Feb. 14, 1933. F. STEVENSON 1,897,917

PROCESS OF KNITTING

Filed Aug. 11, 1932 4 Sheets-Sheet 1

Fig. 1.

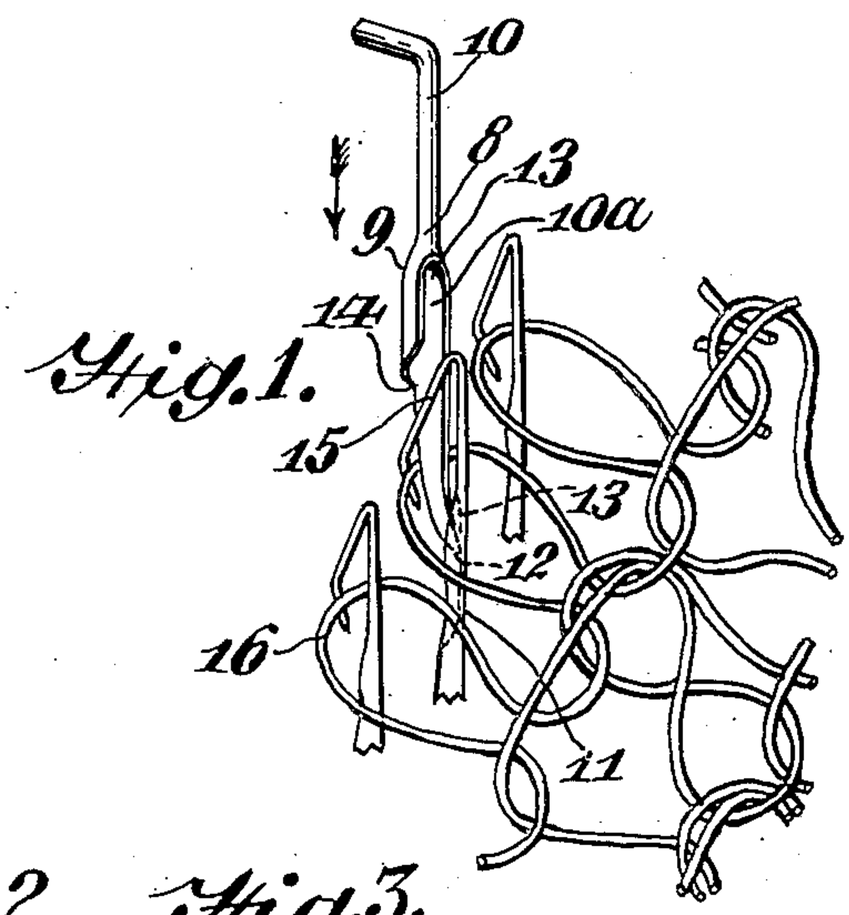


Fig. 2.

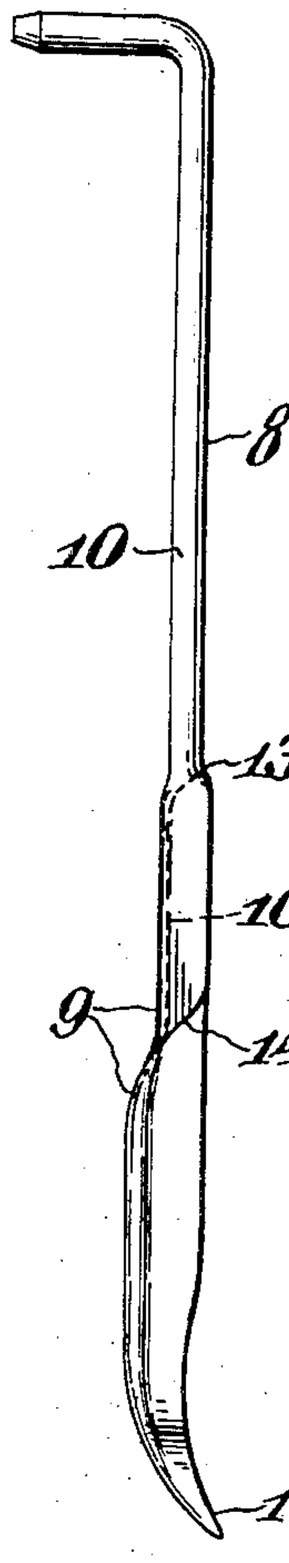


Fig. 3.

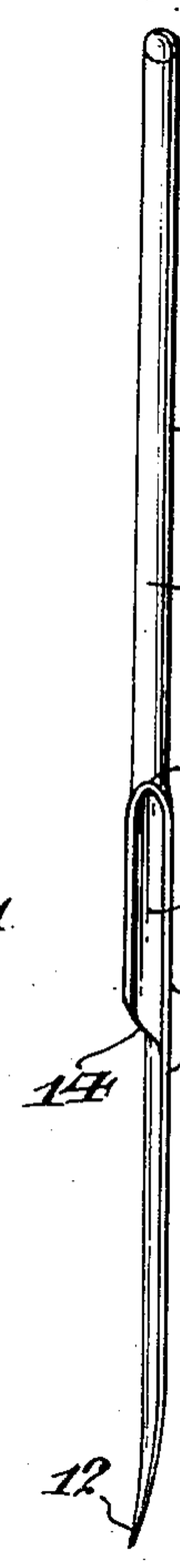


Fig. 4.

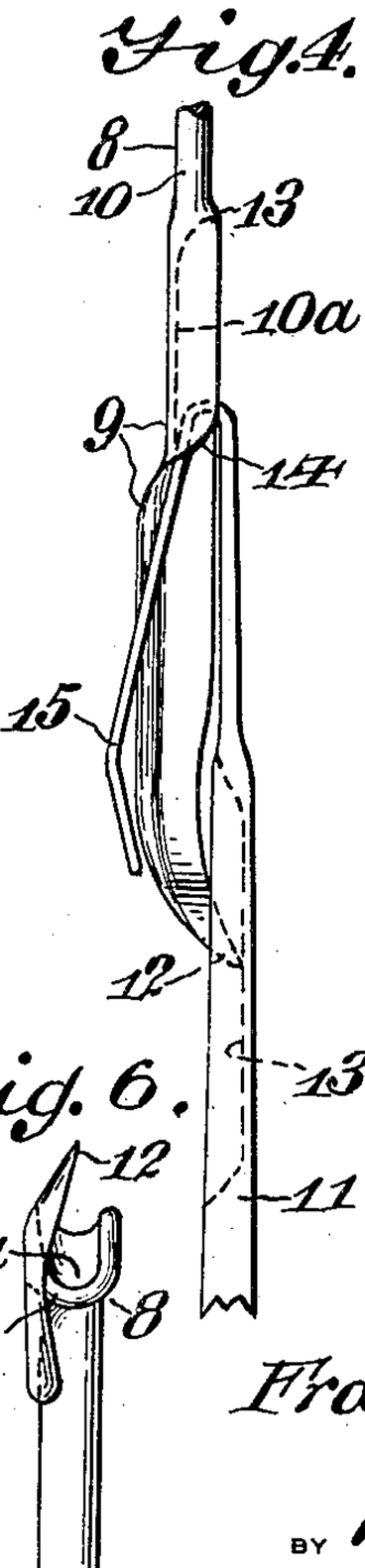


Fig. 5

Fig. 7.

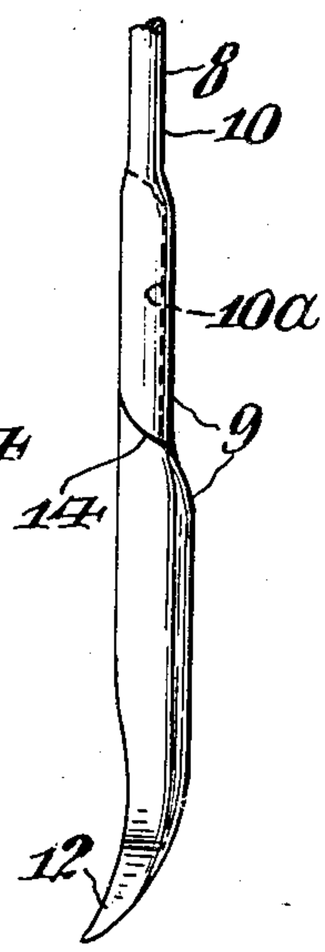
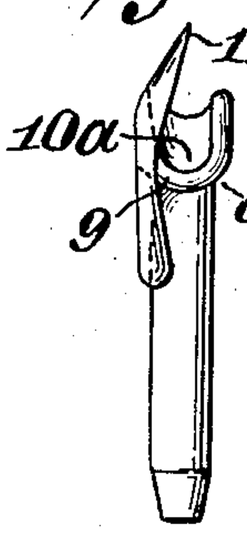


Fig. 6.



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Feb. 14, 1933. F. STEVENSON 1,897,917

PROCESS OF KNITTING

Filed Aug. 11, 1932 4 Sheets-Sheet 2

Fig. 8.

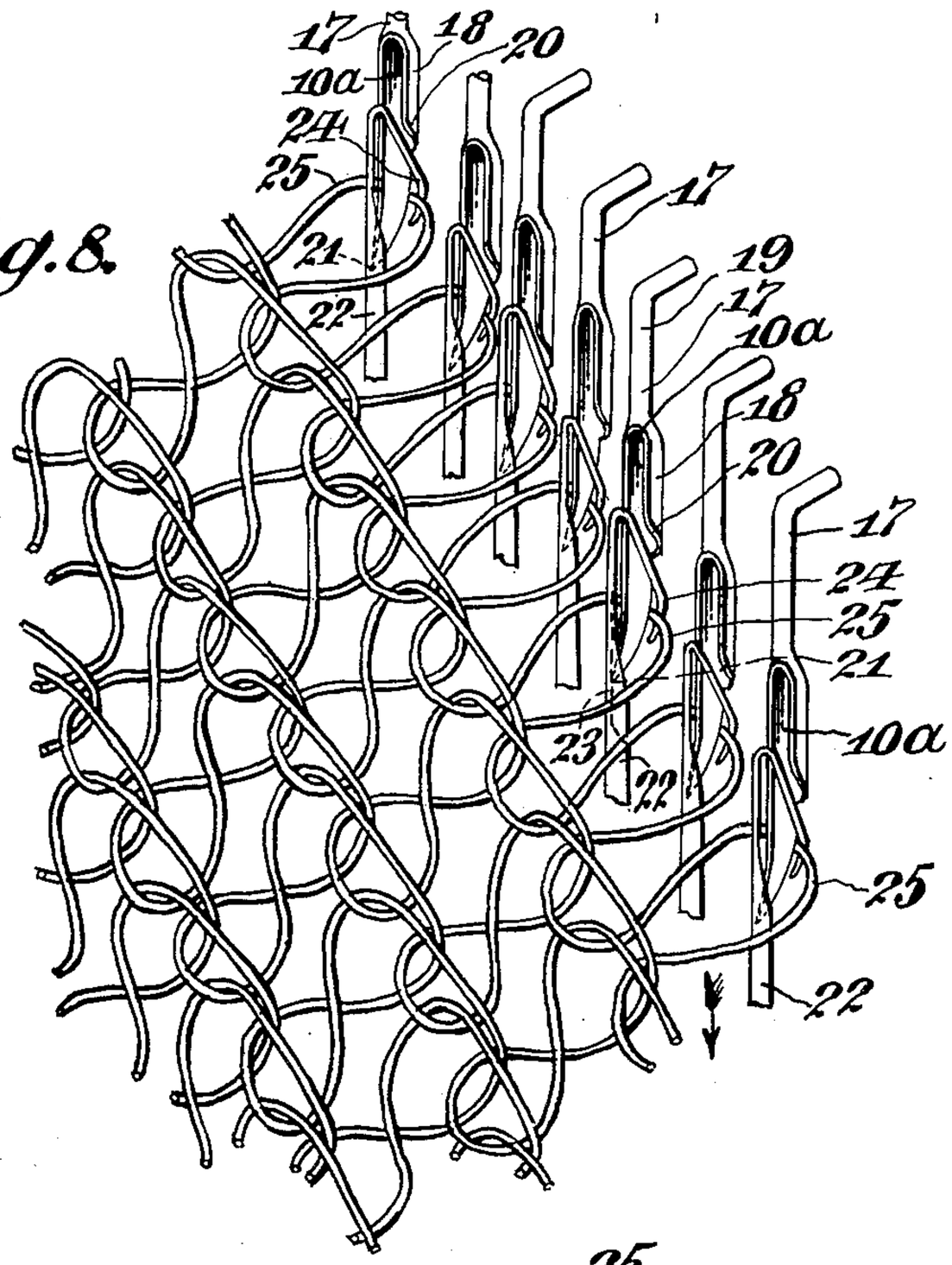
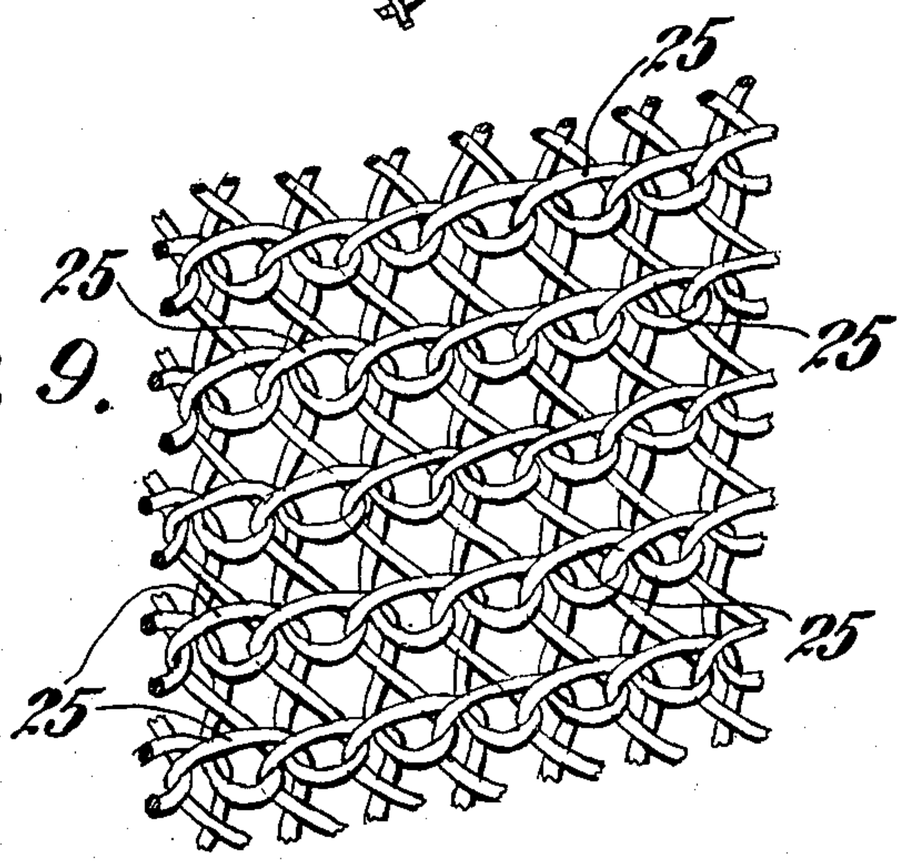


Fig. 9.



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Feb. 14, 1933. F. STEVENSON 1,897,917

PROCESS OF KNITTING

Filed Aug. 11, 1932 4 Sheets-Sheet 3

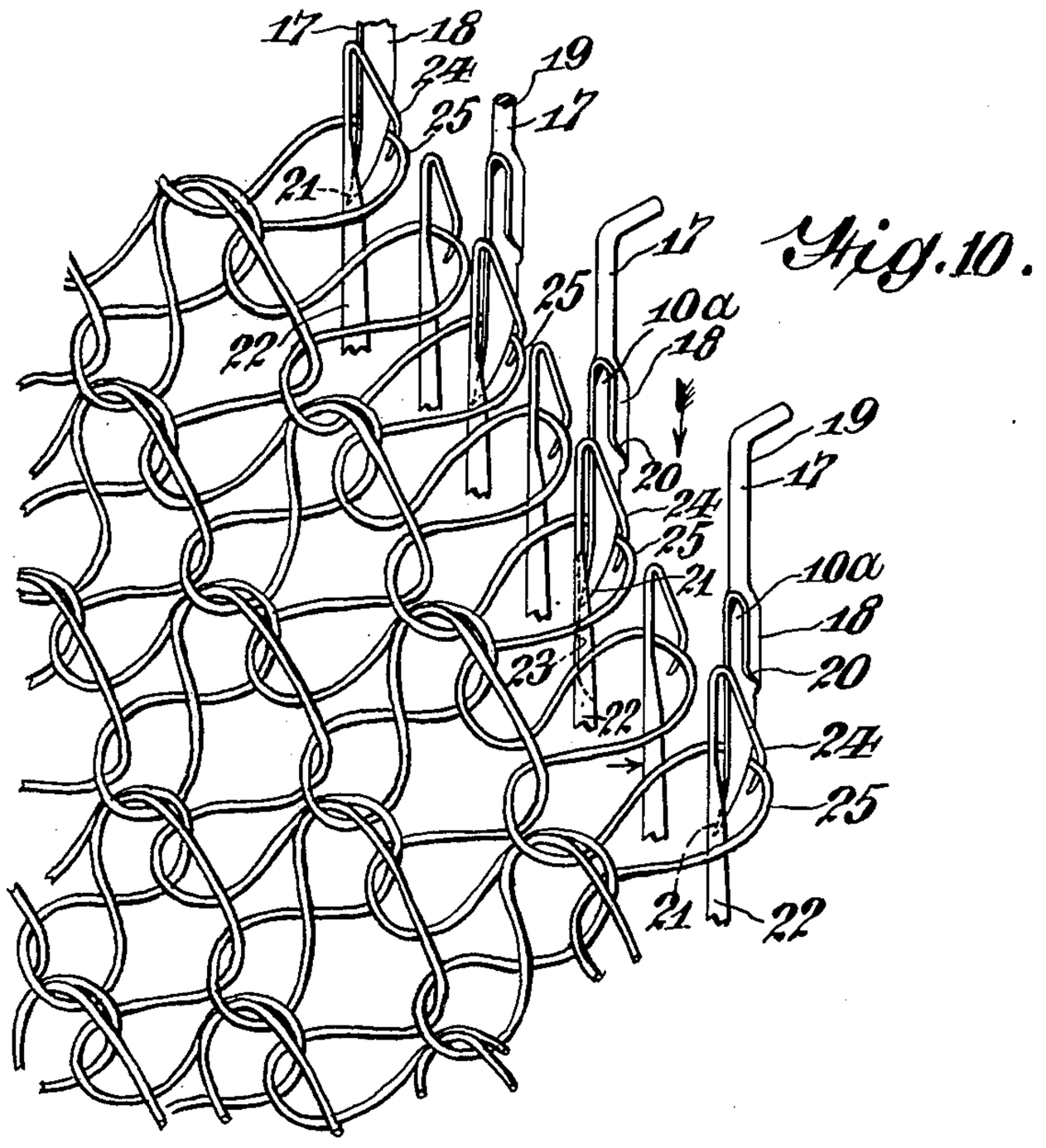

Fig. 10.

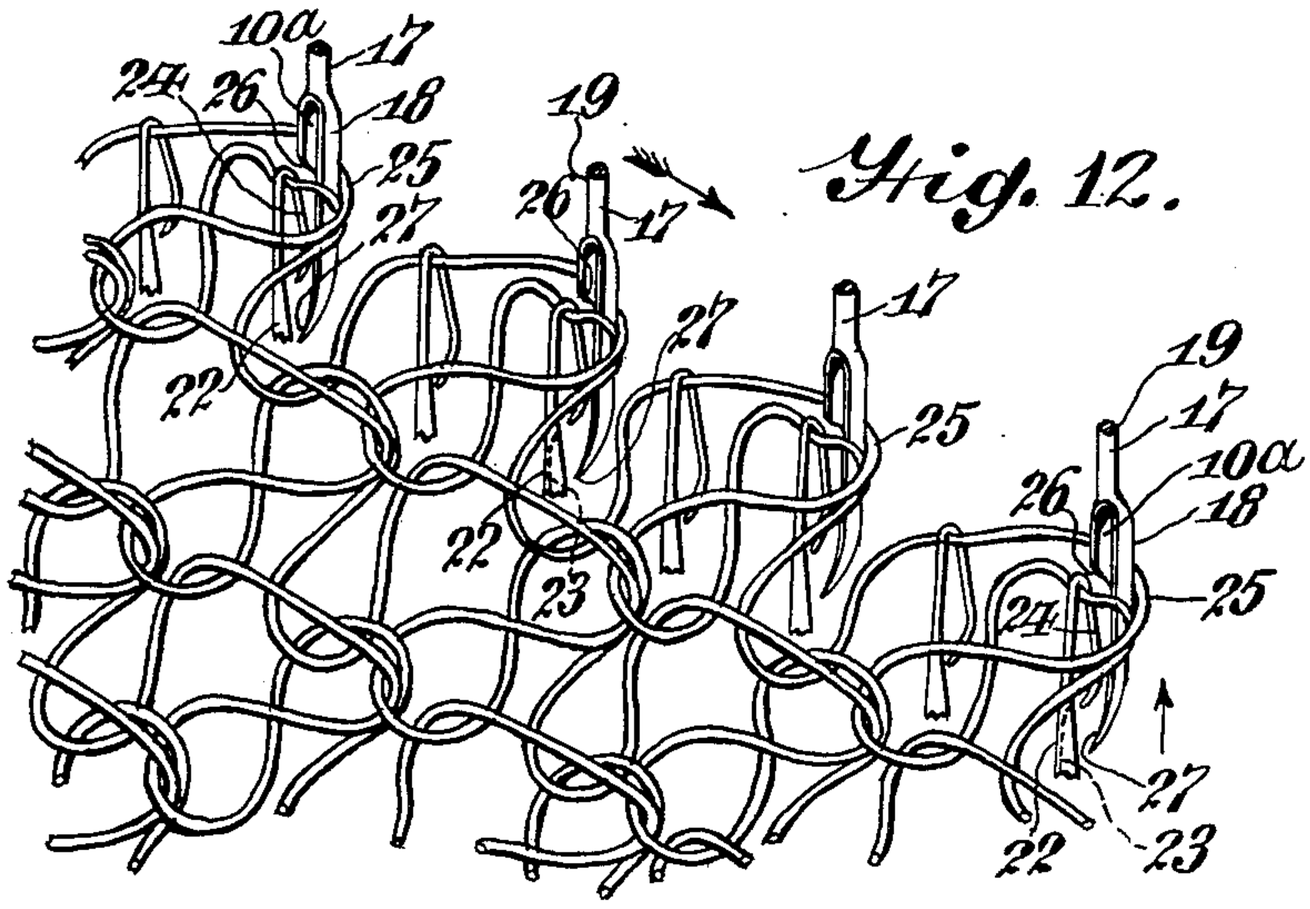

Fig. 12.

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Feb. 14, 1933. F. STEVENSON 1,897,917

PROCESS OF KNITTING

Filed Aug. 11, 1932

4 Sheets-Sheet 4

Fig. 13.

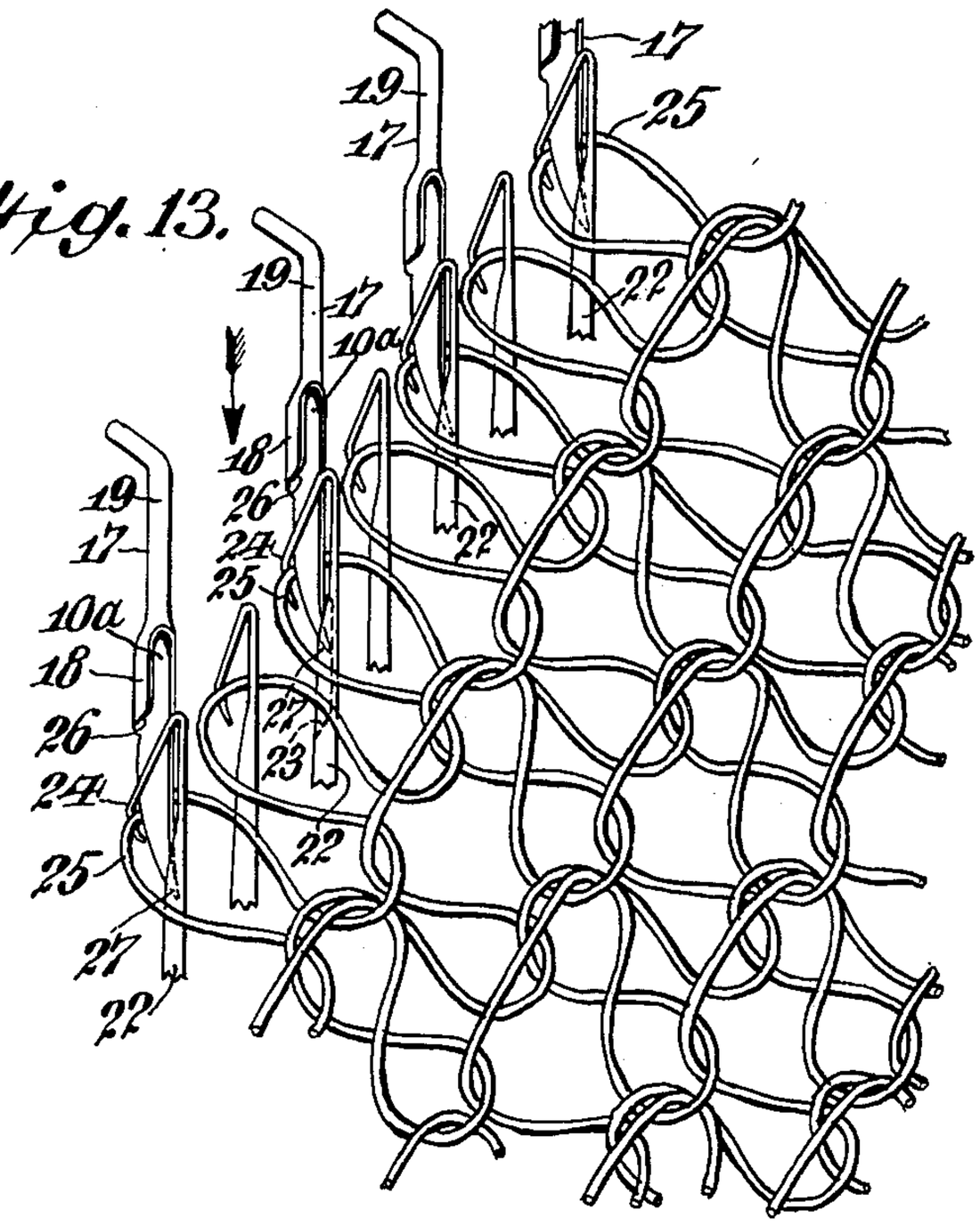
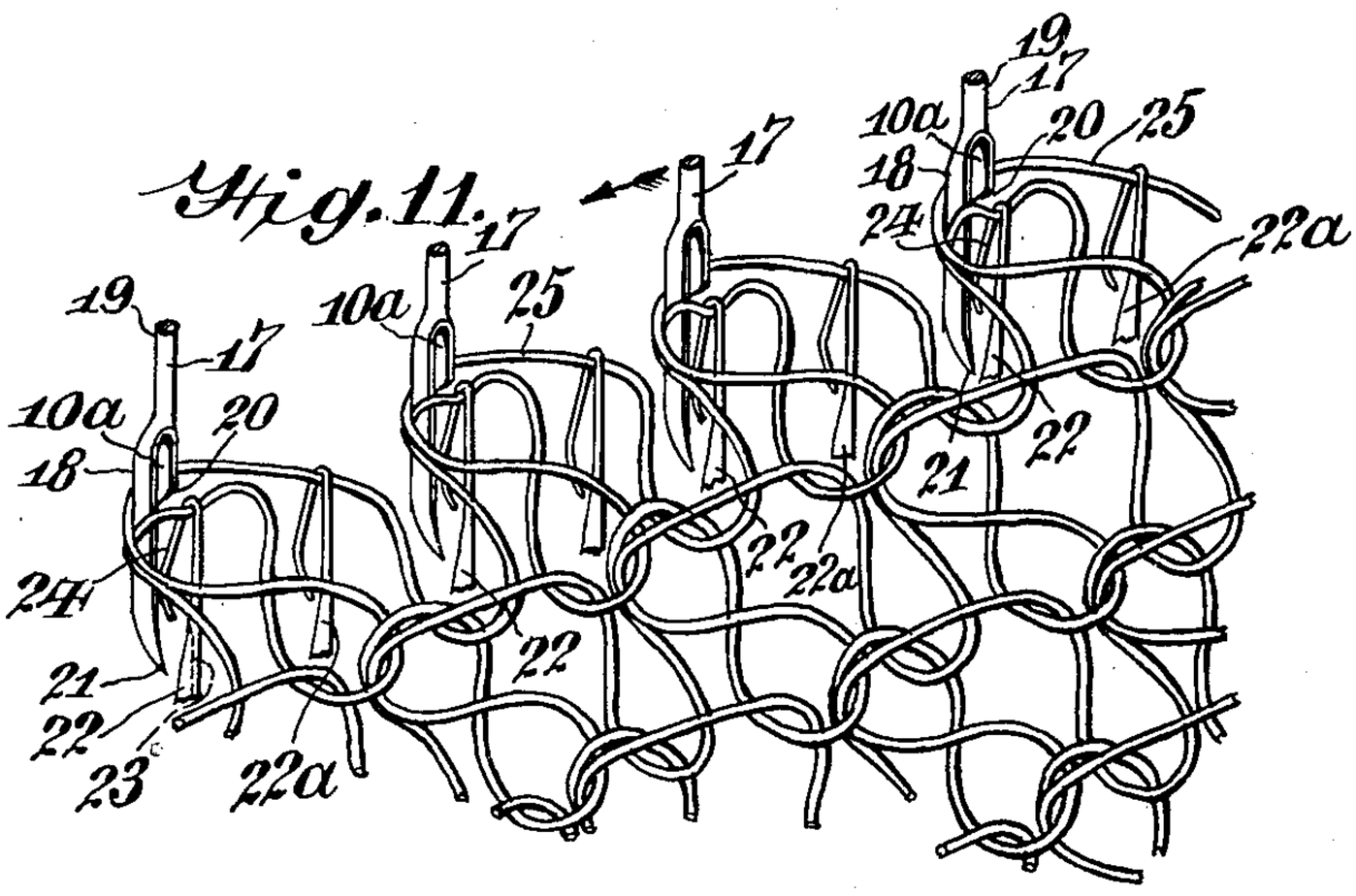


Fig. 11.



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Patented Feb. 14, 1933 1,897,917

UNITED STATES PATENT OFFICE

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PROCESS OF KNITTING

Application filed August 11, 1932. Serial No. 628,387.

This invention relates to the art of knitting, particularly to the manufacture of a knitted fabric especially for hosiery of the nonrun type.

While there are nonrun hosiery now manufactured and in use, they are more or less of the open or lace work effect, and are manufactured by full fashion hose knitting machines, wherein the structure of the machine itself has been substantially modified to produce a nonrun or locked stitch. In modifying or changing the structure of a full fashion knitting machine to produce a nonrun or lock stitch (which only results in the relatively open or lace effect fabric more particularly for evening wear) it is very costly, therefore the purpose of the present invention is to eliminate this excess expense and the necessity of modifying or changing the machine parts of a full fashion knitting machine, and yet produce a relatively closely knitted or a relatively open or lace nonrun fabric for hosiery at an extremely low cost comparable to the first instance, and without in any way altering, modifying or changing the structure of the machine parts of a full fashion hose knitting machine.

The fact is while this improved nonrun fabric can be produced for relatively open or lace work pattern of hosiery where every other or every two stitches may be locked, it is possible to produce a nonrun fabric where each and every stitch is locked, enabling the fabric to be made into hosiery for every day street, business and office wear, because in these walks of life hosiery are more apt to be damaged, and as soon as there is the first nick there is liable to be a run.

The present invention, in order to produce either relatively open or lace pattern or very closely knitted hosiery, resides particularly in the modification or changing of the now extensively used shifting point at a cost so relatively low, that it is incomparable to the cost in modifying the machine parts of a full fashion hose knitting machine.

For example by providing a shifting point, with either its right or its left side cut away, leaving the groove therein open for the greater part of the length of the point, and using one with each and every needle, it is possible to produce a nonrun or lock stitch, resulting in a nonrun fabric for closely knitted hosiery for street, business and office wear. By using this particular type of shifting point with every other, or possibly with every two needles it is possible to produce a nonrun or lock stitch, resulting in a nonrun relatively open or lace pattern fabric for hosiery especially adapted for evening wear.

It is to be understood that the particulars herein given are in no way limitative, and that while still keeping within the scope of the invention, any desired modification of details and proportions may be made in the construction of the appliance according to circumstances.

The invention comprises further features and combination of parts to be hereinafter set forth, shown in the drawings and claimed.

In the drawings:—

Figure 1 is an enlarged view of a piece of hosiery fabric with certain of the stitches locked and widely separated to disclose their construction, illustrating the improved type of shifting point for the purpose of locking the stitch.

Figure 2 is an enlarged view in elevation with the left wall of the shifting point cut away, the shift point adapted for shifting the stitch to the right.

Figure 3 is an enlarged elevational view of the shifting point taken at right angles to that in Figure 2.

Figure 4 is an enlarged elevational view of the shifting point as in Figure 2 showing it in cooperation with a needle.

Figure 5 is an enlarged elevational view of the lower portion of a shifting point illustrating the right wall thereof cut away, the shifting point adapted to permit shifting to the left.

Figure 6 is an end elevational view of the shifting point shown in Figure 5.

Figure 7 is an enlarged elevational view of the shifting point taken at right angles to that in Figure 5.

Figure 8 is a perspective view of a piece of hosiery fabric with the stitches substantially widely separated, showing a plurality of

shifting points and needles in cooperation with every stitch of the fabric, the shifting points being cut away on their right sides to permit shifting to the left.

Figure 9 is an extremely enlarged perspective view of a piece of nonrun hosiery fabric illustrating the actual locked stitch.

Figure 10 is an enlarged perspective view of a piece of nonrun hosiery fabric with the stitches widely separated and illustrating a plurality of shifting points in cooperation with every other needle, the right wall of the shifting point being cut away and thereby permitting shifting to the left, hence permitting a piece of nonrun fabric of the open or lace fabric to be made.

Figure 11 is an enlarged view of a piece of nonrun lace pattern fabric where the stitches are widely separated, also showing the right hand wall of the shifting points cut away and cooperating with every other needle to permit shifting to the left, the stitch in readiness to be placed on a needle.

Figure 12 is an enlarged perspective view of a piece of nonrun fabric with the stitches widely separated, illustrating a plurality of shifting points cut away on their left sides permitting shifting to the right, the shifting points being in cooperation with every other needle.

Figure 13 is an enlarged view in perspective of a piece of nonrun hosiery fabric with the stitches widely separated and the shifting points in cooperation with every other needle, the left wall of the shifting point being cut away and thereby permitting shifting to the right.

Referring to the drawings and especially Figure 1, wherein the grooved shifting point 8 is disclosed, the shifting point comprising the body 9 and its shank 10, is arranged in cooperation with every other needle 11. It will be noted that the side and back wall of the body 9 for the greater portion of the body of the shifting point is cut away down to the extremity 12 of the shifting point. The body of the shifting point also has a groove 10*a* from 13 to 14, and this groove will vary according to the types and various styles of full fashion hose knitting machines. As disclosed the needle 11 has resulted in cooperation with the shifting point, permitting the extremity 12 of the shifting point to enter the groove 13 of the needle, while the beard 15 of the needle lies adjacent or within the cut away portion of the shifting point. By permitting the beard of the needle 11 to cooperate with the shifting point where its back and side wall on the left are cut away, the beard of the needle remains open on the downward motion of the needle 11, and the shifting point 8, for one half the stitch 16, is retained by the beard 15 while the other one half of the stitch 16 is caught by the shifting point.

Referring to Figure 8 and Figure 9 it is to be noted that the shifting points 17, while also consisting of the bodies 18 and the shanks 19, having the right wall and the back wall of the shifting point for the greater portion of their length from 20 to the extension 21 cut away on the right hand side, the shifting points being shown in cooperation with each and every needle, that is to say to cover every needle. In this use of the shifting point in cooperation with every needle 22, the extremity 21 of the shifting points move downwardly in the grooves 23 of the needles, while at the same time the beards 24 are left open, retaining one half of the stitch 25 under the beard, and at the same time another one half of the stitch 25 is caused to be pushed upwardly over the outside of the shifting point, leaving one half of the stitch 25 on the needle and the other one half on the outside of the shifting point. In this manner of cooperation of the shifting points with each and every needle it is possible to produce a closely knitted hosiery fabric for use in the manufacture of nonrun hosiery for street, business and office wear. Also with reference to Figures 8 and 9, the shifting point being cut away on the right hand side, permits the shifting of the stitch to the left.

Referring to the Figures 10 and 11 it is obvious that the shifting points are of the same construction as in Figure 8, namely the right hand side of the walls of the bodies of the shifting points are cut away, thereby permitting shifting of the stitch to the left.

However in Figures 10 and 11 the shifting points are shown in cooperation with every other needle, thereby permitting a piece of nonrun fabric to be made, of a texture substantially open and of the lace appearance, for the production of hosiery for use at evening functions. In Figures 10 and 11, the shifting points 17 are in positions traveling downwardly to take one half the stitch 25 from the needles 22. As previously stated this operation is only possible by having the back and one of the sides of the shifting point cut away for the greater part of its length, namely from 20 to 21, so that the needle 22 in moving downwardly retains one half the stitch 25 in position, while the other one half of the stitch is passing and engaging under the beard 24 of the needle, and this operation is only possible due to the beard 24 remaining open, at the same time the needle 22 presses into the shifting point. It will be noted that in Figure 10 one half of the stitch is passing over the outer edge of the shifting point and directly under the beard 24 of the needle. In Figure 10 it is disclosed that the shifting point is in a position moving downwardly to take one half the stitch 25 from the needle. In Figures 10, 11, 12 and 13 a piece of nonrun fabric for hosiery is in formation, and due to the shifting points in

cooperation with every other needle, the stitches will be relatively open and present a lace appearing fabric for use in hosiery for evening wear.

However in Figures 12 and 13 the shifting points 17 have the left hand side of the walls of their bodies 18 cut away from 26 to the extremity 27, in which case the shifting points are adapted for cooperation with every other needle for shifting the stitches to the right.

In Figure 11 one half the stitch 25 is shifted to the left in readiness to be received on the needle 22. It will also be noted in Figure 11 the other one half of the stitch is held under the beard 24, and in this position the needle 22 presses into the shifting point, that is to say into the groove 10*a* of the shifting point, after which the shifting point 17 and the needle 22 will move upwardly and the stitch 25 is looped around the top of the needle 22, forming a loop around both needles 22 and 22*a*, thereby locking the stitch.

In Figure 10 the stitches are shifting to the left using every other needle and every other shifting point. Figure 11 discloses the stitch being picked up by shifting point and shifted to the left. In Figure 12 a second movement is disclosed showing the stitch shifted to the right, using every other needle and every other shifting point, the needles moving upwardly to take the stitch from the shifting point.

In Figure 13 the shifting of the stitches is accomplished to the right also using every other needle and every other shifting point, the movement being downwardly. Upon spreading loops in nonrun hosiery fabric constructed on a full fashion knitting machine, the shifting point and needle are lowered together, the needle being moved forwardly to bring the needle beard into the groove of the shifting point. The needle is additionally moved downwardly resulting in permitting the beard to remain open, and upon further downward movement of both needle and shifting point positions the loop upon the transfer point and inside the needle beard, as indicated in Fig. 4.

The invention having been set forth, what is claimed is:

1. In a process for knitting nonrun hosiery fabric, the steps consisting in moving vertically from raised positions a bank of shifting points whose one wall and back are cut away to positions opposite a bank of needles momentarily at rest, moving the needles forward into cooperation and into engagement with the lower portions of the grooves of the shifting points to such positions as will allow the needle beards to remain open just sufficiently as to catch one half of each of the stitches and be so retained by the shifting points, the shifting points now momentarily pausing, needle motion carrying the banks of needles slightly downwardly, caused by advancing needle bar downwardly, allowing needle beards to open still further, eliminating possibility of needle beards missing the stitches on the downward motion, retaining one half of each stitch under the needle beard, shifting points picking up the other half of the stitches, ready to be shifted to adjoining needles, the other one half of the stitches being retained by the needle beards, the shifting points and the needles subsequently moving downwardly.

2. In the process of spreading loops on a full fashion knitting machine the following steps; lowering the transfer point and needle together, forwardly moving the needle to bring the needle beard into the groove of the transfer point, additionally moving the needle downwardly resulting in permitting the beard to remain open, and further downward movement of both needle and transfer point to locate the loop upon the transfer point and inside the needle beard.

In testimony whereof I affix my signature.

FRANK STEVENSON.