June 16, 1936. C. L. PAGE 2,044,324

LATCH KNITTING NEEDLE

Filed Oct. 4, 1935

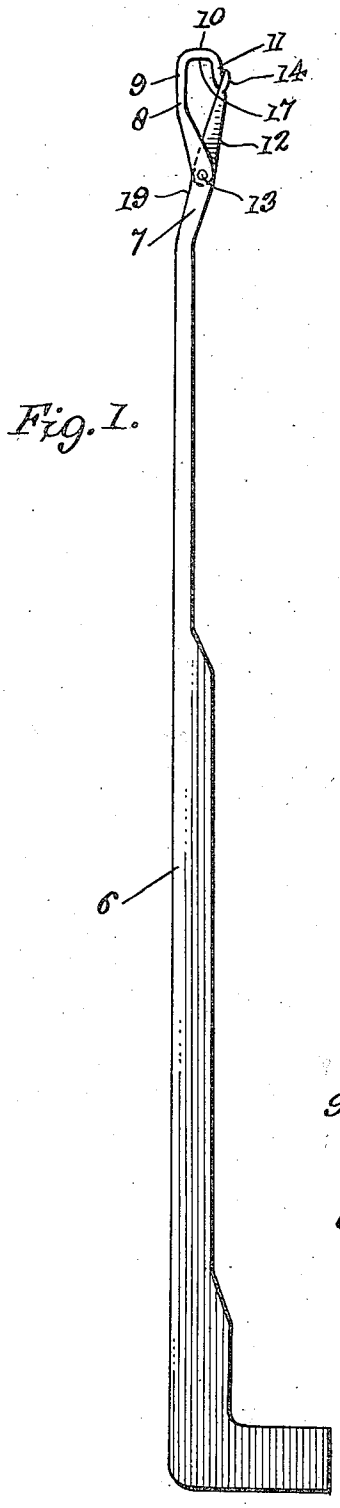


Fig. 1.

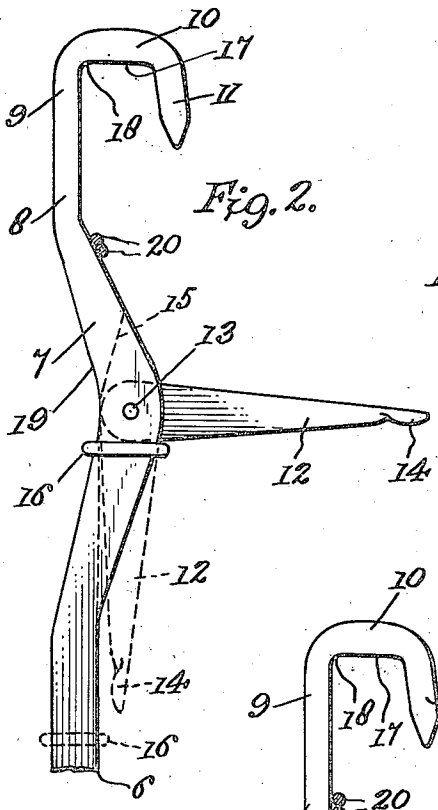


Fig. 2.

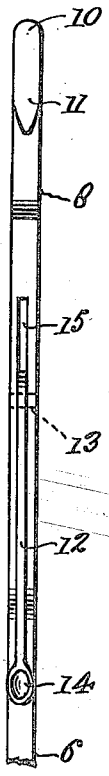


Fig. 5.

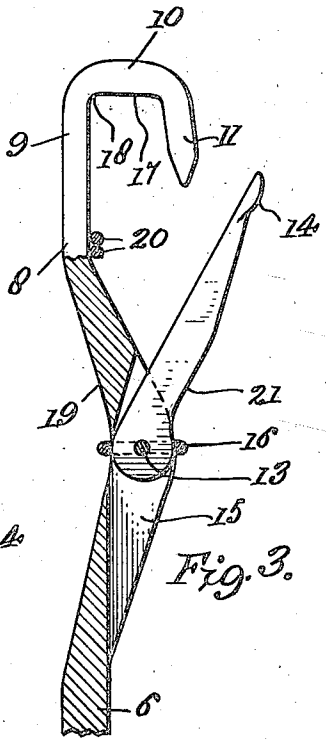


Fig. 3.

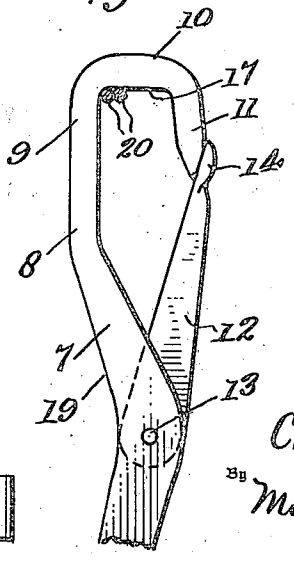


Fig. 4.

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Patented June 16, 1936 2,044,324

UNITED STATES PATENT OFFICE

2,044,324

LATCH KNITTING NEEDLE

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Application October 4, 1935, Serial No. 43,612

6 Claims. (Cl. 66—121)

The present invention relates to latch knitting needles and has for an object to provide what might be called a square hook needle as distinguished from the round standard needles, to the end that all the stitches may be uniformly drawn down the same distance and the knitted fabric consequently made more uniform, smoother and freer of imperfections.

Another object of the invention is to provide a forwardly or outwardly offset cheek to lengthen the yarn eye, causing feeding of the yarn to the hook at a higher point and thus avoiding cutting or pinching of the yarn by the closing of the latch which results in "pulled stitches" and cut yarns, and also requiring the loop to traverse a longer path over the offset cheek, delaying the closing of the latch until the needle is drawn down to a lower position than heretofore and the yarn is consequently higher in the hook at the period of latch closing for a similar purpose.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawing, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a side elevation of an improved latch knitting needle constructed in accordance with the present invention.

Figure 2 is a fragmentary view of the upper portion of the same, taken on an enlarged scale and with the latch open.

Figure 3 is a similar view, with parts broken away, showing the partially closed position of the latch.

Figure 4 is a view similar to Figure 2 with the latch completely closed, and

Figure 5 is a fragmentary edge view of the needle hook and latch with the latter in its lowermost position.

Referring more particularly to the drawing, 6 designates the shank or blade of the needle, 7 the cheek and 8 the throat. The hook is composed of a back section 9, top bar 10 and bill 11.

A latch 12 is pivoted at 13 in the cheek 7 and its spoon 14 closes against the bill 11 of the hook. The cheek is slotted, at 15, where the latch end is received for pivoting and the side walls of the cheek at the side of the slot 15 act to steady the latch 12 in its swinging movement and confine it against lateral movement such as might allow the spoon 14 to escape the proper engagement against the bill 11.

The yarn loop is shown at 16 in Figures 2 and 3.

One feature of the invention is to form the inner or under surface of the top bar of the hook in a substantially straight horizontal line 17 from a point at or adjacent the rear section 9 for a sufficient distance to accommodate at least two or more yarns. This horizontal position of the under part 17 of the bar is at substantially right angles to the back of the blade 6 of the needle. Such construction will enable all yarns in the hook to be drawn down the same distance in forming loops or stitches. This comes about because all the yarns in the hook are obliged by this construction to take up a position side by side in a horizontal plane all directly in contact with such horizontal undersurface of the hook bar. Such disposition of the yarns is shown in Figure 4. Therefore this bar in descending will draw down each one of the yarns an identical distance.

This action is in contrast to the action of the standard form of hook, which is a round hook having a substantially continuous inner rounded surface from the inner section out to the bill. Such rounded hooks have a single high point such that the high point can be occupied by only a single yarn, and when there are two or more yarns in the needle only the particular yarn occupying the high point will be drawn down a proper distance. The yarn in the high point will not be drawn down through the stitch as far as the other yarns in the needle which are necessarily below the yarn occupying the high point.

The disadvantage is that one yarn will be drawn down by the needle a different distance than other yarns. The yarn that occupies the high point in the hook will be last to be drawn through the previously formed stitch and the other yarns not occupying the high point will be drawn down further making longer loops. This irregularity will of course show up in the finished fabric, evidencing itself in the lack of uniformity in the knitted fabric. With the square hook of the present invention this irregularity is eliminated, as every loop is uniformly drawn or produced.

With the square hook of this invention the yarn will occupy the rear corner portion particularly if it be a single yarn and if more than one yarn then these additional yarns will be ranged close along side the innermost yarn but that innermost yarn will occupy substantially the rear corner portion of the hook lying between the rear section 9 of the hook and the top bar 10, as shown in Figure 4. This is important, particularly in circular knitting machines, as such corner portions form a circumference of the needles having the smallest diameter. There-

fore with the stitches knit from these inner corner portions of the hooks, a finer fabric or a finer stitch can be drawn than is possible on the old round hook needle. This advantage lies in the fact that the diameter between the square back portions of the new needles is less than the diameter of the drawing points on the standard round hook needles. The evenness of the stitch produced by the present improvement creates a finer appearance in the fabric and thus increases its commercial value.

Notice especially that the improved hook possesses the extensive or elongated horizontal surface 17 referred to but that, inasmuch as it is necessary in this art to avoid all sharp corners over which yarn may have to pass, the immediate angle 18 of the rear corner portion of the hook is slightly rounded where the yarn passes from the rear section 9 to the top bar 10 of the hook, and this rounded portion 18 will facilitate the passage of the yarn up against the horizontal surface 17 of the top bar. The essential feature of this part of the invention is that there be a yarn engaging surface on the underside of the hook bar which is at substantially right angles to the direction of draw of the needle. It is also essential that this right angular or horizontal surface be at the inner side 17 of the hook.

A second feature of the invention is what is called the delayed latch closing action. This may be brought about in a number of ways, two of which are illustrated in the drawing.

It will be noted that the cheek 7 is offset forwardly out of alinement with the blade 6 of the needle; that is the rear wall of the cheek. The cheek is substantially the same width throughout its length as the ordinary cheek except that it is outwardly curved or bulged, producing the cheek set forward out of alinement with the blade of the needle forming an indentation or concave surface 19 at the back of the needle for the loop 16 to follow in drawing stitches. In this formation I do not materially alter the size of the cheek; that is, it is the same size from end to end of the cheek as the regular needle now in use. This offsetting of the cheek creates a longer yarn eye in which to more easily feed the yarn into the throat of the needle. The yarn 20 is fed into the throat of the needle as shown in Figure 2, and when the needle is drawn down the hook engages the yarn to draw it through the previously formed stitch. This offsetting of the cheek forwardly offsets with it the pivot point 13 of the latch carried by the cheek. Such construction creates greater width in the lower portion of the yarn eye which is usually a V. This V is retained at the same time as the greater width is secured, this V being desirable because it is created by the two lateral walls of the slot 15 in which the latch 12 is pivoted. These two walls prevent the latch from sidewise movement whereby it will always properly close with its spoon 14 engaging the bill 11 of the needle.

The offset construction of the cheek 7 has the further advantage of requiring the loop 16 to travel upwardly in a curved path offset from the vertical and longer than the usual vertical path. In other words it will require the needle to descend a greater distance through the loop before the loop 16 arrives at a position to close the latch. The loop is obliged to traverse about the offset cheek 7 which is a longer path than would be required of the loop were the needle a straight vertical needle as customarily made. The delayed action of the latch allows the yarn to be fed higher up on the throat of the needle before the latch closes and this prevents trapping, fraying, cutting and distortion of the stitches.

These advantages are also gained by the larger yarn eye particularly at its lower portion.

Figure 2 shows the yarn 20 being fed into the hook of the needle at a relatively higher point than customary due to the longer yarn eye.

Figure 3 shows the yarn 20 well up on the throat 8 before the latch 12 begins its scissors action at the bottom of the yarn eye. The yarn 20 is thus not cut by the latch and the imperfection in the knitted fabric known as frayed stitches is avoided.

Figure 4 shows the engagement of the yarn 20 against the horizontal surface 17 in horizontal row or side-by-side position at the inner corner portion of the hook or yarn eye. Both strands of yarn will be drawn by the needle the same distance through a previously formed loop.

A second form of device for accomplishing this delayed action is by forming on the outer edge of the latch 12 a cut-away or indented portion 21 adjacent to the pivot 13 to permit the loop to move into the same as the needle is drawn through the previously formed stitch or loop. The latter moves into the groove and thereby delays the closing of the latch as compared with the ordinary latch. This indented form of latch may be used with or without the forward cheek.

While the square hook and forward cheek with retarded latch action are combined in this description they do not necessarily have to be incorporated in one latch needle but either can be adapted to any latch needle.

The invention therefore contemplates:

(1) A latch needle with a substantially square hook.

(2) A latch needle with a forward cheek, and

(3) A latch needle with a delayed or retarded latch action.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. A latch knitting needle for circular knitting machines including a shank and its throat, a hook on the throat having a rear section, top bar and bill, said top bar being straight horizontally as to its undersurface for a distance substantially from the rear section to accommodate a plurality of yarns side by side in a horizontal sense and to retain the yarns in the inner angle of the hook, such angle being slightly rounded, a forwardly offset cheek having an indented rear portion with a slot and side walls of substantially standard dimensions, and a latch pivoted to said walls within said slot and having a spoon to close against the bill of the hook.

2. A latch knitting needle for circular knitting machines including a hook including a rear section and a substantially straight yarn-engaging portion at approximately right angle to the direction of draw of the needle, the inner wall of the rear section being angularly disposed with respect to said yarn-engaging portion.

3. A latch knitting needle for circular knitting machines, including a hook having a rear section and a substantially horizontal yarn-engaging portion angularly intersecting the inner wall of

the rear section, said yarn-engaging portion being located at the inner upper angle part of the hook to hold the yarns at the back portion of the hook and in a row side by side for the uniform drawing of all the stitches.

4. A latch knitting needle for circular knitting machines comprising a hook having a back section, top bar and bill, the inner undersurface of the top bar being in a substantially straight horizontal line from a point at or adjacent the rear section and forming with the inner substantially vertical wall of the rear section an angle which is substantially a right angle, the corner portion at the angle being slightly rounded to facilitate the movement of the yarn from the vertical to the horizontal wall, and a latch pivoted to the needle and adapted to close against said bill.

5. A latch knitting needle for circular knitting machines including a hook, and a pivoted latch, the under loop-engaging edge of the latch having a cut-away portion adjacent but spaced from the pivot a distance to present such cut-away portion to the loop as the needle is drawn down through the loop whereby to cause delayed closing of the latch.

6. A latch knitting needle for circular knitting machines including a hook, a forwardly offset cheek having an unobstructed indented rear portion to allow the loop to follow the contour of the cheek without distortion of the loop, and a latch pivoted in the cheek, the under loop-engaging edge of the latch having a cut-away portion adjacent but spaced from the pivot a distance to present such cut-away portion to the loop forwardly of the offset cheek as the needle is drawn down through the loop whereby to cause delayed closing of the latch.

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