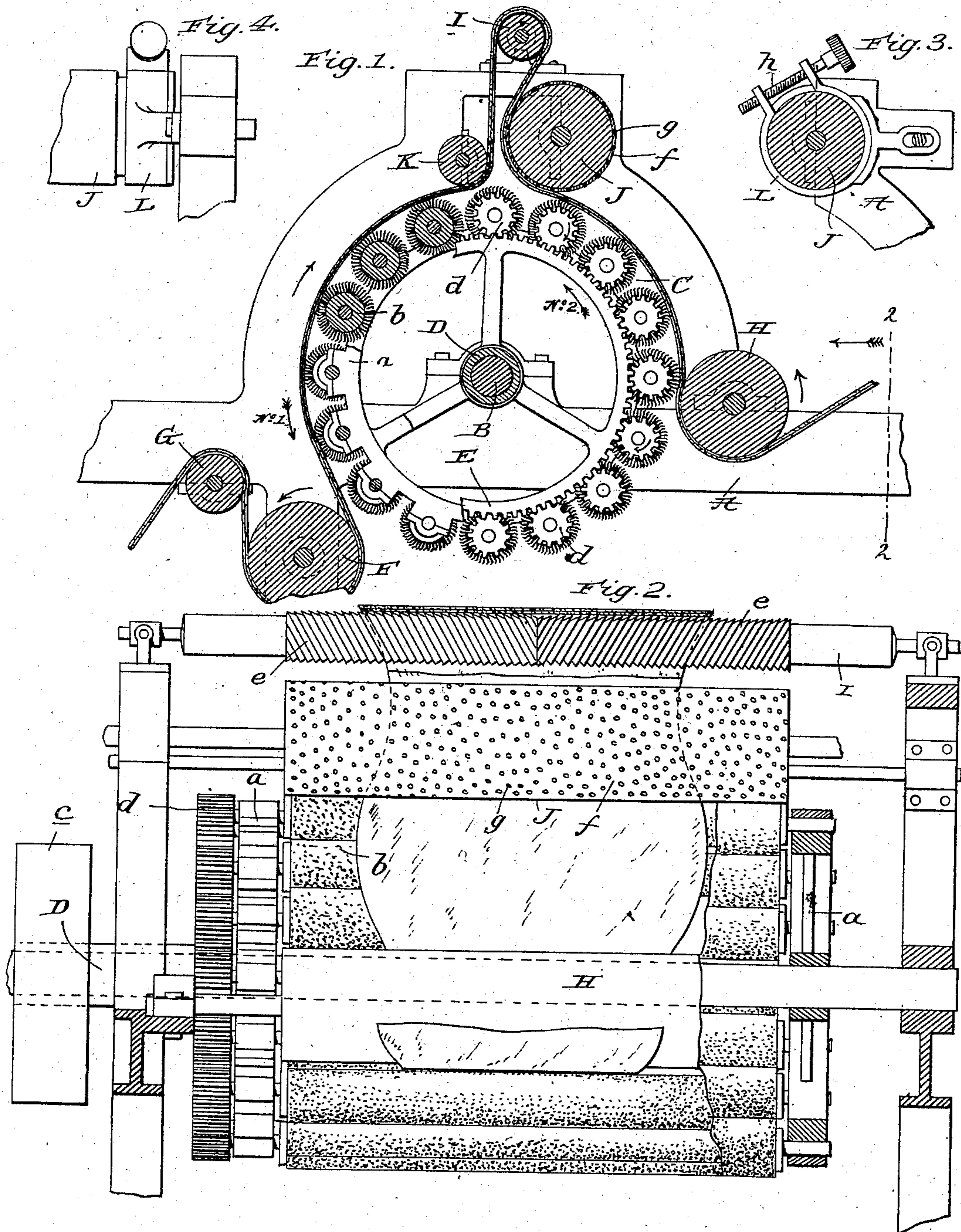


No. 720,018.

PATENTED FEB. 10, 1903.

H. S. GREENE.  
NAPPING MACHINE.  
APPLICATION FILED JULY 31, 1902.

NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

HARRY S. GREENE, OF WOONSOCKET, RHODE ISLAND, ASSIGNOR TO THE WOONSOCKET NAPPING MACHINERY COMPANY, OF WOONSOCKET, RHODE ISLAND.

## NAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 720,018, dated February 10, 1903.

Application filed July 31, 1902. Serial No. 117,826. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY S. GREENE, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Napping-Machines, of which the following is a specification.

My invention relates to improvements in cloth-napping machines, and has for its general object to provide a machine designed more especially for napping the knit stock from which the bodies of undershirts and other undergarments are formed, which stock is not only tubular in form, but is contracted at intervals in its length to form the comparatively narrow waist portions usually desired in undergarments.

The invention will be fully understood from the following description and claims when taken in conjunction with the accompanying drawings, in which—

Figure 1 is a view, partly in longitudinal vertical section and partly in elevation, of a portion of a napping-machine constituting the preferred embodiment of my invention; Fig. 2, a section taken in the plane indicated by the broken line 2 2 of Fig. 1 looking in the direction indicated by arrow and with some of the parts partly broken away; Fig. 3, a detail section illustrating one means for checking the rotation of the retarding-roller which forms part of my improvements, and Fig. 4 a detail elevation of the same.

Similar letters of reference designate corresponding parts in all of the several views of the drawings, referring to which—

A is the main frame of the machine; B, a transverse shaft journaled in suitable bearings in the frame; C, a napping-drum, which comprises opposite spiders *a*, fixedly mounted on the shaft B, and a series of napping-rollers—*i. e.*, card-clothed or toothed rollers—*b*, disposed in a circle about the axis of shaft B and journaled in the spiders *a*; D, a tubular shaft which loosely surrounds the shaft B and is provided with a pulley *c*, designed to be connected by a band (not shown) with a suitable driving means or motor; E, a spur-wheel carried by the tubular shaft and

meshed with spur-pinions *d* on the napping-rollers *b*; F, a transverse feed-roller arranged at one side of the napping-drum and preferably in a horizontal plane below that of the shaft B; G, a transverse guide-roller arranged adjacent to the roller F, and H a transverse feed-roller disposed at the opposite side of the napping-drum with reference to the rollers F and G.

All of the parts thus far described are of the ordinary construction and are operated in the usual manner—that is to say, the feed-rollers F H are rotated by driving connections, which I have deemed it unnecessary to illustrate, in the direction indicated by arrows to feed the cloth or material to be napped through the machine, and the napping-drum is rotated by means (not shown) in the direction indicated by arrow No. 1 in Fig. 1, while the spur-wheel E is rotated in the direction indicated by arrow No. 2 in Fig. 1 to rotate the napping-rollers *b* in the direction of the small arrows thereon incident to the rotation of the drum.

The napping-drum shown and described *per se* forms no part of my invention, and I therefore desire it distinctly understood that any other suitable napping-drum may be employed without involving a departure from the scope of the invention.

My invention consists in the provision in a cloth-napping machine of a transverse roller I, calculated to stretch the cloth in the direction of the width thereof—*i. e.*, open the cloth out to its full width—and a transverse roller J, calculated to retard the feed or lengthwise movement of the cloth through the machine. In conjunction with the rollers I J a transverse guide-roller K is preferably employed, and said rollers I, J, and K are arranged intermediate of the feed-rollers F and H and preferably above the napping-drum, as shown, for a purpose presently pointed out. As best shown in Fig. 2, the stretching-roller I is provided at opposite sides of its middle with oppositely pitched or inclined circumferential ribs *e*, the inner sides of which are beveled. Said ribs are calculated incident to the rotation of the roller to stretch the cloth in the

direction of its width, or, in other words, to open the cloth out to its full width and prevent it from contracting in the longitudinal central portion of the machine. The retard-  
 5 ing-roll J may be provided on its periphery with any means adapted to retard the cloth—such, for instance, as a layer of tin *f*, provided with apertures *g*. I also desire it understood that any suitable means may be em-  
 10 ployed for retarding the rotation of the roller J or making the same rotate at a low rate of speed. For the purpose I have shown a brake-band L, Figs. 3 and 4, which is connected to the frame A and surrounds the roller at one  
 15 end thereof and has its ends adjustably connected by a screw *h*.

According to the practice now in vogue tubular knit stock or material having contracted portions at intervals is passed through an  
 20 ordinary napping-machine in the same manner as a single thickness of cloth. When the tubular stock or material is thus passed through an ordinary napping-machine, the napping-rollers raise or teazel a nap upon the  
 25 surface of the material with which they come in contact; but they do not contact with and produce a nap on all of the surface, this because as the tubular stock passes through, the under layer, being acted upon by the napping  
 30 means, is stretched more than the upper layer, with the result that the upper layer becomes loose and flabby and forms large wrinkles, which permit wrinkles to form beneath them in the under layer, thus causing folds in the  
 35 under layer, the inner sides of which folds cannot be reached by the napping-rollers. Frequently the wrinkles formed in the tubular stock, as stated, are so large and heavy that the napping-rollers catch into them and  
 40 tear the stock or goods. The contraction of the tubular stock or goods at intervals also tends to prevent the napping-rollers from acting against and producing a uniform nap on the surface of the stock or goods.

45 When a napping-machine is equipped with my improvements and a piece of tubular knit stock contracted at intervals is passed through the same in the manner shown in Fig. 1, it will be seen that the roller J by retarding the  
 50 upper layer of the stock or piece of goods sufficiently to draw the same tight will preclude the formation of wrinkles in said upper layer, and consequently leave no place for wrinkles to form in the under layer; also, that the  
 55 stock or piece of goods will be held under uniform tension, which conduces to the proper napping thereof. It will further be seen that the roll I by stretching or opening out the stock or material in the direction of the width  
 60 thereof not only assures pouncing of the whole surface of the stock at the contracted portions, but also at the comparatively wide portions, with the result that a uniform nap is produced on the stock from edge to edge.

65 The rollers I, J, and K are preferably placed

above the napping-drum, as described, because the stock or material does not become stretched sufficiently at its first contact with the napping-rollers to cause trouble. It is  
 70 when the stock or material is between the roller I and the feed-roller H that the difficulties mentioned incident to the napping of tubular knit material in an ordinary napping-machine occur.

I have entered into a detailed description  
 75 of the construction and relative arrangement of parts embraced in the present and preferred embodiment of my invention in order to impart a full, clear, and exact understanding of the same. I do not desire, however, to  
 80 be understood as confining myself to such specific construction and arrangement of parts, as such changes or modifications may be made in practice as fairly fall within the scope of my claims.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a napping-machine, the combination of a napping-drum, means adjacent to the  
 90 same for feeding two layers or thicknesses of stock, and means for retarding the passage of the outer of the layers or thicknesses of stock, and thereby preventing the formation of wrinkles in the stock.

2. In a napping-machine, the combination of a napping-drum, means adjacent to the  
 100 same for feeding two layers or thicknesses of stock, means for retarding the passage of the outer of the layers or thicknesses of stock to prevent the formation of wrinkles in the stock, and means for stretching the stock in the direction of its width.

3. In a napping-machine, the combination of a napping-drum, means adjacent to the  
 105 same for feeding two layers or thicknesses of stock, a roller having a periphery adapted to retard the outer layer or thickness of the stock, and means for retarding the rotation of the roller so as to retard the passage of the  
 110 outer layer or thickness of the stock.

4. In a napping-machine, the combination of a napping-drum, means adjacent to the  
 115 same for feeding two layers or thicknesses of stock, a roller having a periphery adapted to retard the outer layer or thickness of the stock, means for retarding the rotation of the roller so as to retard the passage of the outer layer or thickness of the stock, and a second  
 120 roller equipped with means for engaging and stretching the stock in the direction of the width thereof.

5. In a napping-machine, the combination of a napping-drum, feed-rollers arranged at  
 125 opposite sides of the same, a roller having a periphery adapted to retard the outer of two layers or thicknesses of stock on the drum, means for retarding the rotation of the roller so as to retard the passage of the outer layer or thickness of the stock, a second roller ar-  
 130

ranged adjacent to the retarding-roller, and  
equipped with means for engaging and  
stretching the stock in the direction of the  
width thereof, and a guide-roller for leading  
5 the stock from the napping-drum to the  
stretching-roller.

In testimony whereof I have hereunto set

my hand in presence of two subscribing wit-  
nesses.

HARRY S. GREENE.

Witnesses:

GEO. W. SPAULDING,  
EDGAR L. SPAULDING.