June 19, 1923.

1,459,547

G. C. MOORE ET AL

ELASTIC WOVEN FABRIC

Filed Aug. 24, 1922

Fig. 2.

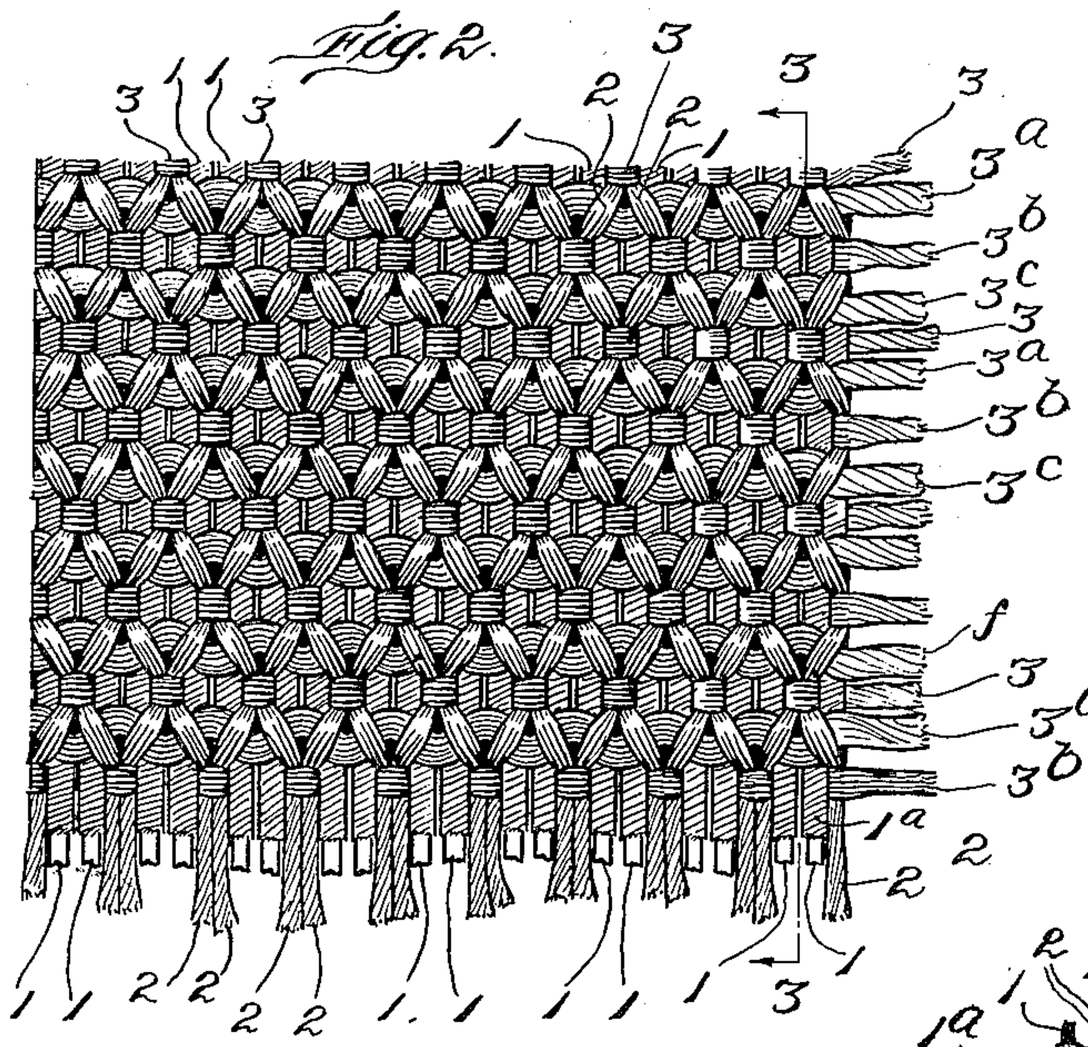


Fig. 3.

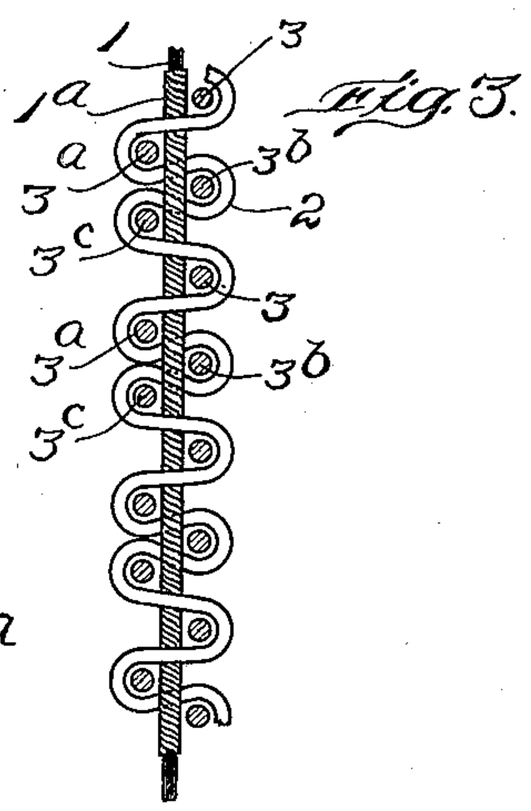
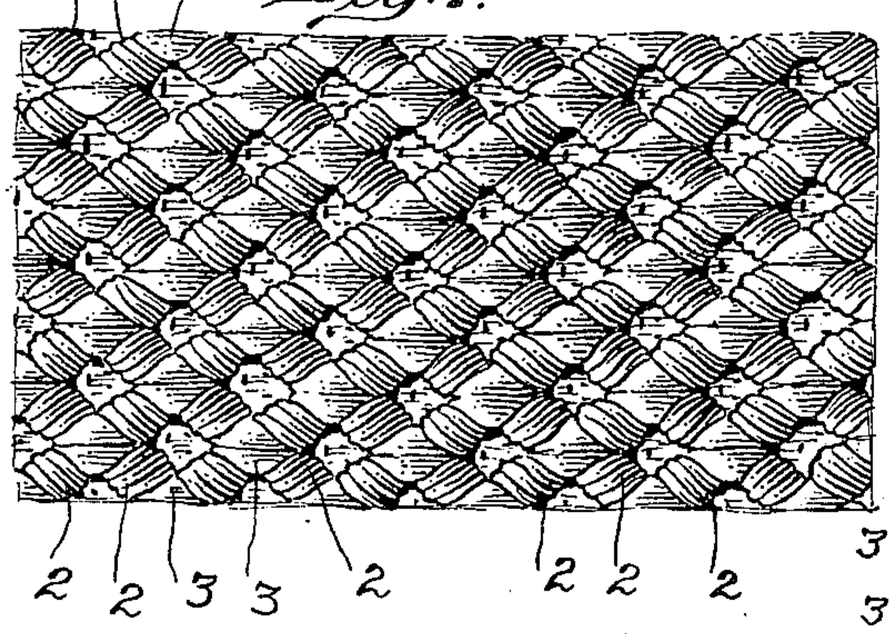


Fig. 1.



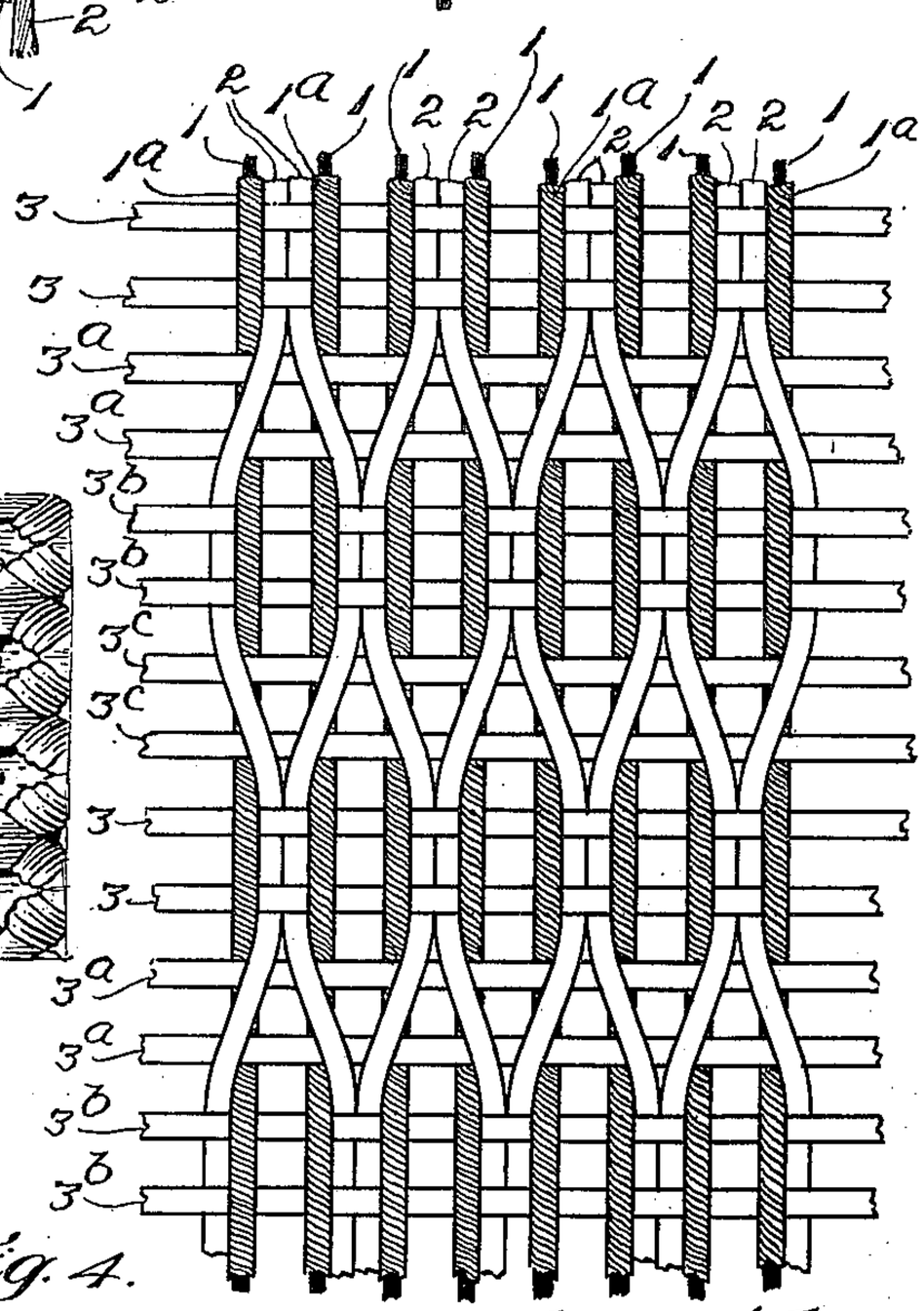


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE C. MOORE AND THOMAS F. MOORE, OF WESTERLY, RHODE ISLAND.

ELASTIC WOVEN FABRIC.

Application filed August 24, 1922. Serial No. 584,044.

To all whom it may concern:

Be it known that we, GEORGE C. MOORE and THOMAS F. MOORE, citizens of the United States, residing at Westerly, in the county of Washington, State of Rhode Island, have invented a certain new and useful Improvement in Elastic Woven Fabrics, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention is applicable in the production of elastic woven fabrics containing wound or covered rubber strands.

An elastic woven fabric embodying our invention has novel texture, special characteristics, and a reticulated honeycomb surface effect in comparatively high relief due to diagonal raised wales extending oppositely in transverse directions, intersecting one another, and with intermediate hollows or depressions.

The nature, etc., of our novel and improved elastic woven fabric are substantially indicated in the drawings in which latter,—

Fig. 1 is a face view of a portion of the said fabric in its normal contracted state. In this view the ends of the different threads are supposed to have been trimmed away close to the edges of the closely woven fabric.

Fig. 2 is a face view of a portion of such fabric in distended condition but with a slight modification in the wefting.

Fig. 3 is a diagram on the order of a view in section on line 3, 3, of Fig. 2.

Fig. 4 is a diagram illustrating the weave of the fabric.

Our fabric is composed, essentially, of pairs of heavy cord warps constituted by wound or covered elastic strands which are indicated at 1, 1, Figs 2, 3 and 4; pairs of fine warp threads 2, 2, each such pair comprising either two individual threads as in Figs. 2 and 4 of the drawings or two groups of threads; and weft or filling 3, 3^a, etc., interwoven with the two sets of warps. The covering or wrapping of the respective rubber strands is indicated at 1^a. The wound or covered rubber strands 1, 1, fine warp threads 2, and weft or filling 3, 3^a etc., are interwoven substantially as indicated in Figs. 3 and 4; namely:— The two fine warp-threads or groups of warp-threads 2, 2, constituting a pair first are located between the two wound or covered elastic strands 1, 1, constituting a pair of the elastic strands, being bound at the under face of the fabric by one or more picks 3, 3, of weft or filling below the strands 1, 1. Two picks 3, 3, are shown in Fig. 4, but only one in each of Figs. 2 and 3. Then the two fine warp-threads or groups of warp-threads appear at the upper surface of the fabric, above one or more picks 3^a 3^a, of weft or filling overlying the wound or covered elastic strands, (two picks 3^a 3^a, being shown in Fig. 4, but only one in Figs. 2 and 3), and diverge from each other in opposite directions so that they cross diagonally in opposite directions laterally to the outer sides of the two elastic strands. Then the two fine warp-threads or groups of warp-threads appear at the under face of the fabric, at the said opposite sides of the elastic strands, and are bound at the said under surface by one or more picks 3^b, 3^b, of weft or filling. The two fine warp-threads then cross back toward each other at the upper surface of the fabric, converging toward each other over the pair of elastic strands and also over one or more picks 3^c, 3^c, of weft or filling overlying said strands. This completes one repeat of the weave, in the direction of the length of the fabric. Then the two fine warp-threads pass down together between the two elastic strands, and are bound at the under surface of the fabric by one or more picks 3, 3, of weft or filling, as before, and so on ad infinitum.

It will of course be understood that in Fig. 4, and also in Fig. 3, the various threads, etc., have been spread widely apart for convenience in illustrating what has just been described. Fig. 2 shows the woven fabric, on an enlarged scale, in its longitudinally extended state, with the rubber strands stretched lengthwise, and with the warp and weft-threads correspondingly spread but not to the extent of separating the picks of weft or filling from one another. As will be apparent in Fig. 2, as the successive picks of weft or filling are beaten up in the progress of the weaving they are slid forward along the wound or covered elastic strands so as to produce a closely woven fabric structure.

In this extended state of the fabric, on one transverse line portions of the respective pairs of elastic strands 1, 1, are seen, alternated with those portions of pick 3 of weft or filling which overlie and are held up by the pairs of fine warp-threads 2, 2, between the successive pairs of elastic strands. On the next adjacent transverse line the pick 3^a of weft or filling appears, overlaid by the diverging portions of the pairs of fine warp-threads 2, 2. On the next adjacent transverse line, portions of the elastic strands are seen, alternated with those portions of pick 3^b of weft or filling which overlie and are held up by the spread apart portions of the said pairs of fine warp-threads. As will be observed the spread apart portions of one pair of the fine warp-threads touch those of the corresponding parts of the pair at either side of such pair. On the next adjacent transverse line, the pick 3^c appears, overlaid by the converging portions of the pairs of fine warp-threads. The next adjacent transverse line is a repetition of that mentioned first, namely, showing portions of the respective pairs of elastic strands 1, 1, alternated with those portions of the next pick 3 of weft or filling which overlie and are held up by the pairs of fine warp-threads 2, 2, between the successive pairs of elastic strands.

As will be apparent from inspection of the drawings, the picks 3^a, 3^c, of weft or filling are elevated above the elastic strands 1, 1, and the portions of the fine warp-threads 2, 2, which cross laterally back and forth over the said picks also are made prominent. The crossing portions of said fine warp-threads produce a waviness of the said picks in the top plane of the fabric. The curves of the waves alternately tend toward each other in the case of a pick 3^a and the adjoining pick 3^c, as in Fig. 2, and when the fabric after being woven assumes its contracted condition as in Fig. 1 the prominences of the curves are pressed together as in said figure. Consequently, the said crossing portions of the fine warp-threads, blending with those portions of the picks 3^a, 3^c, which are not covered by such crossing portions, join in producing a raised reticulated honeycomb effect observable in the case of the normal fabric as represented in Fig. 1.

The described mode of interweaving effects a very secure locking of the elastic strands against lengthwise creeping. This is due to the fact that each fine warp-thread in crossing from one side to the other of an elastic strand and back again loops under one or more picks of weft or filling at each side of the elastic strand. Thereby, by reason of the loop or noose of the fine warp-thread over the elastic strand at two points and under one or more picks of weft or filling between such points, the elastic strands are engaged tightly by the said picks of weft or filling, and by the crossing portions of the fine warps. The expansion of an elastic strand in being relaxed after having been stretched operates against the weft or filling at the under side of the web to tighten the weft or filling against the fine warp which passes under the same, while in the next repeat the same condition exists and at the same time between the repeats the crossing portion of the fine warp-thread and the picks of weft or filling which intervene between such portion and the elastic strand are in like manner acted upon by the expanding elastic strand, with the result that close contact and firm engagement of the successive picks of weft or filling with the elastic strands are caused to occur.

A fabric made in accordance with the invention is very serviceable in the production of elastic girdles, surgical bandages, corset inserts, and the like, it having marked advantages both in respect of reduced cost of manufacture and otherwise over the knitted fabrics heretofore largely used for such purposes, and also over fabrics of other constructions required to have a more or less porous character coupled with an attractive appearance.

A woven fabric embodying the present invention has the characteristic of remaining perfectly flat, and admits of being cut at the required intervals without the tendency to excessive raveling and waste which exists in the case of knit fabrics, and also without the tendency characterizing the latter to roll toward the back of the fabric. The described mode of combining and interweaving the component threads prevents the ends of the elastic strands from creeping into the fabric when the fabric is stretched. A very desirable pattern is obtained. Also, a fabric which is more porous, and at the same time firm and flat, than can be obtained by any other method of construction known to me.

What is claimed as the invention is:—

The described elastic woven fabric composed of warps and wefts or filling in sets comprising a pair of wound or covered elastic strands, a pair of warp-threads, or a pair of groups thereof, and weft or filling, said fabric having the pair of elastic strands covered at face and back of the fabric by the interwoven weft or filling and warp-threads, with the pair of warp-threads first located between the two elastic strands and bound at the under face of the fabric by one or more picks of weft or filling below the elastic strands, then crossed at the top face of the fabric above one or more picks of weft or filling overlying the elastic strands, and diverging from each other in opposite directions to the outer side of the two elastic strands, then bound at the under face of the fabric by weft or filling, and then crossed

back toward each other at the upper surface of the fabric, converging toward each other over the pair of elastic strands and also over one or more picks of weft or filling, and then passing down together between the two elastic strands and bound by weft or filling at the under face of the fabric as before, and so on.

In testimony whereof we affix our signatures, in presence of two witnesses.

GEORGE C. MOORE.
THOMAS F. MOORE.

Witnesses:
ELLA LEIPER,
BERNICE PRESCOTT.