Dec. 14, 1954 C. F. LIBBY 2,696,846

METHOD OF TREATING ELASTIC WEBBING

Filed March 8, 1952

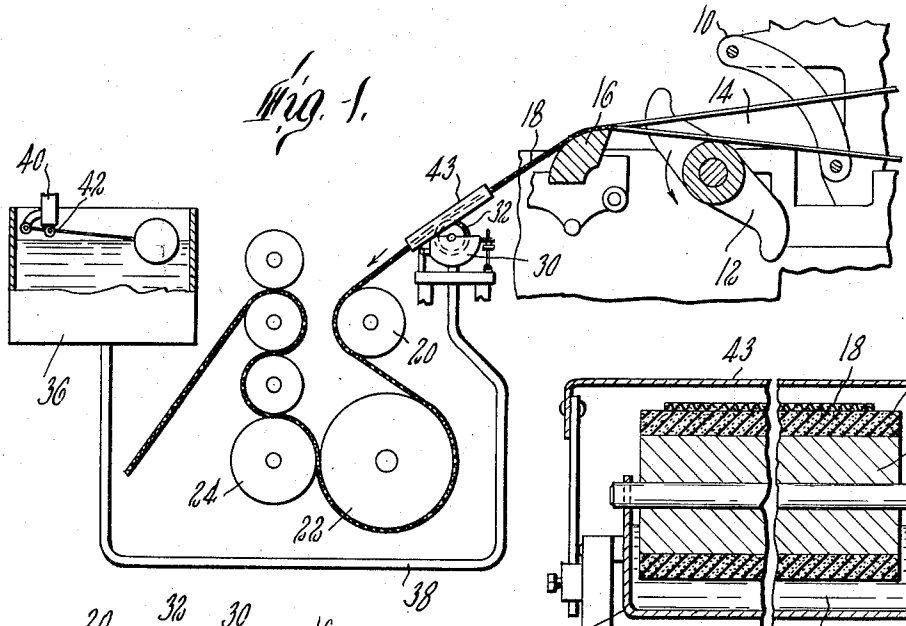


Fig. 1.

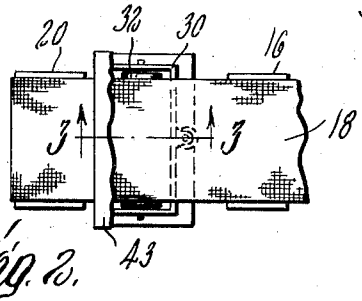


Fig. 2.

Fig. 4.

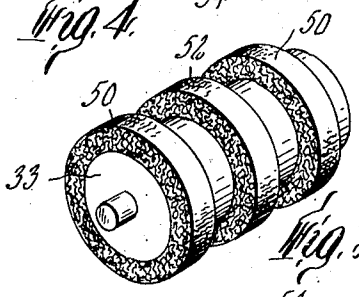


Fig. 5.

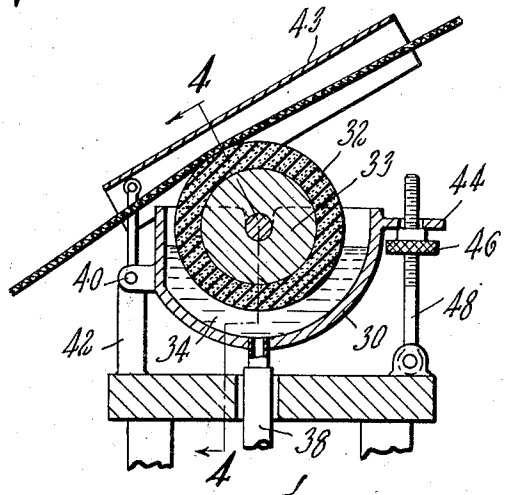


Fig. 3.

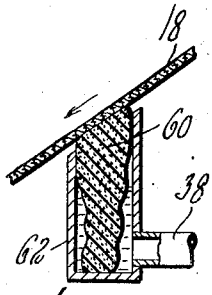


Fig. 7.

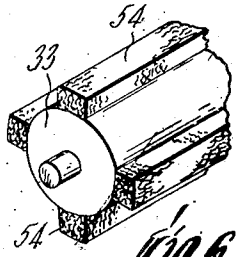


Fig. 6.

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METHOD OF TREATING ELASTIC WEBBING

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Application March 8, 1952, Serial No. 275,559

4 Claims. (Cl. 139—291)

This application is a continuation-in-part of my pending application Serial No. 264,143, filed December 29, 1951. The invention relates to woven elastic webbing in which some of the warp threads are elastically extensible. For example, in weaving narrow elastic webs, the warp is customarily composed partly of soft rubber threads which are usually covered with textile fibers and are considerably stretched during the weaving operation, and partly of fiber threads which are relatively inextensible and are employed to add longitudinal tensile strength to the webbing and to limit the stretchability thereof. Such fiber threads may be of natural fibers such as cotton or artificial fibers such as rayon, celanese, nylon or the like, or mixtures of various fibers. The web after it has been woven passes through the nip of a pair of feed rolls which serve to maintain tension on the warp threads during the weaving operation. This tension is relieved when the web passes beyond the feed rolls, and the stretched rubber threads contract to their natural length or as near thereto as the fiber covers enwrapped thereon will permit. This shortening of the length of the rubber threads, which is substantial, results in a gathering or "shirring" of the other warp threads, which are relatively inextensible, and in crowding together the weft or filling yarns. When the relatively inextensible warp threads are of cotton, the shirring which takes place when the web passes the feed-rolls and leaves the tension zone is in the form of fine, even wrinkles which give the web a pleasing appearance. If, however, the fiber warp threads and the weft threads are of rayon, nylon or other equivalent artificial or continuous fiber, the shirring is coarse and irregular.

According to the present invention, a longitudinally extensible web having warp threads of rayon, nylon or the like in addition to rubber warp threads is moistened just after being woven and while still under tension. When the tension on the moistened web is relieved, the shirring of the tempered fiber warp threads is fine and even. In some cases, it may be preferred to moisten certain parts of the web. For example, if artificial thread fibers are used in the selvages only, the moistening may be limited to the edges of the web. Furthermore, local applications of moisture to limited areas can be employed to produce designs on the web of contrasting areas of fine and coarse shirring. In the process of moistening all or parts of the web, color effects can be obtained by the use of water-soluble dyes. Sizing may also be added if desired.

For a more complete understanding of the invention reference may be had to the following description thereof and to the drawing, of which—

Figure 1 is a somewhat diagrammatic side elevation of apparatus embodying the invention;

Figure 2 is a plan view of the moistening device shown in Figure 1, a portion being broken away;

Figure 3 is a section, on a larger scale, on the line 3—3 of Figure 2;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is a perspective view of a moistening roll for moistening local areas;

Figure 6 is a perspective view of another moistening roll; and

Figure 7 is a sectional view of a modified form of moistening device.

The apparatus shown in Figure 1 includes portions of a narrow-web loom including a set of stationary reeds 10, a rotating reed 12 which serves to beat up the picks

of filling inserted through the shed 14, and a breast beam 16 over which the newly woven fabric 18 passes. The fabric is led about an idle roll 20 and thence to a pair of press rolls 22 and 24 by which it is fed and by which tension is maintained on the warp threads as far back as the warp supply means (not shown).

According to the invention, the woven web is moistened at a point between the breast beam 16 and the feed rolls 22 and 24. As shown, a moistening device 30 is mounted at a convenient distance from the breast beam, this device consisting of a container with an open top, the container having therein an absorbent element 32 of sponge rubber, felt, or any suitable equivalent. The absorbent element 32 projects up above the top of the container 30 sufficiently to engage the web 18 which passes thereover. The absorbent element 32 is maintained in a thoroughly wet condition so as to moisten the web 18 as it moves past in contact therewith. As shown in Figures 3 and 4, the absorbent element 32 may be carried by a horizontal roll 33 which is rotatably supported partly in and partly projecting above the container 30. A supply of water 34 is maintained in the container at a suitable level by any convenient means such as a tank 36 which is mounted at the same level as the container 30 and is connected thereto by a pipe 38. Water for the reservoir 36 may be supplied through a supply pipe 40, the supply being regulated by a float valve 42 of well known construction so that the water in the reservoir 36 is maintained at a suitable level, this level being also maintained by gravity in the container 30. A cover 43 is preferably mounted over the container to protect it from dust and lint. The web 18 as it passes in contact with the wet absorbent element 32 is thoroughly moistened, the fiber threads being thus tempered so that when the web has passed beyond the feed rolls 22 and 24 and the tension is relieved on the elastic warp threads, the latter contract and the moistened fiber threads gather with a fine, even wrinkling or shirring.

The degree of moistening of the woven web can be regulated by the absorbent material selected and also by the force with which the absorbent element is pressed against the web. The latter can be adjusted by raising or lowering the roll 33 which carries the absorbent element. For this purpose the container 30 which carries the roll may be made adjustable. As shown, the container 30 is hinged at one side, as at 40 to a support element 42. At the other side of the container is an ear 44 which rests on a finger nut 46 which is in threaded engagement with an upright support element 48. Rotation of the nut 46 raises or lowers the container 30 and the roll 33 carried thereby.

The absorbent element 32 shown in Figures 3 and 4 covers substantially the entire cylindrical surface of the roll 33. If local applications of moisture are desired, corresponding absorbent elements may be mounted on the roll 33, examples being shown in Figures 5 and 6. The absorbent material shown in Figure 5 is applied in the form of narrow rings. Two such rings 50 may be employed to moisten the selvage of a web. If desired, one or more intermediate rings 52 may be mounted on the roll to make a longitudinally striped pattern on the web.

Figure 6 shows longitudinal strips 54 of absorbent material spaced around the circumference of the roll. These produce a transversely barred pattern on the web. Any number of other patterns can be produced by suitably shaping the absorbent element or elements on the roll.

Instead of being mounted on a roll, the moistening element may be in the form of a stationary wick 60 having a portion projecting up above the top of an open container 62 to engage the under surface of the web while the latter is still under longitudinal tension.

I claim:

1. In the process of weaving a longitudinally elastic web, the steps of maintaining under considerable tension the portion of the warp where the weaving takes place, weaving the weft threads between the tensed warp threads, moistening the woven fabric, and thereafter relieving the tension on the warp of the moistened fabric before it dries.

2. In the process of weaving a web having some warp

threads of soft rubber and other threads of artificial fibers, the warp being under considerable tension during the weaving operation, the steps of moistening the web after it has been woven but before the tension on the warp is relieved, and relieving the tension before the web dries.

3. In the process of weaving a longitudinally elastic web, the steps of maintaining under considerable tension the portion of the warp where the weaving takes place, weaving the weft threads between the tensed warp threads, some of said warp threads being elastically extensible, moistening predetermined areas of the woven fabric where the warp threads are tensed, and thereafter relieving the tension on the warp of the moistened fabric before it dries.

4. The process of weaving a longitudinally elastically extensible web, which comprises tensioning the warp sufficiently to produce a substantial elongation of the elastically extensible threads thereof prior to weaving, weaving the web while the warp is elongated, moistening the freshly woven web while the warp thereof is elongated, and thereafter relieving the tension on the moist web to permit the warp thereof to contract.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,823,034	Dworsky	Sept. 15, 1931
1,823,053	Lawton	Sept. 15, 1931
2,058,476	Lovett	Oct. 27, 1936
2,133,034	Milnes	Oct. 11, 1938
2,301,703	Humphreys	Nov. 10, 1942
2,495,847	Kerr	Jan. 31, 1950
2,574,029	Foster	Nov. 6, 1951
2,601,770	Goldsmith	July 1, 1952