SOCK MONKEY RESOURCE PACKET



Compiled by the Midway Village Museum Collections Department.



Sock Monkey Resource Packet

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Original Documents

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- 3. Photo of Nelson Knitting Company. You can see the Company's sign atop the center building. c. 1880s-1890s
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- 5. Advertisement for the Nelson Hotel. In 1892, John Nelson's sons and other investors built the Nelson Hotel, named in honor of John Nelson.
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- 7. This logo, c. 1915, is for the "Seamless Hosiery" manufactured by Nelson Knitting Company.
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- 15. Instructions from the Nelson Knitting Company on how to make the Sock Monkey Toy. (2 pages)
- 16. This is a copy (found on Google Patents) of the 1953 patent for H. G. Cooke for the Sock Monkey Doll. This is the patent that Helen Cooke gave to Nelson Knitting in 1955, after the lawsuit. (2 pages)
- 17. Patent No. 928,787. Patented July 20, 1909, this patent lays out the inner-workings of one of Nelson's knitting machines. (12 pages)
- 18. Copy of a page from "Industrial and Picturesque Rockford" printed in 1891. It shows a listing for Nelson Knitting Company with a short description.
- 19. 'Knitting, an Important Industry in Rockford'. Copy of (2) pages from "The Register-Gazette Historical Biographical Industrial Edition, December 1904". Includes information on Nelson Knitting, Rockford Mitten & Hosiery Company, Forest City Knitting Company and Burson Knitting Company.
- 20. Copy of a page from "Rockford, 1912". Shows the Nelson Knitting Company factory with information below.

Biographical History on John Nelson & Nelson Knitting Company:

John Nelson was born in Sweden in 1830. He immigrated to the United States in 1852, meeting his future wife Eva Christina Persson (Peterson) on the ship on the way over. He married Eva Christina November 4, 1854.

Nelson and his family moved around a little bit, settling permanently in Rockford in 1857, where he worked as a carpenter before opening his own business as a cabinet maker. While operating this business, Nelson invented a dovetailing machine to make furniture joints.

Nelson then opens a shop sash, door and blind factory in 1865 with Gust Holem and Andrew C. Johnson. He begins working on inventing an automatic knitting machine.

In 1866 he was introduced to William Worth Burson by his financial backers Ralph Emerson and W. A. Talcott. Burson and Nelson started working on developing a home knitting machine. After the machine was developed and patented, by 1871 Burson and Nelson knit 80 pairs of socks in 1 day. In 1877 Burson had already stopped his affiliation with Nelson. By 1880, Nelson Knitting absorbed the FR Brown Company.

Rockford Mitten Company was organized in 1881 with John Nelson as the vice president. By this point, Nelson had developed a knitting machine that was capable of knitting a total mitten except for the two seams running the length of the thumb. January 31, 1882, Nelson was awarded a patent for his mitten and mitten knitting machine.

In 1883, Nelson died of typhoid pneumonia at the age of 53. In 1890, Forest City Knitting Company is incorporated and controlled totally by Nelson's family. During the 1893 Financial Panic, Nelson Knitting responded by reducing their prices. In Rockford, 27 factories declared bankruptcy in one day. By 1904, the production of socks at Nelson Knitting reached 450 dozen pair each day.

World War I saw the 5 knitting companies in Rockford working around the clock, producing socks for the army. Forest City Knitting could produce 3000 pairs per day. During the Great Depression, Nelson Knitting reduced their prices to help keep sales up. During this time period as well, at Nelson Knitting Company and Forest City Knitting, 60% of their employees were women.

Rockford advertising executive Howard Monk suggested that red be added to the heel of the Nelson sock to make it distinctive from its competitors in 1932. Nelson calls this trademark the "De-Tec-Tip" or what is now called the Red Heel sock. The Nelson Knitting Company's socks and the others socks being produced in Rockford before the addition of the red heel all looked the same: brown body, white toe, heel and top. By 1938, Nelson Knitting produced 4000 dozen pair each day of work socks. A knitter working a factory would run 25 to 30 machines at a time.

The machines ran off of belts that were turned by ceiling shafts. These machines never stopped. During an 8 hour shift, there were no breaks. Lunch was eaten while the workers watched the machine.

In 1955, Nelson Knitting was awarded the patent for the sock monkey doll, but this process was not a simple one. Helen Cooke of Aurora, Colorado, got the patent in 1953. She sued a man from Denver, Colorado named Stanley Levy in the same year because he sold dolls made by a local woman in his shop, saying that he was making money from her design without her permission. Levy contacted Nelson Knitting to see if they too would have an interest in declaring the patent void. Nelson Knitting used, among other evidence, a doll made in February of 1951 by Mrs. Grace Winget of Rockford. Grace made a sock monkey doll as a Valentine's gift for her grandson, and she gave it to Nelson Knitting as evidence that Cooke's patent was not valid. It helped proved that the dolls were made before 1953, and Grace also provided a sworn statement during the trial. This evidence helped convince Cooke to give up here lawsuit and transfer the patent for the doll to the Nelson Knitting Company, which she did in 1955. The patent for the sock monkey doll expired in 1970, so now the sock monkey belongs to everyone.

Nelson Knitting worked on cotton crew socks for many years until the 1957 introduction of sports socks as the company's main focus. In 1967 they introduced the "tube sock" and the company was purchased by the Kendall Company in 1969, which in turn was purchased by Colgate-Palmolive Company in fall of 1972.

In 1973, Nelson athletic socks were worn in the Super Bowl (Dolphins vs. Redskins) and in 1985, Nelson Knitting filed for bankruptcy. The next year their socks were the official socks of the U.S. Biathalon Team at the Calgary Winter Olympics.

During the year of 1988 the Nelson Knitting Company was receiving an average of 50 and 100 letters a month about the sock monkey.

The Nelson Knitting Company was again altered in a merger in 1990, and by 1992, Sears was the company's largest customer, focusing still on sport socks. This was the same year that the company was bought out by Fox River Mills.

The world's largest sock monkey is 7 feet, 2 inches tall, including his tail. His name is "Nelson" (named after John Nelson) and he can be found at Midway Village. Nelson was made from 44 Rockford Red Heel socks. [look on www.midwayvillage.com]

A Detailed Timeline of John Nelson & Nelson Knitting Company.

1830 John Nelson was born in Karrakra, Vestergotland, Sweden. He grew up in poverty, his father, a soldier, died when Nelson was 2 years old. He was 22 when he left Sweden, and came to the United States with carpentry skills.

1852 John Nelson immigrated to the United States onboard the ship "Lulea." During the voyage he meets Eva Christina Persson, his future wife.

1854 Nelson married Eva on November 4th in St. Charles, where her family settled.

1857 Settled permanently in Rockford, Nelson worked for a while as a carpenter before opening his own business as a cabinet maker. While operating this business, Nelson invented a dovetailing machine to make furniture joints. This machine was also used in the shop sash, door and blind factory that he opened in 1865 with Gust Holem & Andrew C. Johnson. Not realizing its value, Nelson sold the rights to the machine for \$100, and at the time of his death, 26 years later, the machine was used in all of the furniture factories in the city.

1865 Nelson opened the sash, door & blind factory with Holem & Johnson. Late in 1865 on a trip to Chicago, Nelson saw a demonstration of an automatic sock knitting machine that required the operator to stop the machine and manually close the heel and toe of the sock. This allowed one person to operate only a single machine. Nelson thought that a much better, more automatic machine was possible. He began to spend his free time working on such a machine. He received financial backing from Ralph Emerson and W. A. Talcott, two wealthy Rockfordians who were involved in many Rockford businesses.

1866 (September 26th) Nelson was introduced to machinist and inventor William Worth Burson, and entered into a partnership with him. Burson perfected a grain binder in the late 1850s & early 1860s, which was manufactured by Emerson & Company. Burson & Nelson worked on the development of a home knitting machine. Their first patent application for the machine was filed on December 4, 1866.

1868 The first patent on a knitting machine was granted to Burson and Nelson on June 23rd.

1870 This year the first sock was knit by an automatic machine run by water power in Rockford. The machine used was a circular style machine that still required the toe of the sock to be closed by hand. Nonetheless the machine automatically knit socks one after the other, the socks leaving the machine still joined together by a thread.

1871 (**April 5**th) Burson and Nelson knit 80 pairs of socks in one day. On August 8th they shipped 12 dozen pair of socks to Chicago, which was their first commercial shipment. All the socks were being knit on circular machines and required the toe to be closed by hand.

- **1873** (**February 23**rd) Burson and Nelson knit their first sock on the flat machine by hand, and on May 1st knit the first truly seamless sock created by an automatic process. This flat machine was a parallel row knitting machine that Burson & Nelson developed. Unlike ones before, this machine closed the heel and toe of the sock automatically.
- 1874 1876 Work on the machines continued. They received a patent for improvements for seamless hosiery in 1874 and for improvements to the machine in 1875.
- **1877** Burson ended his affiliation with Nelson. Apparently Burson was discouraged that the partnership had not produced home knitting machines. Burson & Nelson were unable to build a machine that weighed less than several hundred pounds or that was cheap enough for the home market.

This same year William Nelson and his friend Frank Brown bought 10 machines that Nelson & Burson were not using. They formed the F. R. Brown Company, and the pair operated the machines on 12 hour shifts.

- **1878** Burson developed a knitting machine that made a mitten and also a machine that knit several different items including a stocking with a narrowed ankle and 'fancy top' with a 'B' knit into the pattern.
- **1879** On April 15th, the patent for further improvements to the knitting machine is granted to Nelson. John Nelson spends 10 months of the year touring Europe to secure patent rights in European countries and set up a small number of machines in France.
- **1880 (September 15th)** Nelson Knitting Company formed, incorporated by absorbing the small upstart the F. R. Brown Company and the remaining Burson and Nelson interests. They opened in an old Water Power District building. They produced what they called "Celebrated Rockford Seamless Hosiery" and sold them under the name of the "Nelson Sock."
- **1881** The Rockford Mitten Company was organized. Nelson developed a knitting machine that could knit a complete mitten except for the two seams running the length of the thumb. This company concentrated on woolen goods (mittens and socks) as opposed to Nelson's cotton hosiery products.
- 1882 Nelson was awarded a patent for his mitten and mitten knitting machine on January 31st.
- **1883** John Nelson dies at age 53. At the time of his death, 32 of his machines were running in Paris, several in Austria, over 20 in Canada and a mill in Manchester, New Hampshire (set up by the F. R. Brown Company) was operating 60 machines. Nelson Knitting ran 120 machines around the clock.

1885 Rockford Mitten Company reorganized as Rockford Mitten and Hosiery through a consolidation of the St. Charles Woolen Mills of W. H. Ziock, Sr. The St. Charles Mill had supplied spun wool for Rockford Mitten, and was closed & moved to Rockford during the consolidation. Wool socks were added to the product line since demand for only mittens was limited.

1890 Forest City Knitting Company was formed, controlled entirely by Nelson's family. Located on Catherine Street. Frithiof Nelson and J. Franklin Nelson based their business on an improved version of their father's machine that could knit a complete sock, without the need to be hand connected.

1892 Nelson Hotel was built in Rockford in honor of John Nelson by the Nelson family and other investors. Located at the southeastern corner of South Main & Chestnut, it had 200 rooms and boasted that 46 of those rooms had their own baths. The hotel was torn down in the 1950s.

This year Burson Knitting Company formed based on a new type of machine invented by William Burson. This machine made seamless women's hose of silk or lisle (a very fine cotton). The hose were referred to as "semi-fashioned," being seamless yet still knit to fit the leg. The machine he invented was a circular machine with the needle tension adjusted to knit the calf of the stocking.

1893 Financial Panic hits the country and 27 Rockford factories declare bankruptcy in one day. Across the city the knitting mills continued their production and employment right around prepanic levels.

1904 Production at Nelson Knitting reached 450 dozen pair per day.

1905 Since the improved Nelson machine Forest City used did not require looping tops & bottoms together, Forest City claimed that Nelson would benefit greatly from a merger. Looping took a lot of skill and there was always a shortage of women who were capable of doing it.

Nelson Knitting refused. Forest City offered a merger 4 times and it was not until 1954 that they finally merged.

1917 At the time of the U.S.'s entrance into World War I, there were 5 knitting companies in Rockford. Combined, these factories could make 15,000 dozen pairs per day. Forest City could produce 3,000 pair per day at its factory. They all worked around the clock producing for the U.S. Army.

Around this time, Forest City introduced their Brown "Uncle Sam Sock." It was a work sock which would be a big part of its production until the factory's close.

1929 During the Great Depression, the Rockford knitting industry continued at full production. All of the factories reduced the number of hours they worked, per the U.S. government's orders, but they did not have to lay off workers. Nelson Knitting reduced prices to keep their sales up.

In 1930, Nelson Knitting produced 686,218 dozen pair and Forest City produced 507,267 dozen pair, numbers which were only slightly down from pre-Depression levels.

1932 By 1932, three of the knitting companies in Rockford made a sock with brown body, tan toe, heel & top. Across the country work socks of that design were called "Rockfords." Nelson Knitting wanted its socks to stand out from the rest and decided to knit red yarn into the heel. They called the design the "De-Tec-Tip." We know it today as the famous Rockford Red Heel.

Nelson Knitting called its brown socks "Original Rockford" and Forest City called theirs "New Rockford." Nelson Knitting's biggest customers included Montgomery Ward while Forest City sold through Sears.

In advertisements Forest City claimed its New Rockford socks were better than socks with sewn or looped-on tops. Forest City socks were knitted complete, from toe to top, with no seams at all, so they were less likely to rip. Nelson's socks were seamed where the top & bottom were joined. Forest City never called Nelson Knitting by name in their ads, but the target of their criticism was obvious. For their part, Nelson Knitting ignored Forest City.

Each company sold several grades of their "Rockford" socks & also had other lines & styles. Nelson sold white athletic type socks starting from around the 1930s. Forest City had their "Uncle Sam Sock" starting around World War I. Until Nelson Knitting developed the tube sock in the 1960s, both companies' products were knitted on John Nelson's flatbed knitting machines.

Rockford Mitten Company added woolen cloth for jackets to their products in 1938 and in 1946 made hosiery, cloth, men's woolens, dress goods and auto upholstery.

1941 In 1938 Nelson Knitting was producing 4,000 dozen pair daily working 2 shifts. Each machine made one sock every 4 ½ minutes. 80 men and 200 women worked at the factory. Across the city between 2,000 and 2,500 people worked in knitting. 60% of the employees were women. Burson Knitting had the largest factory.

During World War II the knitting factories ran around the clock. Each day the factories in Rockford turned out between 10,000 and 12,000 dozen pair of socks.

Fixers & machinists kept the machines running. Fixers did minor adjustments to the machines on the factory floor. If it needed extensive repairs it was brought into the machine shop. Both Nelson Knitting & Forest City were able to keep individual machines running for decades. Both of these companies also built their own machines from scratch. Until the 1950s, knitters & fixers were all men. Eventually women entered these jobs too.

In 1946 there were 24 million socks made in Rockford. At that time Forest City employed about 170 people. Men worked on 2 shifts as knitters. Women worked the day shift inspecting, mending & packing.

A knitter ran 25-30 machines at a time. The machines ran off belts turned by ceiling shafts. They never stopped. There were no breaks during an 8 hour shift. Lunch was eaten while watching the machines.

1954 Nelson Knitting Company and Forest City Knitting Company merged. In the years after World War II, a trend, which began in the post-World War I years, began again - the demand for work socks like those made in Rockford declined. Forest City, faced with increased competition and declining productivity, was losing money so the two companies merged.

Forest City, its equipment and employees were taken over by Nelson Knitting. Almost no one at Forest City lost their job in the deal.

1955 Nelson Knitting was awarded the patent for the design of the sock monkey doll. The company began to include these instructions for making the dolls in each package of their socks.

How Nelson Knitting received the sock monkey doll patent:

Helen Cooke of Colorado received a patent for the design of a sock monkey doll in 1953. She sued Stanley Levy because he sold dolls of that design not made by Cooke. Levy contacted Nelson Knitting, feeling that they would be interested in declaring the patent invalid.

Nelson Knitting knew people had been making dolls across the U.S. for 2 years. The company gathered dolls made before the date of Cooke's patent to prove it was not valid.

One of the women who contributed was Grace Winget of Rockford. She submitted her testimony for the case and a doll she made for her grandson in February of 1951.

When shown the evidence collected against her, Helen Cooke settled the case versus Levy. She also sold the sock monkey doll patent to Nelson Knitting for \$750. Nelson Knitting paid other women for their rights to the doll, including a Tennessee woman who was given \$1,000. Rockford then became the home of the sock monkey.

The patent expired in the 1970s, but Rockford is still proudly the Home of the Sock Monkey.

1966 Nelson Knitting introduced the tube sock to the world. That year sales were only a few dozen. Within 2 years sales topped 125,000 dozen.

1969 Nelson Knitting is purchased by the Kendall Company.

1972 In the fall, Kendall Company is purchased by Colgate-Palmolive Company.

1973 Super Bowl VII. Nelson Knitting Athletic Socks were worn during the Super Bowl. The company had rapidly expanded its lines of sports socks & many college & professional teams wore Nelson Socks. Nelson was among the first companies to stitch team names & colors into socks.

1985 Nelson Knitting filed for bankruptcy.

1986 Nelson socks were the official socks of the U.S. Biathalon Team at the Calgary Winter Olympics. Nelson Knitting supplied socks made especially for skiing – Nelson "Ultra-Wick" crew socks.

1988 Nelson Knitting received between 50 and 100 letters a month that pertain to the sock monkey.

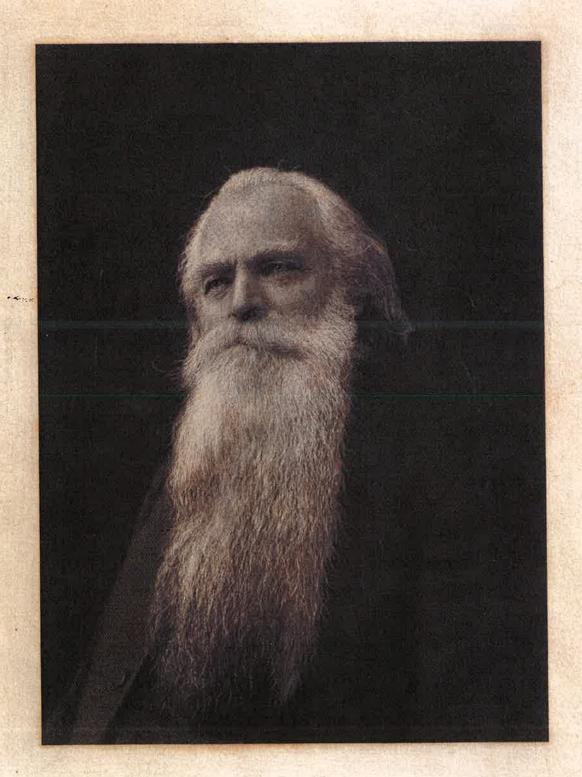
1990 A company called BSN owned Nelson at the time. BSN merged Nelson with another of its textile firms & called the new company "NK Mills." After 110 years, the name "Nelson Knitting" was no longer being used. BSN planned to add workers & expand production.

1992 After 112 years, Nelson Knitting closed their doors. Knitting factories in the South & overseas could sell their socks for less than what Nelson Knitting could because their costs for labor & yarn were less. Nelson also had problems finding the skilled labor it needed to keep its machines running.

In 1992, what was left of the company was purchased by Fox River Mills. Nelson Knitting was the first knitting company in Rockford and it was also the last.

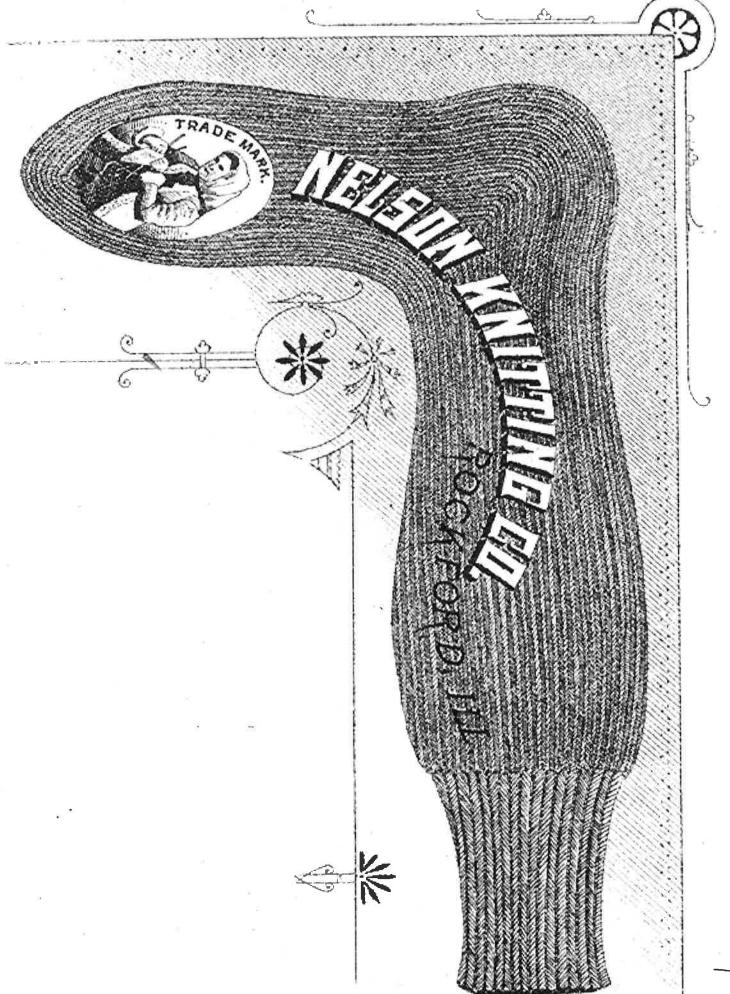
Fox River Mills was interested in the Red Heel trademark. It scrapped all of the old flatbed machines & started making the red heels on modern equipment. The socks are no longer seamless but have a seam in the toe. They are still used to make the sock monkey dolls that are the legacy of Rockford's once thriving knitting industry.





MBurson.

NELSON KNITTING COMPANY.



ROCKFORD.

H. L. ROGKFIELD, Proprietor

ILLINOIS

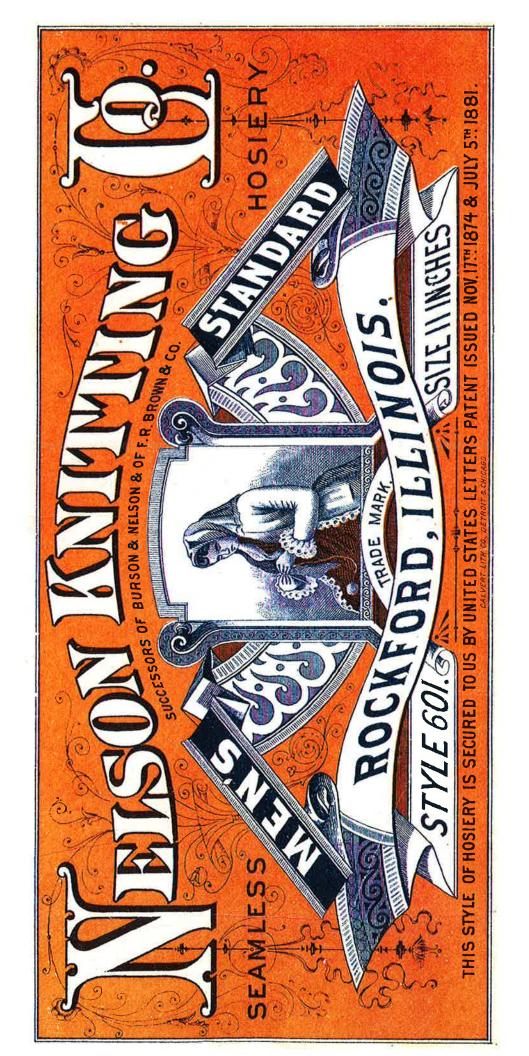
Furmiture, Fixtures and Decorations

Expense of \$150,000

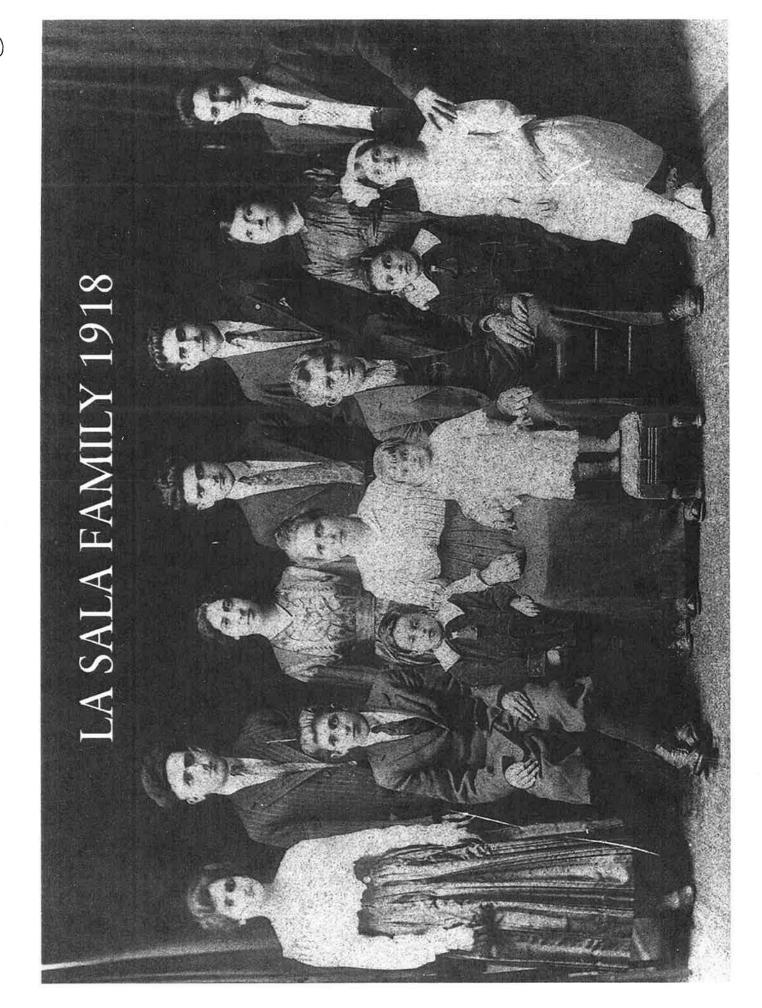
From the Most Artistic Designs, Furnished at an

"Dining Rooms"

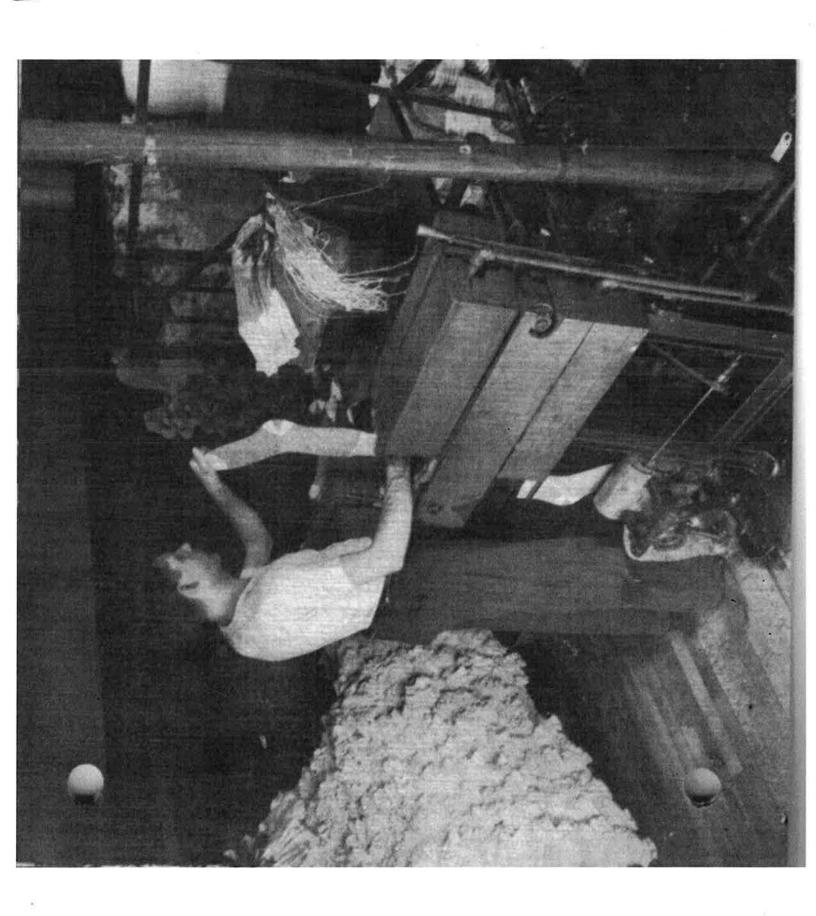
Unsurpassed for Elegance of Appointment and Excellence of Cuisine Service VANDENCOON ENGMAVING & FUR CO. CHICAGO, U. B. A.





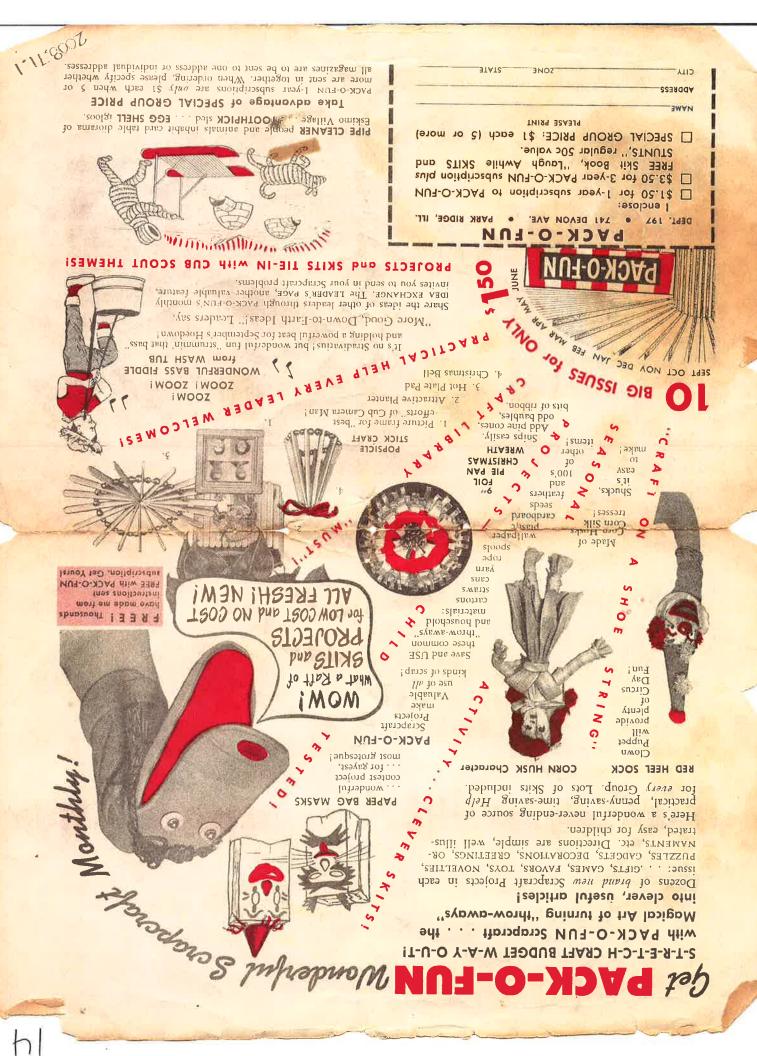


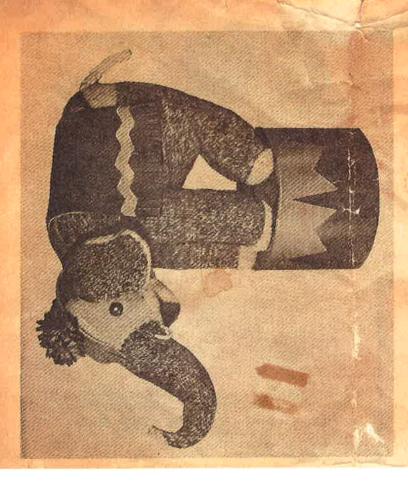












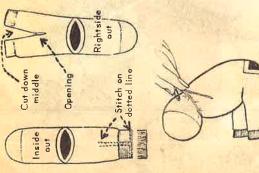
Sock Elephant Doll

COMPANION TO RED HEEL SOCK MONKEY

One of the cuddliest, most charming little toys is this colorful, soft swans-down circus elephant. He is ideal for a teen-ager's bedroom, a precious baby's crib, or as a companion for children on a long trip. Bazaar planners should find this a welcome item since it is quick, easy and inexpensive to make and, above all, NEW, different, and eye-catching.

You are probably familiar with the Rockford Red Heel work socks manufactured by the Nelson Knitting Company of Rockford, Illinois. These socks, which are a brown tweed with white cuffs and toes and a distinlocal dry goods or variety stores. Cost is about 30¢ a pair and much less guishing red heel, may be purchased through mail order houses or your in larger lots. (Prices vary with locality.)

In addition to the Rockford socks, you will need old nylons, shredded rubber or other scraps for filling; bright felt or oilcloth for trim; buttons for eyes; and yarn for pom-poms. With these few odds and ends you are ready to make a companion to the popular Red Heel Sock Monkey.



SOCK NO. 1

side of center line and Turn inside out. Cut 11/2" off rib of across end of ribbing. Cut sock between seams and about 1" farther to make opensock. Starting 3" from heel, sew 1/8" ing for stuffing. Turn right side out, on each

To shape head, stuff foot of sock nice ribbon. Insert ovals of cardboard in feet in crotch, making one seam on underside and stuff. Finish stuffing and sew up slit and plump, and tie off loosely at neck with of body and the other up toward the tail.

SOCK NO. 2

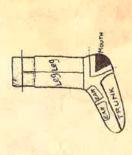
across foot. Insert pieces of cardboard in Turn inside out, seam along one side and MOUTH - Cut off complete heel from feet, stuff, and attach near front of body. second sock. Stuff lightly and sew to head. LEGS - Cut as shown, about 5" long. Stitch across center to shape mouth.

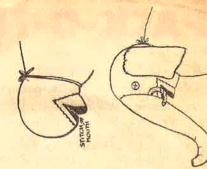
lengthwise, inside out, and seam along TRUNK - Open flat strip of sock so that it is about 1" at one end and 6" at the other. Round the wide end. Fold in half one edge and around narrow end. Turn rightside out and stuff. Sew to head just above mouth with sean underneath. To insert a piece of wire through length bend and hold trunk in various positions, of trunk. Insert pipe cleaner tusks.

EARS - For each ear, cut two pieces in shape of ears. Seam and turn rightside out. Sew on level with highest point of trunk.

EVIS - Sew on round or oblong buttons For very small youngsters, embroider eyes. set wide apart.

TAIL - Make small short roll of material and sew in place. back, or tassles may be sewn on. Rick-rack, little bells, ribbons or beads naturally give the toy a more festive, circus-like appearance.





TRIM is optional. A fringed strip of bright material can be placed over the



INSTRUCTIONS FOR MAKING THE SENSATIONAL MONKEY TOY

MATERIALS:

- 1. One pair NELSON Red Heel Rockford Socks.
- 2. Stuffing cut up old nylon stockings, hosiery waste, cotton batting, kapok or shredded foam rubber.
- 3. Red knitting yarn.

SOCK No. 1

Turn sock inside out. Sew a seam (A) $\frac{1}{2}$ inch on both sides of center of sock, starting three inches from the white heel and across the end of top. Cut sock between seams and to within 11/2 inches of white heel. This leaves an opening in crotch.

Then turn sock so seams are inside and use crotch opening to stuff head, body and legs.

SOCK No. 2

ARMS

HTUOM



Cut off toe of the sock, leaving 1/2 inch of brown to roll for a brim.

TAIL:

Cut a one inch strip the entire length of the front of the sock.

Seam and stuff.

MOUTH: Cut the heel from the sock, leaving a brown edge around the white. Fasten on lower part of face, whipping around the bottom; stuff and finish sewing around top. The mouth can be improved by a running stitch of either black or white across the middle.

ARMS:

Cut the remaining upper part of the sock into two pieces. Seam

and stuff.

EARS:

Cut the ears from the remaining brown part of the sole of the sock.

EYES:

The eyes can be made either by sewing on buttons or by embroidering them with black thread. In this same operation a nose can be

indicated by two small embroidered marks.



TAIL

There are many variations from this basic pattern. Decorations can be either pompoms, yarn or bells. Sometimes a fez is used for a cap. Jackets and skirts are also used for clothing the monkey.

> Purchase of our Red Heel Socks carries with it the right to make Monkey Dolls under our Design Patent 177,008 granted by the U. S. Potent Office July 14, 1953.

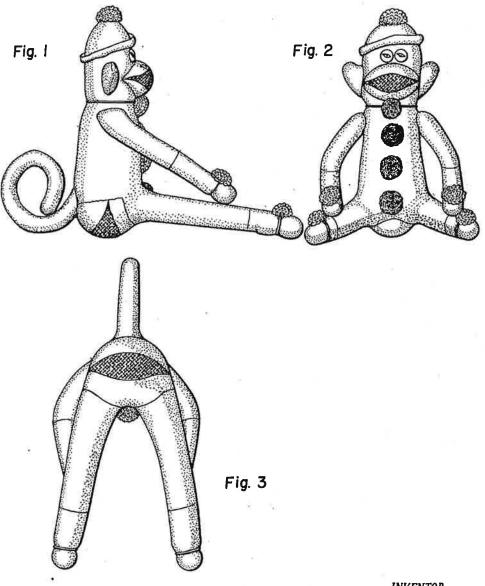
July 14, 1953

H. G. COOKE

Des. 170,008

DÓLL

Filed Nov. 17, 1952



INVENTOR.
Helen G. Cooke

BY

Lamples & Van Vackenbergh

ATTORNEYS

UNITED STATES PATENT OFFICE

170,008 DOLL

Helen G. Cooke, Aurora, Colo.

Application November 17, 1952, Serial No. 22,326

Term of patent 14 years

(Cl. D34-2)

To all whom it may concern:

Be it known that I, Helen G. Cooke, a citizen of the United States, residing at Aurora, State of Colorado, have invented a new, original, and ornamental Design for a Doll, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

Fig. 1 is a front elevation of a doll, embodying my new design;

Fig. 2 is a side elevation of the doll of Fig. 1; and

Fig. 3 is a bottom view of the doll of Fig. 1.

I claim:

The ornamental design for a doll, as shown. HELEN G. COOKE.

References Cited in the file of this patent UNITED STATES PATENTS

 Number
 Name
 Date

 D. 62,509
 Stokes ______ June 12, 1923

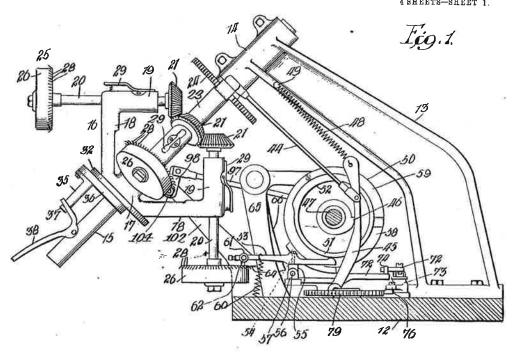
OTHER REFERENCES

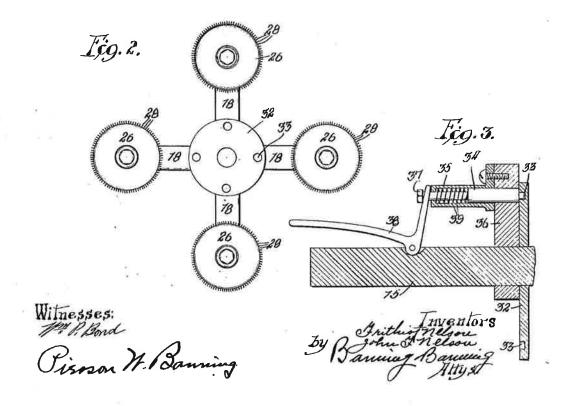
McCall's Printed Patterns, July 1950, page 813, item D.

F. & J. F. NELSON.
LOOPING MACHINE FOR HOSIERY,
APPLICATION FILED AUG. 20, 1908.

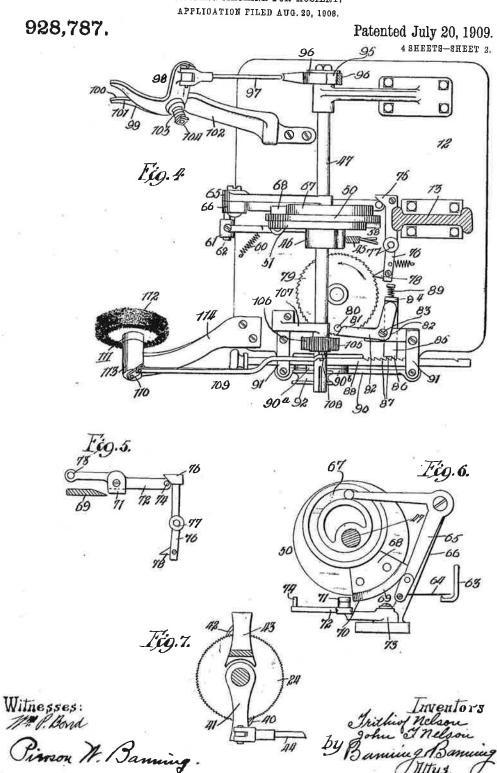
928,787.

Patented July 20, 1909.
4 SHEETS—SHEET 1.





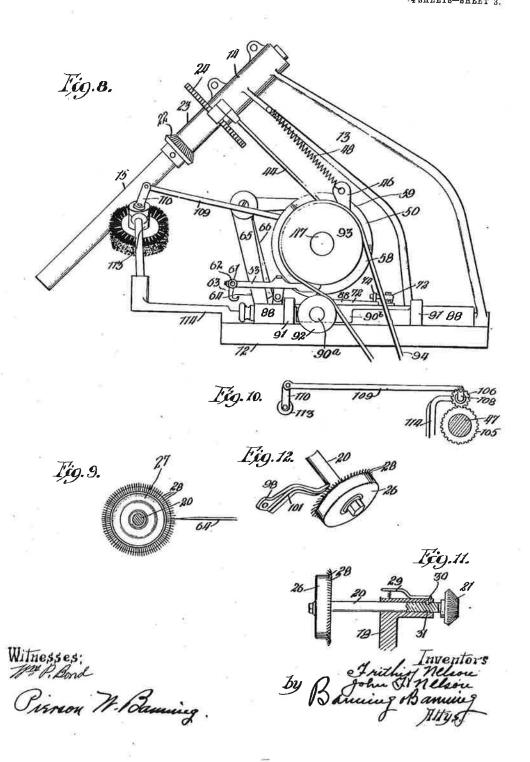
F. & J. F. NELSON.
LOOPING MACHINE FOR HOSIERY.
APPLICATION FILED AUG. 20, 1908.



F. & J. F. NELSON. LOOPING MACHINE FOR HOSIERY. APPLICATION FILED AUG. 20, 1908.

928,787.

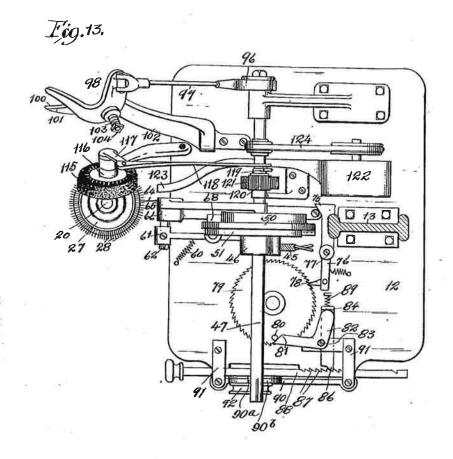
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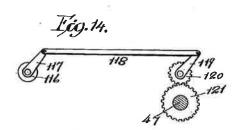


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PED STATES PATENT OFFICE.

FRITHIOF NELSON AND JOHN F. NELSON, OF ROCKFORD, ILLINOIS, ASSIGNORS TO FOREST CITY KNITTING COMPANY, OF ROCKFORD, ILLINOIS, A CORPORATION OF ILLINOIS.

LOOPING-MACHINE FOR HOSIERY.

No. 928,787.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed August 20, 1908. Serial No. 449,460.

To all whom it may concern:

Be it known that we, FRITHIOF NELSON and JOHN F. NELSON, both citizens of the United States, and both residing at Rockford, 5 in the county of Winnebago and the State of Illinois, have invented certain new and useful Improvements in Looping-Machines for Hosiery, of which the following is a

specification.

In the making of hosiery on machines of well known type, it is the practice to knit the leg of the sock on one machine and the ribbed upper of the sock on another machine, and to then unite the portions thus 15 knitted by stitching them together on a looping machine. In the operation of the looping machine as at present practiced, it is customary to secure the body of the sock and the upper together on a circular head, 20 the teeth of which are entered through the adjacent fabrics and serve to hold them distended and in position during the stitching operation. After the stitching, it is customary to transfer the head with the stitched 25 sock to a pair of shears which cut away the surplus fabric beyond the stitching, and after this shearing operation the head, with the sock still carried thereby, is mounted in position to coact with a brush which re-30 moves the surplus lint or threads from the fabric.

The several operations above referred to are successively performed by manually re-moving the head from one device to another, 35 so that the several operations may be per-formed in succession. This manual manip-ulation of the sock is very wasteful in time, and further requires care in the successive adjustments of the parts in order that the 40 various stages of the work may be perfectly

performed.

The object of the present invention is to construct a machine which combines within itself a shearing, a stitching, and a brushing 45 mechanism cooperating with a revoluble carrier having mounted thereon a plurality of heads so positioned and adjusted that the carrier may be moved from one position to another, permitting the several operations 50 to be performed in succession without manipulation on the part of the operator, thereby permitting the operator to devote his entire time to the work of mounting the sock portions in position to be carried to the various | stationary shaft 15 which serves as a mount-

points of operation. This method of per- 55 forming the work provides for great accuracy and perfection in the work, in that each of the operations will be regulated automatically and without the necessity for careful supervision on the part of the oper- 60

The machine is so constructed that it can be readily operated from a convenient point within easy reach of the operator and effects a great saving in space as well as time by reason of the compact arrangement of the several instrumentalities required in per-

forming the various portions of the work.

Further objects will appear from a detailed description of the invention, which 70 consists in the features of construction and combination of parts hereinafter described

In the drawings, Figure 1 is a side elevation of the main portion of the machine, 75 showing the bed plate in section and the driving mechanism removed; Fig. 2 an under face view of the diagonally pivoted rotary carrier; Fig. 3 an enlarged detail, partly in section, showing the centering pin so for the carrier; Fig. 4 a top or plan view of the machine, with the carrier removed and a portion of the frame in section; Fig. 5 a top or plan view of the cam and dog for actuating the stop ratchet wheel; Fig. 85 6 a side elevation of the eccentric for actuating the stitching needle; Fig. 7 a view of the dog and ratchet for actuating the carrier heads; Fig. 8 a side elevation of the machine, showing the driving mechanism, 90 and showing the carrier removed; Fig. 9 a plan view of one of the carrier heads with the stitching needle in coacting relation therewith; Fig. 10 a detail showing the pit-man for driving the brush; Fig. 11 a detail, 95 partly in section, showing the driving shaft for one of the carrier heads; Fig. 12 a detail of the shears; Fig. 13 a slightly modified form of the machine, showing a different arrangement of the brush mechanism; and 100 Fig. 14 a modified form of brush crank mechanism.

The machine comprises a bed plate 12 from which springs a bracket arm 13 in the form of a bent elbow, which carries at its 105 outer end a socket head 14 which has entered thereinto the end of an obliquely extending

ing for the rotary carrier 16. The rotary carrier comprises a flat head 17 from which extend four arms 18, which arms project at an angle of 45° with respect to the sta-5 tionary shaft and are equidistant with re-spect to one another. Each of the arms terminates in an inwardly extending journal sleeve 19 which projects at right angles with respect to the arm to which it is at-10 tached. Each of the journal sleeves has rotatably mounted therein a stub shaft 20 which carries, at its inner end, a beveled pinion 21. The arrangement is one which brings all the beveled pinions into close 15 proximity with the stationary shaft which has rotatably mounted thereon a driving beveled pinion 22 which is connected, by means of a sleeve 23, with a ratchet wheel 24 immediately below the end of the socket 20 head 14 which clamps the end of the stationary shaft. The driving beveled pinion 22 occupies the position at the center of the four beveled pinions 21, so that rotative motion imparted to the driving pin-25 ion will be simultaneously imparted to all of the meshing pinions on the several stub shafts. Each of the stub shafts carries, at its outer end, a carrier head 25 of the type ordinarily employed for distending the ends 30 of the sock members intended to be stitched on the looper. The carrier head, in brief, is in the form of a disk 26 hollowed out on its inner side 27 to provide a slight concavity, through the center of which the 35 stub shaft is entered. The head is provided, around its periphery, with a plurality of pins 28 equal in number to the stitches intended to be made on the looper. In order to permit any one of the carrier 40 heads to maintain a stationary position without interfering with the operation of the remaining carrier heads, each of the journal sleeves 19 has pivoted thereto a spring lever 29 provided, in its end, with 45 an inwardly extending pin 30 which is adapted to engage a groove 31 in the stub shaft 20, which latter is longitudinally ad-justable within its journal sleeve. By de-pressing the lever and raising the pin the 50 shaft, as a whole, can be retracted, throwing the pinion 21 out of mesh with the center driving pinion.

In order to permit the rotary carrier to be revolved, the head 17 has secured thereto, on 55 its under face, a disk or plate 32, best shown in Fig. 2, provided with four equidistant holes 33 in register with the respective arms, which holes are adapted to be brought into register with the inner end of a centering 60 pin 34, which is entered through a socket sleeve 35 carried by an arm 36 through which the stationary shaft 15 is entered, which arm occupies the position immediately adjacent and below the disk or plate 32. The

head 37 which receives the end of an L lever 38 pivoted to the stationary shaft. The sleeve 35 has located therein a coil spring 39 which encircles the pin and is adapted to hold the same in projected position, permit- 70 ting retraction of the pin by the action of the L lever 38. By depressing the lever, the pin can be retracted from one of the holes 33 and the rotary carrier revolved until the pin is brought into position to enter the next 75 adjacent hole, after which the carrier can be locked in its second position until further adjustment is required. The ratchet wheel 24 coacts with an operating dog 40 carried by a swinging arm 41, which is pivoted on 80 the stationary shaft, immediately above the ratchet wheel 24, which operating dog 40 is supplemented by a secondary dog 42 adapted to prevent return movement of the ratchet, which secondary dog is carried by a 85 bracket 43 connected with the side of the socket head 14. The ratchet wheel 24 is provided with teeth equal in number to the pins 28 on each of the four carrier heads; and the center bevel pinion and the four 90 bevel pinions intermeshing therewith, all being of equal size, it follows that one complete revolution of the ratchet wheel will simultaneously afford a complete revolution of each of the carrier heads. The swinging 95 arm 40 has pivoted thereto an operating rod 44, the inner end of which is connected with a pivoted arm 45 which is adapted to be rocked by the engagement of a cam 46 located on a power shaft 47. The upper or 100 free end of the arm 45 has connected therewith a coil spring 48, the end of which is secured to a pin 49 outwardly projecting from the bent elbow frame 13 near the upper end thereof.

The shaft 47 has mounted thereon, immediately beneath the inner angle of the frame 13, a cam disk 50 which is similar in all respects to the cam disk ordinarily found on a looping machine of a class usually employed 110 to stitch the uppers on the socks. In view of the fact that the stitching mechanism employed in the present invention is not in itself new, we deem it necessary to give only

a brief description thereof. The cam disk 50, which operates the stitching and looping mechanisms, is provided, on one side, with a circular cam ring 51 which is thickened at the point 52 to provide a raised peripheral surface at such point, and 120 serves to impart a vertical movement to the looper arm 53, the inner end of which is held in position to engage the periphery of the cam ring 51, being pivoted, at its center, by a vertical pivot pin 54, to a pivotal block 125 55, which latter is pivoted, by a horizontal pin 56, between ears 57. This method of pivoting the looper arm serves to permit both a vertical and a horizontal movement 55 rear end of the pin 34 is provided with a | which is necessary in performing the looping 130

105

operation, the nature of which is well understood.

In order to provide the necessary lateral or horizontal movement, the face of the cam 5 disk 50, outside the periphery of the cam ring 51, is irregular, being provided with a raised portion 58 and a depressed portion 59 which serve to impart a lateral movement to the looper arm coordinate with the vertical 10 movement imparted thereto. The outer end of the looper arm has connected therewith a diagonally extending coil spring 60 which serves to hold the inner end of the arm in engagement with the cam surfaces of the 15 disk. The outer end of the arm is provided with a tubular socket 61 which has entered thereinto a horizontally extending rod 62, the end of which is bent or turned to form a looper 63 of the usual character employed 20 in mechanism intended to perform stitching of the kind required in the present invention. The looper coacts with the usual needle 64 which is entered into the lower end of a bell crank lever 65 pivoted at its elbow to a 25 bracket arm 66 located immediately forward of the cam disk. During the stitching operation, the needle reciprocates in the usual manner between the pins of the carrier head, and the looper, which is substantially of L 30 shape, works around the end of the needle and within the recess 27 in the face of the carrier head as the needle is thrust forward and back. This operation is so well understood in the present art that further de-

35 scription is deemed unnecessary The upper and inner end of the bell crank lever 65 is entered into a circular groove or channel 67 eccentrically formed on the face of the cam disk 50 opposite that previously 40 described. As the cam disk is revolved, the bell crank lever, with the projecting needle, will be reciprocated, carrying the thread back and forth as the fabric is revolved by the carrier head, which for the time being is in stitching position. The face of the cam disk 50, immediately opposite the point of the greatest eccentricity of the groove 67, has secured thereto a segmental shaped plate 68, the edge 69 of which projects beyond the 50 periphery of the cam disk and is beveled, at its forward end 70, to furnish a cam which is adapted to ride under the inner end of an inwardly projecting finger 71 mounted near the center of a swinging arm 72 pivoted, at its forward end 73, immediately beneath the lower end of the bell crank lever 65. The opposite free end of the swinging arm 72 is provided with an upwardly extending pin 74 which coacts with the inner face of a 60 beveled finger 75 on the end of the ratchet arm 76, pivoted at its center 77, and provided, at its opposite end, with an inwardly extending dog 78 adapted to engage the teeth of a stop ratchet wheel 79 which lies in a

45 horizontal plane and closely adjacent the

upper face of the bed plate, as best shown The stop ratchet wheel is provided, at a suitable point near its periphery, with a stop pin 80 which is adapted, at a predetermined point in the revolution of the 70 ratchet wheel, to engage the foot 81 of a lever 82, which is in the form of a bell crank and is pivoted, by means of a pin 83 entered through the knee of the lever. The free end of the bell crank lever is in engagement with 75 a stop 84 on the inner end of a sliding bar 85 provided with a tooth 86 adapted to engage one of a series of notches 87 formed on the inner face of an idler bar 88. The tooth 86 on the sliding bar is adapted to be held 80 in engagement with the selected notch by means of a spring 89 which bears against the stop 84; and the idler bar is slidably mounted within a guideway formed by a flange 90 near the edge of the bed plate. The 85 idler bar is further positioned against removal from the guideway by a pair of cross plates 91 which bridge over the top of the bar and serve to hold the latter within the guideway provided therefor, permitting the 90 idler bar to be moved back and forth to various positions of adjustment. The idler bar carries an outwardly projecting stub shaft 90° which has mounted thereon a grooved idler pulley wheel 92 which lies out- 95 side of the guide flange 90 and immediately beneath the driving pulley wheel 93 which carries a belt 94, the guide flange being cut away at 90° to permit the projection of the stub shaft. It is preferred to provide the 100 stop ratchet wheel with a greater number of teeth than the operating ratchet wheel 24, in order that the machine may be operated to overlap the ends of the line of stitching sufficiently to prevent raveling.

The shaft 47 is provided, near one end, with an eccentric 95 surrounded by an eccentric ring 96 which receives the end of a shear rod 97 adapted to actuate the movable member of a pair of shears. This member is in 110 the form of an angle plate 98 provided, near its free end, with a beveled cutting edge 99 adapted to cooperate with the cutting edge 100 of a stationary shear member 101. The shears are mounted in an oblique plane and 115 pivoted to the upper end of a bracket arm 102 secured to the bed plate. In order to hold the movable cutting member of the shears in cooperative position with the fixed member, a spring 103, adapted to be regu- 120 lated by a nut 104, is provided, which arrangement serves to hold the cutting edges in coacting position. The location of the shears is one which enables the carrier head to swing over outside of the tip ends of the 125 shear members to bring such members about a quarter of an inch from the surface of the, pins on the inner side of the carrier head, as shown in Fig. 12.

Near the opposite end of the shaft 47 is 130

located a driving gear wheel 105 which meshes with a smaller gear wheel 106 car-ried by a bracket 107. The smaller gear wheel is provided with a short crank 108 5 which has pivoted thereto the inner end of a pitman rod 109, the outer end of which is pivoted to a longer crank 110 on the end of a stub shaft 111 which carries a brush 112. The stub shaft is journaled within a sleeve 10 113 on the end of a bracket arm 114 which springs from the bed plate of the machine. The brush shaft extends at an oblique angle with respect to the bed plate, and the brush occupies a position such that the carrier 15 head will be enabled to swing under the lower surface of the brush and clear the bracket arm 114 when moved from one position to another. The crank 108 is shorter than the crank 110, so that a revolution of 20 the driving crank will impart but a partial revolution to the receiving crank, thereby giving to the brush a partial revolution in opposite directions.

In use, the body of the sock and the upper 25 of the sock are turned inside out and mounted together upon the disengaged carrier head which occupies the center position, as shown in Fig. 1. In order to properly position the fabric, the carrier head will be 30 retracted to a position in which the bevel pinion will be thrown out of mesh with the center driving bevel pinion. This opera-tion is performed by depressing the end of the spring lever 29 to raise the pin, carried 35 by the opposite end of the lever, out of the groove in the stub shaft, which allows the shaft to be moved longitudinally a sufficient distance to unmesh the gearing. This inde-pendent adjustment of each of the carrier 40 heads permits the three operations of clipping, stitching and brushing to be carried on automatically with the three other carrier heads while the operator is mounting the fabric on the fourth carrier head. This 45 mounting is performed by distending the body of the sock and the upper into tubular formation and entering the circular row of pins through the two fabrics so distended. After the labric has thus been mounted, the 50 operator waits until all of the other three operations have been performed on the remaining carrier heads, after which the machine will be thrown out of operation, as will be hereinafter explained. At the 55 proper time the operator depresses the lever 38, which throws back the stop pin 34, and allows the rotary carrier to be revolved a quarter of a revolution. This brings the carrier head, with the fabric mounted there-60 on, into close proximity with the tip ends of the shears. The lowermost carrier head is meanwhile thrown into position to receive the stitching; and the carrier head, which has previously occupied the stitching posi-

65 tion, is thrown up into coacting position

with the brush. The last carrier head meanwhile has been moved from brushing position to the upper center position, which it occupies while the operator is removing a completed sock therefrom and applying the 70 two sections of an unfinished sock thereto. The three carrier heads, which are in operative positions, simultaneously receive an equal and intermittent rotation from the center driving bevel pinion which is actuated 75 intermittently by the ratchet wheel 24. Simultaneously the movable member of the shears will be rocked on its pivot, thereby coacting with the stationary member in clipping off the surplus fabric projecting 80 from the edge of the carrier head which is in shearing position; and this action will continue until a complete revolution of the carrier head has been made. Simultaneously the carrier head which is in stitching 85 position will receive the needle which coacts with the looper in the usual manner, and the stitching will continue as the carrier head is intermittently revolved in proximity to the needle and the looper. In like man- 90 ner the last carrier head, which has been moved to brushing position will coact with the brush during the complete revolution of the head.

In order that the ends of the stitching may 95 overlap slightly, the stop ratchet wheel 79 is preferably provided with a greater number of teeth than the driving ratchet wheel 24, so that the latter will make a complete revolution before the former. The stop 100 ratchet wheel is actuated one point with each reciprocation of the needle, and the driving ratchet wheel is moved one point during the same period. The stop ratchet wheel will continue to revolve until the stop pin 80 is 105 brought against the foot of the bell crank lever 82, which thereafter will be moved slightly by the engagement of the stop pin which rides under the heel of the foot, thereby throwing the upper end of the bell crank 110 lever against the stop 84 on the bar 85. This action retracts the bar 85, withdrawing the tooth 86 from the notch within which it registers. This retraction of the tooth allows the pressure of the driving belt to act 115 against the idler 92 which is thrown into position to relieve the belt from all tension, which of course stops the machine.

Figs. 13 and 14 show a slightly modified arrangement of the brush mechanism, and 120 also the application of a blower for removing the lint from the fabric in the vicinity of the needle.

Referring to Fig. 12, it will be noted that the brush 115 occupies a position immediately above the carrier head when in stitching position, being mounted upon a stub shaft 116 having on its end a crank 117 which is connected by a pitman 118 with a crank 119 of equal length, which is con- 130

nected with a transmission gear wheel 120 which receives its rotation from a driving

gear wheel 121 on the main shaft.

Aside from the fact that in Fig. 12 the 5 cranks are of equal length in order to impart a complete revolution to the brush, rather than a partial revolution thereto, the mechanism differs not at all from the brush mechanism previously described. 10 found desirable in certain cases to employ a blower or other suitable device to create a blast of air which will strike the fabric beneath and around the brush operating on the stitching head in order to remove an accu-15 mulation of fine lint at this point.

122 indicates a blower provided with a nozzle 123 adapted to direct a current of air toward the brush at its point of contact with the fabric. The blower is driven by means 20 of a belt 124 which receives its impetus from the power shaft. Obviously other methods of securing the blast could be employed.

What I regard as new and desire to secure

by Letters Patent is:

1. In a looping machine, the combination of shearing mechanism and stitching mechanism, means for actuating the two sets of mechanisms, a movable carrier having a plurality of carrier heads mounted to per-30 mit the heads to be successively carried to different points of operation, means for rotating said heads when positioned at points of operation, and means for disengaging each of said heads from its rotating means 35 whereby each of said heads may be moved to a non-operative position, without stopping the operation of the remaining heads, substantially as described.

2. In a looping machine, the combination 40 of shearing mechanism and stitching mechanism, means for actuating the two sets of mechanisms, a revoluble carrier provided with a plurality of carrier heads adapted to be successively turned to different points 45 of operation, means for rotating said heads when positioned at points of operation, and means for disengaging each of said heads from its rotating means whereby each of said heads may be moved to a non-operative 50 position, without stopping the operation of the remaining heads, substantially as de-

3. In a looping machine, the combination of shearing mechanism, stitching mechanism 55 and brushing mechanism, means for operating the several mechanisms, a movable carrier provided with carrier heads adapted to be moved to different points of operation, means for rotating said head when posi-60 tioned at points of operation and means for disengaging each of said heads from its rotating means whereby each of said heads may be moved to a non-operative position, without stopping the operation of the re-65 maining heads, substantially as described.

4. In a looping machine, the combination of shearing mechanism, stitching mechanism and brushing mechanism; means for operating the several mechanisms, a revoluble carrier provided with a plurality of carrier 70 heads adapted to be turned to different points of operation, means for rotating said heads when positioned at points of operation and means for disengaging each of said heads from its rotating means whereby each 75 of said heads may be moved to a non-operative position, without stopping the operation of the remaining heads, substantially as described.

5. In a looping machine, the combination 80 of shearing mechanism, stitching mechanism and brush mechanism, a power shaft, means actuated by the power shaft for operating the three sets of mechanisms, a carrier provided with a plurality of carrier heads mov- 85' able to different points of operation, means for simultaneously rotating all of the carrier heads when positioned at points of operation and means for disengaging each of said carrier heads from said rotating means, sub- 90'

stantially as described.

In a looping machine, the combination. of shearing mechanism, stitching mechanism and brush mechanism, a power shaft, means actuated by the power shaft for operating 95 the three sets of mechanisms, a rotary carrier provided with a plurality of carrier heads, gearing actuated from the power shaft for simultaneously rotating all of the carrier heads when moved to positions of 100 operation, and means for disengaging each of the carrier heads from the gearing, sub-

stantially as described. 7. In a looping machine, the combination of shearing mechanism, stitching mechanism 105 and brush mechanism, means for actuating the several mechanisms, a rotary carrier comprising a head and four arms spaced equi-distantly and extending obliquely with re-spect to the axis of the head, each of the arms 110 having a journal mounting at an angle with respect to the arm, a shaft extending obliquely with respect to the arms, upon which shaft the revoluble head is mounted, a stub shaft entered through each of the journal 115 mountings and having at its outer end a carrier head and having at its inner end a bevel pinion, a driving bevel pinion centrally mounted on the shaft, and means for imparting intermittent movement to the carrier 120 heads, substantially as described.

8. In a looping machine, the combination of shearing mechanism, stitching mechanism and brush mechanism, means for actuating the several mechanisms, a rotary carrier com- 125 prising a head and four arms spaced equidistantly and extending obliquely with respect to the axis of the head, each of the arms having a journal mounting at an angle with respect to the arm, a shaft extending ob- 130

liquely with respect to the arms, upon which [shaft the revoluble head is mounted, a stub shaft entered through each of the journal mountings and having at its outer end a 6 carrier head and having at its inner end a bevel pinion, a driving bevel pinion centrally mounted on the shaft, means for imparting intermittent movement to the carrier heads each of the stub shafts being adapted for longitudinal movement to disengage the bevel pinion thereon from the driving bevel

pinion, substantially as described. 9. In a looping machine, the combination of shearing mechanism, stitching mechanism 15 and brush mechanism, means for actuating the several mechanisms, a rotary carrier comprising a head and four arms spaced equidistantly and extending obliquely with respect to the axis of the head, each of the 20 arms having a journal mounting at an angle with respect to the arm, a shaft extending obliquely with respect to the arms, upon which shaft the revoluble head is mounted, a stub shaft entered through each of the 25 journal mountings; having at its outer end a carrier head and having at its inner end a bevel pinion, a driving bevel pinion centrally mounted on the shaft, a ratchet wheel connected with the driving bevel pinion, a 30 dog for actuating the ratchet, a swinging arm with which the dog is connected, a rod for actuating the swinging arm, a pivoted arm to which the rod is connected, and a cam for actuating the pivoted arm, substan-

35 tially as described.

10. In a looping machine, the combination of shearing mechanism, stitching mechanism and brush mechanism, means for actuating the several mechanisms, a rotary carrier 40 comprising a head and four arms spaced equidistantly and extending obliquely with respect to the axis of the head, each of the arms having a journal mounting at an angle with respect to the arm, a shaft extending 45 obliquely with respect to the arms, upon which shaft the revoluble head is mounted, a stub shaft entered through each of the journal mountings, having at its outer end a carrier head and having at its inner end a 50 bevel pinion, a driving bevel pinion cen-trally mounted on the shaft, a ratchet wheel connected with the driving bevel pinion, a dog for actuating the ratchet wheel, a swinging arm with which the dog is connected, a 55 rod for actuating the swinging arm, a pivoted arm to which the rod is connected, and a cam for actuating the pivoted arm, each of the stub shafts being adapted for longitudinal movement to disengage the bevel 60 pinion thereon from the driving bevel pin-

ion, substantially as described. 11. In a machine of the class described, a rotary carrier comprising a head having four arms extending therefrom at an oblique 65 angle with respect to the axis of the head,

each of the arms being provided at its end with an angularly disposed journal mount-ing extending inwardly toward the axis of the head, a stub shaft journaled within each of the mountings, carrier heads on the outer 70 ends of the stub shafts, a driving bevel pinion adapted to mesh with all of the bevel pinions, a mounting for the rotary carrier, and means for actuating the driving bevel pinion, substantially as described.

12. In a machine of the class described, a rotary carrier comprising a head having four arms extending therefrom at an oblique angle with respect to the axis of the head. each of the arms being provided at its end so with an angularly disposed journal mounting extending inwardly toward the axis of the head, a stub shaft journaled within each of the mountings, carrier heads on the outer ends of the stub shafts, a driving bevel pin- 35 ion adapted to mesh with all of the bevel pinions, a mounting for the rotary carrier, means for actuating the driving bevel pin-ion, means for holding the bevel pinion on each of the stub shafts in mesh with the 90 driving bevel pinion and permitting retraction of the shaft to disengage the pinions, and means for locking the rotary carrier in different positions of adjustment, substan-

tially as described.

13. In a looping machine, the combination of a bed plate, a supporting frame, a stationary shaft carried by the supporting frame and extending obliquely with respect to the bed plate, a rotary carrier comprising 100 a head revolubly mounted on the shaft, and four arms extending obliquely with respect to the axis of the head and the shaft, each of the arms terminating in a journal mounting in the form of a sleeve angularly disposed 105 with respect to the arm, stub shafts journaled within the sleeves, bevel pinions on the inner ends of the stub shafts, carrier heads on the outer ends of the stub shafts, a driving pinion mounted on the stationary 113 shaft and adapted to mesh with the pinions on the stub shafts, a ratchet wheel connected with the driving pinion, a dog engaging the ratchet wheel, a main power shaft, shearing, stitching and brush mechanisms actuated 115 from the main power shaft, a cam on the main power shaft, members connected with the dog and adapted to be engaged by the cam for intermittently moving the ratchet wheel, a stop ratchet wheel provided with 120 a stop pin, means for intermittently moving the stop ratchet wheel, and means actuated by the engagement of the stop pin for stopping the machine at a predetermined point, substantially as described.

14. In a looping machine, the combination of a bed plate, a supporting frame, a sta-tionary shaft carried by the supporting frame and extending obliquely with respect to the bed plate, a rotary carrier comprising 130

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a head revolubly mounted on the shaft, and four arms extending obliquely with respect to the axis of the head and the shaft, each of the arms terminating in a journal mount-5 ing in the form of a sleeve angularly disposed with respect to the arm, stub shafts journaled within the sleeves, bevel pinious on the inner ends of the stub shafts, carrier heads on the outer ends of the stub shafts, 10 a driving pinion mounted on the stationary shaft and adapted to mesh with the pinions on the stub shafts, a ratchet wheel connected with the driving pinion, a dog engaging the ratchet wheel, a main power shaft, shear-15 ing, stitching and brush mechanisms actuated from the main power shaft, a cam on the main power shaft members connected with the dog and adapted to be engaged by the cam for intermittently moving the 20 ratchet wheel, a stop ratchet wheel provided with a stop pin, means for intermittently moving the stop ratchet wheel, a lever adapted to be thrown by the stop pin, a bar in engagement with the lever and provided in 25 its end with a tooth, a notched bar carrying an idler belt wheel, a driving belt wheel on the main shaft, and a belt adapted to be tightened by the idler, the arrangement being one whereby a retraction of the toothed 30 bar will permit the notched bar to spring back under the tension of the belt against the idler wheel, substantially as described.

15. In a looping machine, the combination of a driving shaft, a cam disk on the driving 35 shaft, looping mechanism actuated thereby, an eccentric on the power shaft, shears actuated by the eccentric, a brush shaft, a brush mounted thereon, a crank on the shaft, a crank gear wheel having a shorter crank, a connection between the two cranks, a driving gear wheel on the driving shaft in mesh with the crank gear wheel, a pivoted arm in proximity to the cam disk, a cam on said disk actuating said arm at predetermined 45 intervals, a pin on the end of said arm, a beveled finger engaging said pin, a pivoted arm on which the finger is mounted, a dog on the opposite end of said arm, a stop ratchet wheel actuated by said dog, a stop 50 pin on said ratchet wheel, and releasing mechanism actuated by said stop pin for stopping the driving shaft at a predetermined point, substantially as described.

16. In a looping machine, the combination 55 of a driving shaft, a cam disk on the driving shaft, looping mechanism actuated thereby, an eccentric on the power shaft, shears actuated by the eccentric, a brush shaft, a brush mounted thereon, a crank on the shaft, a 60 crank gear wheel having a shorter crank, a connection between the two cranks, a driv-ing gear wheel on the driving shaft in mesh with the crank gear wheel, a pivoted arm in

intervals, a pin on the end of said arm, a beveled finger engaging said pin, a pivoted arm on which the finger is mounted, a dog on the opposite end of said arm, a stop ratchet wheel actuated by said dog, a stop 70 pin on said ratchet wheel, a pivoted lever having one end within the path of travel of the stop pin, a toothed bar in engagement with the opposite end of said lever and adapted to be moved thereby, an idler bar 75 having notches adapted to receive the tooth when projected, an idler belt wheel, a main belt wheel, and a belt adapted to be tightened on the main belt wheel by the idler when moved and held in proper position, 80

substantially as described. 17. In a looping machine, the combination of a driving shaft, a cam disk on the driving shaft, looping mechanism actuated thereby, an eccentric on the power shaft, shears actu- 85 ated by the eccentric, a brush shaft, a brush mounted thereon, a crank on the shaft, a crank gear wheel having a shorter crank, a connection between the two cranks, a driving gear wheel on the driving shaft in mesh 90 with the crank gear wheel, a pivoted arm in proximity to the cam disk, a cam on said disk actuating said arm at predetermined intervals, a pin on the end of said arm, a beveled finger engaging said pin, a pivoted 95 arm on which the finger is mounted, a dog on the opposite end of said arm, a stop ratchet wheel actuated by said dog, a stop pin on said ratchet wheel, a pivoted lever having one end within the path of travel of 100 the stop pin, a toothed bar in engagement with the opposite end of said lever and adapted to be moved thereby, an idler bar having notches adapted to receive the tooth when projected, an idler belt wheel, a main 105 belt wheel, a belt adapted to be tightened on the main belt wheel by the idler when moved and held in proper position, a rotary carrier provided with four carrier heads adapted to be successively moved to points 110

18. In a looping machine, the combination 115 of a driving shaft, a cam disk on the driving shaft, looping mechanism actuated thereby, an eccentric on the driving shaft, shears actuated by the eccentric, a brush shaft, a brush mounted thereon, a crank on the shaft, 120 a crank gear wheel having a shorter crank, a connection between the two cranks, a driving gear wheel on the driving shaft in mesh with the crank gear wheel, a pivoted arm in proximity to the cam disk, a cam on said 125 disk actuating said arm at predetermined intervals, a pin on the end of said arm, a beveled finger engaging said pin, a pivoted proximity to the cam disk, a cam on said arm on which the finger is moutned, a dog of disk actuating said arm at predetermined on the opposite end of said arm, a stop 130

of operation, and means for revolving said heads at a speed coordinate with the speed

of the several mechanisms, substantially as

6

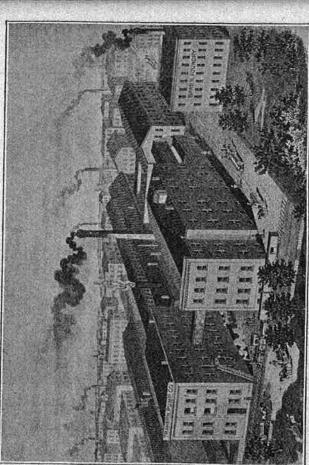
ratchet wheel actuated by said dog, a stop pin on said ratchet wheel, a pivoted lever having one end within the path of travel of the stop pin, a toothed bar in engagement 5 with the opposite end of said lever and adapted to be moved thereby, an idler bar having notches adapted to receive the tooth when projected, an idler belt wheel, a main belt wheel, a belt adapted to be tightened on 10 the main belt wheel by the idler when moved and held in proper position, a rotary carrier provided with four carrier heads adapted to be successively moved to points of operation,

driving mechanism for simultaneously revolving all of the heads, means for disengaging any one of the heads from the driving mechanism, and a ratchet and dog mechanism, actuated by the main driving shaft, for imparting intermittent motion to the head driving mechanism, substantially as described.

FRITHIOF NELSON. JOHN F. NELSON.

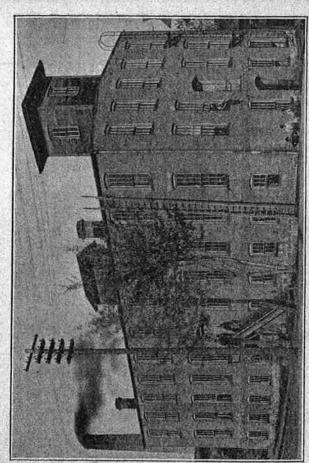
Witnesses:

SAML. H. RECK, WALTER B. BROWN.



TRAHERN PUMP WORKS.





ROCKFORD TACK COMPANY PLANT.

Industrial and Activersone Laclober. 1891

COTTON, WOOL, PAPER AND KNITTING

1890, with a capital stock of \$60,000, with Wm. Nelson, President; Oscar Nelson, Vice-President; F. F. Nelson, Secretary and Treasurer. They manufacture a line of fine ladies' and gentlemen's cotton hosiery, and produce annually over \$200.000 Forest City Knitting Co. This company was organized in November worth. They employ one hundred hands, with an annual pay-roll of \$25,000. factory is of brick, two stories high, 200x39, with an L 106x39.

Sixth Street and Eleventh Avenue, and was incorporated December 13, 1889, with a capital of \$50,000. The directors are: August Lundberg, President: C. A. Gustaf-Dahlin, Gust Lindblade, Gust Holm, Levin Eksell, directors. They employ forty. five hands, with an annual pay-roll of \$13,500, and their product will foot up to \$75,000. Their building was erected in 1890, is built of brick, 57x100 feet in size Globe Clothing Company. This concern is located at the corner of son, Vice-President; Axel Rydberg, Secretary; Aug. P. Floberg, Treasurer; C. J. and three stories high. Graham Cotton Mills. This company was organized in 1865. The capiretary and Treasurer. They manufacture carpet warp, cotton fowels, cotton batten, and scamless socks, and produce annually \$450,000; employ 145 hands, with an The company also have large cotton and paper mills at Rock Island, employing 600 annual pay-roll of \$60,000. They occupy three large factories on the water power. tal stock is \$150,000, with G. A. Sanford, President; and Freeman Graham, Jr., Sec-

and Treasurer, They manufacture a line of seamless cotton hosiery, and manufacpany was organized in 1880. 'I he capital stock is \$160,000. Antes Rubl, Secretary The Nelson Knitting Company. Located on water power. This comture over 1,500,000 dozen pairs annually. The factories cover two acres of ground They employ 400 hands, and do a business of over \$800,000 a year. Henry W. Price, Glove Works. Business established in 1862; located corner of Wyman and Peach Streets, in two three-story frame buildings; manufacture tanned leather gloves; product of factory, \$200,000; total business, \$500,000 a year; employ 140 hands, with an annual pay-roll ofc875,000.

M. B. St. John, Secretary and Treasurer. They manufacture seven tons of straw with an annual pay-roll of \$15,000. Their plant is located on Mill Street, on the water power. They occupy three buildings: one two story and basement, frame, ceeding to the paper mill and jobbing business of Rhoades & Utter, established in 1865. The officers are: Levi Rhoades, President; C. M. Utter, Vice President; and wrapping papera day, footing up to \$46,000 a year. They employ thirty hands, 40x64; one two story and basement, stone, 40x62; one one-story frame warehouse, Rhoades, Utter & Co. This is a corporation formed in 1890, and suc-

will employ about forty hands, with an annual pay-roll of \$22,000. They estimate Rockford Linen Fibre Company. Organized June 1891. Capital stock \$100,000. Will manufacture paper pulp in the Keeney paper mill plant; their annual product at \$200,000.

4

Knitting, an Important Industry in Rockford.

sand people, had its inception in 1866 ward J. Ziock, superintendent. when the late John Nelson and W. W. The Nelson Knitting company was Burson formed a partnership for the organized in 1880 with a consolidation building of knitting machines, manufacturing goods and selling same to the jobbing trade.

Both pioneers of the knitting industry were expert machinists and each was the owner of valuable patents. Combining their patents and knowledge they worked together for several years, each adding valuable improvements to the original machine, until the first practical automatic knitting machine was fairly perfected. It was what was known as the circular vari-

Their modest shop was located on the water power and Ralph Emerson and the late Wm. A. Talcott were early associated with Burson & Nelson in the business.

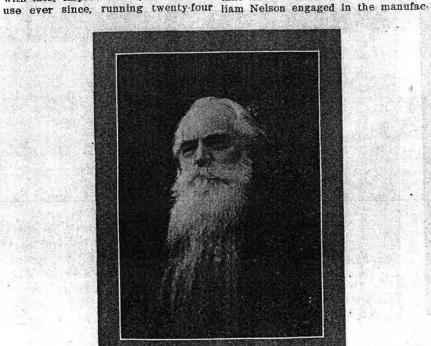
In 1873 Burson & Nelson evolved the parallel row knitting machine, which finished both the heel and toe of the stocking, dropping off each piece before beginning another; a most desirable feature and something entirely new in knitting circles.

The knitting industry of Rockford, are Wm. Ziock, president; Ralph Emrepresenting an investment of nearly erson, vice president; W. W. Burson, a million and a half dollars and giv- second vice president, Wm. E. Hinching employment to nearly two thou- liff, secretary and treasurer, and Ed-



WILLIAM ZIOCK.

of the Burson interests and F. R. This machine was the first practi- Brown & Co., the company of the latcal automatic knitting machine which ter firm being William Nelson, son of knit a stocking ready for wear and the inventor of the machine bearing with later improvements, has been in that name. Frank Brown and Wil-



W. W. BURSON.



JOHN NELSON.



hosiery in a small way in a building at the foot of Wyman street where the Burson industry is now located.

The machines used were the Franz and Pope hand device and Wm. Lathrop, David Keyt and others were interested financially in the industry.



JUDGE WM. BROWN.

started out in the manufacture of Forest City Knitting Co.

One of the Prosperous and Rapidly Growing Concerns of the City.

The Forest City Knitting company was organized in 1890 with a capital stock of \$60,000 as a private enterprise of the Nelson sons, with the purpose of manufacturing a finer grade of goods than had hitherto been made with the Nelson machine. The enterprise was started on the water power with 12 machines as a nucleus, but in 1891 a tract of land was purchased and the present factory buildings erected on Catherine street. Fifty machines of the old type were added and from time to time additional machines were installed until the production reached 1,000 dozen per day.

The idea was then conceived by the youngest of the sons, J. F. Nelson, of producing a machine which would knit a ribbed top stocking complete. This had long been regarded by the knitting world as a mechanical impossibility and has always been the goal of inventors in this line. For ten years and at great expense ex-Some years later the company re- periments were patiently and persistorganized as the Rockford Hosiery ently carried on until in 1903 success company and increased the capital was finaly achieved and the new typestock and in the early '90s the Chi- of machine perfected and made praccago-Rockford Hosiery company was tical. In the past year 60 machines.



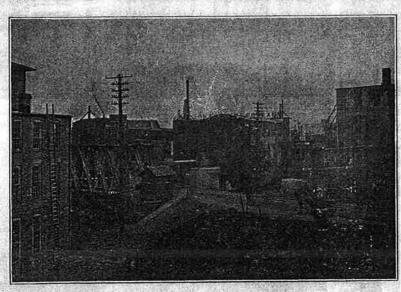
COL. WILLIAM NELSON.

organized and the office of the com- of the new type have been placed in

as Rockford was concerned at least, treasurer. until 1892, when the Burson Knitting On the death of John Nelson in

hours per day as it is doing now. ture of hosiery late in the '70s. They In October, 1877, the Burson & conducted business for a short time Nelson company was succeeded by the and in 1880 the Nelson Knitting com-Nelson Knitting company and Mr. pany was organized with Wm. Brown Burson retired from active connec- as president, John Nelson, vice presition with the knitting industry, so far dent, and Antes S. Ruhl secretary and

company was organized with a capital April of 1883 W. A. Talcott succeeded of \$24,000. The stockholders were to the vice presidency, and on the deall members of the Burson-Emerson mise of Judge Brown Mr. Talcott was families and the machine used was elevated to the presidency of the comthe Burson machine. Since then the pany, Frank R. Brown taking the vice of the modest plant was 250 dozen located at the corner of South Wyman

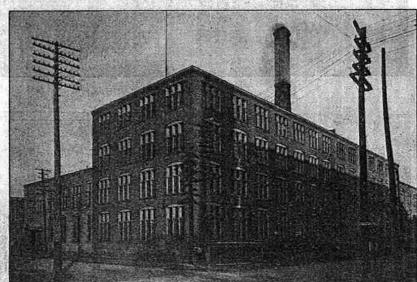


NELSON KNITTING COMPANY PLANT.

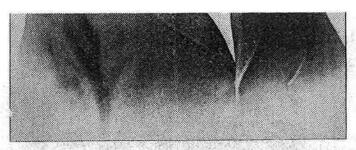
permissible \$750,000.

ity of 400 men, women, boys and girls, 000.

capital stock has been increased to a presidency. The present officers are Frank R. Brown, president; Wm. Nel- president; John Nelson, vice presi- about 1,500 dozen pairs per day. is now located at the foot of Cedar secretary and treasurer. The present street and is employing in the vicin- capital stock of the company is \$160,-



ROCKFORD MITTEN & HOSIERY COMPANY PLANT.



FRANK R. BROWN.

000 pairs of hose per day, fully 500 with every modern convenience machines being kept in constant use known. twenty-four hours of each day.

and also the cotton end of the knitting manufacturing institutions of the city. business of William Zlock of St. The Forest City Knitting company Charles, Mo., who had secured the was organized in 1890 by the sons of right from the New Hampshire firm. the late John Nelson, the pioneer

ing institutions in northern Illinois. tion. The capital stock is \$60,000.

treasurer.

ford Mitten & Hosiery company. Mr. industry to a point where from 400 to chine. The rib-topping attachment, han & Hanlon and will be personally vice president.

with Wm. Walton as vice president at Joliet and other points. and W. H. Ziock as secretary. The The S. B. Wilkins company emcompany as well as president.

pairs per day. Now the output is 5,- and Cedar streets and is equipped

The Forest City Knitting company, During the early days of the com- located on Catherine street, in Buckpany it absorbed the cotton business bee's addition, is the youngest of the of A. P. Alzendorn & Co. of Manches- knitting industries, but it early estabter. New Hampshire, who had acquir- lished a field for itself and today it hands are employed. ed a right to use the Nelson machine, ranks with the leading and growing

Messrs. Brown, Nelson and Ruhl around whose name the knitting inhave been actively interested in the dustry practically centers. Wm. Nelmanagement of the concern from its son was selected as president, Oscar inception and to their tireless energy Nelson, vice president and superinand good business tact is due the tendent and Frithiof F. Nelson as secbuilding up of one of the most stu- retary and treasurer. These officers pendous and prosperous manufactur- still stand at the helm of the institu-

The Rockford Mitten & Hosiery The Forest City company branched company dates its history back to out a little on a special line, manu-1881. In that year the Rockford Mit- facturing a finer knit grade of hosiery ting industry of Rockford would not Dan J. Hanlon. The training Mr.

Ziock, who came here from St. 500 dozen a day were being turned Charles, Mo., was chosen president of out. They made their own yarns and the new company and Wm. A. Talcott sold to Farwell of Freeport and other outside dealers.

The company prospered to a grati- When the Nelson machine was imfying degree and today operates a proved and the making of stockings plant covering an even block square, was pushed to the thousands per day four stories in height. It is equip- capacity the Grahams quit the stockped with its own electric lighting ing industry and confined their enerplant, sprinkling system with fire gies to the making of yarns only. They fighting apparatus, makes its own supplied the Nelson company with yarns and its own boxes and runs day yarn until the latter industry developed such phenomenal proportions Wm. Zlock has continued at the that the Graham plant was inadequate head of the institution since his first to supply the amount of yarn needed. connection with the enterprise. He The Grahams also furnished yarn for is president of the concern today, factories at Baraboo, the penitentiary

elder Ziock is also treasurer of the barked in a knitting venture in September of 1883. It was capitalized The company operates about 500 at \$100,000 and nearly three-fourths knitting machines, employs about 650 of the stock was held by S. B. Wilcommodate the growing institution. structures. At the time of the or- dozen pairs per day. Its present cap- secretary and treasurer and J. W. machine and places it as near perfecting requests you to co-operate with him. The present officers of the company ganization of the concern the output italization is \$600,000. The plant is Irvine vice president. The company tion as human ingenuity can devise. for your mutual business advantage.

organized and the office of the com- of the new type have been placed in

Chicago and then the name was hind orders. changed to the Chicago-Kenosha com- The officers are: pany as it is known today, the directors saying they had advertised Rockford long enough with all manner of competing plants here.

S. B. Wilkins is vice president of the Chicago-Kenosha company and Wm. Lathrop still holds stock in the concern but other Rockfordites origdustry have dropped out. The Chicago-Kenosha concern is capitalized The circulation of all the Chicagoat \$300,000 and between 600 and 700 papers in the entire city of Rockford

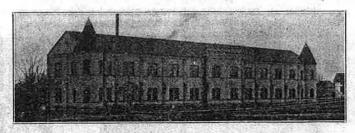
pany was transferred to Chicago while use and the business is being enerthe plant was moved to Kenosha, getically pushed, the production having now reached about 1,700 dozen For something like eight years the per day. A reputation for these Chicago-Rockford company operated goods has been established second to at Kenosha with the main office in none, and the factory is constantly be-

> President-William Nelson. Vice president-Oscar Nelson. Secretary and treasurer-F. F. Nel-

Dan. J. Hanlon.

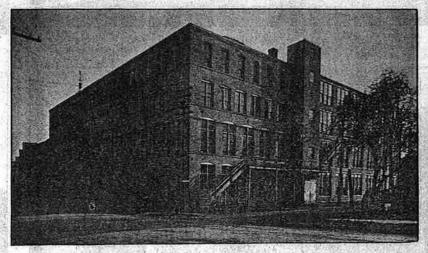
inally interested in the Wilkins in. Supplies the City of Rockford With Chicago Papers.

is dependent upon the efficient ser-An up-to-date resume of the knit- vice now being given patrons by Mr.



FOREST CITY KNITTING COMPANY PLANT.

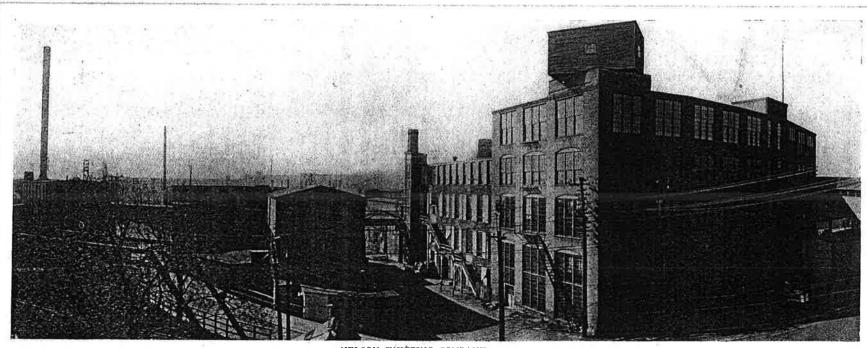
ten company was organized with a than their competitors. They keep be complete without a reference to Hanlon has received on New York capital stock of \$20,000. The officers about 150 machines in operation, em. J. Franklyn Nelson, son of the late and Chicago papers makes him parof this concern were Wm. A. Talcott, ploy about 150 hands and turn out John Nelson. Frank inherited the ticularly fitted for this most strenumechanical and inventive genius of ous work. The agency has a single-The factory of the Burson company son, vice president, and A. S. Ruhl secretary and According to Julius Graham the his father, took up the work where aim, efficiency of service, and every Graham Cotton Mill company was the Nelson the elder left off and after patron of a Chicago paper in the city Four years later the mitten com- first Rockford concern to go into the years of patient toil, perseverance and is requested to report the slightest pany was reorganized and Wm. Ziock manufacture of socks. Mr. Graham experience ultimately evolved an in- neglect of perfect service to the new took a hand in affairs. The capital had constructed a machine similar in tricate and yet simple device for turn-offices in the Mead building, corner stock was increased to \$160,000 and many respects to the Nelson machine ing out a complete stocking including South Main and Chestnut streets. the name was changed to the Rock- and the company pushed the stocking the rib top, without a change of ma- Mr. Hanlon is the successor to Skey-



BURSON KNITTING COMPANY PLANT.

The main building is 50x150 feet and The Nelson company employs about hands, in the various departments, kins who was made president of the invented by Frank Nelson, adds the responsible for everything connected several additions are utilized to ac- 500 hands and occupies four factory and the hosiery output is about 2,000 concern. John W. Hart was made finishing touch to the Nelson knitting with the delivery of your paper and

Kildeford 1912



NELSON KNITTING COMPANY

ELSON always will be associated with hosiery in Rockford. The Nelson Knitting Company is the pioneer in this line in Rockford, being established in 1870 with the first automatic machines. In 1880 it was incorporated and now has a capital of \$160,000. Seamless cotton hosiery is the specialty of this plant and 500 employes are busy at this task. A million dollars worth of goods are turned out yearly. The Nelson was the parent of all hosiery making in Rockford and was the original seamless stocking maker. Some figures as to the plant are of interest. The daily output is 5,000 dozen pairs, 60,000 pairs or 120,000 individual socks each day. This is a million and a half dozens or 18,000,000 pairs a year. It would take an army of 60,000 persons to knit in a day what the Nelson Knitting Company turns out in that time. It would take one person 200 years, working steadily 300 days in the year, to equal one day's output. The plant uses 3,000,000 pounds of yarn a year. This yarn would make a cable of 3,456 strands that would reach from New York to San Francisco. It would girdle the globe with a cable of 500 strands. The company uses its own automatic machines exclusively and uses none but the best yarn to be obtained. The machine automatically knits a double heel and toe, giving the most comfortable and best wearing hosiery in the world. The guarantee is real and for every imperfect pair found they give two pairs in exchange. The merchant never has damaged hose to sell at a loss and the customer always is guaranteed satisfaction in his goods. The Nelson Knitting Company is one of the solidest concerns in the city and is a rock of strength for the business world. Its orders would stagger a man not used to the magnitude of its dealings and probably quotations of some orders would pass belief in the lay mind. The plant is on the water power and that power is utilized largely in the making of its goods. They are sold the breadth of the land and have made the name of Rockford famous over the continent while some go to foreign l

Additional Resources

Books

Everything's Coming Up Sock Monkeys! Bonnie Kraus Connelly. In My Own Dream Publishing,

Sock Monkey. Arne Svenson & Ron Warren, 2008.

Sock Monkey Dreams: Daily Life at the Red Heel Monkey Shelter. Whitney Shroyer, 2006.

Sock Monkeys: (200 Out of I,863). Arne Svenson & Ron Warren, 2002.

Website Articles

http://www.rrstar.com/carousel/x493344242/Plans-to-redevelop-former-Nelson-Knitting-Cotake-shape "Plans to redevelop former Nelson Knitting Co. take shape." Mike Wiser, December 15, 2010.