

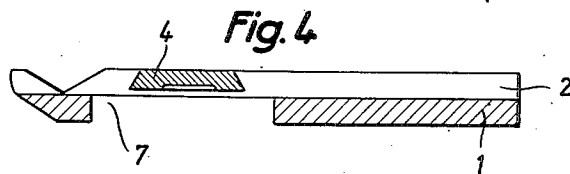
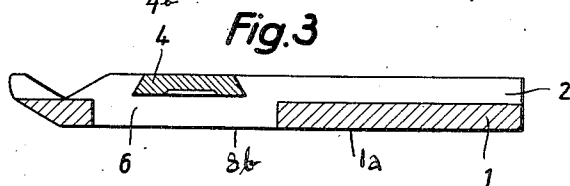
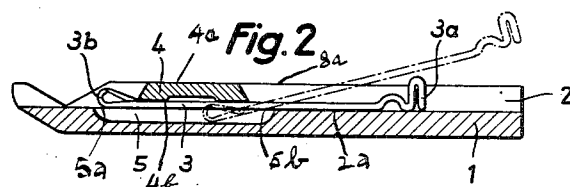
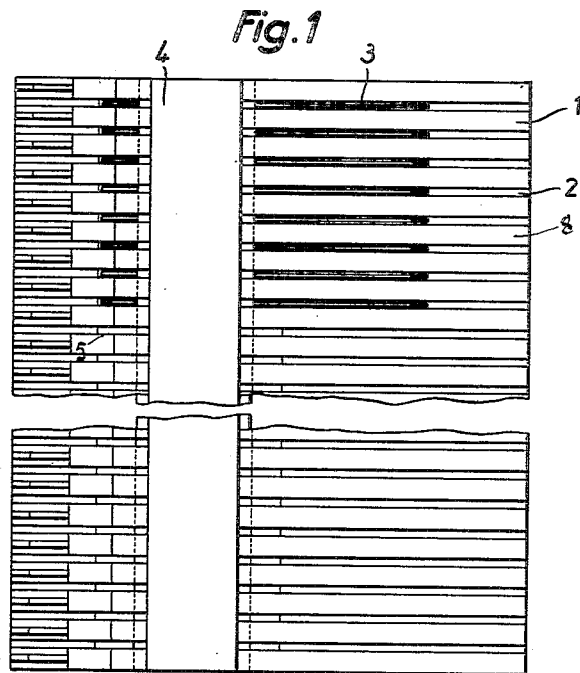
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NEEDLE BED FOR KNITTING MACHINES

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1

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NEEDLE BED FOR KNITTING MACHINES

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1 Claim. (Cl. 66—115)

This invention relates to knitting machines, and more particularly to needle beds for knitting machines.

The knitting machines hitherto used in the art are generally equipped with one or more needle beds for carrying out knitting, the needle beds having needle channels open at the upper ends, in which the knitting needles are movably supported one alongside the other. The knitting needles are generally guided at the open side of the needle channels by means of a bar arranged above, or pushed into the needle bed.

Now, frequently a change of needles is necessary either because one or more needles have become damaged or because the use of several kinds of needles is required for making patterns. However, such a change of needles can be effected only after removing said bar, thus requiring an additional, time-consuming step.

It has now been found that the needle bed or beds can be shaped in such manner that the knitting needles are removable from the needle bed without removing said bar, by moving the heels of the needles from their rest position upwards and simultaneously backwards. This is accomplished by deepening the needle channels at the side opposite to the open side, below and at both sides of the bar. Thus, the heads of the knitting needles can be caused to slide below the bar in said movement.

According to a further embodiment of the present invention the needle bed is provided with perforations at the lower side thereof.

Finally it may be advisable to provide the needle bed with a recess consisting of a single opening traversing the needle bed in a direction across the direction of the needle channels. This recess is preferably so high from the lower side that it reaches as far as a level exceeding the bottom of the needle channels.

The deepening of the needle bed according to the present invention can be effected in a simple manner. For instance, if the needle channels are produced by milling, the milling tool is adjusted at the place of the deepening to a deeper level. A piercing of the bottom of the channels can be effected by providing the raw needle bed with recesses at the corresponding places on the lower side, the upper side of the recesses being cut open in the normal milling of the needle channels. In the same manner the transverse recess can be formed already in the raw needle bed.

The invention will now be described in more detail with reference to the accompanying drawings which illustrate by way of example, some embodiments of the invention. In the drawings Fig. 1 is a top plan view of a needle bed according to the invention; Fig. 2 is a cross-section of the needle bed shown in Fig. 1; Fig. 3 is a cross-section of a modified embodiment of the needle bed; and Fig. 4 is a cross-section of a still further embodiment of the needle bed according to the invention.

Referring now to the drawings, in all embodiments of the invention a needle bed 1 is provided with a plurality of needle channels 2 arranged in parallel to one another.

2

In each needle channel 2 a knitting needle 3 is removably inserted, each of said knitting needles having a heel portion 3a and a head portion 3b. A bar 4 is arranged across the needle channels 2. The bar 4 has a trapezoidal cross-section with the smaller side 4a arranged flush with the tops 8a of the strips 8 separating the needle channels 2 from one another. The larger side 4b of bar 4 is parallel with the smaller side 4a at a distance from the bottom 2a of channels 2, corresponding substantially to the thickness of needles 3.

In the embodiment shown in Figs. 1 and 2 indentations 5 are provided, respectively, in the channels 2 of the needle bed 1 underneath and symmetrically to the cross-section of bar 4. These indentations 5 are longer than the width of the larger side 4b of the cross-section of bar 4 so as to leave openings 5a and 5b communicating with the needle channels 2.

The operation of this device is as follows:

In the normal position of the knitting needles 3 shown in Fig. 2 of the drawings in full line, the head portion 3b of the needle 3 is in a position above the opening 5a while the stem of needle 3 bridges the opening 5b.

If it is intended to remove the knitting needle 3 from its normal position, the heel 3a of the needle is lifted and simultaneously pulled in the longitudinal direction of the needle 3 toward the right in Fig. 2. During this step the head 3b of the needle is automatically lowered from its normal position shown in full line in Fig. 2 so as to enter the indentation 5 and slide under the lower side 4b of the bar 4 so that the needle 3 passes the position shown in dotted line in Fig. 2. In this position the needle can be easily withdrawn entirely from needle bed 1.

Referring now to Fig. 3 of the drawings, the indentations 5 shown in Fig. 2 are replaced, respectively, by longitudinal recesses or openings 6 communicating with the lower side 1a of the needle bed 1. The recesses 6 are separated from one another by the bottom parts 8b of the strips 8.

In the embodiment shown in Fig. 4 of the drawings a single recess or opening 7 is provided, which runs across the needle bed 1 underneath and symmetrically to the bar 4.

The operation of the embodiments shown in Figs. 3 and 4 is substantially the same as that of the embodiment shown in Fig. 1.

It may happen that the knitting needles supported by a needle bed according to the invention are inadvertently removed from the rest positions thereof, for instance by vibrations. In order to counteract such inadvertent removal, suitable safety devices can be used, comprising for instance, a preferably turnable ledge or bar which is arranged above the heels of the needles so as to prevent an upward movement thereof. Or the downward movement of the heads of the needles can be prevented by a ledge or bar supported in the continuous recess and being either turnable or slidable into position. These safety devices, however, have to be removed before an exchange of the needles. In the case of the needle channels being provided with continuations toward the lower side of the needle bed, the safety device may comprise a stamped resilient band or bands which are supported in the recess or recesses piercing the lower side of the needle bed and, owing to their resiliency, do not have to be removed during removal of the needles. The bands may consist, for instance, of steel.

Having now described my invention I wish it to be understood that I do not want to be limited to the embodiments of my invention described in detail hereinabove and that my invention is defined in the claim annexed and forming part of this specification.

What is claimed is:

A needle bed for knitting devices, comprising, in combination, first wall means defining open channels supporting the knitting needles in the rest positions thereof, a bar arranged across the needle bed at the open sides of said channels so as to guide the knitting needles, and second wall means defining a deepening of said channels at the sides thereof opposite to said open sides thereof, said second wall means being arranged below said bar, said deepening of said channels extending over a distance exceeding the width of said bar at either side so as to enable the knitting needles to be withdrawn from their rest positions without removing said bar by imparting to the heel portions of the knitting needles a combined

movement being the resultant of movements directed from the upper side and to the back of the needle bed, said second wall means defining a single recess running across the needle bed and communicating with the lower side thereof.

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