Sept. 13, 1932. H. HARRIS 1,877,458

KNITTED FABRIC FOR HOSIERY

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Fig. 1.

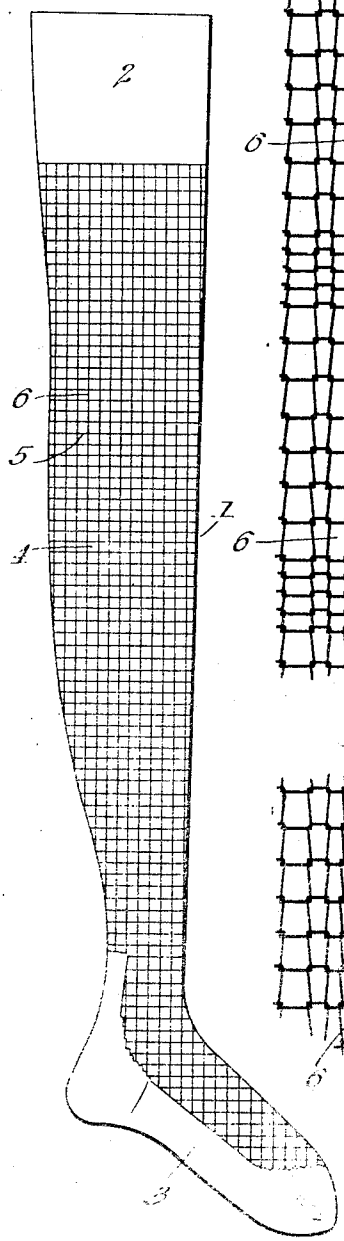

Fig. 2. -All Needles Working- -One Sinker Out- Five Sinkers In- -or Special Sinker In-

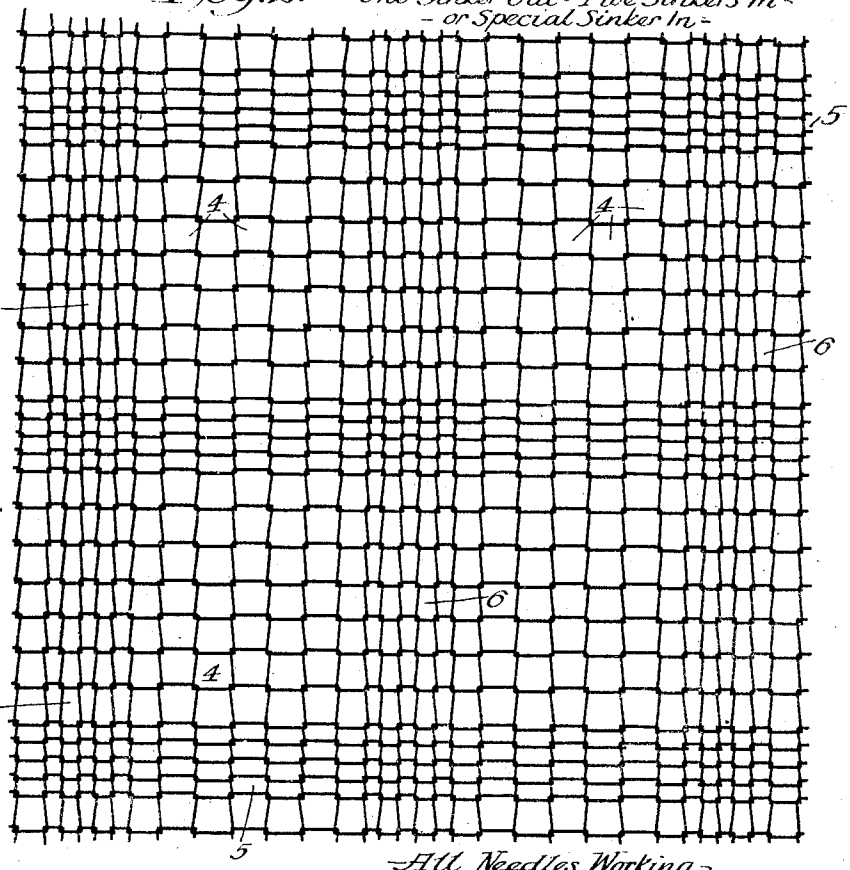

Fig. 7. -All Needles Working- -One Sinker Out- Five Sinkers In- -or Special Sinker In- -No Tranverse Tight Stitches-

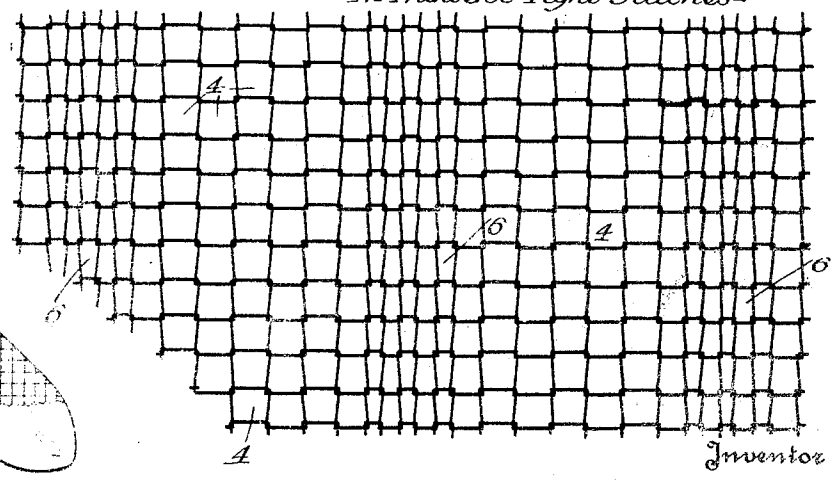

Fig. 6.

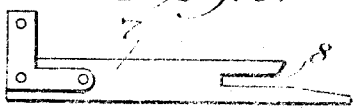

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Fig. 3

All needles working, ONE sinker out, TWO sinkers in.
(or special sinker in)

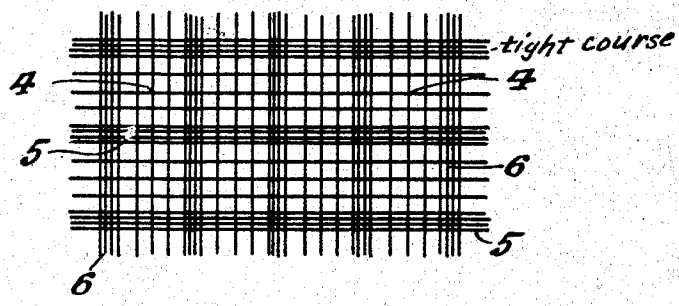


Fig. 4

All needles working, ONE sinker out, THREE sinkers in.
(or special sinker in)

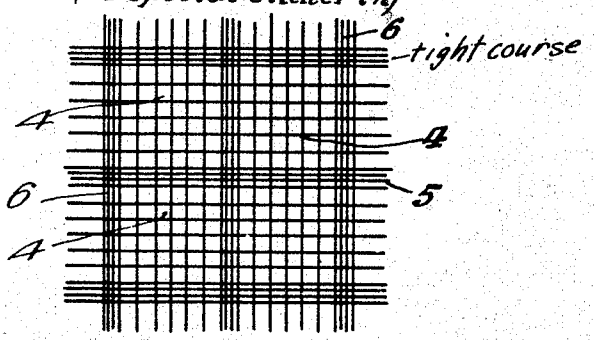


Fig. 5

All needles working, ONE sinker out, FOUR sinkers in.
(or special sinker in)

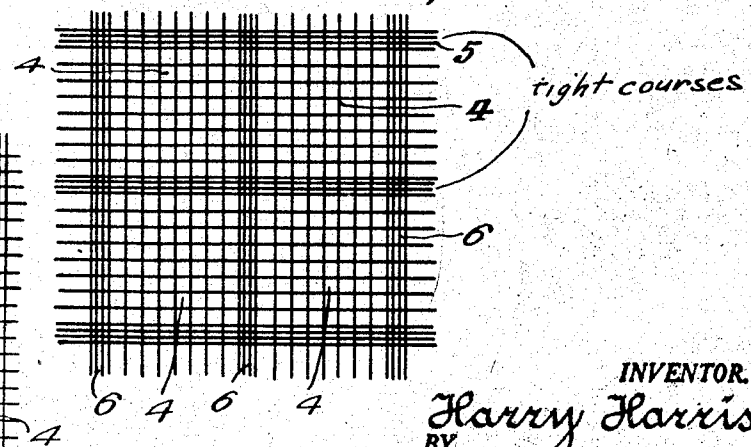
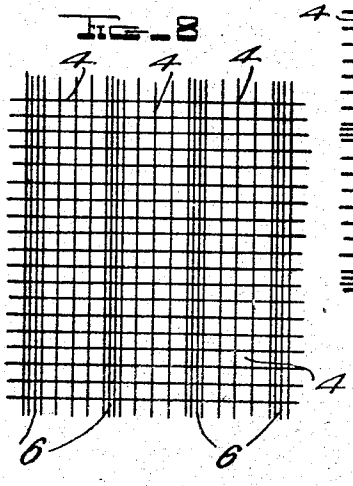


Fig. 8



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Patented Sept. 13, 1932 1,877,458

UNITED STATES PATENT OFFICE

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KNITTED FABRIC FOR HOSIERY

Application filed December 17, 1931. Serial No. 581,754.

My invention relates to new and useful improvements in knitted fabrics and more particularly to a knitted fabric adapted for use in the manufacture of full-fashioned hosiery, the primary object of the invention being to provide a new and improved method of producing a fabric and a new and improved fabric wherein the same is formed with lacelike patterns producing a most desirable shadowed effect.

A further object of the invention resides in providing a means for producing a fabric and a fabric wherein a plurality of rectangular blocks are formed through the provision of vertical and horizontal lines, the vertical and horizontal lines being respectively formed in said fabric through different mediums on a flat or full-fashioned knitting machine.

A still further object resides in the making of a fabric wherein the vertical lines, or those running in the direction of the wales, are produced by omitting one sinker of the knitting machine at regular and predetermined intervals or by utilizing a special slotted sinker and wherein the horizontal lines or those running cross-wise in the direction of the courses, are formed by producing a predetermined number of tight courses at certain predetermined and regular intervals in the knitting of the fabric, thereby to produce blocks in the fabric of predetermined and definite size which produce a shadow effect, giving to the hosiery made of such fabric a beautiful and most desirable appearance.

A further object of the invention resides in the production of a fabric and the means for accomplishing it so that blocks of varied sizes may be produced therein, according to the desire of the manufacturer.

The lace effects are simulated in two ways which may either be used alone or in combination with each other, depending upon the desired fabric. I have discovered that by knitting certain loops in either predetermined courses or predetermined wales or both with an abnormally small amount of yarn, pleasing lace effects are obtained that heretofore were never obtainable. Thus, during the sinking operation I omit certain sinkers from operation or render their operation ineffective for measuring loops. The resultant loops will be constricted and the remaining loops of the fabric will consequently be relatively larger. As a result of this, the fabric has an open work appearance such as is commonly called lace work in the knitting art because it simulates lace. Another result of omitting sinkers is that in the subsequent loop drawing operation the constricted loops will rob adjacent loops so that there will be a gradation of loop size between the most constricted loops and neighboring larger loops or normal size loops. This will give a pleasing shadow effect not heretofore obtained so far as I am aware.

The constricted loops, as above described, are produced by rendering certain sinkers entirely ineffective. Of course, similar effects to a less marked degree might be obtained by rendering sinkers only partially or slightly effective. This leads me to my other method above mentioned. In certain predetermined courses all the sinkers can be made to measure shorter loops than normal or in other ways, shorter loops may be formed. These interspersed with normal length or longer loops in other courses will have the result similar to that above described. The resultant fabric will have an open work or lace-like effect with a somewhat shadowy appearance.

These two methods can be used separately or together to make either horizontal or vertical stripes or figured areas of various kinds, such as squares, rectangles, etc. In fact, any design might be produced by my method, but that is a matter of fabric designing and needs no further discussion here.

Thus, still another object of the invention resides in the production of a fabric to produce the effect aforesaid with a means which is more or less simple and inexpensive, so that the cost of production of hosiery made of such fabric will not be unduly increased, and the fabric will have an enhanced appearance which has thus far never been produced in a fabric so far as I am aware.

With these and other objects in view my invention consists in the novel features of construction, combination and arrangement

of parts as will be hereinafter referred to and more particularly set forth in the specification and claims.

In the accompanying drawings forming a part of this application,

Figure 1 is a side elevation of a stocking diagrammatically illustrating the effect produced therein when said stocking and fabric thereof are made in accordance with my invention.

Figure 2 is an enlarged detail elevation of a section of the fabric showing the arrangement of the threads in the knitting process which produces the blocks in said fabric.

Figure 3 is a diagrammatic view of a section of the fabric showing the effect when all needles are working one sinker being out or in place thereof a special slotted sinker substituted and two succeeding sinkers remaining in.

Figure 4 is a similar view wherein the effect is produced with a larger block, one sinker being out or the special slotted sinker substituted and three succeeding sinkers remaining in.

Figure 5 is a similar view showing the effect with a still larger block formed in the fabric with one sinker out or a special slotted sinker substituted and four succeeding sinkers remaining in.

Figure 6 is an elevation of a specially provided sinker slotted from its outer end.

Figure 7 is an enlarged detail elevation of a section of fabric made without any transverse lines being formed therein; and

Figure 8 is a diagrammatic view of a section of the fabric showing the effect as produced by the disclosure in Figure 7.

I have not attempted to show all the various patterns that might be made by the use of my invention. Instead, I show certain illustrative simple patterns that have been made and have proven very satisfactory.

In describing the invention, I shall refer to the drawings in which similar reference characters designate corresponding parts throughout the several views and in which 1 designates a stocking leg, the welt of which is designated by the numeral 2 and the numeral 3 represents the foot attached thereto. The leg is shown as being made of a fabric producing a plurality of rectangular blocks designated by the numeral 4, the same being formed through the medium of vertical and horizontal lines. As shown, the blocks continue through a portion of the foot and stop at the welt, but it will be understood that these blocks may be formed in the welt and throughout the length of the stocking if desired.

In carrying out my invention I desire to produce a fabric in which the body of the blocks which are formed are knit in the usual manner and said blocks are formed by the production of vertical and horizontal lines, that is, lines which run in the direction of the wales and lines which run cross-wise or in the direction of the courses. For convenience I have designated in the drawings the cross-wise or horizontal lines by the numeral 5 and the vertical lines, running in the direction of the wales as 6. In order to produce the horizontal lines 5 a predetermined number of tight courses are formed at regular and predetermined intervals in the knitting of the fabric, such tight courses being provided in a usual or any well-known manner. On the other hand, I produce the vertical lines or those running in the direction of the wales by preferably omitting a sinker in the knitting machine at predetermined and regular intervals in the knitting process, or by the use of a special slotted sinker such as designated by the numeral 7 in Figure 6. Whereas in the ordinary knitting of the fabric under normal conditions, such as is illustrated in the blocks 4, there is a certain amount of open-work in the stitches, the omitting of the sinker at certain intervals or the use of the slotted sinker 7 produces a closely knit line or the like designated by the numeral 6.

Note that in either case, by omitting sinkers wale-wise or producing tight stitches course-wise, I constrict certain predetermined loops. It is this constriction of the loops as distinguished from elongations of the loops that produces the phenomenal lace or open work effect. It is this constricting of loops which also causes the shadow effect which results from the abnormally tight loops robbing adjacent loops which have been measured with or been made to draw the normal or greater amount of yarn. Note also that I do not resort to displacing or shifting loops. All the loops have exactly the same structures or formations. The loops are only different in size. The gist of the invention, as applied to a full fashioned machine, is to make the sinkers advance an abnormally short distance or not advance at all.

The effect of the tight courses designated by the numeral 5 in the fabric appears obvious and both this effect and that designated by the numeral 6 are clearly illustrated, under enlargement, in Figure 2 of the drawings. In this particular view every third sinker is omitted so that there is one sinker out or special slotted sinker substituted and the succeeding two sinkers in, and at all times, all needles are in the machine and working.

In making this fabric with square designs, in all the blocks that are formed in this fabric, the tight courses are placed distances apart to conform with the distance apart that the vertical lines are disposed. In other words, where a fabric is formed with every fifth sinker out, or by substituting the special slotted sinker for every fifth sinker, eight courses are made before putting in four tight courses. In such a setup, a block is formed and in the case where the fabric is made with

two sinkers in and one sinker out or a special cut sinker provided every third sinker, it only requires four courses being knitted before putting in four tight courses to form a smaller block.

In Figure 3, I have shown a diagrammatic view of a fragment of fabric made with every third sinker omitted or a special slotted sinker substituted so as to produce blocks of a very small size, this view being quite an enlargement over the original produced under such circumstances.

As indicated above, blocks or squares of various sizes may be produced and in Figure 4 I have shown a diagrammatic view under enlargement of a fragment of the fabric made wherein one sinker is out or special slotted sinker substituted and three succeeding sinkers remain in so that every fourth sinker is omitted or substituted with special slotted sinker. The tight courses are formed at greater intervals, usually, under such circumstances and in this manner larger squares or blocks are produced.

Figure 5 illustrates diagrammatically the fabric made under the conditions wherein every fifth sinker is either omitted or substituted with a special slotted sinker and the tight courses are formed at greater intervals so as to produce blocks or rectangles of still greater size than those illustrated in Figures 3 and 4.

These are merely illustrations of the patterns that may be produced by omitting one sinker or substituting a special sinker at various intervals and correspondingly forming tight courses at various intervals. It will be understood, however, that I do not wish to be limited in this respect as sinkers may be omitted or special slotted sinkers substituted and tight courses formed at any points or intervals as may be desired to produce whatever pattern is desired. It usually requires four tight courses to produce a transverse line which matches or is equivalent in width to the vertical line formed by omitting a sinker or using a special slotted sinker.

In Figure 6 of the drawings, I have shown the specially constructed sinker which may be used in the machine where it is not desired to omit a sinker. In other words, a sinker may be left out at certain intervals or in place of leaving out such a regular sinker, there may be substituted for the regular sinker a sinker such as shown in Figure 6. The sinker is designated by the numeral 7 and is provided with a slot 8 extending inwardly thereof from the outer end of said sinker. The effect of such a slot in the sinker appears obvious.

It will be understood in the manufacture of my improved fabric that the needles are working in the machine at all times. It is known that effects have been attempted by what is known as the "needle-out" method but such method of omitting or dropping needles produces an entirely different effect from that produced by omitting sinkers or using slotted sinkers. Through my improved method shadowed blocks are produced in the fabric which afford a most beautiful and desirable effect when made into a stocking. In the manufacture of women's hosiery, it is the aim of the producer to provide the same to the consumer in a form which is attractive to the eye of said consumer, attractive on the leg of the consumer and which will be durable in use. Hosiery made in accordance with my invention answers these requirements.

In Figures 7 and 8, I have shown a slightly modified form of the invention wherein the fabric is provided merely with vertical lines and no transverse lines. Such a fabric will give a slenderizing effect when made into hosiery. In other words, the vertical lines represented by the numeral 6 are formed in the fabric at predetermined intervals by either omitting a sinker at such intervals or by substituting for the regular sinker at such intervals the specially constructed and slotted sinker such as shown in Figure 6. This produces a series of lines 6 in the fabric as clearly shown in the diagrammatic view illustrated in Figure 8. Otherwise, the fabric is constructed as heretofore described. The invention teaches the production of horizontal lines. However, simple horizontal line patterns would ordinarily not be desirable in hosiery because, conversely to vertical lines, they give a fattening appearance to the leg of the wearer.

From the foregoing description of the construction of my improved fabric and the method of manufacturing the same, the invention will be readily understood and it will be seen that I have provided a comparatively inexpensive and simple means for accomplishing the objects of the invention.

While I particularly describe the elements best adapted to perform the functions set forth, it is obvious that various changes in form, proportion and in the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the principles of the invention.

Having thus described my invention what is claimed is:

1. A machine knitted fabric simulating lace, which comprises loops knitted to a size below the normal of the machine, interspersed in a predetermined pattern with loops at least of a size normal for that machine, and loops between the constricted and normal size loops being of an intermediate size.

2. A weft knitted lace-like fabric, comprising in predetermined courses, loops of a yarn wholly or in part robbed from adjacent loops, other loops made up of yarn undisturbed by robbing, loops intermediate the

first named and last named loops having a deficiency of yarn because of robbing.

3. A weft knitted lace-like fabric comprising in predetermined courses, loops of yarn wholly or in part robbed from adjacent loops, other loops made up of yarn undisturbed by robbing, loops intermediate the first named and last named loops having a deficiency of yarn because of robbing, and comprising in other courses loops shorter than loops of the previously mentioned courses.

4. That method of knitting a lace-like fabric on equidistant knitting elements which consists in feeding yarn to all knitting elements by measuring and forming loops in the space between certain adjacent elements and laying the yarn straight across the space between other adjacent elements and knitting the yarn so fed on all knitting elements, whereby certain knitting elements draw yarn into their loops from adjacent loops.

5. That method of knitting a weft fabric lace-like, which comprises in predetermined courses knitting loops of yarn robbed from adjacent loops, knitting other loops of yarn undisturbed by robbing, and knitting loops intermediate the first named and last named loops of yarn remaining after robbing.

6. That method of knitting a lace-like weft fabric which comprises in predetermined courses knitting loops of yarn robbed from adjacent loops, other loops of yarn undisturbed by robbing, and loops intermediate the first named and last named loops of yarn remaining from robbing, and knitting other courses of loops all of the same size.

In testimony whereof, I affix my signature.

HARRY HARRIS.