

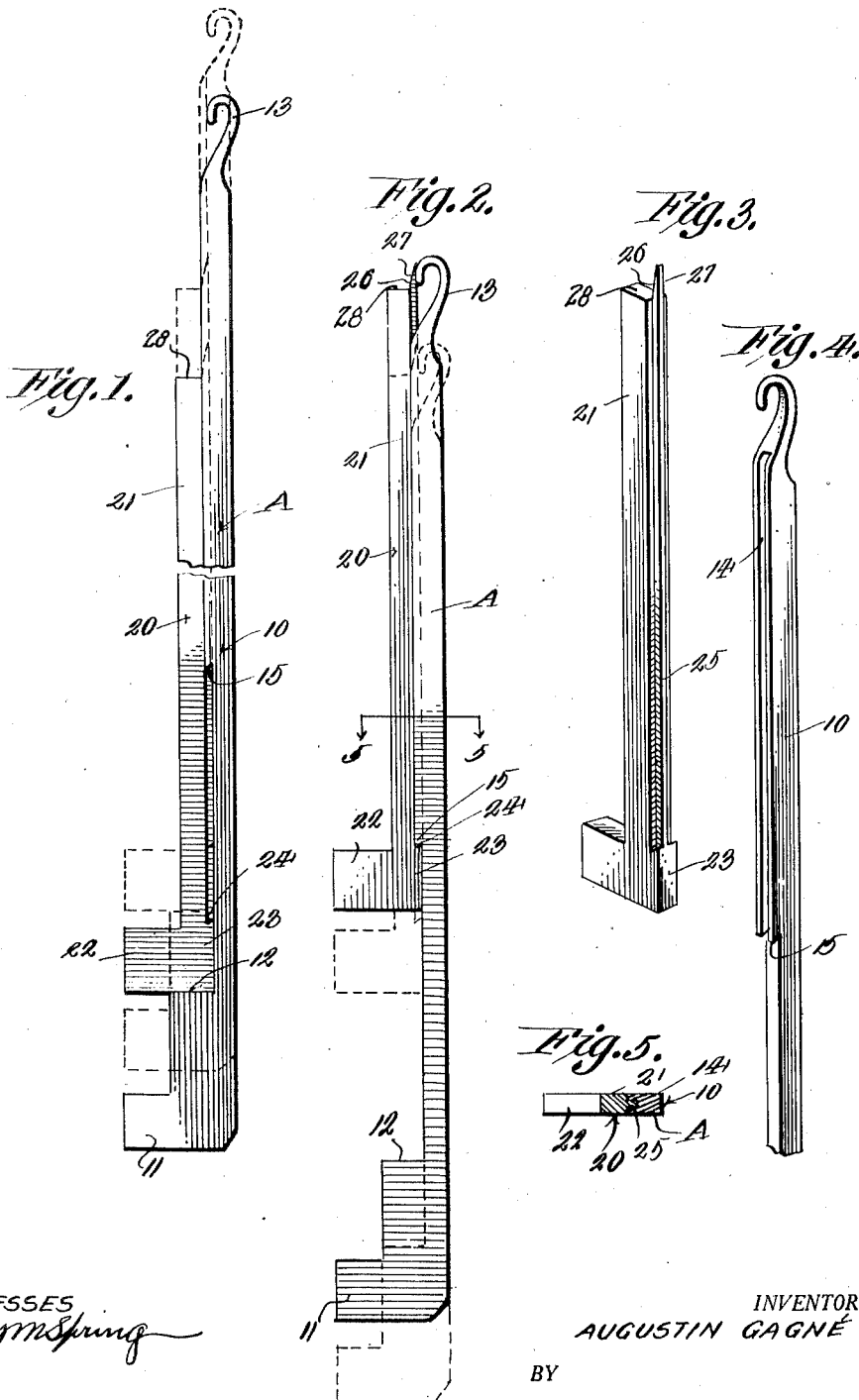
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NEEDLE

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WITNESSES

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## UNITED STATES PATENT OFFICE

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## NEEDLE

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This invention relates to knitting machines and more particularly to an improved needle therefor.

In the drawings:

5 Fig. 1 is a view in side elevation of the needle, the dotted line position showing the hook in position to take thread;

Fig. 2 is a similar view but with the latch closing the hook of the needle to permit the last drawn stitch to be cast off over the top of the needle hook;

Fig. 3 is a detail perspective view of the latch;

Fig. 4 is a detail perspective view of the 15 stitch drawing portion of the needle; and

Fig. 5 is a view in section through the complete needle taken on the line 5—5 of Fig. 2 looking in the direction of the arrows.

Referring to the drawings in detail, where- 20 in similar reference characters designate corresponding parts throughout the several views, the letter A generally indicates the complete needle.

The needle A comprises an elongated shank 10 having a butt 11 formed on the lower end thereof. It is to be noted that the shank 10 is reduced in cross section slightly above the butt 11 to form a shoulder 12, the purpose of which will be later described. The extreme upper end of the shank 10 has formed thereon a hook 13 which engages the yarn or yarns, in the usual way. The inner edge of the shank 10 is provided with an elongated groove 14, which opens out at the upper end 35 of the shank adjacent to the hook of the needle. The inner wall of the groove is in the same plane as the outer surface of the bill of the hook and by such a construction the latch 20 moves to hook closing position in a straight line without being laterally deflected. At a point below the transverse center of the shank 10, and above the shoulder 12, the side walls of the groove 14 are cut away, so as to provide stop shoulders 15 and 40 these shoulders are undercut as clearly shown in Fig. 4 of the drawings.

Connected with the shank 10 is a latch 20, which forms an important part of the present invention. This latch includes a longitudinally extending body or shank 21, which is of 50

substantially the same thickness as the shank 10 and has formed on its lower end an outwardly extending short butt 22, the outer end of which terminates in the same plane as the butt 11 carried by the loop drawing portion of the needle. Directly inward of the short butt 22 the body 21 has formed thereon a heel 23, the upper face of which is beveled inwardly and downwardly as at 24 to correspond to the undercut shoulders 15 formed on the lower ends of the walls of the groove 14 of the shank 10. The body 21 has formed on its inner edge a guide rib 25 one edge of which is beveled as at 26 adjacent to its upper end 27. Adjacent to the upper end of the rib 25, a loop retaining shoulder 28 is provided which shoulder constitutes the extreme upper end of the shank or body 21 and extends at substantially right angles to the directions of movements of the latch and loop drawing 70 members. The guide rib 25 is slidably mounted within the guide groove 14, so that the latch will move longitudinally of the shank 10. In view of the location of the short butt 22 and the heel 23 relative to the shoulders 12 and 15, the movement of the latch on the shank 10 is limited as can be readily understood by referring to Figs. 1 and 2. 75

During the knitting of each course the hook portion of each needle is raised from the dotted line position of Fig. 2 to the full line position of Fig. 1 when the shoulder 12 engages the lower edge of the latch 20 and then the hook portion of the needle and latch 80 are raised to the dotted line position of Fig. 1. The hook portion of the needle then moves down to the full line position of Fig. 2, and during such descending movement, the hook 13 engages a thread or threads and draws the same down to a position slightly above the upper edges of adjacent sinkers after which the hook portion of the needle and the latch move down from the full line position, Fig. 2, to the dotted line position, 85 the interengagement of the shoulders 15 and 24 causing the latch to move with the hook portion of the needle. During the last described movement of the latch and stitch drawing portion of each needle, the hook por- 90 95 100

tion thereof draws the new course of yarn over the edges of adjacent sinkers and thereby measures the stitch. While a hook portion of a needle moves from the dotted line position of Fig. 1 to the dotted line position of Fig. 2, the shoulder 28 provided by the shank or body 21 of the latch holds the old stitch and prevents the same from moving down with the yarn within the needle hook as the latter draws the stitch. Without the shoulder 28 the old loop or stitch would tend to move down along the shank 21 of the latch, the knitted fabric would not be uniform and difficulty would be experienced in properly drawing a new stitch through the old. The hereinbefore described relative movements of the hook portion of the needle and latch are controlled by cams which engage the butts 11 and 22.

Prior to the knitting of heels and toes, the instep needles are raised to a position above the heel needles by means of jacks which are positioned beneath the needles and in the grooves of the needle cylinder, the jacks in turn being raised by means of an instep cam. As is customary during the narrowing of the heel and toe pockets, the heel and toe needles are moved up out of action by means of picks acting upon butts carried by the mentioned jacks; thereafter during the widening of the heel and toe pockets widening picks pick down the jacks pertaining to the heel and toe needles which permits their needles to resume active knitting; finally when circular knitting is to be resumed a cam depresses the long butt jacks which are positioned beneath the instep needles which needles are then permitted to resume active knitting.

From the foregoing, it can be seen that I have provided a novel knitting machine needle of a simple construction which will perform the necessary work with all of the advantages of the so-called latchless needles as well as needles embodying pivoted latches.

Changes in details may be made without departing from the spirit or the scope of this invention.

I claim:

1. A knitting machine needle consisting of a loop drawing member terminating at one end in a hook and a latch member slidably associated therewith, the said latch member being adapted to move relatively to and from loop drawing position with respect to the hook, the latch member having a loop retaining shoulder adjacent to its hook closing end and said shoulder extending substantially at right angles to the directions of movements of the latch and loop drawing member said shoulder being located, when the latch and loop drawing members are in hook closing position, substantially opposite the point of the bill of the hook.

2. A knitting machine needle consisting of a loop drawing member terminating at one

end in a hook and a latch member slidably associated therewith, the said latch member being adapted to move relatively to and from loop drawing position with respect to the hook with the hook closing portion of the latch member moving in a substantially straight line undeflected laterally during such movements, the latch member having a loop retaining shoulder adjacent to its hook closing end and said shoulder extending substantially at right angles to the directions of movements of the latch and loop drawing member said shoulder being located, when the latch and loop drawing members are in hook closing position, substantially opposite the point of the bill of the hook.

3. A knitting machine needle consisting of a loop drawing member terminating at one end in a hook and a latch member slidably associated therewith, the said latch member being adapted to move relatively to and from loop drawing position with respect to the hook, the latch member having a loop retaining shoulder adjacent to its hook closing end and said shoulder extending substantially at right angles to the directions of movements of the latch and loop drawing member and being located, when the latch and loop drawing members are in hook closing position, substantially opposite the point of the bill of the hook, and means consisting of butts on the latch and loop drawing members adapted to be engaged by cams, whereby to time the relative movements of the latch and loop drawing members.

4. A knitting machine needle consisting of a loop drawing member terminating at one end in a hook and a latch member slidably associated therewith, the said latch member being adapted to move relatively to and from loop drawing position with respect to the hook with the hook closing portion of the latch member moving in a substantially straight line undeflected laterally during such movements, the latch member having a loop retaining shoulder adjacent to its hook closing end and said shoulder extending substantially at right angles to the directions of movements of the latch and loop drawing member and being located, when the latch and loop drawing members are in hook closing position, substantially opposite the point of the bill of the hook, and means consisting of butts on the latch and loop drawing members adapted to be engaged by cams, whereby to time the relative movements of the latch and loop drawing members.

In testimony whereof I affix my signature.

AUGUSTIN GAGNÉ.