

Nov. 26, 1935.

O. E. HUBER

2,022,350

BRAID ELASTIC FABRIC AND METHOD OF MAKING THE SAME

Filed April 11, 1935

5 Sheets-Sheet 1

FIG. 1.

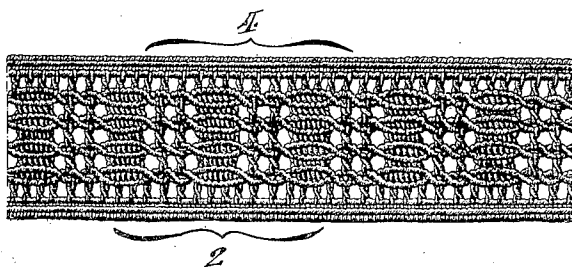
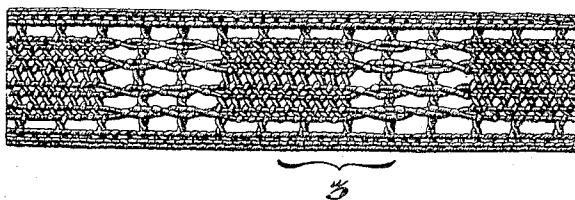


FIG. 2.



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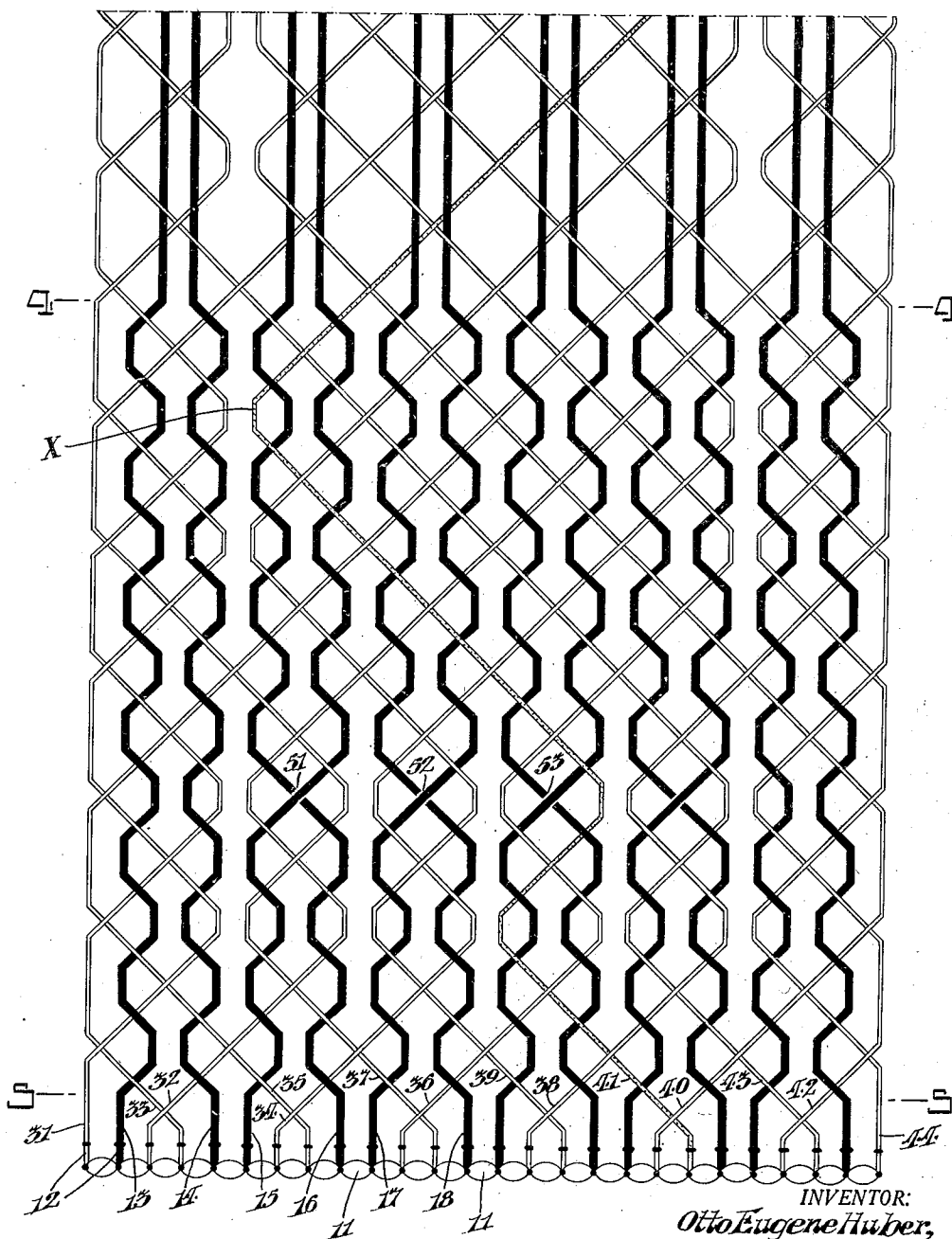
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FIG. 3.



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FIG. 4.

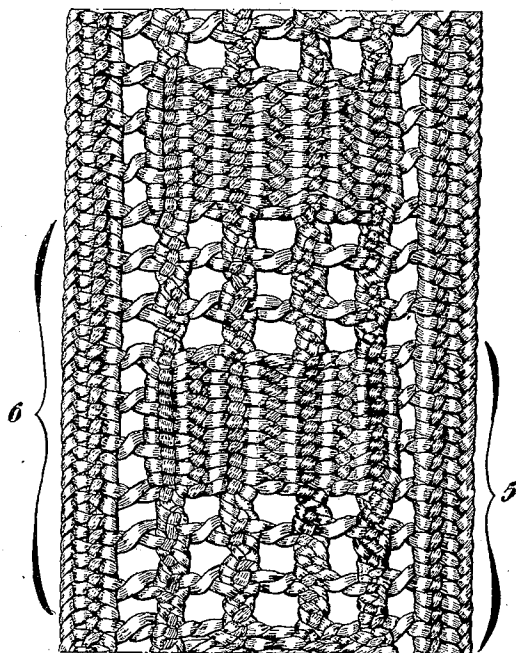
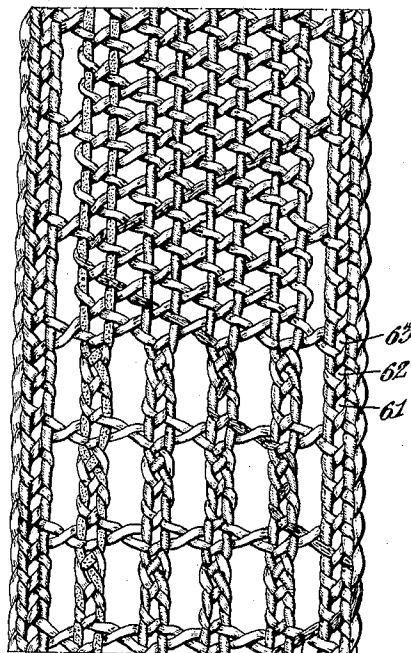


FIG. 5.



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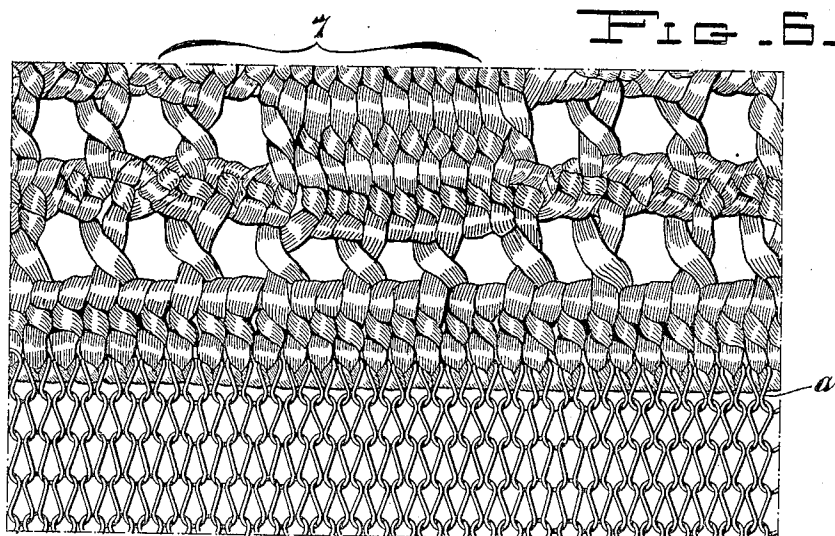
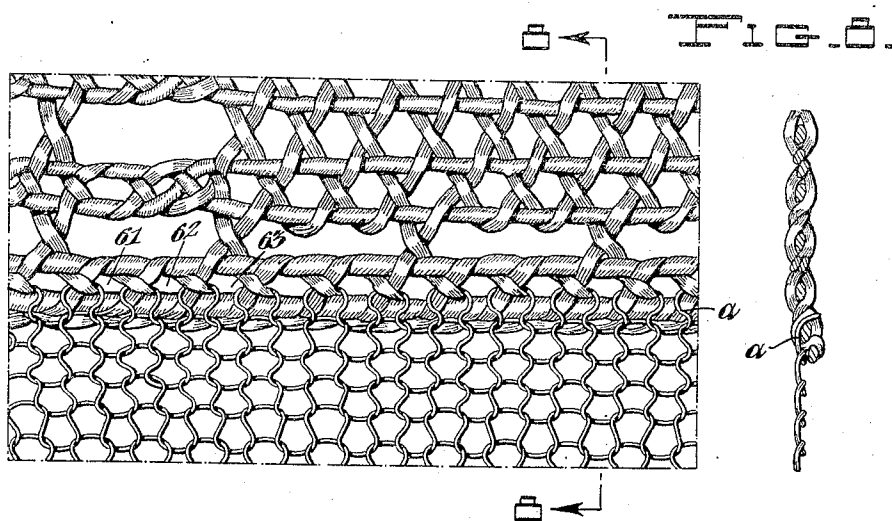


FIG. 7.



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Filed April 11, 1935

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FIG. 9.

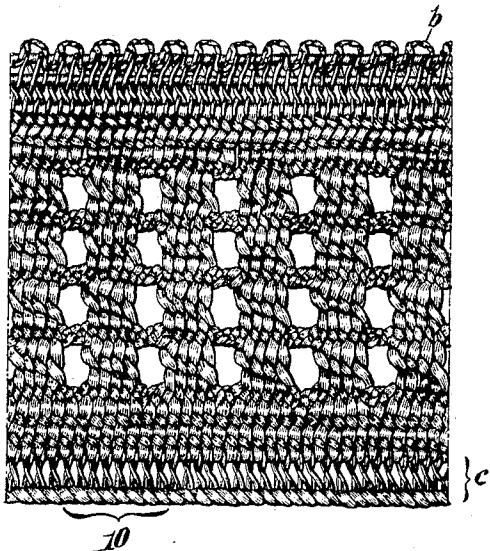


FIG. 10.

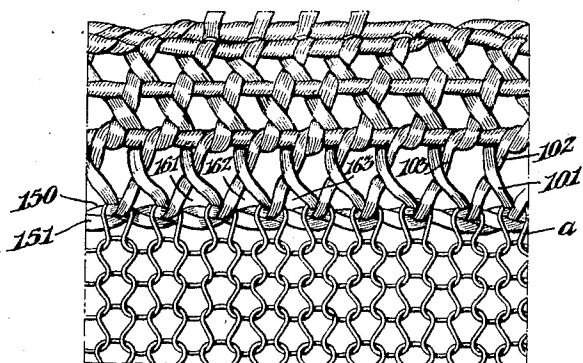
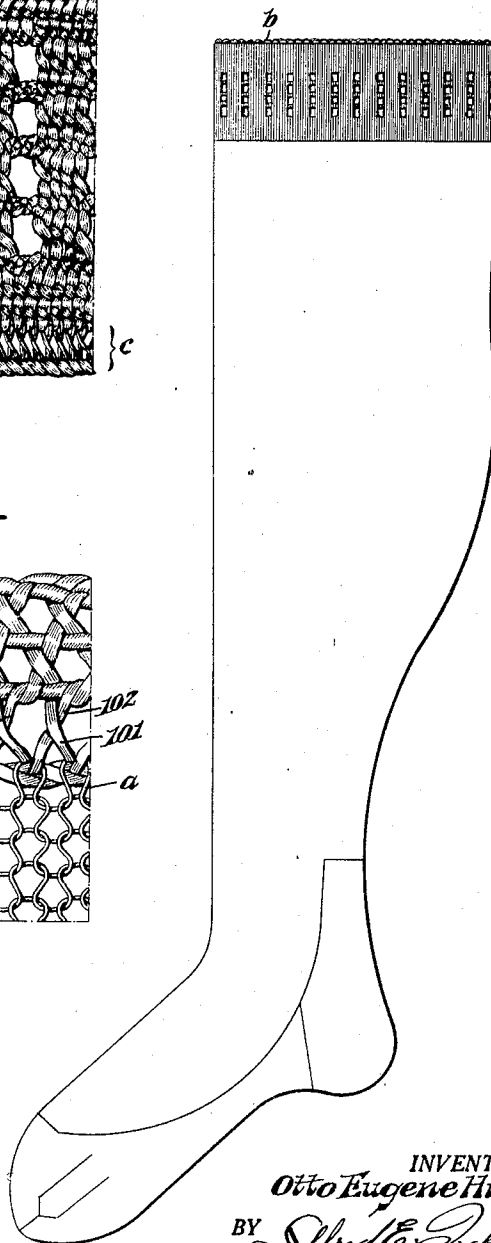


FIG. 11.



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UNITED STATES PATENT OFFICE

2,022,350

BRAID ELASTIC FABRIC AND METHOD OF
MAKING THE SAME

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Application April 11, 1935, Serial No. 15,761

16 Claims. (Cl. 96—25)

This invention relates to elastic fabrics such as braided bands and the like, and more particularly to a new and improved method of producing such fabrics.

In the past, a number of difficulties have been experienced in producing elastic lace-braid bands having varied and attractive designs therein. This being especially true of such bands having a straight bar effect in their design, as produced by the longitudinally extending strands. When produced by methods different from the one herein described, the defects common to such materials, namely, creeping, bunching, slipping, etc., of the yarns, could be obviated only with considerable difficulty and excessive expense.

With this in view, it is an object of the invention to produce novel elastic lace-braid bands, which overcome the mentioned and other difficulties.

It is also an object of this invention to produce elastic lace-braid wherein the transverse binding threads are never placed under any excessive tension even though the elastic longitudinal strands may be stretched to their elastic limit.

A still further object of this invention is to produce elastic lace-braid which has a minimum of latitudinal or sidewise contraction even though the elastic strands be stretched excessively in a longitudinal or lengthwise direction.

A further object of this invention is to produce an elastic braid wherein the laterally extending threads are prevented from creeping and causing a bunched appearance in the fabric.

Another object of the present invention is to produce a novel elastic lace-braid fabric or band having elastic strands extending longitudinally thereof, which strands are inter-locked with each other and with other strands of the braid structure to insure the permanency of relationship between the elements in the shape and form as braided, i. e. the several strands in the braid structure are so intertwined that no single one or a number of the strands may be pulled longitudinally to any extent.

Another object is to produce inexpensive and effective, yet beautifully designed, elastic-braid bands having all of the above and other advantageous elements and features, and which are particularly adapted for use as garter tops or elastic welt units for hosiery.

Another object of the invention is to provide an elastic braid having a distinct border design which is not only concerned with the attractive appearance of the article, but in which such edge presents a readily discernable topping on line

adapted to facilitate the attachment thereof to the knit loops of a stocking.

It is another object of this invention to produce such elastic-braid bands in designs comprising a repeated pattern having dense center portions separated by open lace-like center portions, both of which are centrally positioned by pillar-like strands extending perpendicularly from longitudinally extending border portions.

A still further object is to produce novel lace-braid fabrics or bands in which the design will be relatively unchanged even though the band is fully extended; the only effect of extending the band being to produce a slightly more open and loose-course structure, still retaining, however, the basic features of the original untensioned band.

It is also an object to produce a novel braided fabric of this type, wherein the extension of the band is accompanied by a practically equal extension of both the dense and the open center portions with very slight, if any crosswise contraction of these center portions, the lengthwise stretch of the braided band being effected by stretching of the longitudinally extending elastic pairs of strands, which strands are kept parallel for a fixed portion of their length and are then concurrently intermittently intertwined within a given strand pair for the production of a lace-like or open work effect in the center portion of the band.

In addition, it is an object of this invention to produce such elastic lace-braid bands by an improved method and to simultaneously embody within the braid, non-elastic binder strands, singly decussated and yet completely effective in holding the elastic strands and inelastic strands against movement and/or "creeping" relative, both to each other and to the body of the braid fabric and yet only very slightly, if at all, to effect limiting of the longitudinal or lengthwise stretching qualities of the fabric. It is also to be noted that ornamental designs and open mesh or lace forms of considerable beauty are possible and may be effected by utilizing this method of manufacturing braided fabric, which designs could not heretofore be produced.

With these and other objects in view, which will become apparent from the following detailed description of the illustrative embodiments of the invention shown in the accompanying drawings, my invention resides in the novel braided elastic fabrics and articles and methods of producing the same.

In the drawings:

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Figure 1 is an enlarged face view of a piece of elastic lace-braid made according to the principles of this invention;

Fig. 2 is a corresponding face view of fabric similar to that shown in Fig. 1, but illustrating respectively a longitudinally extended portion of the same, namely that portion indicated by the bracket 2 of Fig. 1 but, however, in extended condition;

Fig. 3 is a diagrammatic composite view illustrating, enlarged, the fabricated portion indicated in Fig. 2 by the bracket 3; at the top, above the line 4-4, the manner in which the various strands appear after they are inter-laced or decussated; in the center, between lines 4-4 and 5-5, is shown the course of the bobbins which carry the elastic or elastic and inelastic strands; and at the bottom, below the line 5-5, this figure shows a portion of the raceway or race circle which limits and/or determines, with the aid of a jacquard mechanism, the course travelled by the bobbins;

Fig. 4 is a further enlargement of the elastic lace-braid and more specifically is that portion indicated in Fig. 1, by the bracket 4;

Fig. 5 is a view similar to that of Fig. 4, but showing only a portion of the fabric of Fig. 4 in a stretched condition, namely that portion more specifically indicated in Fig. 4, by the bracket 5;

Fig. 6 is a view of the elastic lace-braid fabric shown in Figs. 1 to 5 inclusive but with a portion of the first course of a knitted stocking leg integrally knitted therewith. More specifically, this figure shows that portion indicated by bracket 6, of Fig. 4;

Fig. 7 is a view similar to that of Fig. 6 but shows a portion of the knitted stocking and the elastic lace-braid thereon in extended or stretched condition. More specifically this figure shows that portion indicated by bracket 7 of Fig. 6, but in extended form;

Fig. 8 is a section taken along the line 8-8 of Fig. 7;

Fig. 9 is an illustration of a design for a lace-braid elastic fabric for a stocking top in a preferred construction, the same being a modification of the form shown in Figs. 1 and 8;

Fig. 10 is a detailed view showing the fabric of Fig. 9 together with a portion of the first course of a knitted stocking integrally knitted thereto. More specifically this figure shows a portion of the elastic fabric indicated by bracket 10, Fig. 9; and

Fig. 11 is a completed stocking blank and an integrally knitted elastic lace-braid fabric thereon.

According to the invention, the improved elastic lace-braid may be manufactured by any of the well-known lace braiding machines which may be governed in their design producing effects by the familiar jacquard mechanism which in turn controls the travel of the various carriers about one or more tellers or quoits, and thereby forms the finished fabric. The operation of the jacquard mechanism is so well-known to those versed in the related art that no description of it is deemed necessary here.

Referring now, more particularly to the diagrammatic pattern illustration shown in Fig. 3, 11 represents the tellers or quoits which are rotated under the control of the ordinary jacquard mechanism, causing the bobbins or yarn carriers diagrammatically indicated at 12 to traverse the race-courses. In accordance with the

punchings in the pattern cards of the jacquard mechanism, some of the bobbins 12 will be idle still others will course one teller, while others will course or traverse the whole series of tellers.

In the pattern shown in the figures, and particularly more clearly shown in Fig. 3, the strands 13, 14, 15, 16, indicated by the heavy lines may be cotton or silk covered elastic fibers or even bare rubber strands and, as usual, are especially tensioned or held taut so as to increase their length during the braiding operation. It is to be noted, that at portions such as 51, 52, 53, pairs of elastic strands, e. g. pairs 15, 16; pairs 17, 18, are interchanged or twisted, and are themselves intertwined with other elastic or inelastic yarns or strands whereby to prevent these elastic strands from being pulled-out longitudinally of the braid.

The strands which are designated in the drawings by numerals 31 to 44 inclusive (see particularly Fig. 3) may be either other elastic strands of a different gauge than the elastic strands 13, 14, 15, 16, etc. or inelastic strands, and these strands 31 to 44 are, as is customary in braiding apparatus, carried by the spindles 12 and caused to form the pattern together with such other elastic strands, also on other spindles 12.

In producing the pattern illustrated in Figs. 1 to 9, the bobbins 12 carrying elastic strands 13, 14, interbraid their strands with the other strands while they themselves remain rotating each on its own teller only. Bobbins 12, carrying strands 15, 16, 17, 18 interbraid their strands with the other strands and remain rotating each on one teller for a portion of the time and then both cross over and within pairs mutually interchange tellers, the one with the other at a predetermined point in the fabric.

Bobbins 12, carrying strands 32, 34, 35, 36, 37, 38, 39, 40, 41 and 43, will be seen to traverse at some time or another each and/or every teller on the braiding machine.

In order to more clearly follow out the course of the inelastic or elastic transverse strands, one of the same, denoted by letter X has been shaded in Figs. 3 and 5.

The various threads, both elastic and inelastic threads, are similarly numbered in all the drawings Figs. 1 to 8 inclusive. The structural details of the novel elastic lace-braid and its method of attachment to, and integral knitting with, the stocking blank, are very clearly shown, and more particularly so in the extended or stretched views of the elastic fabric. For this reason, mere reference to the diagrammatic view of Fig. 3 together with any one of the extended or stretched views of the finished and correspondingly designed article is believed to clearly and adequately disclose the complete details of the invention.

However, in order to further facilitate an understanding of the invention herein involved, the first course of the stocking is indicated by letter "a". This course is produced on the needles of a straight or full fashioned stocking knitting machine after the new and improved braid has been topped onto said needles, in the well known manner, the openings, indicated at 61, 62, 63, etc. at the edge of the braid being particularly adapted for the transfer operation. It will be seen from an inspection of Figs. 6 and 7 that the number of interstices at such braid edge correspond with the number of loops coursewise of the stocking, hence, providing an extremely efficacious medium for the attachment of a braided top to knitted stockings.

Figs. 9 and 10 show an improved elastic lace-braid having a picot edge "b" and an improved topping edge "c" comprising inter-lace braided elastic or inelastic threads 101, 102, 103, etc., firmly held in place by an intertisted pair of elastic threads 150, 151 to form a stable selvage edge which may be topped, through openings 161, 162, 163, etc., on the needles of the stocking knitting machine.

In the form of the invention shown in detail in Figs. 9 and 10, there is provided a braid having a topping edge especially adapted to cooperate with the instrumentalities used in a topping-on operation; also, this new braid has been devised with a view to a more permanent non-slipping arrangement between the elastic and other elastic or inelastic threads at its edge. In the operation of topping a stocking with elastic braid, the latter is usually stretched prior to its attachment to the transfer bar and subsequently to the knitting needles, which not only spreads the openings 161, 162, 163, etc., to facilitate positioning the transfer points or needles therein, but affords the correct amount of contraction in the top of the finished stocking. In the usual types of elastic braid wherein the elastic strands are merely laid straight and held from longitudinal slippage only by the crossing therewith of inelastic threads, when such braids are stretched considerable care must be taken to grip all the strands at each end thereof to prevent the dislocation of the elastic strands. If these elastic strands are deranged from their original position in the braid it results most times in the destruction of such braid for use.

As best seen in Fig. 10, the elastic strands 150, 151 at the topping edge of the braid are crossed with each other and interbraided with inelastic strands 101, 102, and by such construction the braid is insured against any of the usual difficulties which occur during handling.

It is to be noted that this invention involves a novel lace-braid and a novel method of knitting a stocking integrally with an edge of an elastic lace-braid. It is to be further noted that this method of integrally knitting a lace-braid and a stocking is not limited to its use on a straight or full fashioned stocking knitting machine, whether for stockings or for other knitted fabrics wherein an elastic member would be a desirable element.

It will appear from the foregoing that the several illustrated and described embodiments of this invention are directed to braids composed of a plurality of elastic and inelastic strands which are arranged in the new and improved manner to provide stretch only in the longitudinal plane thereof, these particular illustrated embodiments being adapted to serve as welts for stocking tops, in which use it is preferable to have elasticity only transversely of the stocking. This, however, is not to be construed as limiting to the invention, as the new and improved braid may well be constructed to provide both longitudinal and transverse stretch and still retain all of the herein disclosed novel features, e. g., an open mesh beautifully designed elastic braid to be used as stocking top welts, and having a spaced selvage presenting a readily discernable topping-on line in braids of this type, or an elastic braid for use in underwear or other articles wherein it is desirable to have an elastic element capable of being stretched in more than one direction.

Of course, the improvements specifically shown and described, by which I obtain the above re-

sults, can be changed and modified in various ways without departing from the scope of the invention herein disclosed and hereinafter claimed.

I claim:

1. A braided stocking welt composed of elastic and inelastic strands inter-lace-braided to provide a main center portion and a distinct selvage edge or border portion spaced therefrom, said selvage edge comprising a pair of decussated elastic strands and inelastic strands intertisted therewith, said inelastic strands connecting the selvage edge with the center portion.

2. A braided stocking welt composed of elastic and inelastic strands inter-lace-braided to provide a main center portion and a distinct selvage edge or border portion discernably spaced therefrom, said elastic strands being arranged in pairs in both said main portion and selvage edge with the strands of at least one such pair intertisted about each other, and said inelastic strands connecting the selvage edge with the center portion.

3. A stocking welt composed of elastic and inelastic strands inter-lace-braided together, certain of the elastic strands being arranged in decussated pairs, a selvage edge or border portion spaced from the main portion of the braid a distance sufficient to provide a readily discernable topping line on the welt, and certain of said inelastic strands connecting said selvage edge to the main portion of the braid, said last named inelastic strands providing distinct regularly spaced interstices adjacent such selvage edge of the braid.

4. A braided stocking welt composed of elastic strands and transverse strands inter-braided to provide a main central portion and a distinct selvage edge or border portion spaced therefrom, said selvage edge comprising an elastic strand and transverse strands intertisted to provide a readily discernable topping line of regularly spaced interstices adjacent such selvage edge.

5. A braided stocking welt composed of elastic strands and other strands inter-lace-braided to provide a main central portion and a distinct selvage edge or border portion spaced therefrom, said elastic strands in said selvage edge being paired and intertisted with each other and with certain of the other strands and providing a readily discernable topping line of regularly spaced interstices adjacent such selvage edge.

6. An elastic lace braid comprising elastic longitudinal strands, transverse braiding threads interconnecting the elastic strands, said braid having auxiliary selvage edge or border portions and a longitudinally extending center portion of alternately juxtapositioned dense and open sections, the elastic strands of both portions being arranged in decussated pairs substantially parallel to each other.

7. An elastic lace braid comprising elastic strands, transverse braiding threads interconnecting the elastic strands, said braid having an auxiliary border portion, the braiding threads transversely coursing the braid and connecting the border portion to the center portion and forming a selvage edge with a pair of said elastic strands, said pair of strands being intertisted about each other and a transversely coursing thread inserted therebetween.

8. An elastic lace braid comprising elastic strands, transverse braiding threads interconnecting the elastic strands, said braid having auxiliary border portions and a main center por-

tion, the braiding threads transversely coursing the braid and connecting one of the border portions to the center portion and forming a selvage edge with a pair of said elastic strands, said pair of strands being intertwisted about each other and a transversely coursing thread inserted therebetween, the other border portion being a picot edge of intertwisted interconnecting braiding threads.

9. An elastic lace braid comprising elastic strands, non-elastic braiding threads interconnecting the elastic strands and holding the braid against substantial lateral extension, said braid having auxiliary selvage edge or border portions and a longitudinally extending center portion of alternately juxtapositioned dense and open sections, the elastic strands of both portions being arranged in decussated pairs.

10. An elastic lace braid comprising elastic strands, transverse non-elastic braiding threads interconnecting the elastic strands and holding the braid against substantial lateral extension, said braid having auxiliary selvage edge or border portions and a longitudinally extending center portion of alternately juxtapositioned dense and open sections, the elastic strands of the center portion comprising a plurality of longitudinally extending pairs of threads having the threads of each pair twisted about each other only in the open sections thereof.

11. An elastic lace braid comprising elastic strands, transverse non-elastic braiding threads interconnecting the elastic warps and holding the braid against substantial lateral extension, said braid having auxiliary selvage edge or border portions and a longitudinally extending center portion of alternately juxtapositioned dense and open sections, the elastic strands of the center portion comprising a plurality of longitudinally extending decussated pairs of threads, said threads being substantially parallel to each other in the dense section thereof.

12. An elastic lace braid comprising longitudinal elastic strands, inelastic braiding threads interconnecting the elastic strands and holding the braid against substantial lateral extension, said braid having an auxiliary selvage edge or border portion and a main center portion, the inelastic threads transversely coursing the braid and connecting the border portion to the center portion, and said inelastic threads forming the selvage edge with a pair of said elastic strands, said pair of strands being intertwisted about each other and a transversely coursing inelastic thread inserted therebetween.

13. The method of making an elastic lace braid fabric which comprises feeding to a braiding point longitudinally extending elastic strands in predetermined spaced relation with respect to each other and with two of said strands arranged closely parallel and at one side of said other strands, maintaining tension on said strands to elongate the same at said braiding point, inter-

braiding non-elastic strands with said longitudinally extending strands in transverse direction relative thereto to produce a lace-like fabric and simultaneously intertwisting such pair of strands in such manner as to maintain the same and the interbraided strands in predetermined position relative to each other and to said other longitudinally extending strands, and arranging said pair of twisted strands and the interbraided strands connecting the same to provide a distinct selvage edge.

14. An elastic band adapted to be connected to an article of wearing apparel having an edge portion provided with a certain number of connecting elements, the said band being adapted to maintain said article of wearing apparel in position on the body of the wearer, and provided with a selvage topping on edge which is spaced from the main body portion of the band, and joined thereto by transversely extending elements equal in number to the connecting elements of the article of wearing apparel, said body portion consisting of a series of relatively spaced fabric sections separated from one another by apertures extending through the body fabric and which cooperatively function with the apertures to exert a double gripping action upon the surface being gripped.

15. An elastic band adapted to be connected to an article of wearing apparel, provided with a number of elements for engagement with the band, to effect holding of the article in position on the body of wearer, the said band having a selvage edge provided with means for engagement with each of said elements and spaced from the body portion of the band by strands extending transversely from the body portion, the main body portion of the band including a portion consisting of a series of relatively spaced fabric sections separated from one another by apertures extending through the body fabric and which cooperatively function with the apertures to exert a double gripping action upon the surface being gripped.

16. The method of making a lace braid fabric which comprises feeding to a braiding point longitudinally extending strands in predetermined spaced relation with respect to each other and with two of said strands arranged closely parallel and substantially spaced from said other strands, interbraiding strands with said longitudinally extending strands in transverse direction relative thereto to produce a lace like fabric and simultaneously intertwisting such pair of strands in such manner as to maintain the same and the interbraided strands in predetermined position relative to each other and to said other longitudinally extending strand, and arranging said pair of twisted strands and the interbraided strands connecting the same to provide a distinct selvage edge.

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