 6 September 1881.
- ⁶² Oscar Hanson, 1894, *Life-saving Garment*, US Patent 525342, filed 23 April 1894, and issued 4 September 1894.
- ⁶³ Emerson & Adams, 5, -7, 11-16 ; F. C. Howlett 20.
- ⁶⁴ L. Frank, 145; *L. D. Stone & Saddle Co. Saddle*, 170.
- ⁶⁵ Janice & Mason Coggin (Eds.), "The Cowboy's Reverie," *Cowboy Poetry: Classic Rhymes and Prose* by D. J. O'Malley the N Bar N Kid White, 1868-1943, (Cowboy Miner Productions, 2000) 29.
- ⁶⁶ John Henry Smalpage, 1892, *Combined Rug and Cloak*, US Patent 471903, filed 26 December 1891, and issued 29 March 1892.
- ⁶⁷ Jordan, Marsh & Co., *Jordan, Marsh Illustrated Catalog of 1891* (private publication 1891; reprint New York: The Athenaeum of Philadelphia and Dover Publications, 1991), 22.
- ⁶⁸ Ibid.
- ⁶⁹ Martha C. Geldowsky, 1894, *Dress-skirt*, US Patent 529828, filed 23 April 1894, and issued 27 November 1894.
- ⁷⁰ John Wade Orr, 1895, *Waterproof Cape*, US Patent 531695, filed 9 March 1894, and issued 1 January 1895.

CHAPTER 6

THE GOSSAMER

Consumers had several options when it came to choosing a waterproof garment, but one garment in particular emerged as having its peak in the 1880s: the gossamer. Historically, the term gossamer had been used to describe thin, flimsy, gauze-like fabric.¹ Naturally, when an extremely light version of rubber outer wear became available, it was given the name gossamer, referring to its lightness.

The New Garment

The double texture method used in garments, such as the mackintosh, made rubber outer coats very heavy. When the gossamer arrived in the 1870s, the new light product enhanced the convenience of wearing a waterproof garment. *The Saturday Evening Post* in 1874 promoted the use of the “new” gossamer when they stated:

Have any of our readers tried the new gossamer waterproof cloth? We hear on all sides praise of its good qualities, and it is said to be entirely impervious to rain. The lightness of the garment, when made up even with a cape attached, is almost incredible—ten to twelve ounces is the ordinary weight of a long full cloak of it; and after the weight of an old-fashioned waterproof garment, the relief of wearing it can well be imagined. The material is said to be a mixture of Scotch gingham and silk, covered with a thin coating of rubber. As a summer wrap for protection against rain, it will also be found invaluable.²

The resourcefulness of this new article was again praised in a letter written to the *Saturday Evening Post* in 1875.³

Ehrichs' Fashion Quarterly offered a description of this “new” gossamer in their 1878 publication. As with the *Saturday Evening Post*, the description of the garment was of a Scotch gingham fabric covered with a thin layer of rubber which had the appearance of black silk. They went on to mention that the garment, besides being light in weight

could be rolled into a package or pocket for easy transportation. The garment was even claimed to have been awarded “the highest premium at the Centennial International Exhibition at Philadelphia, as the best light-weight Rubber Garment in the world.”⁴ The publication offered two styles of gossamers for sale: the “Newport” with a double cape and the waterproof circular or cloak with an attached hood and armholes.

Popularity through the 1880s

Advertisements appearing in an 1883 *Peterson’s Magazine*, a ladies’ magazine, were placed by the Gossamer Rubber Clothing Co. of Boston, Massachusetts (see fig. 33). The promotion warned consumers not to be misled by imitations. Their garments



Fig. 33. Gossamer waterproof garment advertisement. Image from Advertisement, *Peterson’s Magazine* 84, no. 1 (July 1883), 91.

had received five grand metals including the Exposition Universelle in Paris in 1878 and the Centennial Exhibition in Philadelphia in 1876. The image on the advertisement was of the ladies’ waterproof circular with the attached hood.⁵

The ladies' gossamer continued to appear in *Ehrichs' Fashion Quarterly* in 1885 (see fig. 34). The description of the standard garment had remained the same including the Scotch gingham fabric. By this time, however, many more styles were offered in various grades and fabrics. The publication offered six different circulars, seven Newports with a cape, and four new market garments. Also offered were a multitude of shawls and a misses' or girl's Mother Hubbard style waterproof.⁶



Fig. 34. Ladies' gossamer garment with cape. Image from Ehrich & Co., *Ehrichs' Fashion Quarterly* (Fall 1885), 266.

Other companies offered the gossamer products under their own name by the early 1880s. An 1881 catalog published by the Goodyear Rubber Co. explained that the company offered three grades of gossamer goods. The highest quality garments were called the “Goodyear” and the second grade models were called “Prince Albert” for men and the “Princess” and “Empress” style of medium quality for women. The “Royal” was the third grade and lesser in quality; although, all gossamer garments were guaranteed to not become sticky and each came with an enameled cloth bag.⁷ By 1883, Goodyear Rubber Co. added to the selection of gossamer garments offered. Gossamer clothing was again offered for men, women and children, but the garments have additional names including the “Western,” which appears to be the least expensive gossamer, and the “Newport,” which was a ladies garment with a cape to better protect a lady’s arms in bad weather. Also offered were gossamer hats and derby hat covers as well as gents’ leggings (see fig. 35).⁸

The price-list of rubber goods from Paxton, Comfort & Co. in 1885 offered both gossamer and plain rubber clothing. The price list offered gossamer styles called “Prince Albert” for men and the “Princess” and “Empress” for women and claimed that their garments were the best quality among gossamers offered at a medium price level. Their garments also came in an enameled bag.⁹

In 1885, the Goodyear Rubber Curler Co. offered lightweight coats called the “Featherweight.” These garments appear to be the same or similar to gossamer goods as they were estimated to weigh about ten ounces, made on gingham fabric and could easily be carried when not in use. The company likely decided to change the name of the goods from gossamer to featherweight to differentiate themselves from the multiple companies


No allowance on Goods after they have been worn.

Goodyear Rubber Co.'s

Gossamer Rubber Clothing.

A Very Superior Quality.

GENTS' LONG COATS.
Sizes, 36 to 50 in.




G. R. Co., any size.....\$4.00
Prince Albert, any size... 2.50
Royal, " " " 2.00
Western, " " " 1.50

Boys' sizes, 26 to 34.

Prince Albert,.....\$2.25
Royal,..... 1.75
Western,..... 1.25

HATS AND CAPS.




RUBBER HATS.

per doz.

Gossamer.....\$4.50
Derby Hat Covers,..... 3.00

LADIES' ULSTERS.
G. R. Co.



Price, any length.....\$5.00
Sizes, 50, 52, 54, 56, 58, 60 in.

GENTS' LEGGINGS.



Price.....per pair, \$1.00

No allowance on Goods after they have been worn.

Goodyear Rubber Co.'s.

Gossamer Rubber Clothing.

CLOAK.


This Cloak is of the well-known form of the ordinary. "Ladies' Waterproof" with the usual hood.

Misses' Sizes.	Ladies' Sizes.
Length of Back, 36, 38, 40, 42, 44, 46, 48 inches.	Length of Back, 50, 52, 54, 56, 58, 60 inches.

	Misses'.	Ladies'.
G. R. Co.....	\$1.75	\$3.25
Princess.....	1.75	2.00
Royal.....	1.25	1.50
Western.....	.90	1.00

LADIES' NEWPORT.

This garment, similar to our *Circular* in shape, has a cape surrounding the upper part of the body. It has the advantage of affording protection to the arms, without impeding their freedom.




Length of back, 50, 52, 54, 56, 58, 60 in.

Price any size, G. R. Co.....\$4.00
" Empress..... 3.00

Ladies' Leggings.

FLANNEL LINED.

In ordering, give measure of calf, ankle, and length desired.



Furnished at 15 days notice.
Made to Order.

Price.....per pair, \$1.25

12

13

Fig. 35. Gentlemen, ladies' and children's gossamer goods. Image from Goodyear Rubber Company, *Price List of Heavy and Gossamer Rubber Clothing*, (Chicago: privately printed, 1883), 12-13.

producing the goods, some of which produced sub-quality products. Similar products were offered; however, the men's "featherlights" added a herdsman's coat to the selections which was adapted for riding on horseback.¹⁰

Patents

Gossamer goods were generally the simplest and least expensive of the rubber goods. Several patents, however, sought to improve these goods and to make them more

versatile. Patents associated with waterproof compounds made reference and helped to illuminate the process of making gossamer goods. According to an 1880 patent that sought to deodorize rubber goods, the patentee claimed that the process for making gossamer goods required no vulcanization. The rubber would have been dissolved or softened into a solvent before being rolled in thin sheets onto the fabric. Instead of incorporating sulphur, a key element in vulcanization, gossamer goods were formed by allowing the solvent to evaporate once the rubber was spread onto the fabric.¹¹ This method contradicted the catalog claims for the rubber maintaining its surface and not becoming sticky or tacky, which was likely without vulcanization. An 1883 patent for more durable waterproof goods also stated that gossamer goods were made using only the solvent which did not create a long-lasting coating.¹² Another 1883 patent went on to further clarify how gossamer rubber goods were cured. The patentee claimed that after the rubber was partially dissolved in a solvent, such as naphtha, and spread onto a fabric, generally cotton or linen, the rubber was typically cured (the solvent dissolved) through the heat of the sun.¹³

Several apparel patents were created between 1880 and 1895 to make improvements on gossamer and similar light rubber garments. George Watkinson created a patent in 1882 to improve the gossamer by incorporating the wrapper or container bag into the design of the garment. The bag was sewn onto the side of the garments. By creating the garment's pouch as part of the design, the wearer did not need to be concerned with what to do with the empty pouch when the garment was in use. When the garment was not worn, it could be rolled into the wrapper and secured with cords.¹⁴ A similar patent was taken in 1884 by Sigmund Wetzler. His patent was also for a

gossamer circular and attached a receptacle to the interior of the garment (see fig. 36). In this patent, he claimed that the receptacle could be used as a pocket when the garment was being worn. When the garment was removed, it could easily be rolled into the pouch and fastened with ties or buttons.¹⁵ These patents were for the standard gossamer circular, a long cape-like garment, of which an image can be found in such catalogs as the 1883 Goodyear Rubber Co.¹⁶

Another patentee sought to improve the design of the garment itself. The gossamer circulars were a style of cape with openings for the arms. If the wearer needed to use her arms during wet weather, her arms would get wet. A patent in 1883 sought to remedy this problem by adding retractable sleeves to the inside of the gossamer garment. The removable sleeves were attached using buckles to the inside of the garment and the wearer could slide her arms into the sleeves when necessary. When not in use, the sleeves could hang on the inside of the garment or be removed.¹⁷

Inventors sought to find other uses for the gossamer fabric by creating a hem-protector using a strip of gossamer cloth.¹⁸ An 1889 patent by Wilfrid D. Stearns sought to improve the gossamer garments by adding a skirt protector to the hem of the garment. The hem of the gossamer had a series of bellows and ribs on the inside that attached to the skirts and held them away from the ground where they would be soiled by rain or mud (see fig. 37). When in use, the bellows were inflated using a tube which filled out below the skirts for protection.¹⁹

Many of the patents referred to problems due to stress points on waterproof garments. Most of the patents related to strain were created for gossamer garments. Patentee P. Charles Getz claimed that gossamers were known to place a great deal of

(No Model.)

S. WETZLER.

CLOAK.

No. 293,386.

Patented Feb. 12, 1884.

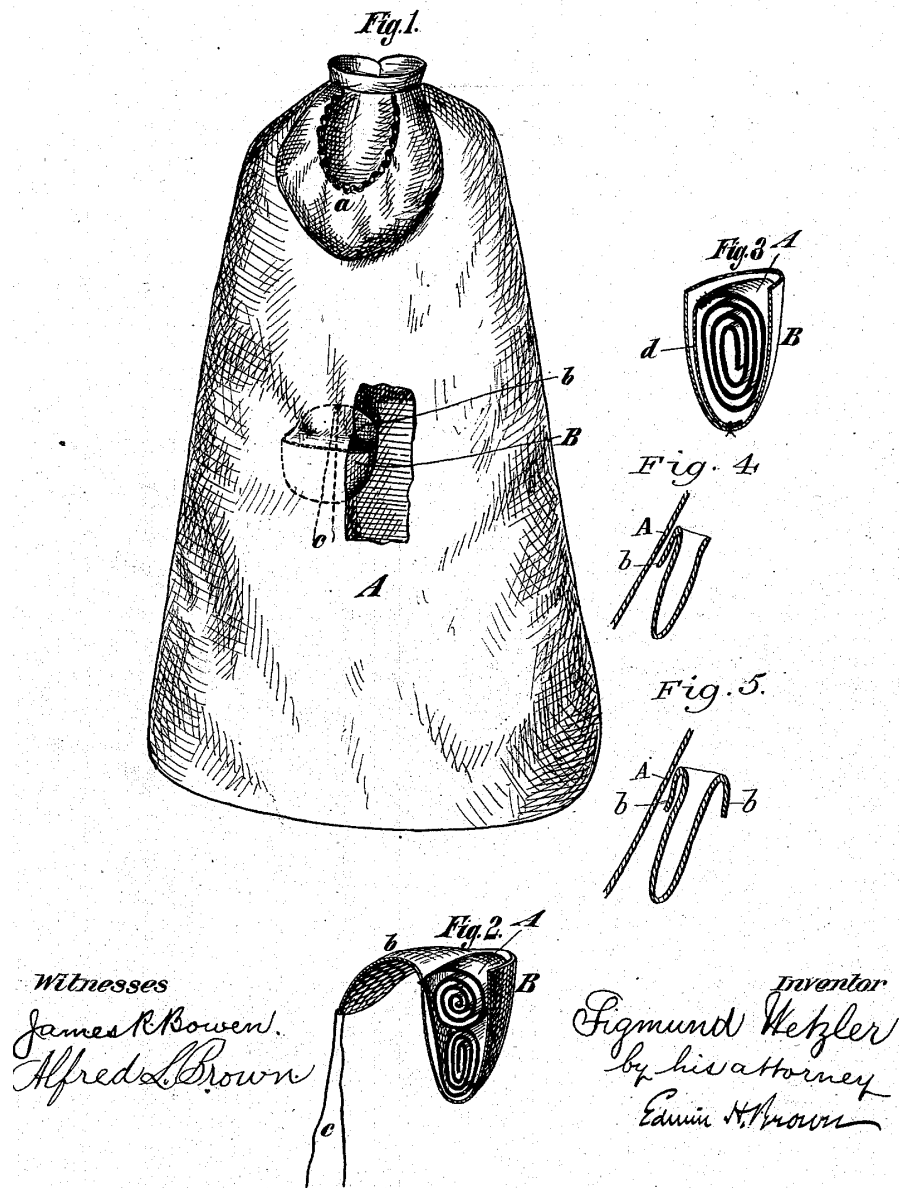


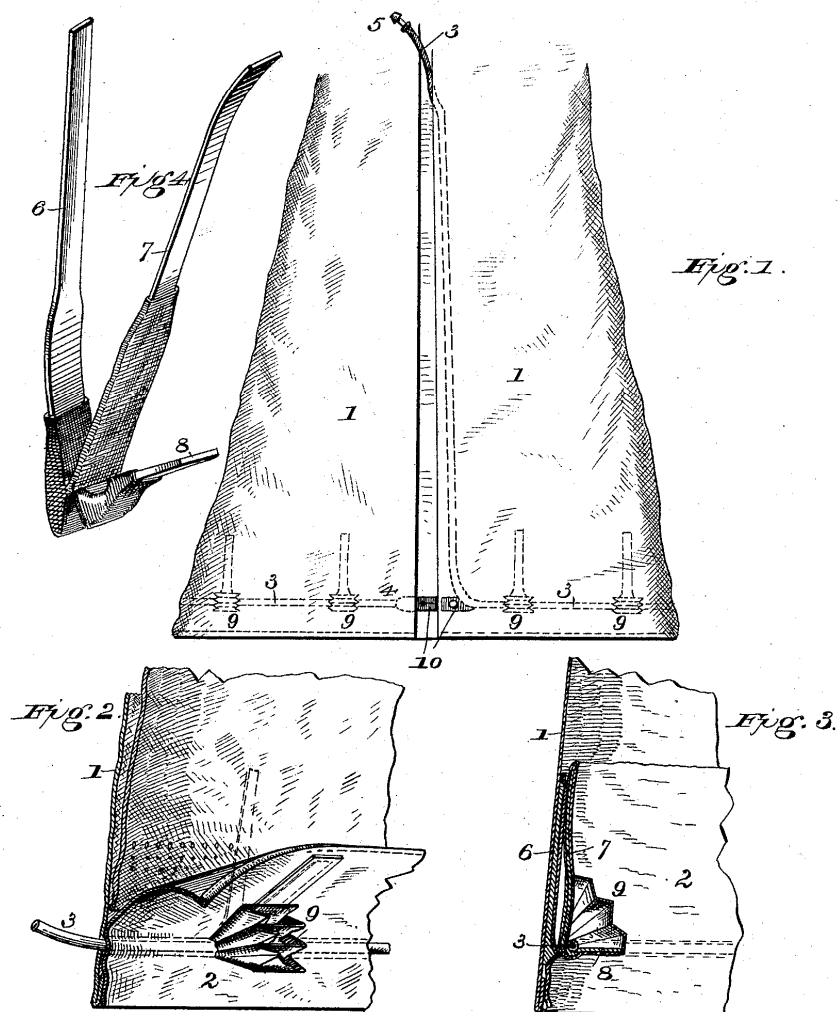
Fig. 36. Gossamer with attached pocket container. Image from Sigmund Wetzler, 1884, *Cloak*, US Patent 293386, filed 4 November 1882, and issued 12 February 1884.

(No Model.)

W. D. STEARNS.
GOSSAMER.

No. 418,081.

Patented Dec. 24, 1889.



WITNESSES
F. L. Ourand
H. A. Smith

INVENTOR
Wilfred D. Stearns
By *Frank L. Ourand*
Attorney.

N. PETERS, Photo-Lithographer, Washington, D. C.

Fig. 37. Skirt-protector with bellows. Image from Wilfred D. Stearns, 1889, *Gossamer*, US Patent 418081, filed 15 October 1889, and issued 24 December 1889.

stress on the armholes of the garment. The armholes were easily torn which made the waterproof properties of the coat ineffective. For his patent, he added reinforcement patches at either end of the armhole slits to help withstand the strain.²⁰ A patent created in 1886 sought to relieve the strain placed on the arm openings in cloaks by gathering the front of the cloak to elastic bands on the inside of the coat to provide more give when moving the arms.²¹

A patent created in 1888 attempted to relieve the strain on gossamer garments that were designed with lapels. The patentee claimed that typically lapels were attached to the front of the garment, adding to the strain across the front and at the armholes, possibly distorting or damaging the garment, particularly when the wearer raised her hands. In the patent, the lapel attached at either the shoulder or collar seam to redirect the strain.²² A patent by Amanda M. Lougee in 1890 sought to relieve strain on the armholes by connecting the arm openings to the collar or lapel by using a tape in the inside of the garment. The expectation was that the tape would take the brunt of the strain, rather than the outside of the garment.²³ These types of garments with the reinforcement details on the inside of the garment are difficult to determine, based on images, whether or not they were offered in the catalogs. Few of the catalogs provided a detailed description about the garments.

Mary L. Brown created a waterproof garment in 1890 that was intended to be used as a “waterproof,” “gossamer,” or “traveling suit” as a light comfortable garment (see fig. 38). The upper portion of the garment fit close to the body with perforations for ventilation. The basque or bodice could be worn buttoned closed in the front or buttoned back to form revers or a turned back collar. Sleeves were wide and extended out from the

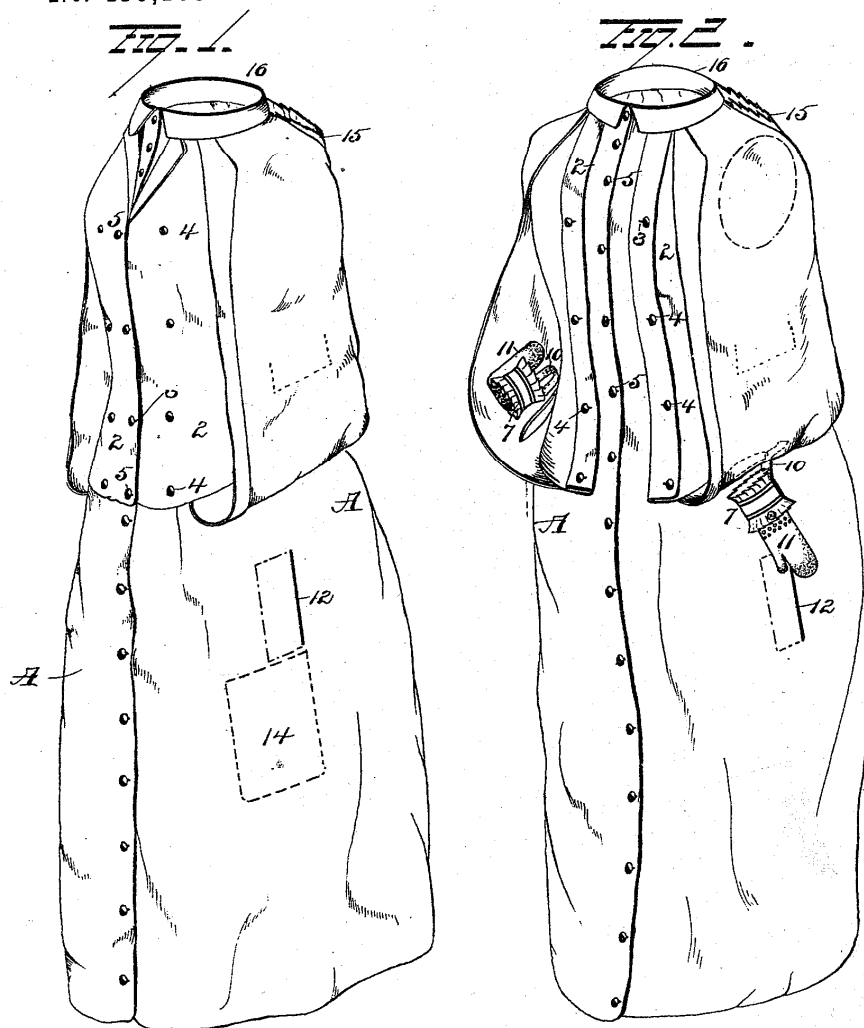
(No Model.)

3 Sheets—Sheet 1.

M. L. BROWN.
WATER PROOF GARMENT.

No. 439,103.

Patented Oct. 28, 1890.



Witnesses
E. J. Nottingham
G. F. Downing.

Inventor
Mary L. Brown
By her Attorney
H. A. Seymour

THE MORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

Fig. 38. Ladies' waterproof garment with sleeve protection. Image from Mary L. Brown, 1890, *Water-proof Garment*, US Patent 439103, filed 11 July 1888, and issued 28 October 1890.

garment to protect the arms when the wearer was reaching into the pockets. The wrist of the sleeves had elastic with detachable mittens. A hood was attached using hooks and eyes. The garment also had a skirt-elevating attachment consisting of several straps to lift up the skirts.²⁴ This garment illustration looked similar to some of the gossamers offered in the late 1880s and early 1890s (see fig. 39).²⁵ The illustration from the patent had a similar appearance to the illustration of the traveling outfit in the 1891 Jordan, Marsh & Co. catalog.²⁶ It was difficult to determine if the design of the garment was the



Fig. 39. Ladies' Featherlight Newport waterproof cloak. Goodyear Rubber Company, *Price List of Heavy and Gossamer Rubber Clothing*, (Chicago: privately printed, 1883), 13.

same as that in the patent; however, both were intended for travel and recreation and the advertisement indicated that the garment benefited from the latest improvements.

The Decline

By the 1890s, gossamer rubber goods began to disappear from magazines and catalogs. This decline may have been due in part to the fragility of the garment. The patents indicate that the garments had only a thin coating of rubber and could easily tear at key stress locations. The Paxton, Comfort & Co. catalog had a warning at the bottom of their price list that gossamer garments were not intended for hard or prolonged use. This was likely because they were the lightest in weight and had the lightest coating of rubber which would have been more susceptible to degradation.²⁷ At least one of the waterproof compound patents supported the argument that gossamer goods did not last because the rubber coating was thin and expired quickly.²⁸

The 1891 Jordan, Marsh & Co. continued to offer a selection of gossamers for women and children, but not for men. The company had their own “Alligator” trademark; however, they only offered the standard circulars. They promoted their product by stating that they were of the highest quality and benefited from the latest improvements.²⁹ The 1895 E. G. Stearns & Co. catalog offered a small selection of ladies gossamer goods including the Inverness with capes and the traditional circular. These were clearly the least expensive of the waterproof outerwear.³⁰ By 1890s, the Goodyear Rubber Co. had eliminated the lightweight rubber goods—both the gossamer and the featherweight garments that had been offered in the 1880s.³¹ Their focus was more on the Inverness style associated with mackintosh garments that rose in popularity in the United States during the mid 1890s.

An interesting transition occurred during the lifespan of the gossamer. In the beginning, gossamer garments were available for both men and women. Early 1880s catalogs provided imagery of multiple garments for men. By the 1890s, the light weight gossamer had become associated with women and the heavy rubber clothing for men. In addition, alternative waterproof and rain-resistant garments were becoming available. The gossamer, although its use only spanned approximately two decades, endured as a product much longer than most garments in spite of the ever-changing apparel trends.

¹ Mary Brooks Picken, *A Dictionary of Costumer and Fashion: Historic and Modern*, (New York: Dover Publications, 1985), 153.

² Ninon, "The Boudoir Fashion Notes & Queries," *Saturday Evening Post* (Philadelphia) 54, no.22 (26 December 1874), 8 [database online]; available from American Periodical Series Online.

³ Ninon, "The Boudoir Fashion Notes & Queries," *Saturday Evening Post* (Philadelphia) 55, no. 6 (4 September 1875), 8 [database online]; available from American Periodical Series Online.

⁴ Ehrich & Co., *Ehrichs' Fashion Quarterly* (Autumn 1878), 25.

⁵ Advertisement, *Peterson's Magazine* 84, no. 1 (July 1883), 91.

⁶ Ehrich & Co., *Ehrichs' Fashion Quarterly* (Fall 1885), 266.

⁷ Goodyear Rubber Company, *Illustrated Rubber Trade Journal: Prices of Rubber Clothing, Boots ad Shoes, Gloves, Mittens, &c.* (New York: privately printed, 1881), 2.

⁸ Goodyear Rubber Company, *Price List of Heavy and Gossamer Rubber Clothing*, (Chicago: privately printed, 1883), 12-13.

⁹ Paxton, Comfort & Co., *Price-list of Rubber Goods*, (Philadelphia: privately printed, 1885).

¹⁰ Goodyear's Rubber Curler Co., *Illustrated Price List*, (New York: privately printed, 1885) 14, 16-21.

¹¹ Charles Y. Beach, 1880, *India rubber and Other Gum Compounds for Surfacing Cloth and for Other Purposes*, US Patent 226017, filed 21 January 1880, and issued 30 March 1880.

¹² William McNeil, 1883, *Process of Waterproofing Fabrics*, US Patent 272569, filed 11 May 1882, and issued 20 February 1883.

¹³ The Brunswick Antimony Company, 1883, *Water-proof Cloth*, Thomas J. Mayall (assignor), US Patent 286039, filed 19 March 1883, and issued 2 October 1883.

¹⁴ George Watkinson, 1882, *Water-proof Garment*, US Patent 261109, filed 15 May 1882, and issued 11 July 1882.

¹⁵ Sigmund Wetzler, 1884, *Cloak*, US Patent 293386, filed 4 November 1882, and issued 12 February 1884.

¹⁶ Goodyear Rubber Company, *Price List*, 13; Goodyear's Rubber Curler Co., 19.

¹⁷ Frank E. Aldrich, 1883, *Circular Cloak*, Caroline W. Morrison (assignor), US Patent 278727, filed 19 March 1883, and issued 5 June 1883.

¹⁸ Charles P. Nicolson, 1883, *Skirt-protector*, US Patent 289020, filed 2 May 1883, and issued 27 November 1883.

¹⁹ Wilfred D. Stearns, 1889, *Gossamer*, US Patent 418081, filed 15 October 1889, and issued 24 December 1889.

²⁰ P. Charles Getz, 1885, *Gossamer Cloak*, US Patent 313316, filed 27 February 1884, and issued 3 March 1885.

²¹ Francis G. Town, 1886, *Water-proof Garment*, US Patent 344606, filed 27 February 1886, and issued 29 June 1886.

²² Amanda M. Lougee, 1888, *Water-proof Garment*, Caroline M. Morrison (assignor), US Patent 376720, filed 10 October 1887, and issued 17 January 1888.

²³ Amanda M. Lougee, 1890, *Outer Garment*, US Patent 425439, filed 5 February 1890, and issued 15 April 1890.

²⁴ Mary L. Brown, 1890, *Water-proof Garment*, US Patent 439103, filed 11 July 1888, and issued 28 October 1890.

²⁵ Goodyear Rubber Company, *Price List*, 13; Goodyear's Rubber Curler Co., 20.

²⁶ Jordan, Marsh & Co., *Jordan, Marsh Illustrated Catalog of 1891*, (Private publication 1891; reprint New York: The Athenaeum of Philadelphia and Dover Publications, 1991), 22.

²⁷ Paxton, Comfort & Co.

²⁸ McNeil, US Patent 272569.

²⁹ Jordan, Marsh & Co., 22.

³⁰ E. G. Stearns & Co., *Rubber Goods: Boots and Shoes, Tennis Shoes, Mackintoshes*, (Boston: privately printed, Spring 1895), 19.

³¹ Goodyear Rubber Company, *Mackintoshes, rubber and oil clothing, ect.: Illustrated Catalogue and Price List of the Goodyear Rubber Company*, (St. Paul, MN: privately printed, 1890s).

CHAPTER 7

CONCLUSION

Waterproof clothing was an important part of dress in the United States between 1880 and 1895. By examining United States patents, catalogs, magazines, and other publications, the types of garments offered to consumers and the role those garments played in people's lives becomes clearer.

By the end of the nineteenth century, a majority of consumers in the United States would have been familiar with waterproof garments. Evidence of the common nature of these goods was illustrated by the mention of waterproof dress in contemporary literature. A short story published in the *Saturday Evening Post* in 1876 described a bound servant girl wearing a waterproof dress. The story suggested that the girl wore her waterproof dress frequently as it had seen much wear and tear.¹ Other stories made reference to the importance of waterproof dress for certain occupations. Over thirty years after the story in the *Saturday Evening Post*, a footman in the book *The Secret Garden* was described as follows: "his long waterproof coat and the waterproof covering of his hat were shining and dripping with rain as everything was."² Both stories indicate that people from all stations of life were not only familiar with waterproof apparel, but that it was easily obtainable.

The Importance of Waterproof Apparel

Waterproof clothing came in many forms. Apparel could be treated with chemicals, oils, or rubber. Each of these methods appeared to have been developed at a different pace. Oiled clothing was one of the oldest forms of clothing and although inventors continued to try to improve oiled clothing, newer technologies, such as rubber

and chemicals, received more attention in the nineteenth century. The main alteration suggested by the patents of compounds was that inventors sought to create more durable products by experimenting with alternative oils and resins. The chemical process did not appear to gain as much attention in the United States as in Britain. Although magazines published methods of waterproofing through chemicals, few patents addressed chemically treated apparel. The chemical process seems to have differed in its growth in Britain versus the United States. Companies such as Burberry, in England, had established businesses selling this type of apparel long before evidence of such a business in the United States.

Rubber gained great attention in the early nineteenth century. Much focus was placed on rubber due to its thriving technological advancements throughout the nineteenth century. Although garments may have played a part in the beginning of the rubber industry, goods of all sorts began to appear after vulcanization. Rubber goods continued to improve people's lives as a form of protective gear. With the advent of the gossamer rubber garment in the mid-1870s, rubber garments became more affordable and easier to transport. As rubber goods became less expensive in general, some of the garments, particularly ladies' garments began to follow the fashions more closely. By 1895, a resurgence of the mackintosh double texture coats swept the United States.

The design of many garments enhanced the utility of garments for both occupations and recreation. More people were able to travel due to a better transportation infrastructure and with a growing middle-class, more people were able to enjoy sporting and recreation. As many sports, such as hunting, yachting, camping, hiking, and

bicycling took place outdoors, waterproof garments became an important asset. Many magazines claimed that having a waterproof garment in one's wardrobe was essential.

When it came to occupations, waterproof garments potentially played a critical role in the safety of the wearer. Improvements in design for horsemen sought to ensure that the men would stay dry on horseback. If a rider were to get wet while tending to cattle, he would take the risk of falling ill and being unable to work or worse. This issue was true for other occupations such as sea-faring occupations. Other occupational garments, such as officer's coats and firemen's coats added to comfort so the wearer did not get wet while working and fall sick from wearing damp clothing.

Understanding Waterproof Dress

Terminology related to waterproof garments retards the ability to easily find information about waterproof garments throughout history. During the nineteenth century, waterproof was a common prefix for such garments; however, other terms appeared such as "rain-proof," "water-resistant" and "storm-coat." Other terms relating to the type of waterproofing technique used, such as chemical, oil, or rubber also add to the confusion. Many companies sought to differentiate themselves by providing trademark names for their goods which led to general usage of the trademark name rather than a descriptive name, such as gossamer. The twentieth century brought new terms as well. Today, waterproof garments are not referred to as waterproofs, but in general are called raincoats. Terminology plays an important role in research of this kind.

More needs to be done to investigate the design and use of waterproof apparel. Future research can explore different aspects of waterproof clothing. One topic could be to continue to investigate the design and use of waterproof apparel from the late

nineteenth century through today. Waterproof apparel has survived many phases. After the turn of the century, chemical processes seem to have become more prominent. World War II signified a turning point with synthetic fibers and today, textile researchers continue to experiment with waterproofing fibers. It is interesting to see what role fashion played on this functional clothing during its journey through time.

Another important aspect of future research would be to better investigate the role of demographics, factory conditions, and labor had in the manufacturing process of waterproof apparel. Data that includes import and export information could prove to be invaluable at determining the consumption patterns and consumer demands for these garments. Business directories may be another great source of information to better understand where the manufactories were located in the United States and their growth westward.

Waterproof apparel leads to other areas of research including the impact of waterproof apparel on the military. Frequently, as new waterproof technology became available, it was the military that received the earliest mass production of these items. Other apparel items deserve attention as well, including shoes and ladies' dress shields, which provided almost equally the number of patents described in this research.

As long as people are exposed to water, whether it is weather-related, or due to one's occupation, they will always have need for waterproof apparel. These garments have the potential to provide great insight into the daily lives of everyday people. Many of today's waterproof garments are designed for purely functional purposes; however, the outerwear industry, which includes raincoats and like garments, strives to follow the

fashions which are ever changing. As waterproof garments continue to bridge the gap between fashion and function, our understanding of these garments remains essential.

¹ Olive Bell, "A Bound-girl's Valentine," *Saturday Evening Post* (Philadelphia) 55, no. 29 (12 February 1876): 4 [database online]; available from American Periodical Series Online.

² Frances Hodgson Burnett, *The Secret Garden*, (Philadelphia: J. B. Lippincott Company, 1962), 22.

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