May 13, 1941. R. E. DAVIS 2,241,901

HOSIERY

Filed July 18, 1939 2 Sheets-Sheet 1

Fig. 1

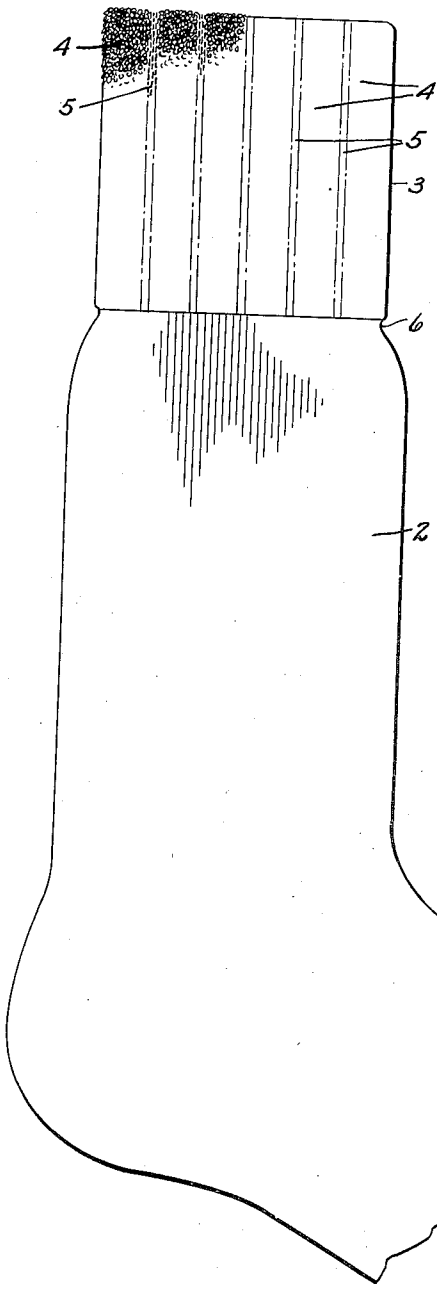
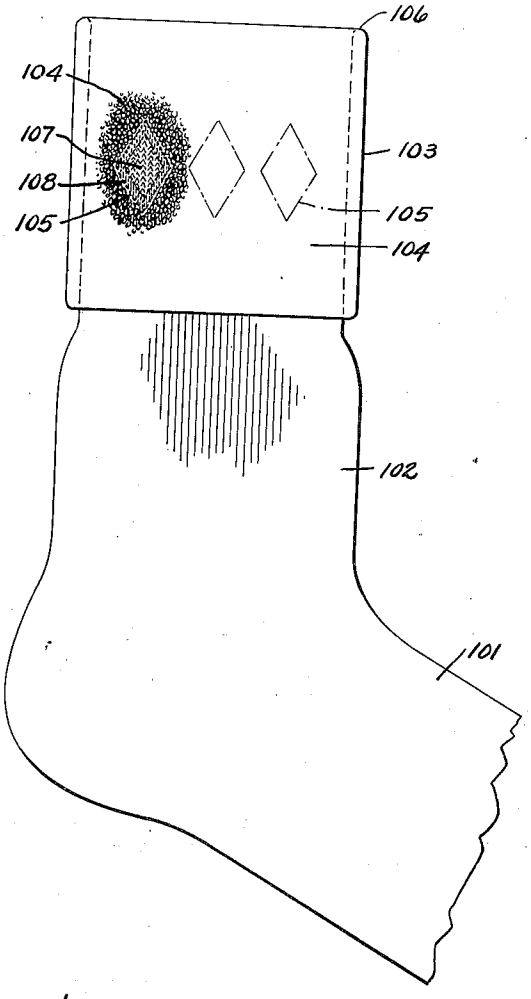


Fig. 2



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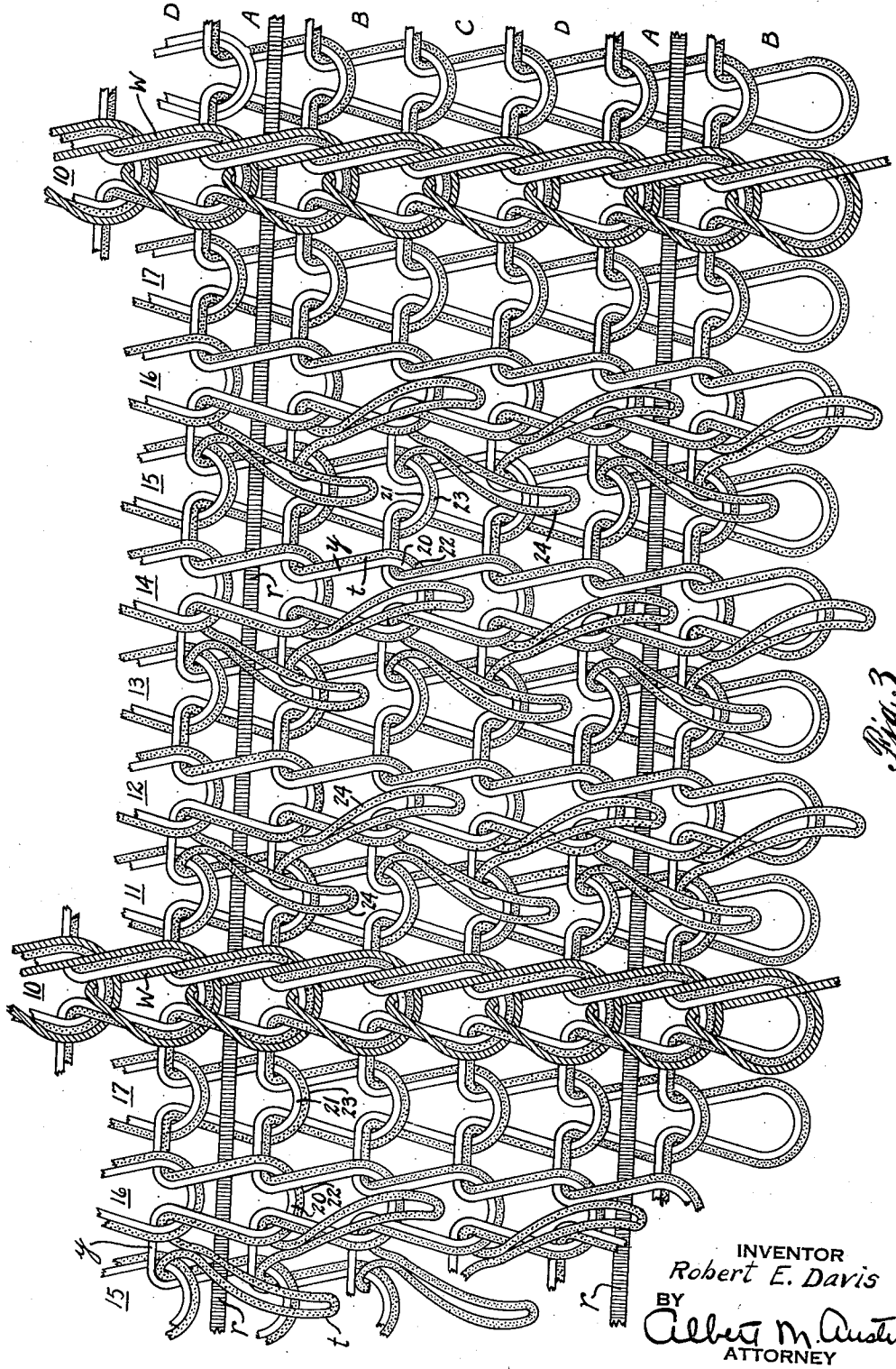


Fig. 3

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UNITED STATES PATENT OFFICE

2,241,901

HOSIERY

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Application July 18, 1939, Serial No. 285,058

7 Claims. (Cl. 66—172)

The present invention relates to hosiery and more particularly to a novel fabric especially adapted for hosiery, and to a method of making the same.

In accordance with the present invention, a rib knit fabric is produced by knitting one or more main or body threads. Along with the main or body thread or threads is knit a terry thread or threads, in which terry loops are formed, thereby producing in at least portions of the fabric a terry cloth. A wrap stripe or design is formed in the fabric, preferably in those portions where no terry loops are formed, by feeding a wrap thread or threads to certain, selected needles in accordance with the stripe or design desired. Preferably, an elastic thread is incorporated in the fabric in a suitable manner to cause the fabric to have increased elasticity and thereby to cling to the leg or other body portion of the wearer, thus making the fabric self-supporting.

An object of the invention is the provision of a knitted fabric of novel construction and appearance and especially adapted for forming hosiery tops and like articles.

Another object of the invention is the provision of a novel fabric having a design or pattern therein, wherein there is a marked contrast between the several portions of the fabric forming the design or pattern.

Still another object of the invention is the provision of a novel and attractive fabric which can be conveniently made on a single knitting machine in the course of a single continuous knitting process, and which does not necessitate additional operations, such as embroidering, after the fabric has been knitted.

Still another object of the invention is the provision of a novel method of making a fabric wherein a wrap strip or design is combined with a terry fabric to produce a novel and striking appearance.

Various other features and advantages of the invention will be apparent from the following particular description and from an inspection of the accompanying drawings.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part hereof, in which:

Fig. 1 is a fragmentary side elevational view, somewhat diagrammatic of a stocking embodying the present invention, and in which the top is a so-called "straight up" top;

Fig. 2 is a generally similar view embodying the invention only illustrating a stocking wherein the top is a so-called "turn-over" top; and

Fig. 3 is an enlarged fragmentary view of a portion of the fabric forming the top of the stocking shown in Fig. 1, the view being taken from the outside of the fabric.

In the following description and in the claims, various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit. Like reference characters denote like parts in the several figures of the drawings.

The fabric of the present invention is especially well adapted for forming the tops on cuffs of stockings and particularly children's half hose, children's, misses' and men's anklets and so-called "slacks" socks; it will be appreciated, however, that the fabric is capable of many and varied uses. For the purpose of illustrating the invention, it is described in connection with its application to the making of tops for half hose and anklets, respectively.

Referring now particularly to Fig. 1 of the drawings, there is illustrated a half hose comprising a foot 1, a leg 2, and a top or cuff 3. The top or cuff 3 may be attached to the leg 2 in any suitable manner, as by the usual transfer operation. The top 3 in the present illustrative embodiment comprises a terry cloth portion 4 formed in a manner hereafter described and a series of vertical stripes 5 hereinafter more particularly described.

A portion of the fabric constituting the top 3 of the embodiment of the invention illustrated in Fig. 1, is illustrated somewhat more in detail in Fig. 3, to which reference now is made. It will be understood that the illustration in Fig. 3 is somewhat diagrammatic as to the position and the condition of the several threads.

The fabric is essentially a so-called 1 and 1 rib fabric, formed by knitting one or more body yarns *y* on dial and cylinder needles to form stitches 20 constituting cylinder wales 10, 12, 14 and 16 and stitches 21 constituting dial wales 11, 13, 15 and 17. The courses are designated as A, B, C and D. It will be understood that other arrangements of dial and cylinder needles may be provided if desired, for example 1 and 2, 2 and 1, 2 and 2, etc. However, for the purpose of the present invention, it has been found

preferable to employ a 1 and 1 needle arrangement. It will also be understood that the fabric may be formed by feeding more than a single body yarn *y*, as by feeding a plurality of yarns simultaneously at different feeds, in order to form different courses of fabric by the different yarns. Also, horizontal stripes (not shown) may be formed by suitable yarn changes.

One or more terry yarns are knit with the body yarn or yarns *y*, the terry yarn *t* being fed to the cylinder and dial needles to form the loops 22 and 23. Between certain of the wales, for example, between wales 11 and 12, 13 and 14, and 15 and 16, the terry yarn *t* has a terry loop 24 formed therein for the purpose of providing a terry fabric. Such terry loops 24, may be of any suitable and desired length and preferably are of sufficient length to extend over approximately three courses of the fabric, the loops being shown somewhat shorter in the present drawings, for convenience.

Between certain of the wales, for example, between the wales 17 and 10, no terry loop is formed, but the terry thread *t* is knitted with the body thread *y* without forming a terry loop. For convenience in description herein, the portions of thread which extend between adjacent needle loops, when terry loops are not formed, are designated as "connecting loops" to distinguish these from terry loops. Thus, there is provided a contrast in the appearance of the fabric between such portions and the terry cloth portions. In order to provide a design or pattern and to further provide contrast in appearance, and particularly to provide a vertical or generally vertical strip, a wrap thread *w* is fed to the needles forming the wales 10 and forms a vertical stripe 5.

From the foregoing it will be seen that when the fabric is knitted in the manner described, it will have a unique and attractive appearance owing to the existence of a vertical wrap stripe being formed against a background of terry fabric. The striking contrast between the vertical wrap stripe 5 and the terry background 4 may be still further enhanced by forming the terry stitches 24 of one yarn, for example, cotton, and the wrap stripe 5 by another yarn, for example, rayon or silk. Furthermore, other contrasts may be provided by selecting yarns of different colors for forming the terry fabric and the wrap strip respectively.

In making hosiery of the type to which this invention is particularly adapted, it is often desirable to construct the top or the top and leg in such a manner that it will be form-fitting and self-supporting and will cling to the leg so as to provide a neat and attractive appearance when in use. This result may be accomplished by incorporating in the fabric an elastic thread or threads formed of bare rubber, or covered rubber, such as the thread sold commercially under the trade name "Lastex." The elastic thread may be incorporated by laying it in between the dial and cylinder needles so that it extends transversely of the fabric and lies between the stitches forming the dial and cylinder wales, as illustrated particularly in Fig. 3 of the drawings.

In order to make the fabric form-fitting, self-adjusting and comfortable, and in order to provide certain advantages over the so-called true garter top, the elastic thread is incorporated in the fabric in spaced courses. In certain cases the elastic may be incorporated in successive courses but it is generally preferable to space the elastic carrying courses by at least one intervening course which does not carry elastic. In most cases it is preferable to incorporate elastic in about every fourth course, as illustrated particularly in Fig. 3 of the drawings.

The elastic is incorporated under sufficient tension to compensate for the drawing in of the rib knit fabric as it leaves the machine, thus eliminating the possibility of the elastic having slack loops or bights formed therein when the fabric contracts as it leaves the machine. In certain cases it has been found desirable to provide somewhat higher degree of tension so that the elastic causes an even greater contraction of the fabric than is caused by the natural contraction of the fabric as it leaves the machine.

It will be understood by those skilled in the art that when the elastic thread is incorporated by being laid in between dial and cylinder stitches it will be more or less hidden when the fabric is in its normal contracted condition. However, when elastic is incorporated in this manner, in ordinary rib fabric, it is likely to be exposed somewhat when the fabric is stretched. The presence of the terry loops provides more complete concealment of the elastic, even when the fabric is stretched; the wrap threads also contribute to concealing the elastic.

The fabric of the present invention can be knitted on a so-called rib, or dial and cylinder machine having suitable attachments for drawing the terry loops, feeding the wrapped threads *w*, and feeding the elastic thread *r*. These operations can be accomplished on a suitably modified machine generally similar to the Fidelity wrap thread knitting machine, one embodiment of which is illustrated in U. S. patent to Larkin 1,841,249, issued January 12, 1932. This machine is essentially a dial and cylinder knitting machine employing latch needles and provided with individual needle wrapping fingers adapted to apply a wrap thread to each of the cylinder needles respectively, and a mechanism for operating said wrap finger in a predetermined manner to produce the desired stripe or pattern.

The terry loops of the fabric forming the present invention may be formed by auxiliary, bearded needles inserted one in each, or selected, of the cylinder slots adjacent the cylinder needles and having associated therewith a suitable cam mechanism for operating the bearded needles to draw terry loops of the terry yarn intermediate adjacent loops drawn by the cylinder needles. Such auxiliary, bearded needles and operating mechanism are illustrated in U. S. patent to McAdams 1,777,699, issued October 7, 1930. It will be understood that one such bearded needle is inserted in each slot or in selected slots of the needle cylinder adjacent the regular cylinder needles and that a suitable operating cam is provided in association with the butts of the bearded needles. Also a suitable thread feed is provided for feeding the terry yarn to the regular cylinder needles and to the auxiliary bearded needles.

It will be understood that the regular, latch cylinder needles are raised to catch the wrap thread and the auxiliary bearded needles are raised to catch the terry yarn at different points in order to prevent interference.

The elastic thread *r* is fed or laid in the trough formed by the dial and cylinder needles by any suitable feed so located as not to interfere with the operation of the bearded auxiliary needles or the wrap fingers. If desired, the elastic thread *r* may be taken in and out, in order to lay it in spaced courses of the fabric, or the

fabric may be formed by feeding a plurality of threads in a multiple feed machine and the elastic fed along with one of the threads thereby automatically placing it in spaced courses of the fabric.

The present invention makes it possible to produce a large number of different designs or patterns by suitable arrangement of various threads and needles and the manner of incorporating the same. By way of illustration of another design, there is illustrated in Fig. 2 an anklet having a so-called "turn-over" top. The anklet is formed with a foot portion **101**, a leg portion **102** and a top or cuff **103**. The top or cuff **103** is attached to the top of the leg portion **102** as by a transfer at the upper edge of the top whereby the top constitutes a turn-over top.

In the top **103**, illustrated in Fig. 2, the body portion of the top is formed of terry cloth **104** in the manner illustrated, and the design or pattern comprises a plurality of diamond or lozenge-shaped figures **105** which in turn consist of a border **108** formed by a wrap thread and an inner portion or field **107** constituted by regular stitches of rib knitting having no terry loops therein.

While certain novel features of the invention have been disclosed herein, and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. A circular rib knitted fabric comprising a body thread knit to form wales and courses, a terry thread knit with said body thread and having terry loops therein, a wrap thread incorporated in said fabric at predetermined portions thereof, and an elastic thread laid in said fabric between the rib and plain wales.

2. A self-supporting hose comprising a body thread rib-knit to form wales and courses, a terry thread incorporated with said body thread and having terry loops therein, a wrap thread incorporated in said fabric at predetermined portions thereof, and an elastic thread incorporated in said fabric at least in the upper portion of said hose thereby providing a self-supporting top.

3. The method of forming an article of hosiery which comprises knitting a body thread on dial and cylinder needles to form rib and plain wales, knitting a terry thread with said body thread and drawing terry loops therein between predetermined stitches, wrapping at least certain of said needles to provide a wrap thread pattern in said fabric, and incorporating an elastic thread in said fabric during the knitting thereof.

4. The method of forming a patterned fabric which comprises knitting a body thread to form wales and courses, knitting a terry thread with said body thread during the knitting of at least certain courses of the fabric and drawing terry loops and connecting loops in said terry thread, and incorporating a wrap thread in said fabric at stitches located between connecting loops of said terry thread during the knitting of said fabric.

5. A circular knitted fabric comprising a body thread knit to form wales and courses, a terry thread knit with said body thread in at least a portion of the fabric and having both terry loops and connecting loops therein in at least certain courses of said fabric, and a wrap thread incorporated at predetermined stitches located between regular connecting loops of said terry thread in the portion of the fabric having terry loops.

6. A patterned knitted fabric comprising a body defined essentially by a body thread and a terry thread, and a surface pattern defined essentially by terry loops of said terry thread and by a wrap thread incorpoarted in said fabric adjacent said terry loops in a predetermined arrangement.

7. A patterned knitted fabric comprising a body thread knit to form wales and courses, a terry thread knit with said body thread and having terry loops forming a terry surface and connecting loops forming a non-terry surface, and a wrap thread incorporated in said fabric forming a wrap surface, said fabric having a decorative pattern formed by at least three distinct surface areas of different appearance, defined respectively by said terry surface, said non-terry surface and said wrap surface.

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