Nov. 27, 1923 1,475,182

J. G. HANES

KNITTING MACHINE NEEDLE

Filed April 19, 1922

FIG. I.

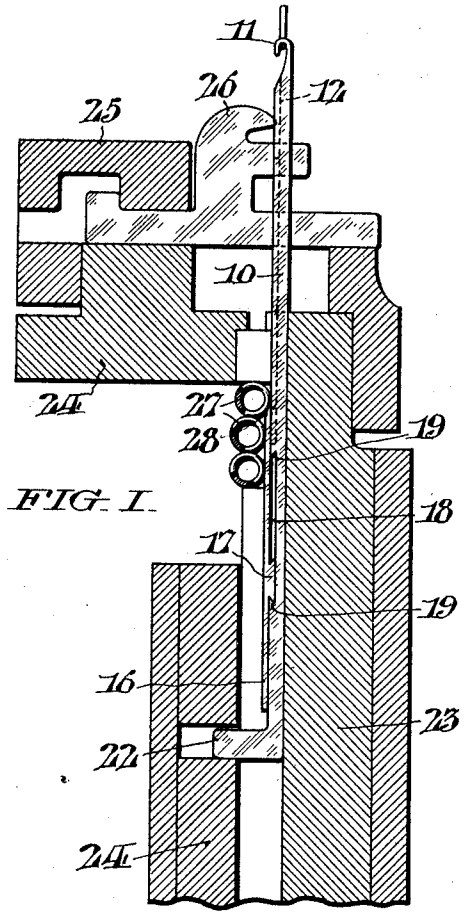


FIG. II.

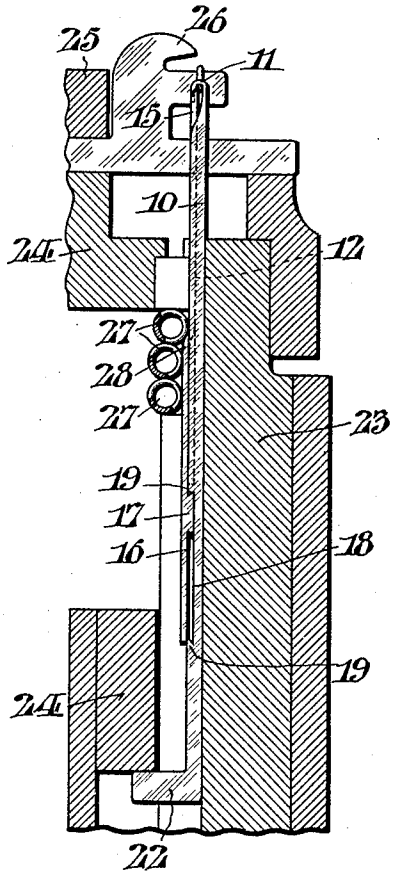


FIG. III.

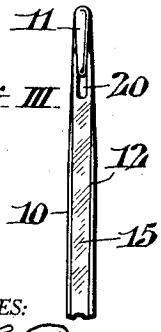


FIG. IV.

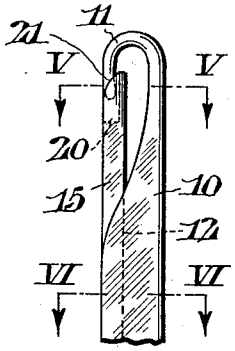


FIG. V.

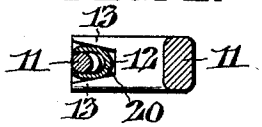
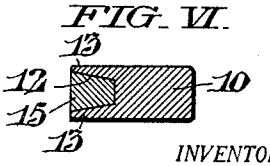


FIG. VI.



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UNITED STATES PATENT OFFICE.

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KNITTING-MACHINE NEEDLE.

Application filed April 19, 1922. Serial No. 555,581.

To all whom it may concern:

Be it known that I, JAMES GORDON HANES, a citizen of the United States, residing at Winston-Salem, county of Forsyth, and State of North Carolina, have invented certain new and useful Improvements in Knitting-Machine Needles, of which the following is a specification, reference being had to the accompanying drawings.

This invention has relation to knitting machine needles and its principal object is to obviate the use of pivoted latches by substituting in lieu thereof a latch member having a slidable connection with the shank of the needle, thereby avoiding the disadvantages incident to pivoted latch needles and to insure a more positively and smoothly operating latching means.

Another object of the invention is to provide a sliding latch having a shield, which is designed and adapted to receive and enclose the point of the needle while casting a loop, so as to insure the smooth casting of the loop over the hook without possibility of the yarn catching or tearing upon any protruding corners.

In addition to the foregoing, this invention comprehends improvements in the general details of construction of a sliding latch needle, to be hereinafter set forth and more particularly pointed out in the appended claims.

In the accompanying drawings, Fig. I is a view in side elevation of an improved sliding latch needle constructed in accordance with the present invention, illustrating the latch in a retracted position, and showing in section a portion of a needle cylinder and correlated parts.

Fig. II is a similar view showing the needle in loop casting position and the latch in a hook closing position.

Fig. III is a detail edge view in elevation on an enlarged scale of the hook of the needle showing the latch in closed position.

Fig. IV is a similar view showing the hook position in side elevation.

Figs. V and VI are detail views in section taken on the lines V—V and VI—VI respectively of Fig. IV.

With reference to the drawings, 10 indicates the shank of a knitting needle, the upper end of which is reduced in diameter and curled to form the hook 11. The side of the shank toward which the hook is directed is provided with a longitudinal groove 12 which is bevelled or tapered inwardly, in cross section, as shown in Fig. VI, the formation of the groove defining a pair of side or enclosing walls 13. The groove terminates at a point approximately midway the length of the needle and is intended to receive in closely fitting and sliding engagement one end of a latch member 15, the opposite or butt end of which indicated at 16, is offset, so as to engage the shank of the needle along its side, out of alignment with the groove. A dove-tailed enlargement 17 is formed upon the inner side of the portion 16 and is adapted to slide within a recess 18 formed in the side of the needle shank, the upper and lower defining walls of said recess being bevelled inwardly as at 19 so as to receive the bevelled walls of the enlargement 17 when the latter is either in an extreme upper or lower position. The opposite end of the latch member 15 is hollow or cupped as at 20 and the end of the latch is bevelled along its inner side as at 21, the bevelled surface being preferably curved so as to enclose the point of the hook and overlap the inner surface of the point, leaving the outer surface of the point open or exposed, but not protruding from the cupped latch end. If desired the latch may be fabricated of sheet material rolled to tubular formation to form the socket for the hook point, which will then fit within the channel of the latch; or the latch member may be constructed of solid material and its end cupped to receive the hook point. The lower end of the needle shank is bent over to form the butt 22 in the usual manner.

The relation of the needle to the parts of the needle cylinder of a typical form of knitting machine is shown in Figs. I and II wherein 23 indicates the needle cylinder proper and 24 the cam, receiving the butts 22 in the usual manner. The bed ring and cap ring are indicated at 24 and 25 respectively and cooperate to support the web holders 26 which cooperate with the needles to cast the loops in a well known manner. One or more spring bands 27 are embraced about the needle cylinder, engaging the lower portions of the needles under tension and incidentally engaging the offset ends 16 of the latch members. These bands will contact with the latching members at points above and below the offsets thereof, the junctures of the offsets being indicated at 28 and as shown are curved to form a round-

ed hump so as not to be too abrupt. During the operation of the knitting machine, as the needle shank rises the latch is carried with it but in a retracted position, the enlargement 17 of the latch member seating against the lower wall of the recess 18. It will be noted that owing to the dove-tailed formation of said enlargement the lower end of the latching member is held against outward separation from the shank of the needle. As the needle shank is lowered the frictional engagement between the latch member and the aforesaid needle bands will serve to retain the latch member stationary relative to the needle shank until the hook point is seated within the cupped end of the latch member, and continued downward movement of the nedle shank will thus carry the latch with it, against the resistance afforded by the frictional contact of the needle band with said latch. The hook on the needle will now be closed and the loop is cast over the end thereof in the usual manner. It will be noted that when the latch member is in hook-closed position, its enlargement 17 will be seated against the upper wall of the recess 19, and by engagement therewith will prevent lateral movement of the latch member relative to the needle shank. Owing to this construction the latch members are readily separated from the needle shanks when desired for the purpose of replacement or repair of either part, and hence no pivotal or embracing connections of any kind are required between the two parts.

Other advantages will be readily apparent to those familiar with the art to which this invention appertains.

Having thus described my invention, I claim:

1. A knitting machine needle including a shank terminating at one end in a hook, the side of the shank to which the hook is directed having a longitudinal groove extending part way of the shank, the ungrooved portion of the shank on the same side having a dove-tailed recess, a latch member having its ends offset and one end slidably mounted in said groove to close the hook in one position thereof, and a dove-tailed enlargement on the other end of the latch member adapted to enter a dove-tail recess to retain the needle and latch member against separation in either open or closed position of the latter by interlocking engagement of the enlargement with the walls of its recess.

2. A knitting machine needle including a shank having a dove-tailed recess, a sliding latch member cooperating therewith, and a transverse dove tailed enlargement on the latch member operating in the recess.

3. A knitting machine needle including a shank having a groove formed in one side with outwardly diverging side walls, a latch member slidably fitted in said groove and having tapering sides to correspond thereto, and interlocking means preventing separation of the latch member relative to the shank at the extreme limits of travel.

4. A knitting machine needle including a shank, a sliding latch member applied to said shank for relative movement without permanent connections therebetween, so that the shank may be freely withdrawn and replaced, and means operating between the shank and latch member causing locked engagement therebetween against separation only at the moments of extreme advance and retraction of the latch member.

5. A knitting machine needle including a shank having a longitudinal groove, a sliding latch member having one end fitted into the groove flush with the shank surface and its opposite end extending beyond the shank surface for engagement with needle bands of a knitting machine to frictionally retain the latch member against movement during movement of the shank.

6. A knitting machine needle including a shank having a longitudinal recess, a sliding latch member, and means on said latch member entering the recess, said means and upper and lower ends of the recess being adapted for cooperation to lock the latch member against separation from the shank only at the extreme advanced and retracted positions of the latch member.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this eighth day of April, 1922.

JAMES G. HANES.

Witnesses:
JAMES H. BELL,
E. L. FULLERTON.