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N. KATAJA

2,129,327

KNITTING MACHINE NEEDLE

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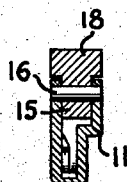
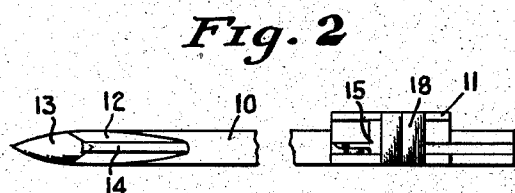
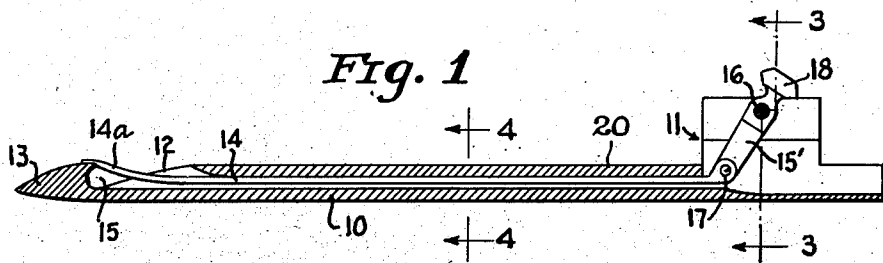


Fig. 4



Fig. 8

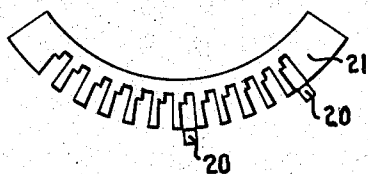


Fig. 5

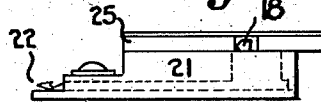


Fig. 6

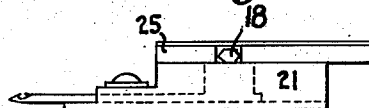


Fig. 9

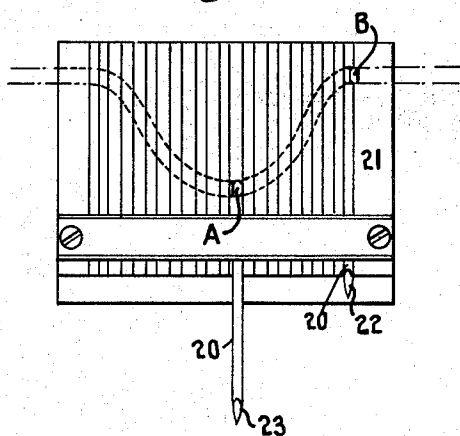
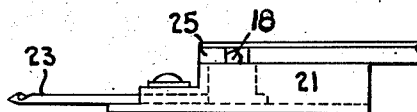


Fig. 7



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KNITTING MACHINE NEEDLE

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4 Claims. (Cl. 66—120)

This invention relates to improvements in knitting instruments and more particularly to an improved type of knitting needle adaptable for use in conjunction with knitting machines.

5 It is an object of the present invention to provide an improved type of knitting needle structure wherein improper catching of threads during the knitting operation will be at least largely avoided.

10 It is another object of the present invention to provide a type of knitting needle structure which is simple in operation and construction and accordingly is economical from the standpoint of manufacturing purposes.

15 The invention will be fully and comprehensively understood from a consideration of the following detailed description when read in connection with the accompanying drawing which forms part of the application.

20 In the drawing:

Fig. 1 is a vertical sectional view of a preferred embodiment of the present invention.

Fig. 2 is substantially a top plan view of an embodiment of the present invention.

25 Fig. 3 is a sectional view of Fig. 1 taken along the line 3—3.

Fig. 4 is a sectional view of Fig. 1 taken along the line 4—4.

30 Fig. 5 is a side view of a needle prepared in accordance with the present invention mounted in a knitting machine with the needle in substantially retracted position.

Fig. 6 is a view similar to Fig. 5 except that the needle is shown in an intermediate position.

35 Fig. 7 is another view similar to Fig. 5 showing the needle in fully extended position with guard member in place.

40 Fig. 8 is a substantially diagrammatic view of a portion of a machine wherein the needle according to the present invention can be used; and

45 Fig. 9 is a substantially diagrammatic top plan view of a portion of the machine of the type referred to in Fig. 8 showing certain of the needles in extended and retracted position.

50 In the drawing, 10 is a substantially quill-like sheath, formed of flexible but hard stock such as spring steel, which is fixedly positioned and integral with the channelled block generally designated at 11. It is preferred to form the sheath 10 in substantially rectangular cross-section as shown but if desirable other forms such as circular or elliptical can be used. The sheath terminates in an opening or throat generally designated at 12 and adjacent thereto is posi-

tioned a substantially pointed hook element generally designated as 13. In the preferred embodiment of the present invention the exposed edges of the throat and hook element as well as a point of the needle are carefully ground to form 5 relatively smooth surfaces whereby accidental catching or tearing of delicate fabric during knitting operation is substantially minimized. The guard element 14 is movably positioned within the sheath 10 and carries near the end thereof a formation generally designated as 14a which 10 is ground and adapted to fit over the hook element generally designated as 13 substantially as shown in Fig. 1 so that when objects are within the area generally designated at 15 and 15 the guard element is positioned in cooperative relationship with the hook element, the movement of said objects will be substantially restricted. The lever arm 15' which is freely pivoted on the shaft 16 journaled in the block generally designated at 11 is attached by means of 20 the pivot 17 to the slidable guard element 14 substantially as shown in Fig. 1 so that when counterclockwise movement is imparted to the lever arm the guard member will be moved from its cooperative relationship with the hook element and retracted into the body of the sheath thereby leaving the throat and hook element fully open. The other end of the lever arm 15' terminates in the cam rider element generally designated at 18 30 which is greater in width than the channel in the block 11 and accordingly abuts against the upper surfaces of the sides thereof substantially as indicated in Figs. 1, 2 and 3 thereby restricting the movement of the lever arm.

35 In order to facilitate a fuller comprehension of the matter of the present invention its use in conjunction with a knitting machine is illustrated in Figs. 5-9, inclusive. In the particular type of knitting machine illustrated for this purpose, the channel blocks carrying a plurality of needles, two of which are shown and designated by the numeral 20, are mounted in slides in the block or plate generally designated at 21, so that the needles can be placed in relatively retracted position, as for example 22 in Fig. 9, or in relatively extended position, as 23 in Fig. 9. The movement of the needles is controlled by a cam plate 25 having a groove cut therein substantially 40 in conformity with that shown in dotted lines in Fig. 9. This cam plate is movably positioned adjacent to the plate carrying the needles so that the cam riders 18 are positioned within the groove of the cam plate. In operation the cam plate is moved relative to the plate carrying the 55

needles thereby causing each of the needles, successively, to move out to extended position and certain other of the needles to move into retracted position, the needles in extended position having the guard member retracted within the sheath and the needles in retracted position having the guard member positioned in cooperative relationship with the hook element. For example, referring to the needle 22 in Figs. 5 and 9, the cam rider 18 is positioned within the cam groove as shown at B in Fig. 9 and when so positioned the needle is in fully retracted position. Under these conditions the pivoted lever arm has been moved to the maximum extent possible in a clockwise direction and the dogs on said lever arm are resting upon the surface of the channel mounting block, accordingly the guard member is extended into cooperative relationship with the hook element substantially as shown in Fig. 1. As the cam 25 is moved, the pivoted lever arm is moved in a counter-clockwise direction thereby retracting the guard element and opening the throat in the sheath so that, when the dogs on the upper surface of the pivot lever arm engage with the sides of the channel block thereby preventing further movement of the pivot arm in a counter-clockwise direction, the block is moved along its sliding base thereby causing the needle to move outward from its retracted position. An intermediate step in this movement is illustrated in Fig. 6. When the needle is in fully extended position as illustrated in Fig. 7 the cam rider is located substantially at the point indicated by A in Fig. 9. Further movement of the cam reverses these operations and retracts the needle to the position shown and described in conjunction with Fig. 5.

A notable feature of the invention is that it permits simultaneous movement of needle and guard member without necessitating a plurality of cams to operate same thereby diminishing the cost of manufacturing the machine as well as the number of moving parts and corresponding likelihood of break-down due to wear.

Although the needle prepared according to the present invention has been shown and described in connection with one type of machine adapted to its utilization, it will be apparent to those skilled in the art that modifications can be made to adapt it to other types of knitting machines and the like.

It is to be understood that this improvement is capable of extended application and is not confined to the exact showing of the drawing nor to the precise construction described and, therefore, such changes and modifications may be made therein as do not affect the spirit of the invention nor exceed the scope thereof as expressed in the appended claims.

What is claimed is new is:

1. A knitting instrument of the type described

comprising a sheath, an open throat near one end of said sheath and a hook element disposed adjacent to said throat, a guard member movably positioned within said sheath and adapted to enter into cooperative relationship with said hook element, and means for imparting movement to said guard member relative to said sheath comprising a lever arm pivoted upon a mounting integral with said sheath, said arm being pivotally connected to said guard member.

2. A knitting instrument of the type described comprising a sheath, an open throat near one end of said sheath and a hook element disposed adjacent to said throat, and integral with said sheath, a guard member movably positioned within said sheath and having a formation near one end thereof adapted to cover at least a part of the throat and enter into cooperative relationship with said hook element, and means for imparting movement to said guard member relative to said sheath comprising a lever arm pivoted upon a mounting integral with said sheath, said arm being pivotally connected to said guard member.

3. A knitting instrument of the type described comprising a sheath, an open throat near one end of said sheath and a hook element disposed adjacent to said throat and integral with said sheath, a guard member movably positioned within said sheath and having a formation near one end thereof adapted to cover at least a part of the throat and enter into cooperative relationship with said hook element whereby the movement of objects positioned within localities of said hook and throat is materially restricted, and means for imparting movement of said guard member relative to said sheath comprising a lever arm pivoted upon a mounting integral with said sheath, said arm being pivotally connected to said guard member.

4. A knitting instrument of the type described comprising a sheath, an open throat near one end of said sheath and a hook element disposed adjacent to said throat and integral with said sheath, a guard member movably positioned within said sheath and having a formation near one end thereof adapted to cover at least a part of the throat and enter into cooperative relationship with said hook element whereby the movement of objects positioned within localities of said hook and throat is materially restricted, and means for imparting movement to said guard member relative to said sheath comprising a cam actuated lever arm pivoted upon a mounting integral with said sheath, said arm being pivotally connected to said guard member whereby reciprocal movement can be imparted thereto by manipulation of said lever arm.