Aug. 1, 1950 F. C. WEDLER 2,517,067

OVERFEED AND INTERNAL EXPANDER FOR FABRIC IN TUBULAR FORM

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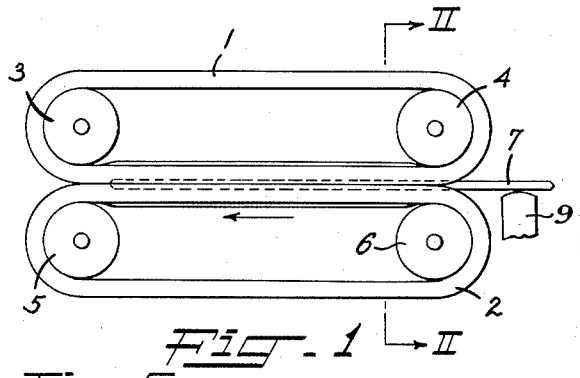


Fig. 1

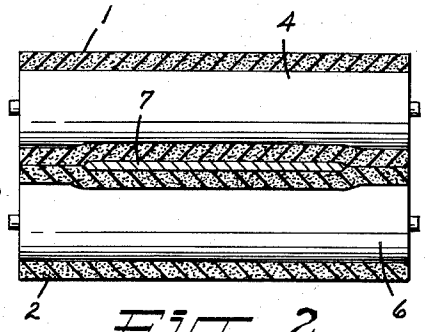
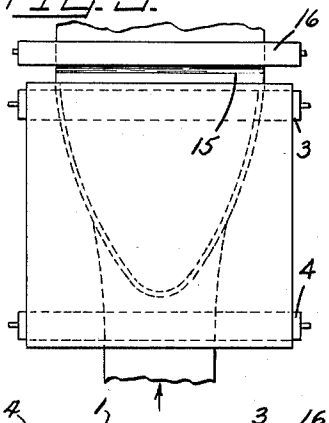
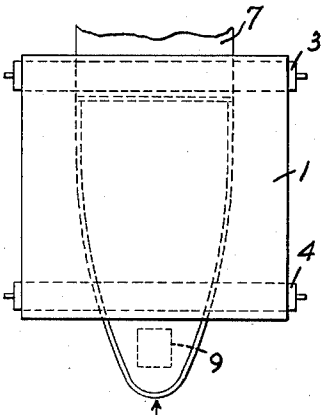


Fig. 2

Fig. 5.





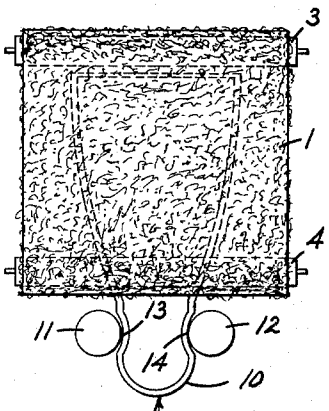


Fig. 4

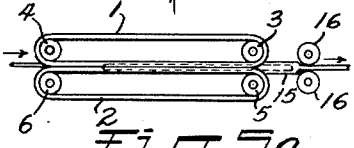


Fig. 5a

Fig. 3

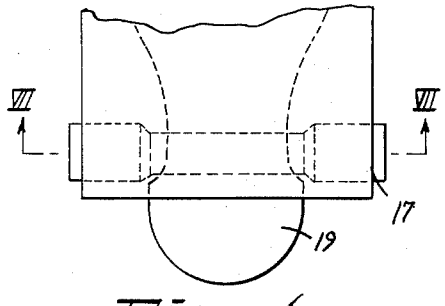


Fig. 6

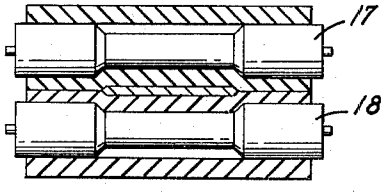


Fig. 7

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OVERFEED AND INTERNAL EXPANDER FOR FABRIC IN TUBULAR FORM

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12 Claims. (Cl. 26—55)

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This invention relates to an apparatus for spreading and stretching fabrics in tubular form. More particularly this invention relates to an apparatus for uniformly spreading and stretching fabrics which are to be processed and finished in the tubular form.

Various types of apparatus have been previously suggested for spreading and stretching fabric in tubular form. However it was found that they did not feed the fabric uniformly and as a result the spreading and stretching of the fabric was not uniform.

This invention has for its principal object to provide an apparatus for uniformly spreading and stretching fabric in tubular form.

Another object of the invention is to provide an apparatus for uniformly feeding and spreading and stretching fabric in tubular form.

A further object of the present invention is to provide a means for gripping and evenly moving a tubular form of fabric over a stretcher.

Other objects and advantages of the invention will be apparent from the following description and accompanying drawings.

In the drawings:

Figure 1 is a side elevational view of a preferred embodiment of the present invention.

Figure 2 is a sectional view of the embodiment of the invention shown in Figure 1, taken along the line II—II in Figure 1.

Figure 3 is a top view of the preferred embodiment of the present invention.

Figure 4 is a top view of another embodiment of the invention.

Figure 5 is a top view of another embodiment of the invention.

Figure 5*a* is a side elevation view of the apparatus shown in Figure 5.

Figure 6 is a top view of another embodiment of the present invention.

Figure 7 is a sectional view of the embodiment shown in Figure 6 taken along the line VII—VII in Figure 6.

The embodiment of the invention shown in Figure 1 of the drawing comprises the continuous belt-like members 1 and 2 of relatively thick flexible, resilient, compressible material such as sponge rubber or a fabric having a relatively thick, resilient nap. The belt-like members are mounted to travel over the substantially parallel rollers on cylindrical members 3, 4 and 5, 6. The rollers are so positioned that the adjacent portions of the belts passing between the rollers are in contact substantially throughout. The rollers 3 and 5 are positively driven so that the adjacent portions of the belts move in the direction shown by the arrow in Figure 1. If desired the rollers 4 and 6 may also be positively driven. The means for spreading the tubular fabric comprises a relatively flat, sheet-like stretcher member having at least a portion of the width to which it is desired to stretch the tubular fabric. The stretcher member 7 is positioned between the adjacent portions of the belt-like members 1 and 2, between the pairs of rollers 3, 5 and 4, 6 and the tubular fabric is passed over it. The stretcher member 7 and the belt-like members 1 and 2 are of such a thickness that the belt-like members firmly engage substantially all portions of the tubular fabric passing over the flat surfaces and the side portions of the stretcher member. The belt-like members advance or feed all portions of the tubular fabric at a uniform rate over the stretcher member so that the tubular fabric is uniformly stretched and shaped throughout its length. The tubular fabric is not pulled over the stretcher as was done in the prior art. In the present invention the tubular fabric is gripped by the resilient and compressible blankets and moved over the stretcher by this gripping action at the same speed as the belts. One of the roller members is mounted so that it may be lifted to enable the spreader means to be inserted between the belt members prior to stretching. In this way various size stretchers may be employed in the present invention.

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Several problems are present in the design of the spreaders. It is desirable that the fabric move at substantially the same rate on all sides of the spreader. In the present invention this is accomplished by the flexible belt-like members that travel at the same rate and lightly engage the fabric with the same force on all sides. Another problem is to provide a means for retaining the spreader in substantially the same position between the rollers. Several methods of performing the latter are utilized in the present invention.

A preferred embodiment of the means used to hold the spreader 7 in position between the endless belt-like members 1 and 2 is illustrated in Figure 3. In this embodiment the spreader is composed of a magnetic material or a non-magnetic material with a magnetizable insert. The spreader extends longitudinally from one end of the belt-like members and projects over a magnetic pole piece 9 which due to its magnetic field restrains the spreader from moving between the belt-like members. The magnet employed in the present invention may be of the permanent or of

the electromagnetic type. The electromagnet preferably operates on the same circuit as the one which drives the belt-like members. These magnetic plates may be either on one or both sides of the longitudinally extending portion of the spreader 7. The main consideration in the use of a magnetic type holder is that it is of such strength that it will restrain any forward movement of the spreader as the tubular fabric passes over the spreader. The spreaders employed in the variations of the present invention may be of any desired shape. They are constructed so that they increase in width as the fabric is fed on them by the travel of the belts or blankets.

Another means for holding the spreader is illustrated in Figure 4 in which napped fabric belts are shown. A longitudinally extending portion 10 of the spreader is flared. The revolvable pulleys 11 and 12 mounted on the vertical axes engage the spreader in the arcuate portions 13 and 14 between the body of the spreader and the flared portion thereof and retain the spreader in position.

Another modification of the present invention is illustrated in Figure 5. In this embodiment the longitudinally extending portion 15 of the spreader projects to two nip rolls 16. These rolls are spaced so that the distance between them is just enough to admit the tubular fabric but too narrow to allow the spreader to pass through. In this embodiment it is important that the transverse edges of the extending portion 15 be rounded off to prevent any possibility of the spreader being pulled through the nip rolls. Another modification of the present invention is illustrated in Figures 6 and 7. In this embodiment the driving rollers 17 and 18 have a spaced portion of less diameter than their outer diameters and as shown, the spreader is placed therebetween. The spreader is flared as shown by reference character 19 to such a size that it is greater in width than the spaced portion having a smaller diameter on the driving rollers. This indenture on the driving rollers allows the tubular fabric to pass through but restrains the spreader from passing therebetween. However the main reason for the different diameter rollers is to insure an even pressure on all sides of the fabric. By having the rollers indented to substantially one half the thickness of the spreader the resilient and compressible belts are compressed a like amount throughout and there is no undue compression of the belts in the vicinity of the stretcher. This embodiment of the present invention insures longer life of the belt and a more even spreading and stretching action on the tubular fabric.

The forms of apparatus shown spread and stretch the fabric in successive stages. As the fabric passes over the spreader between the flexible blankets it is spread open and stretched. This spreading and stretching is gradual, starting at a minimum when it first goes on the spreader and increasing to a maximum as it leaves the spreader and continues onward for further treatment. By using the flexible blankets embodied in the present invention the fabric is assured of being stretched and spread uniformly without danger of catching or snagging as was frequently the case in the prior art which used combinations of rollers to guide the fabric over the spreader.

While preferred embodiments of the invention have been shown, it is understood that changes and variations may be made without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. Apparatus for spreading and stretching fabric in tubular form comprising two continuous belt-like members of sponge rubber having portions in opposing relationship, and flat spreader means positioned between the belt-like members, and the flat surfaces thereof facing and in contact with opposing surfaces of the belt-like members.

2. Apparatus for spreading and stretching fabric in tubular form comprising continuous belt-like members of compressible resilient material having portions in contacting and opposing relationship, spaced rollers for mounting said belt-like members, flat spreader means positioned between the belt-like members, and the flat surfaces thereof facing and in contact with opposing surfaces of the belt-like members, and nip rolls at one end of the belt-like members for positioning and restraining movement of said spreader means.

3. Apparatus for spreading and stretching fabric in tubular form comprising continuous belt-like members of compressible resilient material having portions in contacting and opposing relationship, superposed roller members for mounting said belt-like members, spreader means positioned between the belt-like members, said roller members having portions of different diameters, the portions adjacent the centers being of smaller diameter than the portions adjacent the ends, and said spreader means having a portion extending between the smaller portions of the roller members and an enlarged section of the spreader retained by the enlarged ends of the rollers.

4. Apparatus for spreading and stretching tubular fabric comprising two continuous belts of compressible resilient material having portions in opposing relationship outside of and entirely enclosing a path traversed by the fabric along a portion of its length, a rigid spreader member between the belts so that it is positioned within the fabric during spreading operations, said belts being juxtaposed to press the fabric against the opposite surfaces of the member, and means for retaining the member in its position relative to the belts.

5. Apparatus for spreading and stretching fabric in tubular form comprising two continuous belts of heavy napped material having portions in opposing relationship outside of and entirely enclosing a path traversed by the fabric along a portion of its length, a rigid spreader member between the belts so that it is positioned within the fabric during spreading operations, said belts being juxtaposed to press the fabric against the opposite surfaces of the member, and means for retaining the member in its position relative to the belts.

6. Apparatus for spreading and stretching fabric in tubular form comprising two continuous belts of compressible resilient material having portions in opposing relationship outside of and entirely enclosing a path traversed by the fabric along a portion of its length, roller means for mounting the belts, a rigid spreader member between the belts so that it is positioned within the fabric during spreading operations, said belts being juxtaposed to press fabric against the opposite surfaces of the members, and means for retaining the member in its position relative to the belts.

7. Apparatus for spreading and stretching

fabric in tubular form comprising two continuous belts of compressible resilient material having portions in opposing relationship outside of and entirely enclosing a path traversed by the fabric along a portion of its length, roller means for mounting and driving the belts, a rigid spreader member between the belts so that it is positioned within the fabric during spreading operations, said belts being juxtaposed to press the fabric against the opposite surfaces of the member, and means for retaining the member in its position relative to the belts.

8. Apparatus for spreading and stretching fabric in tubular form comprising two continuous belts of compressible resilient material having portions in opposing and contacting relationship outside of and entirely enclosing a path traversed by the fabric along a portion of its length, means for mounting the belts, a rigid spreader member between the belts so that it is positioned within the fabric during spreading operations, said belts being juxtaposed to press the fabric against the opposite surfaces of the members, and means for retaining the member in its position relative to the belts.

9. Apparatus for spreading and stretching fabric in tubular form comprising continuous belts of compressible resilient material having portions in opposing and contacting relationship outside of and entirely enclosing a path traversed by the fabric along a portion of its length, roller means for supporting and driving the belts, a rigid spreader member between the belts so that it is positioned within the fabric during spreading operations, said belts being juxtaposed to press the fabric against the opposite surfaces of the members, and means for retaining the member in its position relative to the belts.

10. Apparatus for spreading and stretching fabric in tubular form comprising continuous belts of compressible resilient material having portions in opposing and contacting relationship outside of and entirely enclosing a path traversed by the fabric along a portion of its length, spaced rollers for supporting said belts, a rigid spreader member between the belts so that it is positioned within the fabric during spreading operations, said member having transversely spaced arcuately recessed portions, and pulley-like members mounted to engage the arcuately recessed portions of the member so as to retain the member in its position relative to the belts.

11. Apparatus for spreading and stretching tubular fabric comprising two continuous belts of compressible resilient material having portions in opposing and contacting relationship outside of and entirely enclosing a path traversed by the fabric along a portion of its length, a rigid spreader member between the belts so that it is positioned within the fabric during spreading operations, said belts being juxtaposed to press the fabric against the opposite surfaces of the member, means for retaining the member in its position relative to the belts, and means for driving the belts.

12. Apparatus for spreading and stretching fabric in tubular form comprising continuous belt-like members of compressible resilient material having portions in contacting and opposing relationship, spaced roller members for mounting said belt-like members, flat spreader means comprising a magnetic material positioned between the belt-like members and the flat surfaces thereof facing and in contact with opposing surfaces of the belt-like members, and a stationary magnet in closely spaced relation to the spreader.

FREDERICK C. WEDLER.

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