B. A. PARKES.

FABRIC TUBE OPENING DEVICE.

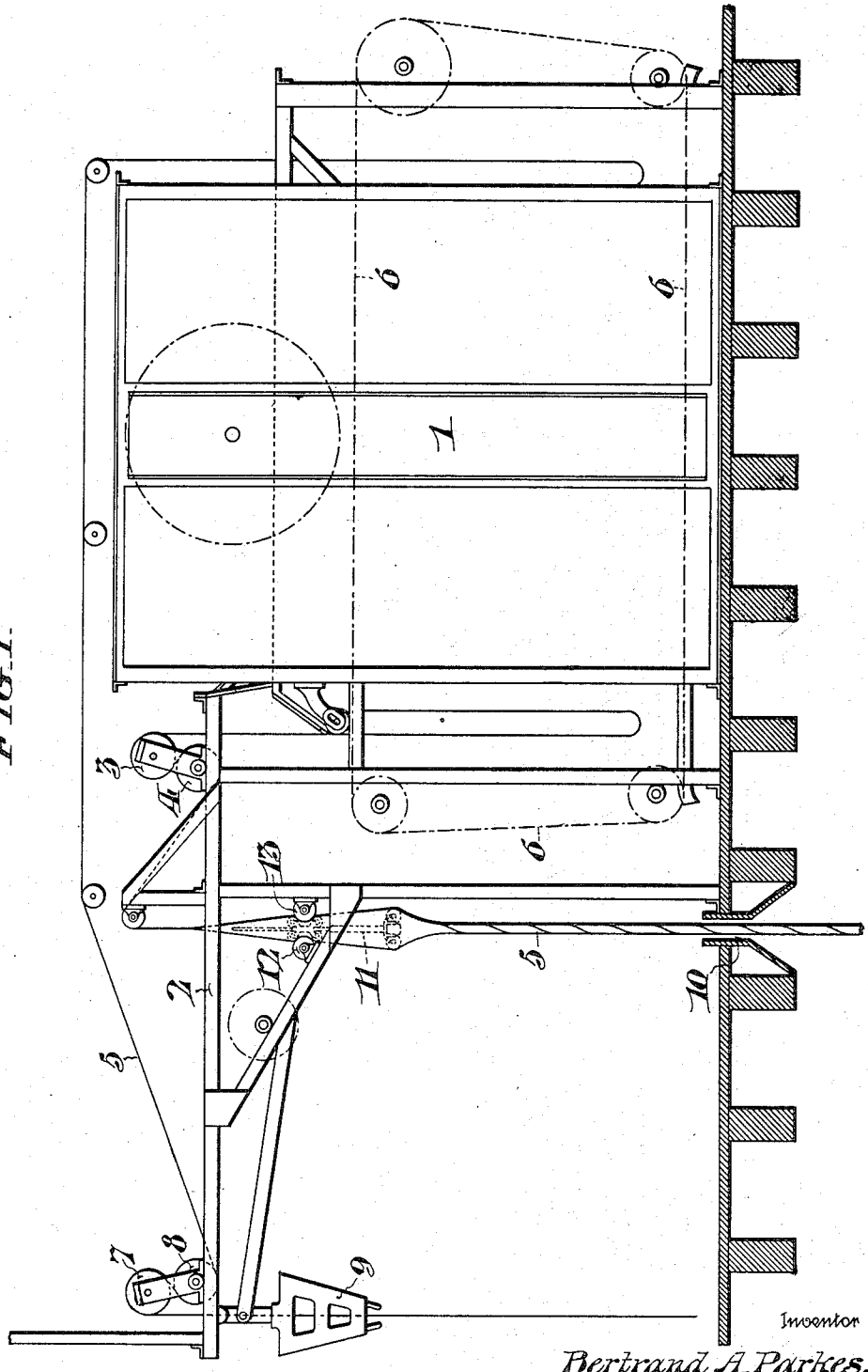
APPLICATION FILED JULY 8, 1913.

1,141,883.

Patented June 1, 1915.

2 SHEETS—SHEET 1.

FIG. I.



Witnesses

John C. Bergner.

James H. Bell.

Inventor

Bertrand A. Parkes,

by Fulwider & Paul

Attorneys.

B. A. PARKES.

FABRIC TUBE OPENING DEVICE.

APPLICATION FILED JULY 8, 1913.

1,141,883.

Patented June 1, 1915.

2 SHEETS—SHEET 2.

FIG. II.

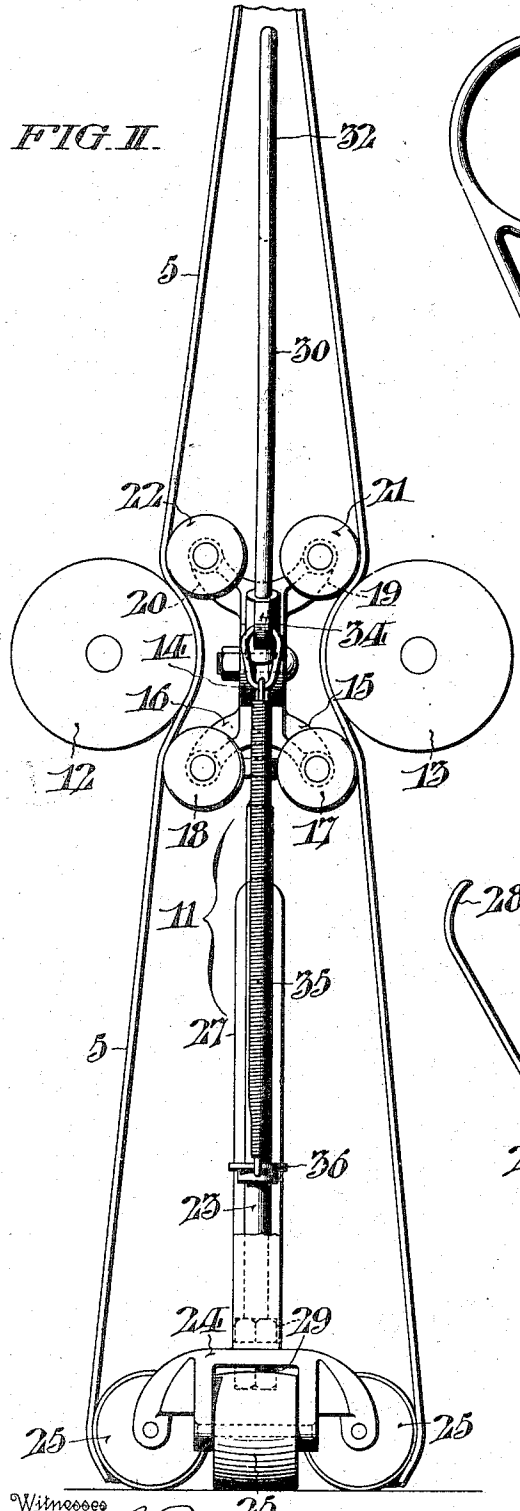
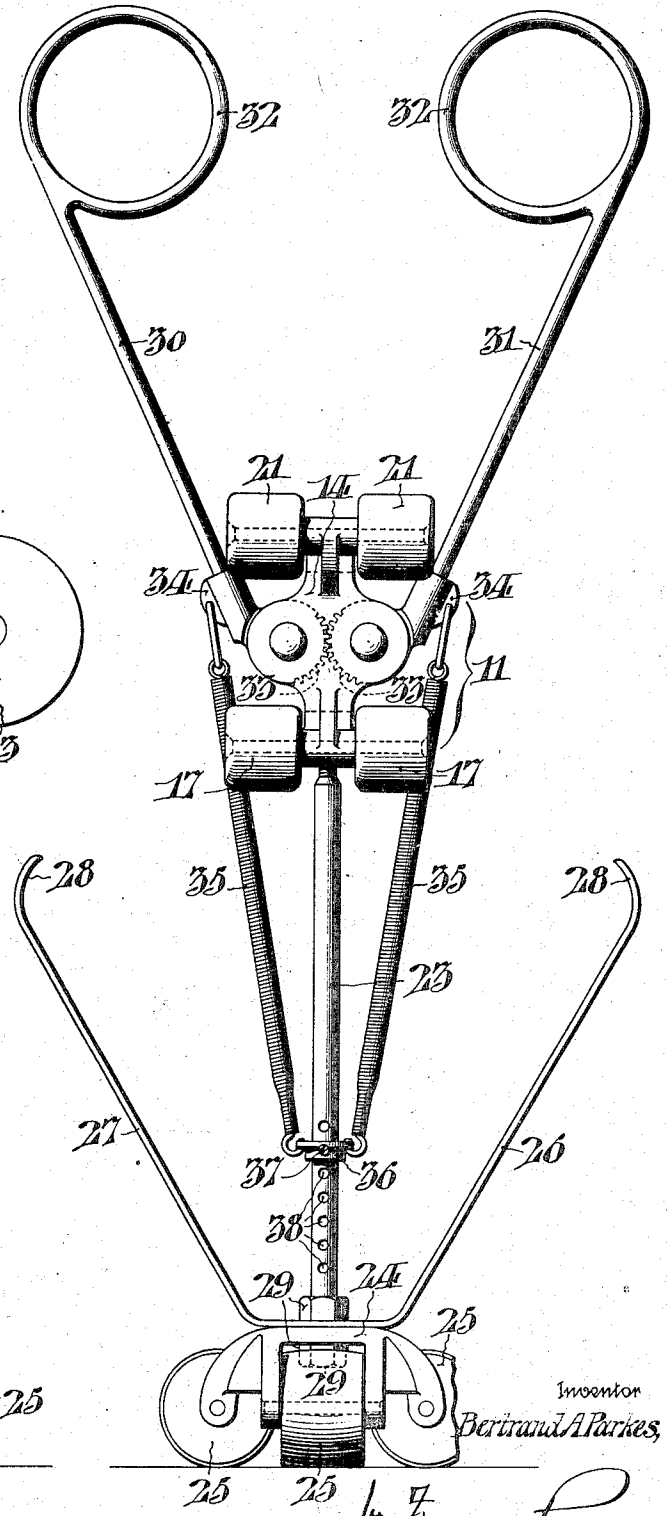


FIG. III.



Witnesses

John L. Bergner

James C. Bell

Inventor

Bertrand A. Parkes,

by Mulley & Fang

Attorneys.

UNITED STATES PATENT OFFICE.

BERTRAND A. PARKES, OF BARREN HILL, PENNSYLVANIA, ASSIGNOR TO THE PHILADELPHIA DRYING MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

FABRIC-TUBE-OPENING DEVICE.

1,141,883. Specification of Letters Patent. **Patented June 1, 1915.**

Application filed July 8, 1913. Serial No. 777,822.

To all whom it may concern:

Be it known that I, BERTRAND A. PARKES, of Barren Hill, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvments in Fabric-Tube-Opening Devices, whereof the following is a specification, reference being had to the accompanying drawings.

In the manufacture of knitted underwear, the fabric tubes, when taken from the knitting machine, are subjected to a washing, bleaching or dyeing operation, and are then dried preparatory to being steamed, stretched, cut and formed into garments. In the operation of washing, bleaching or dyeing, the fabric becomes twisted and tangled, and it is necessary to take the twist and tangle out of the fabric with the least possible friction before drying.

The invention relates more particularly to devices which are adapted to enter a tube of fabric of the above kind, as it is fed to a drying apparatus, for the purpose of separating and spreading the tube so that it may be more readily dried.

An object of the invention is to provide a tube opening device which is so constructed as to engage the inner walls of the tube, and separate the same, which device is also provided with means whereby said device may be supported and held from movement with the tube being opened.

A further object of the invention is to provide a supporting means for a fabric tube opening device, which supporting means may be used in connection with a plurality of opening devices, and is so constructed and arranged that the fabric tube passing over one opening device may stop, without interfering with the operation of the other opening device.

A further object of the invention is to provide a drying apparatus with a supporting device for opening the tube of the fabric, which is so disposed and arranged that the fabric tube may untwist as it passes over the tube opening device and be fed in a flat open condition through the drier.

These and other objects will in part be obvious, and will in part be hereinafter more fully described.

In the drawings, which show by way of illustration one embodiment of the invention. Figure I is a side view of a drying apparatus showing a fabric tube passing through the same, and my improved opening and untwisting device operating within the tube; Fig. II is an enlarged view, showing an edge view of the opening and untwisting device; Fig. III is a side view of the same.

Prior to my invention it has been customary to place inside of a tube, as it passes to a drying machine, a separating and spreading device for opening the tube. These opening devices, so far as I am aware, have been supported entirely by the frictional contact between the device and the tube operated upon. The present invention contemplates the provision of means for supporting the opening device and for holding the same from travel with the tube being opened. To this end the spreading device is provided with a central head, from which depends a rod carrying separating rollers, which rollers separate the inner walls of the tube, one from another, as the tube passes over the same. Adjacent the separating rollers are outwardly projecting spring arms which further tend to separate the walls of the tube one from another. The separating and untwisting device also includes further spreading arms which are held under spring tension against the walls of the tube, and which tend to deliver the tube in a flat condition to the feed rollers of the drying apparatus. The tube is led to the drying apparatus upwardly in a vertical direction, and there is a considerable distance between the separating and untwisting device and the pile from which the tube is led, which gives the fabric tube an opportunity to untwist as it is led on to the separating and spreading device. The separating and spreading device is also provided with rolls which are spaced and which coöperate with supporting rollers so that the tube may travel over the separating and spreading device, and said device held not only from turning, but also from longitudinal movement with the tube by the rollers, which rollers are located between the rolls carried by the head of the separating and spreading device.

Referring more in detail to the drawings, I have shown in Fig. I, a drying apparatus consisting generally of a drying chamber 1, from which projects a frame 2. Air is circulated through the drying chamber by

means of a fan indicated by the circular broken line in Fig. I, as is customary in this type of apparatus. Mounted in suitable bearings in the frame 2 are feeding-in rollers 3 and 4. These rollers are positively driven, and the web or tube of fabric 5, passes about the rollers, so as to be fed by the frictional contact of the fabric with the rolls. The drying apparatus consists also of an endless carrier 6, shown in dotted lines in Fig. I, which supports the fabric to be dried, as is customary in this type of drier. The endless carrier 6 is provided with spaced rods which move with the carrier and the loops of fabric to be dried are laid one after another on these rods. The rods as they pass through the drying chamber slide on suitable supporting bars. The fabric after leaving the drier may, if desired, be carried over suitable rollers to the receiving side of the drying apparatus, where it is led over feed rollers 7 and 8, and through a folding apparatus 9, which lays the fabric in a suitable pile.

The details of the drying apparatus and the manner of feeding the fabric thereto form no part of the present invention, and further description thereof will not be necessary.

The tube or fabric to be dried is preferably received through an opening 10, formed in the floor, adjacent the drier. The spreading device 11, is supported by two parallel spaced rollers 12 and 13. The spreading device 11 consists of a central supporting head 14. Extending laterally from the head are two bracket arms 15 and 16, each of which carries a pair of rolls 17 and 18 respectively. These rolls may be journaled on the bracket arms in any suitable way. The spreader head also carries bracket arms 19 and 20, which are provided with similar pairs of rolls 21 and 22.

The separating and spreading device, as shown in detail in Figs. II and III, is also provided with a downwardly extending rod 23, which is rigidly carried by the supporting head 14. At the lower end of said rod is a supporting bracket 24, which carries four rolls 25, which are equally spaced and mounted in arms projecting from the bracket 24. These rolls are the entering rolls which first engage the tube and separate the walls one from another. They are closely associated with each other so that they may properly enter into and open the tube, although the tube may be considerably twisted. Adjacent the bracket 24 and mounted on the rod 23 are two spring arms 26 and 27. These arms are inclined outwardly in an upward direction and the free ends of the arms are curved as at 28. These arms and the bracket 24 are clamped to the rod 23 by suitable nuts 29. Also pivoted on the supporting head 14 are two arms 30 and 31. As herein shown, each of these arms is formed with a curved ring-shaped end 32. The arms are formed with intermeshing gears 33, so that any movement imparted to one arm will be likewise imparted to the other. Each arm is provided with a lug 34 and springs 35, engaging the respective lugs at one end and attached at their other ends to a collar 36. This collar is adjustably secured to the rod 23 by a pin 37 which passes through the collar and one of the holes 38 in the rod. By adjusting the collar 36, the tension of the springs 35 may be varied.

In the operation of my device the tube is led over the entering rolls of the spreading device and is passed between the rolls 17, 18, 21 and 22, and the rollers 12 and 13. The rolls 21 and 22 are spaced from the rolls 17 and 18. The rollers 12 and 13 are located in these spaces so that the spreading device will be supported through the resting of the rolls 21 and 22 on the rollers 12 and 13, and at the same time allow the web or tube 5, to pass freely over the spreading device and between the rollers 12 and 13, and the rolls 21 and 22. The rolls 17 and 18 are beneath the rollers 12 and 13 and in case the tube should become unduly twisted or knotted the spreading device would be lifted until these rolls 17 and 18 contact with the rollers 12 and 13, and further travel of the spreading device with the tube will be prevented. In such a case the feed rollers 3 and 4, which frictionally engage the tube, will slide on the tube and the feeding in of the tube which is knotted will cease, although the other spreading devices operating upon adjacent tubes may continue in their operation and the tubes operated on thereby fed to the drier.

The rollers 12 and 13 extend across the entire front of the drying apparatus and are supported in suitable bearings at each end thereof. These rollers are adapted to support and control the spreading device for each tube which is being fed to the drier. Suitable collars may be provided for holding the tubes spaced from each other. By this construction, wherein the supporting rollers are located on the frame adjacent the feeding-in rollers for the fabric, and the spreading device is supported and held in position by the rollers, and the tube of fabric to be spread is led up through an opening in the floor, the tube passing to the spreading device is given ample range of movement, so that the twist in the tube may be taken from the fabric.

After the tube of fabric passes the entering rolls 25, it will pass over the yielding separating arms 28 and these arms will tend to flatten out the tube, separating the walls from each other, so that the tube will pass in a flat condition between the rollers 12

and 13. A further upward movement of the tube causes the same to pass over the yielding arms 30 and 31, which further spreads the tube and holds the same in a flat condition as it passes to the feed rollers of the drying apparatus.

From the above description, it will be apparent that I have provided a drying apparatus which is adapted to receive a plurality of tubular fabrics for drying, fed thereto in an upward vertical direction, which drying apparatus includes frictional feeding-in rolls for conveying the tubes to the drying apparatus. The drying apparatus is also provided with a supporting frame on which are two rollers which are spaced and extend the entire width of the frame, and these rollers are adapted to support the spreading devices for the tubes and to prevent said spreading devices from traveling with the tubes. When a tube passes off from the spreading device, it will be supported by the rollers. Furthermore, if a tube should knot or stop, the feeding-in frictional rollers would merely slip on the tube and the remaining tubes would be carried to the drying apparatus. It is thought the manner of inserting the spreading devices in the tubes and the starting of the tubes into the drying apparatus is obvious.

It will be obvious that minor changes in the details of construction and the arrangement of parts may be made without departing from the spirit of the invention, as set forth in the appended claims.

Having thus described my invention, what I claim is:

1. A drying apparatus including feed rollers to which a tube to be dried is fed upwardly in a vertical direction, a tube opening and untwisting device adapted to engage and separate the inner walls of the tube, said device having a central head, entering rolls carried by said central head for engaging and initially opening the tube, and means independent of the tube for supporting said opening device in said tube and for preventing the same from traveling with the tube.

2. A drying apparatus including feed rollers to which a tube to be dried is fed upwardly in a vertical direction, a tube opening and untwisting device adapted to engage and separate the inner walls of the tube, said device having a central head, spaced rolls carried thereby, entering rollers carried by said central head for engaging and initially opening the tube, and rollers for engaging the outer face of the tube between the rolls on the central head for supporting the opening device and preventing the same from traveling with the tube.

3. A drying apparatus including feed rollers, to which a tube to be dried is fed upwardly in a vertical direction, a tube opening and untwisting device adapted to engage and separate the inner walls of the tube, said device having a central head, spaced rolls carried thereby, entering rolls carried by said central head for initially opening the tube, and yielding arms adjacent said entering rolls for spreading the tube and rollers for engaging the outer face of the tube between the rolls on the central head for supporting the opening device and preventing the same from traveling with the tube.

4. A fabric tube opening device comprising a supporting head, a depending rod carried thereby, opening rolls supported at the lower end of the rod for engaging and initially opening the tube, yielding arms mounted at the lower end of the rod and extending upwardly therefrom for engaging and separating the walls of the tube, and means carried by the central head, whereby said opening device may be supported by members outside of the tube and held from movement with the tube.

5. A fabric tube opening device comprising a supporting head, a rod depending from said head, opening rolls carried at the lower end of said rod for engaging and initially opening the tube, arms mounted adjacent the lower end of the rod and extending upwardly therefrom for engaging and separating the walls of the tube, and arms connected with the central head and projecting upwardly therefrom for further separating the tube and holding the same flat, and springs for normally forcing said last named arms outwardly against the walls of the tube.

6. A fabric tube opening device comprising a supporting head, a rod depending from said head, opening rolls carried at the lower end of said rod for engaging and initially opening the tube, arms mounted adjacent the lower end of the rod and extending upwardly therefrom for engaging and separating the walls of the tube, and arms connected with the central head and projecting upwardly therefrom for further separating the tube and holding the same flat, springs for normally forcing said last named arms outwardly against the walls of the tube, and means for varying the tension of said springs.

7. A fabric tube opening device comprising a supporting head, a rod depending from said head, opening rolls carried at the lower end of said rod for engaging and initially opening the tube, arms mounted adjacent the lower end of the rod for separating the walls of the tube, and arms connected with the central head and projecting upwardly therefrom for further separating the tube and holding the same flat, springs for normally forcing said last named arms outwardly against the walls of the tube, means

for varying the tension of said springs, spaced rolls carried by said central head, and rollers engaging the outer face of the tube and coöperating with the spaced rolls on the central head, whereby said opening device is supported and held from longitudinal movement with the tube.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this third day of July, 1913.

BERTRAND A. PARKES.

Witnesses:
JAMES H. BELL,
E. L. FULLERTON.