R. FENN.

KNITTING NEEDLE.

APPLICATION FILED OCT. 2, 1919.

1,364,088.

Patented Jan. 4, 1921.

Fig. 1.

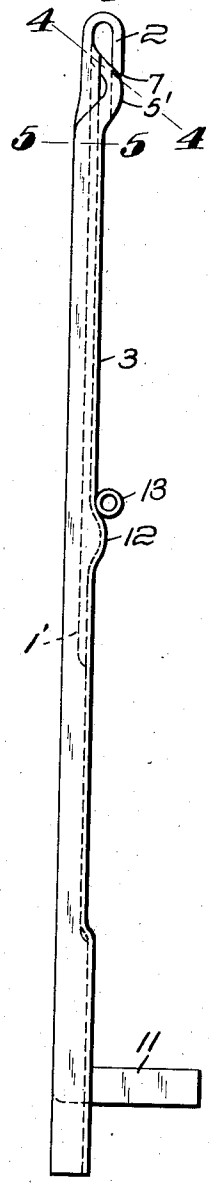


Fig. 2.

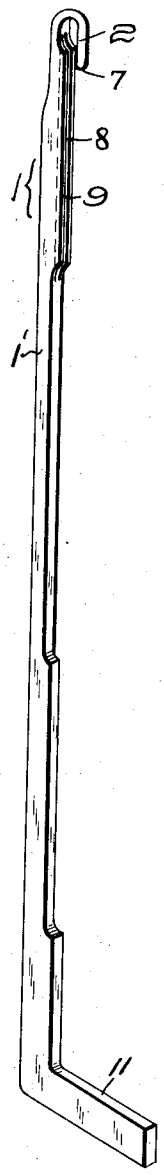


Fig. 3.

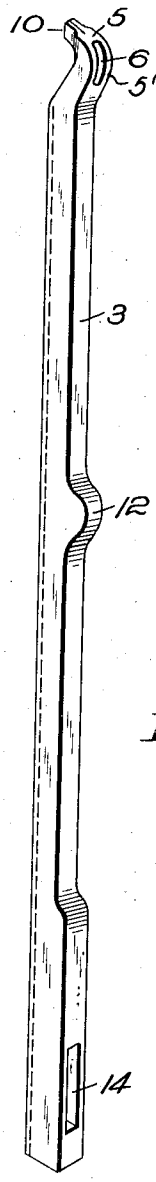


Fig. 6.

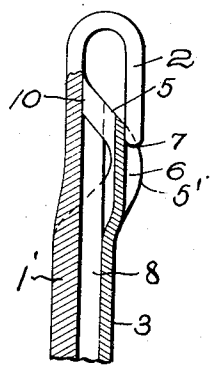


Fig. 7.

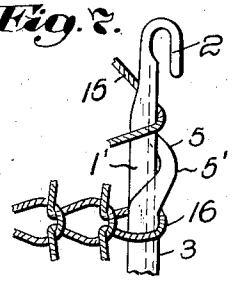


Fig. 8.

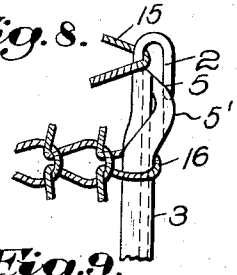


Fig. 9.

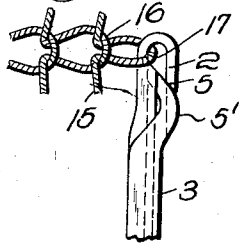


Fig 4

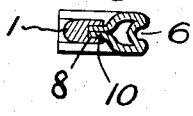
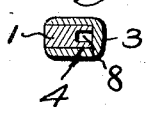


Fig. 5.



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UNITED STATES PATENT OFFICE.

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KNITTING-NEEDLE.

1,364,088. Specification of Letters Patent. Patented Jan. 4, 1921.

Application filed October 2, 1919. Serial No. 327,982.

To all whom it may concern:

Be it known that I, RAY FENN, a citizen of the United States, and a resident of Providence, in the county of Providence and State of Rhode Island, have invented an Improvement in Knitting-Needles, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to knitting needles and more particularly to knitting needles having relatively slidable hook and casting-off members as distinguished from needles having latches or spring beards.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims.

In the drawings wherein I have shown merely for illustrative purposes one embodiment of the invention—

Figure 1 is an enlarged side elevation of the knitting needle;

Fig. 2 is an enlarged perspective view of the hooked member of the needle;

Fig. 3 is an enlarged detail perspective view of the casting-off member thereof;

Fig. 4 is a transverse section taken on the line 4—4 of Fig. 1;

Fig. 5 is a transverse section taken on the line 5—5 of Fig. 1;

Fig. 6 is a very much enlarged longitudinal section of the loop forming end of the needle;

Fig. 7 is a diagram illustrating the first step in the formation of a loop;

Fig. 8 is a view similar to Fig. 7 illustrating another step in the formation of a loop and

Fig. 9 is similar to Figs. 7 and 8 illustrating the completion of the formation of a loop upon the needle embodying this invention.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 1 indicates one member of the needle which for purposes of identification is termed a hooked member having a hook 2 formed at one end thereof.

3 indicates another part of said needle which for convenience has been designated a sheath, and this sheath preferably has a groove 4 formed in the back edge thereof to receive the stem 1′ of the hooked member 1 and permit a relative longitudinal movement between said hooked member and said sheath. The sheath 3 may be and is herein shown formed from sheet metal bent substantially U-shaped or in channel formation as will be seen most clearly in Fig. 5, so as to engage the front edge and opposite sides of the stem of said hooked member 1; the term "front edge" herein designating that edge of the needle that is directed toward the open end of the groove of the needle cylinder or that edge from which the hook of the needle projects.

Furthermore the sheath 3 constitutes what has been called the casting-off member of the knitting needle and which I also designate as the hook guarding member and in order to render said sheath capable of effecting the casting-off of loops a suitably formed loop guiding element, herein the finger 5, is provided at one end thereof to coöperate with the hook 2 of said hooked member. The finger 5 is outwardly or laterally curved with respect to the body of the sheath 3 as at 5′ and its front edge or face which is extended slightly beyond the end 7 of the hook 2 may, if desired, be recessed as shown at 6 to receive said end 7 at certain times in the loop forming operations in order to cover said end so that the old loop upon the needle shank may be properly cast off over the new yarn held within the hook of the needle as hereinafter more fully described.

The end of the finger 5 is bent backward at an angle to the portion 5′ and is herein formed to extend into the hook 2 of the needle and means are provided for guiding the extremity of said finger during relative longitudinal movements of said hooked member and said sheath, said means including a groove 8 formed in the front edge or hook side of the stem of said hooked member 1 preferably in a thickened portion 9 thereof. In order to facilitate coöperation with said slot the tip end of the finger 5 is herein flattened as at 10, (see Fig. 4), that is the opposite edges of the U-shaped portion are pressed together so as to fit into said groove 8 and thus properly guide said finger during its loop forming operations.

During the formation of loops by the needle embodying this invention said needle may be and preferably is reciprocated in the usual manner, that is if knitting is to be produced by hand, said needle will be

moved longitudinally by hand, or if the needle is to be used as a machine needle then the reciprocating thereof will be effected by the usual knitting cams and in the present example I have illustrated a needle constructed to be used in a knitting machine and to be functioned in the usual manner by knitting cams. Therefore the needle is provided with a knitting butt 11 formed in the usual manner and herein projecting from the front edge of the hooked member.

During the reciprocation of said hooked member by the knitting cams to form loops of the fabric it is desirable that the sheath 3 be retarded in its longitudinal movement so as to create a relative movement between said sheath and said hooked member, thus moving the loop-forming finger 5 toward and away from the end of the hook 7.

For the purpose of retarding the movements of said sheath I have herein provided an enlargement 12 at a suitable point upon said sheath preferably at the front portion thereof, as shown and in such a location as to engage, during certain portions of the reciprocating movement of the needle, the usual spring band or bands 13 of the knitting machine within which the needle is arranged (see Fig. 1).

It is also desirable to provide means for limiting the relative longitudinal movements of said hooked member and said sheath and for this purpose I have herein provided means including a slot 14 formed in the front wall of the sheath 3 near the lower end thereof and through which is arranged to extend the knitting butt 11, said slot being of a length sufficient to permit the finger 5 of said sheath to move away from the end 7 of the hook of the needle in order to allow new yarn to be inserted between said finger and said hook, while in the opposite direction said slot is made sufficiently long to allow the tip 7 of said hook to enter the recess or notch 6 of said finger.

The design of the stem of the hooked member 1 of the needle may within the scope and purpose of the invention be varied as desired and likewise the design of the sheath may be altered to conform to a greater or less degree with that of the hooked member. It is, however, desirable that the walls of the sheath be as thin as possible in order that the combined hooked member and sheath below the finger 5 and also at the finger 5 will not cause the loops that are being formed thereon to be unnecessarily enlarged, in fact these loops need be no larger, if as large as those formed upon the usual latch needle.

It is furthermore within the scope and purpose of the invention to form said sheath in any desired manner, the present example which preferably involves the stamping of the same from sheet metal to substantially correspond with the shape of the stem of the hooked member, being but one of the many methods that may be followed in this respect.

In Figs. 7, 8 and 9 are illustrated three steps in the formation, by the needle hereinbefore described, of a fabric known as plain fabric, this type of fabric being shown merely as an example of one of many types which may be formed by the needle herein described and it is distinctly to be understood that this invention is not limited to the construction of the particular type of fabric shown.

In Fig. 7 the hook 2 is shown in its highest position with new yarn 15 laid around the front portion of the stem 1' directly beneath the end 7 of said hook, while the finger 5 is illustrated in its lowermost position with respect to said hook and the old loop previously formed upon the needle is shown at 16 below the curved finger 5 of said sheath. The hooked member is raised to the position shown herein by the usual knitting cams engaging the knitting butt 11 and during the upward movement of said hooked member a similar upward movement of the sheath 3 is prevented, or retarded at least, by reason of the enlargement 12 engaging the spring bands 13 of the knitting machine which are generally disposed in circumferential grooves formed in the outer face of the needle cylinder. The extent of the movement of the sheath in a downward direction is in the present example sufficient only to separate the finger 5 thereof from the extremity 7 of the hook to allow for the admission of the new yarn 15 as shown in Fig. 7, but obviously this movement may, within the scope and purpose of this invention, be varied as desired by lengthening or shortening the slot 14.

The next step in the formation of a loop is shown in Fig. 8 wherein the hooked member has been depressed far enough for the extremity 7 of the hook thereof to enter the recess 6 of the casting-off member or loop forming finger and upon continued downward movement of the needle to the position shown in Fig. 9 the casting-off of the old loops 16 will be effected in the usual manner to form a new loop 17 from the new yarn 15 held within the hook 2 of the needle.

While I have herein shown and described merely for illustrative purposes one specific embodiment of my invention, and have disclosed and discussed in detail the construction and arrangement incidental to such disclosure, it is to be distinctly understood that the invention is limited neither to the mere details or relative arrangement of the parts nor to the specific application herein shown, but that extensive variations from the illustrations may be made without departing from the principles thereof.

Claims:

1. A knitting needle comprising relatively movable hook and hook guarding members, said hook guarding member having an open faced groove in its back edge to receive the stem of said hook member.

2. A knitting needle comprising hook and hook guarding members adapted for relative longitudinal movement, said hook guarding member having an open groove at the back thereof extending the greater portion of its length to receive said hook member, and means to limit the relative longitudinal movement of said members.

3. A knitting needle comprising hook and hook guarding members adapted for relative longitudinal movement, said hook guarding member having a groove at the back thereof to receive said hook member, and means including a slot in said hook guarding member, and a projection on said hook member extending through said slot to limit the relative longitudinal movements of said members.

4. A knitting needle having a hook member provided with a knitting butt, a hook guarding member engaging the front portion of said hook member, said hook guarding member having a slot formed therein to receive said butt and allow a predetermined relative longitudinal movement between said members.

5. A knitting needle having a hooked member, a hook guarding member arranged to slide upon the hook side of said hooked member, and a knitting butt on said hooked member adapted to extend through said hook guarding member and limit relative movement of said members.

6. A knitting needle having a hooked member provided with a knitting butt, and a hook guarding member slidable upon the hook side of the stem of said hooked member, said hook guarding member having a slot to receive said knitting butt and limit the relative sliding movements of said members.

7. A knitting machine needle having a hooked member, a hook guarding member slidably arranged upon the hook side of said hooked member, means to limit the sliding movement of one of said members relatively to the other, and means adapted for engagement with a spring band of the knitting machine to retard the movement of said hook guarding member.

8. A knitting needle having a hooked member, a hook guarding member having a groove extending substantially the length of its back edge to receive the stem of said hooked member, said hook guarding member having a loop guiding element adapted to extend from opposite sides of the groove into the hook of said hooked member, and means including a groove in the front portion of said hooked member to guide the end of said loop guiding element during relative movements of said hooked and hook guarding members.

9. A knitting needle having a hooked member, a sheath slidable upon the front portion of said hooked member and a loop guiding element carried by said sheath near the hook coöperating end of said sheath and adapted to extend into the hook of said hooked member and coöperate with said hook to cast the loop from said needle, said sheath having guard means to engage the sides of said hooked member closely adjacent to said loop guiding element.

10. A knitting needle having a hooked member, a channel-like sheath slidable upon the front portion of said hooked member, a loop guiding element carried by said sheath at a portion of the channel like formation and adapted to coöperate with said hook to cast loops from said needles, and means including a groove in the front edge of said hook member, to guide the end of said loop guiding element during the relative sliding movements of said hooked member and said sheath.

11. A knitting needle having a hooked member, a channel-like sheath slidable upon the hook side of said member, a laterally curved finger carried by said sheath at a portion of the channel like formation and adapted to coöperate with the hook of said hooked member to cast loops from said needles, and means including a flattened portion at the end of said finger and a groove formed in said hooked member to guide said finger during relative movements of said hooked member and said sheath.

12. A knitting needle having a hooked member, a channel-like sheath slidable along the hook side of said hooked member, and a laterally curved finger carried by said sheath at a portion of the channel like formation and having a recess to receive the end of said hook to effect the casting off of loops from said needle.

13. A knitting needle having a hooked member, a sheath slidable along the hook side of said member, a loop engaging element carried by said sheath adapted to cooperate with the hook of said hooked member to form loops and means including an enlargement formed upon said sheath to retard movements of said sheath.

14. A knitting needle having a hooked member, a sheath mounted for longitudinal movement relatively to said hooked member, a loop engaging element carried by said sheath to coöperate with the hook of said hook shaped member in forming loops and means including an enlargement on said sheath to retard the movements of said sheath.

15. A knitting needle having a hooked

member, a sheath slidable upon the front portion of said hooked member, and a loop guiding element carried by said sheath adapted to extend into the hook of said hooked member and coöperate therewith to cast the loop from said needle, said sheath having guiding means to engage the outer opposite sides of the hooked member adjacent to said loop guiding element and in proximity to said hook.

16. A knitting needle having a hooked member grooved along the hook side of its stem and a sheath slidable upon said hooked member, said sheath including a loop guiding element having portions engaging opposite sides of said hooked member in close proximity to the hook thereof and extending therefrom around the front of said hooked member, the terminal portions of the sheath walls being pressed together to permit sliding engagement thereof within said groove.

17. A knitting needle comprising relatively movable hook and hook guarding members, said hook guarding member having an open groove at its back edge to receive the stem of said hook member, the back of the hook member being adapted and arranged relatively to the hook guarding member to engage evenly the bottom of the needle groove wherein said knitting needle is adapted to slide.

18. A knitting needle having a hooked member, a channel like sheath slidable upon the front portion of said hooked member, the back of the hooked member being adapted and arranged relatively to the sheath to engage evenly the bottom of the needle groove, a loop guiding element carried by said sheath at a portion of the channel like formation and adapted to coöperate with said hook to cast loops from said needles, and means including a groove in the front edge of said hooked member to guide the end of said loop guiding element during the relative sliding movement of said hooked member and said sheath.

In testimony whereof, I have signed my name to this specification.

RAY FENN.