May 24, 1932. H. C. ABERLE 1,860,272

ELASTIC WELT FOR STOCKINGS

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Fig. 1.

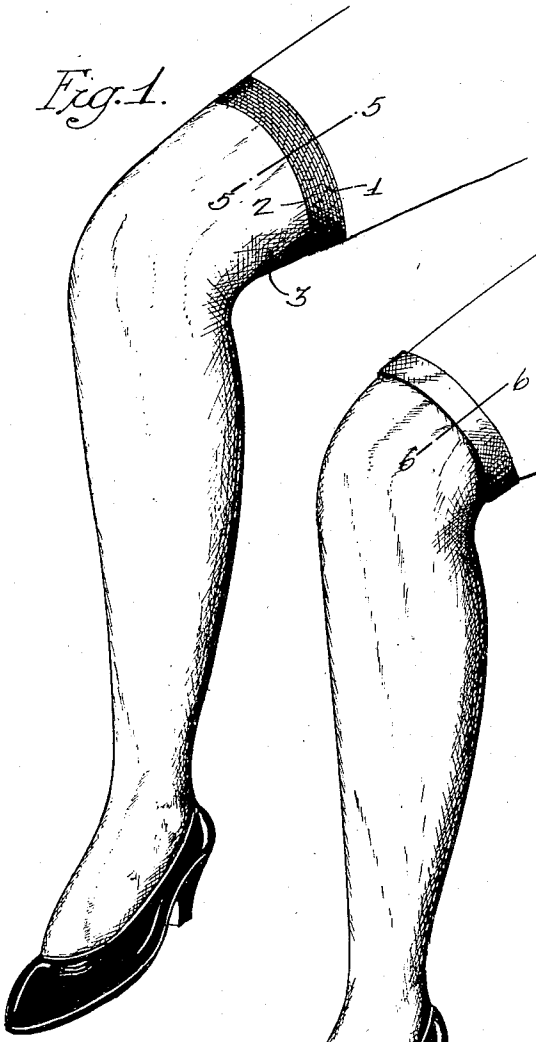


Fig. 2.

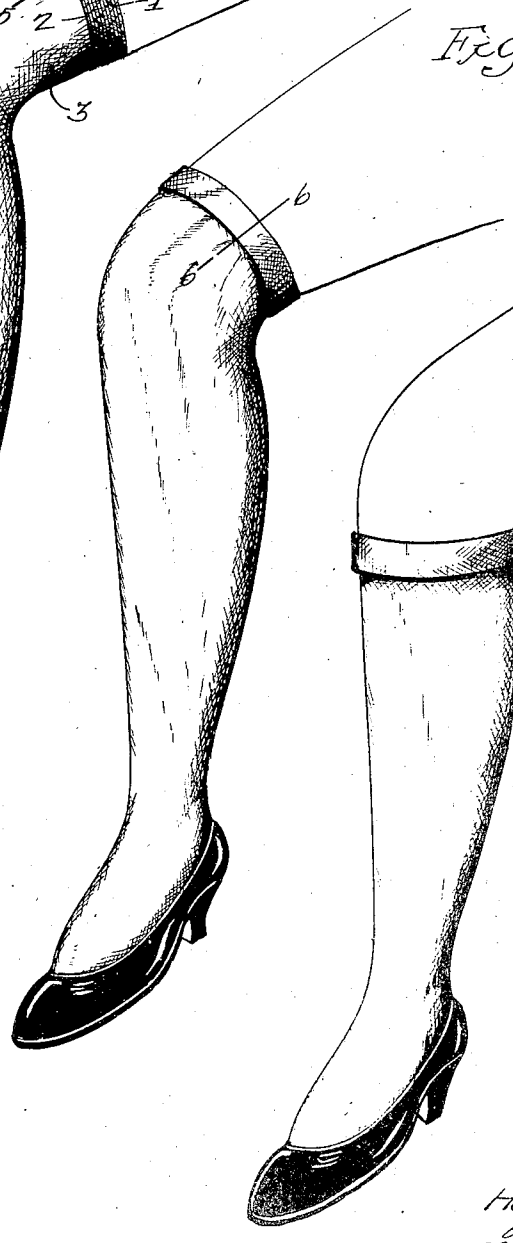


Fig. 3.

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Fig. 7.

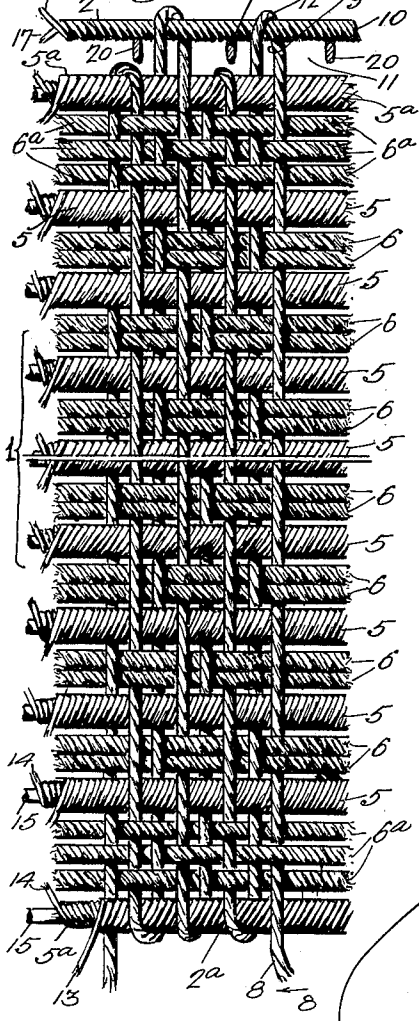


Fig. 4.

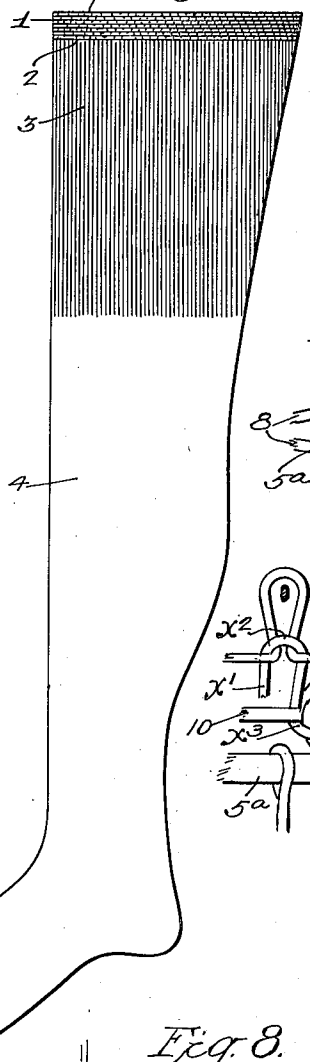


Fig. 5.



Fig. 6.

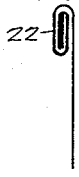


Fig. 9.

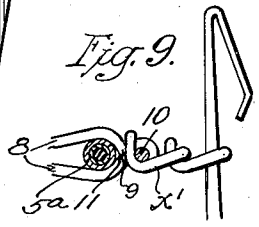


Fig. 10.

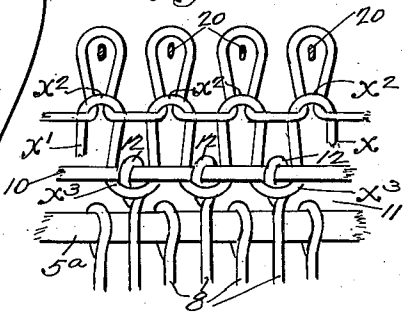


Fig. 8.

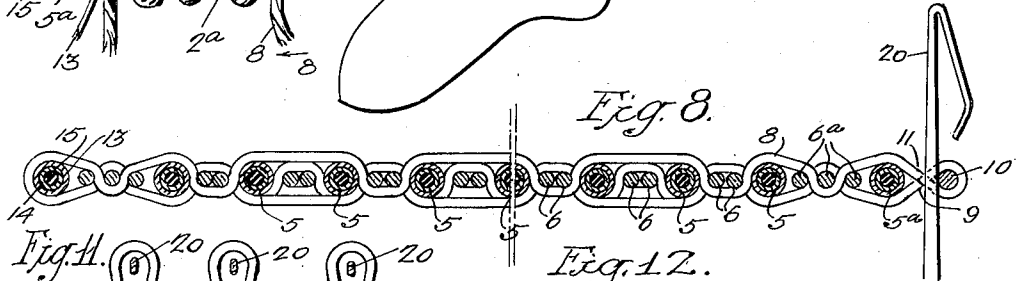


Fig. 11.

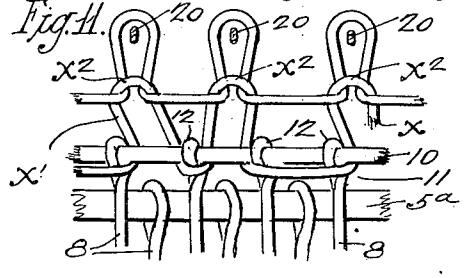
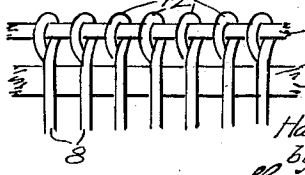


Fig. 12.



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UNITED STATES PATENT OFFICE

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ELASTIC WELT FOR STOCKINGS

Application filed November 27, 1931. Serial No. 577,603.

This invention relates to hosiery, and more particularly to a stocking having an elastic welt adapted to maintain the stocking smoothly and in a fixed position on the limb of the wearer at full length, knee length, calf length, or other intermediate position without the use of additional supporting means.

Another feature of the invention resides in the provision of a relatively firm welt which will facilitate the folding of the stocking to any desired length, before or after the stocking has been applied to the limb of the wearer.

Another object of the invention is to produce the welt of the stocking as a separate preformed unit which may be readily applied to the needles of a knitting machine for the knitting of the leg portion of the stocking directly to the welt to form an integral part thereof, whereby the stocking at the juncture of the two parts of the stocking will have the same degree of elasticity as the areas adjacent thereto.

Another object of the invention is to provide an elastic welt composed of woven fabric and provided at one edge with a well defined readily perceptible line for facilitating the topping of the welt unit onto the points of a topping bar of a flat knitting machine, onto the quills of a transfer ring of a circular knitting machine or directly onto the needles of either of said types of machine.

Another feature of the invention resides in the particular construction of the welt fabric wherein a supplementary selvage cord is provided substantially parallel to and spaced laterally from one of the selvage edges of the body portion of the welt and is secured to the body as an integral part thereof, thereby providing the readily perceptible topping line and at the same time making the welt adaptable for application to the needles of a machine of any gage and eliminating the necessity for the topping of individual loops onto the points, quills or needles as above noted.

Another feature of the invention resides in the adaptability of the stocking to use with the popular girdle garter commonly secured to a girdle and attached to the stocking to keep the girdle down in place on the wearer. In such instances the stocking welt is subjected to severe strain, which in ordinary stockings frequently results in the starting of runs in the welt which many times extends down into the leg of the stocking. The elastic welt with suitable reinforcement of the stocking immediately below the welt obviates this condition.

Referring to the drawings:

Fig. 1 shows a stocking made in accordance with the principles of the present invention as being applied full length to the limb of a wearer;

Fig. 2 illustrates the stocking at knee length;

Fig. 3 illustrates the stocking at calf length;

Fig. 4 diagrammatically illustrates the stocking in flat form;

Fig. 5 is a section taken on the line 5—5, Fig. 1;

Fig. 6 is a section taken on the line 6—6, Fig. 2;

Fig. 7 is an enlarged and expanded diagrammatic view of a fragment of the welt, showing one form of weave, with the welt topped onto the needles of a knitting machine;

Fig. 8 is a section on the line 8—8, Fig. 7;

Fig. 9 is a view similar to Fig. 8, but showing two courses of stitches having been knit onto the elastic welt;

Fig. 10 is a diagrammatic view of the structure shown in Fig. 9;

Fig. 11 is a view similar to Fig. 10, but showing the welt applied to the needles of a coarser gage machine; and

Fig. 12 illustrates a modified edge on the welt.

As shown in the drawings, a stocking made in accordance with the principles of the present invention includes an elastic welt 1, which may be of any width desired, preferably from three quarters to one inch, for convenience in folding the stocking to any desired length.

Knit directly to the lower edge 2 of the elastic welt 1 is the upper leg portion 3 of the stocking. As shown in Fig. 4, the upper leg portion 3 is composed of relatively heavier fabric than the calf and lower leg portions

4 of the stocking. For example, in cases where the lower leg and calf portions would be composed of four-thread silk the upper leg portion 3 would be composed of eight-thread silk or other equivalent thread.

As shown in Figs. 7 and 8, the elastic welt 1 is a woven fabric composed of a plurality of rubber containing warps 5, 5, which alternate transversely of the body of the welt strip 1 with fibrous warps 6, 6 grouped in pairs.

At each of the opposite edges of the body of the welt strip 1 is an elastic selvage warp 5*a* and intermediate these elastic selvage warps and the first elastic body warp 5 is a series of three fibrous warps 6*a*, 6*a*.

At one edge of the fabric strip 1, in the present instance, and parallel to the selvage warp 5*a* is a supplemental selvage warp 10 which is spaced from the adjacent body selvage 5*a* leaving an open space 11 which constitutes a readily perceptible line along the edge of the body strip 1.

It will be here noted that Fig. 7 is a diagrammatic view of the fabric showing all the warp threads separated for the purpose of illustrating the particular weave employed but in the fabric as actually produced the warps 5, 5*a*, 6 and 6*a* lie in close lateral abutting relation to each other making a close woven fabric in which only the open space 11 is readily perceptible.

In order to produce such a fabric the warps 5, 5*a*, 6 and 6*a* are bound together by a continuous weft thread 8 which, as shown at the right side of Fig. 7, passes first under the center single fibrous warp 6*a* at one edge of the strip, over the other two adjacent single warps 6*a* and the first elastic warp 5, then under the first grouped pair of fibrous warps 6, then over the next elastic warp 5, the next grouped pair of fibrous warps 6 and the next elastic warp 5, and repeating this order of under one and over three across the fabric to the opposite edge thereof, where the weft 8 passes under the center one of the three single fibrous warps 6*a* from which it passes over the next single warp 6*a* and the body selvage 5*a*.

After passing over the last said body selvage warp 5*a* the weft thread 8 passes under and completely around the supplemental selvage 10 crossing itself within the space 11 as shown at 9 in Figs. 7, 8 and 9 and passing under the adjacent body selvage 5*a*.

The crossing of the weft 8 intermediate the body selvage warp 5*a* and the supplemental selvage warp 10 holds the said supplemental selvage warp 10 in laterally spaced relation to the adjacent body selvage warp 5*a*, thereby producing the readily perceptible open space or line 11 along the edge 2 of the welt strip 1, the return loops 12 of the weft 8 functioning as tie-threads at relatively closely spaced points longitudinally of the welt strip 1.

After passing under the elastic selvage warp 5*a* at the edge 2 of the welt strip 1, the weft 8 passes under the first single fibrous warp 6*a*, over the center single fibrous warp 6*a*, under the next single fibrous warp 6*a* and the first elastic body warp 5, coming up and over the first grouped pair of fibrous body warps 6, then going down and under the next two elastic body warps 5 and the intermediate grouped pair of fibrous body warps 6, 6.

This order of over one and under three then follows in sequence across the fabric until the three single fibrous warps 6*a* are reached at the opposite edge 2*a* thereof, where the weft 8 comes up and over the center single fibrous warp 6*a* and then passes under the next single fibrous warp 6*a* and the body selvage warp 5*a* at the edge 2*a* of the welt strip 1.

The weft 8 then passes around the elastic body selvage 5*a* at the edge 2*a* of the welt strip 1 and passes under the first single fibrous warp 6*a*, over the center single fibrous warp 6*a* and under the third single fibrous warp 6*a*, then over the first and second elastic body warps 5 and the intermediate grouped pair of fibrous body warps 6, then under the next grouped pair of fibrous body warps 6 and continuing this order of under one and over three across the strip until the single fibrous warps 6*a* at the edge 2 of the welt strip 1 is reached, where the weft 8 passes under the first warp 6*a*, over the center warp 6*a*, under the third warp 6*a* and over and around the elastic body selvage 5*a* at the edge 2 of the welt strip 1.

At this point, as shown in Fig. 7, the weft 8 does not pass around the supplemental selvage warp 10, but may do so if desired in order to double the number of tie-in loops or threads 12. Such an arrangement is shown in Fig. 12.

After passing over, around and under the elastic body selvage warp 5*a* at the edge 2 of the welt strip 1, the weft 8 passes over the first single fibrous warp 6*a*, under the center warp 6*a*, and over the third single fibrous warp 6*a*, then under the next two elastic body warps 5 and the intermediate grouped pair of fibrous body warps 6, then over the next grouped pair of fibrous body warps 6.

This order of under three and over one is followed out across the fabric until the single fibrous warps 6*a* at the edge 2*a* of the fabric is reached, where the weft 8 comes up and over the first single warp 6*a*, under the center single warp 6*a*, over the next single warp 6*a* and under, around, and over the elastic body selvage 5*a* at the edge 2*a* of the welt strip 1, thus completing one full cycle in the weaving of the welt strip 1.

While the particular weave has been described in detail any desired weave may be employed without departing from the essential feature of the welt strip which resides in the provision of the supplemental warp 10

in spaced relation to the body selvage 5*a* at one edge of the welt strip whereby a readily perceptible topping line 11 is formed at the one edge of the welt strip and wherein the number of tie-in loops 12 will be equal or greater per inch than the number of needles per inch of the finest gage knitting machine to which the welt is applied for knitting the leg portion of the stocking directly thereto.

In order that the welt strip 1 will be sufficiently elastic the elastic warps 5 and 5*a* are wrapped with fibrous threads 13 and 14 while the rubber core 15 is in a stretched or extended condition. When permitted to return to a normal unstretched state the covering threads of composite warp 5 or 5*a* will assume the form of closely positioned convolutions which will yield when the rubber core is again stretched.

The fibrous warps 6, 6*a* and 10 are for the same reason composed of double twisted threads 16 and 17.

The fabric is woven with all warps under tension, hence when the fabric is removed from the loom all the warps will contract longitudinally with the rubber cores 15 and the wefts 8 will also be drawn into close substantially abutting relation to each other.

When topped onto the needles of a knitting machine the welt strip 1 is in a normal unstretched condition with the tie-in loops 12 in close relation to each other.

In topping onto the needles of a knitting machine on the points or quills of a transfer device such needles or points are projected through the open line 11 without regard to the location of the tie-in loops 12 and it so happens that due to the close relation of the said tie-in loops 12 along the edge of the welt strip 1, one or more of the said tie-in loops will be positioned between each two adjacently positioned needles of the knitting machine, as shown in Figs. 7, 10 and 11, thus when the needles 20 pull the knitting thread x through the welt fabric 1 to form the first course of stitches x^1 of the upper leg portion 3 of the stocking a single loop x^2 (Figs. 10 and 11) will be formed by each needle 20, the sinker loops x^3 of the stitches x^2 passing around one or more of the tie-in loops 12 of the welt and behind the supplemental selvage 10.

In this manner the leg portion 3 of the stocking is integrally knit to the welt 1 and the juncture between the two is such that no restriction of elasticity of the stocking is present.

The welt 1, while it is extremely elastic and functions to support the stocking in any desired position on the limb of a wearer without additional supporting means, is also sufficiently firm to act as a form for folding the stocking smoothly and evenly from the position shown in Fig. 1 to that shown in Fig. 2 or Fig. 3, such folding being illustrated in Figs. 5 and 6 respectively, where the welt 1 forms the center or core of the flat fold 21 or 22 in said figures.

When used with a garter that is secured to a girdle, corset etc., the garter fastening, see Fig. 1, is attached to the elastic welt 1 which has very little elasticity lengthwise of the stocking and therefore firmly holds the garter fastener 25. In order to avoid breaking stitches at the line of juncture where the welt 1 is integrally attached to the upper leg 3 in line with the garter fastener 25 the upper leg portion 3 of the stocking is preferably made heavier than the lower leg portion 4, as noted above.

I claim:

1. A stocking composed of a woven welt having a selvage spaced from the body of the welt a distance sufficient to provide a readily discernable topping line on the welt, and a leg knitted onto said spaced selvage.

2. A stocking composed of a relatively firm woven welt having a selvage spaced from the body of the welt a distance sufficient to provide a readily discernable topping line on the welt, and a leg knitted onto said spaced selvage.

3. A stocking composed of a relatively firm woven elastic welt having a selvage spaced from the body of the welt a distance sufficient to provide a readily discernable topping line on the welt, and a leg knitted onto said spaced selvage.

4. A stocking comprising a welt composed of woven fabric consisting of warps and wefts with one of said warps spaced laterally from the remaining warps a distance greater than the normal spacing of said remaining warps and tied thereto by said wefts, and a leg knitted to said spaced warp.

5. A stocking comprising a welt composed of woven fabric consisting of warps and wefts with the outermost warp at one edge of the welt spaced laterally from the remaining warps a distance greater than the normal spacing of said remaining warps and tied thereto by predetermined wefts passing around said spaced warp and crossing themselves respectively intermediate said spaced warp and the warp next adjacent thereto, and a leg comprising a course of stitches looped around the weft crossings and the said spaced warp.

6. A welt unit comprising a body composed of warps and wefts and a selvage warp spaced laterally from said body a distance greater than the normal spacing of the body warps and secured thereto by threads extending outwardly from said body providing a readily discernable topping line on the welt unit.

7. A welt unit comprising a woven fabric consisting of a body composed of warps and wefts and a selvage warp spaced laterally from one edge of said body a distance greater than the normal spacing of the body warps

and secured thereto by predetermined wefts forming a relatively open space between the body of the weft and the said spaced warp.

8. A welt unit comprising an elastic woven fabric body including a plurality of elastic warps and non-elastic welts, and a warp spaced laterally from said body a distance greater than said body warps and secured thereto by predetermined wefts to form a relatively open space between the spaced warp and the body of the welt.

9. A welt unit comprising an elastic woven fabric body including a plurality of elastic warps and non-elastic wefts, and a warp spaced laterally from said body a distance greater than the spacing of said warps and secured thereto by predetermined wefts passing from one face of the body into the relatively open space formed between said body and said laterally spaced warp, thence around said laterally spaced warp and through said space to the opposite face of said body.

10. A stocking welt unit consisting of longitudinal warps and transverse threads binding said warps together to form the body of the welt and a selvage spaced from the body a distance sufficient to provide a readily discernable topping line on the welt.

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