

[54] **NEEDLE CLAMP FOR STRAIGHT
KNITTING MACHINES**
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Zinn & Macpeak

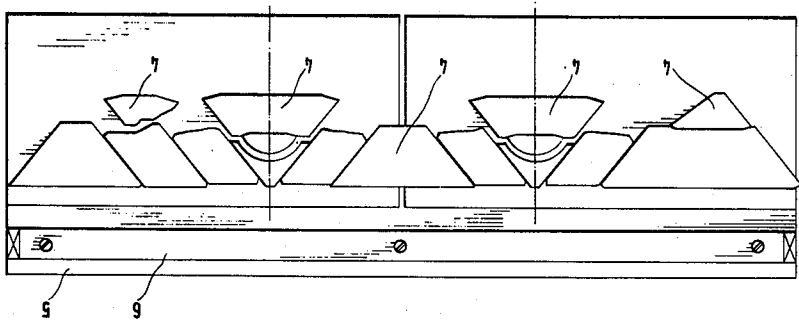
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[58] **Field of Search** 66/78

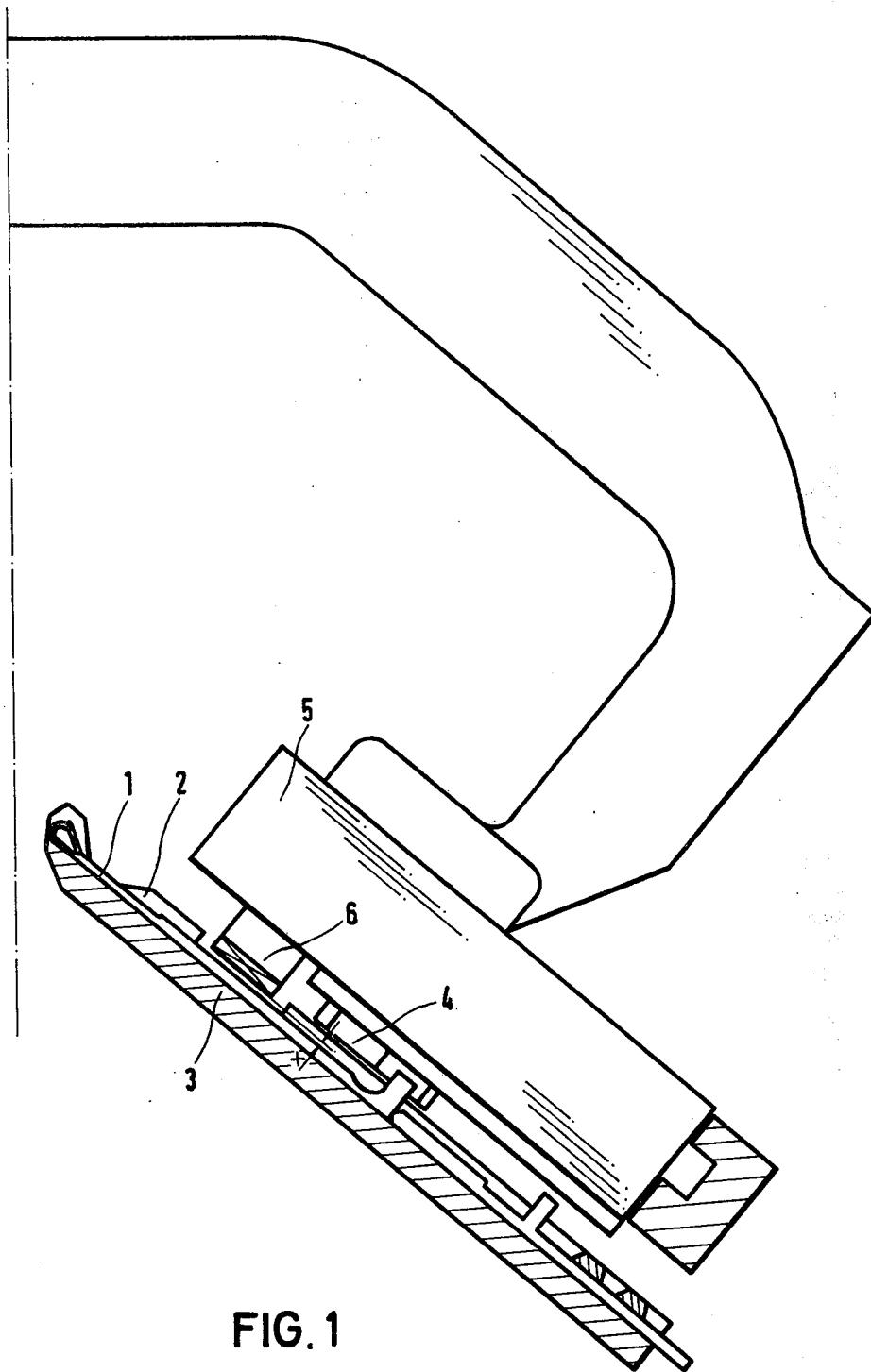
[57] **ABSTRACT**

A srraight knitting machine with a flexible mounted clamp attachable to the needle carriage which hold the needles in their channels.

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3 Claims, 3 Drawing Figures





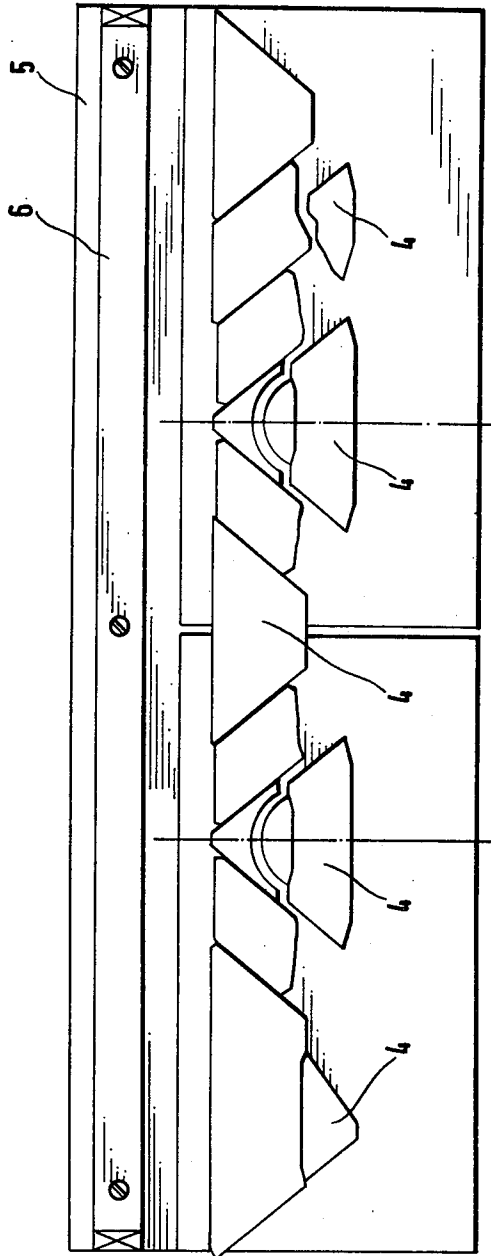


FIG. 2

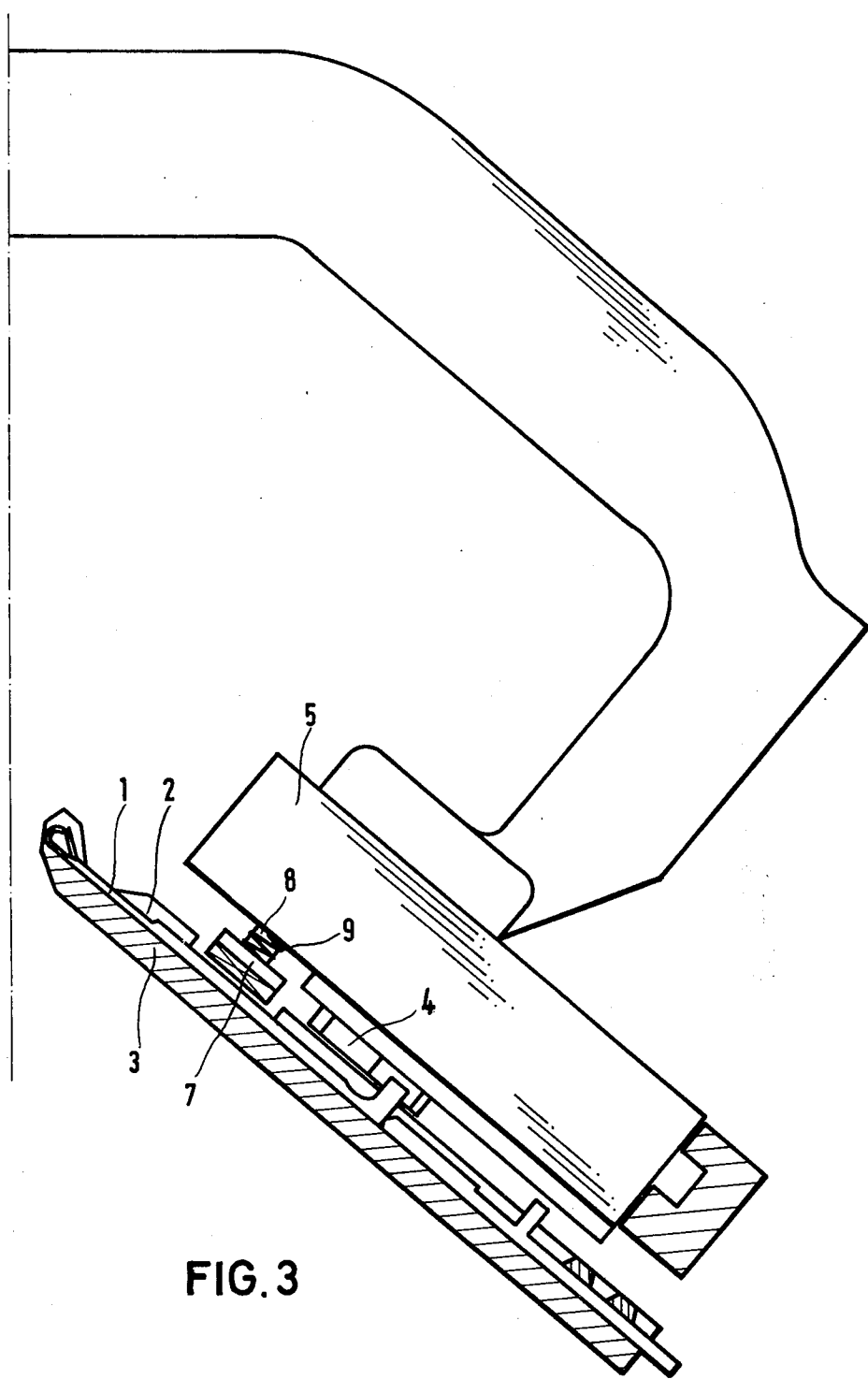


FIG. 3

NEEDLE CLAMP FOR STRAIGHT KNITTING MACHINES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a straight knitting machine having needles displaceably mounted in needle boards and comprising clamps mounted on the sliding carriage of the knitting machine for keeping the needles in their needle channels.

2. Description of the Prior Art

It is necessary to hold the needles in the needle channels of the needle boards during the knitting process to avoid needle breakage and to obtain a clean knit. The known clamps for keeping the needles in their needle channels are in the form of needle covering bars mounted on the needle board. These needle covering bars generally having a swallow-tailed cross-section and the needle boards are provided with corresponding grooves for receiving the needle bars.

The known needle covering bars for needle retention are subject to the disadvantage that it is very complicated and costly to produce the needle covering bars and swallow-tailed grooves in the needle boards and to fit the needle covering bars into the needle boards. In addition, with longer needle boards, it is necessary to construct the needle covering bars in a plurality of sections to enable the needle covering bars to be removed both from the point of view of energy consumption and also the need for space. When needle covering bars are used to retain the needles, it is very awkward to change the needles as the needle covering bars must be removed from the needle board each time it is necessary to change a needle.

A straight knitting machine is also known which comprises clamps mounted on the sliding carriage itself. However, in the case of this straight knitting machine, there is the risk that the needles which are locked in place or can only be moved with difficulty will be damaged when the sliding carriage passes through the clamp.

SUMMARY OF THE INVENTION

The object of the present invention is to eliminate the above-mentioned disadvantages of the known needle clamps and produce a clamp which will retain the needles in a reliable manner, which enables the needles to be changed simply and rapidly and which avoids any damage to needles which are locked in place.

This task is solved according to the invention in a straight knitting machine of the type mentioned above in that the flexibly mounted clamps are secured to the sliding carriage. In this way, the needles are only held in their needle channels by the clamps attached to the sliding carriage during the knitting operation and they are readily accessible after the sliding carriage has passed through the clamp without having to remove the clamp to change the needles. In addition, the flexible clamp ensures that any needles which have been raised and which are not pressed down when they pass by the clamp, for example, because they are locked in position owing to the effect of dirt in the machine, will cause the clamp to yield. This largely avoids any needle breakage and damage to the pieces between the needle channels.

A small space is advantageously provided between the clamp and the needle board. This allows the sliding carriage to be displaced unobstructed, keeps the wear

on the clamps to a minimum and avoids any damage to the needle board by the clamp.

In a preferred embodiment, the clamp consists of clamping bars extending lengthwise of the sliding carriage over the length thereof. The clamps are advantageously made of metal or plastics material.

Various embodiments of the invention are represented in the drawings and these will be described in more detail hereafter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic partial view of a needle board and sliding carriage showing a sectional view of a clamping bar rigidly mounted on the sliding carriage at right angles to the needle board.

FIG. 2 shows a plan view of a clamping bar attached to the sliding carriage, and

FIG. 3 is a diagrammatic partial sectional view according to FIG. 1 with a flexibly mounted clamping bar.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1, the needles 1 are displaceably mounted in needle channels 2 of a needle board 3. For the looping operation, the needles 1 are displaced in a reciprocating movement in their needle channels 2 by the breech parts 4. A sliding carriage comprising a cam box 5 is mounted for displacement along the needle board 3.

A clamping bar 6 is rigidly secured to the cam box 5. The clamping bar 6 prevents the needles 1 from working out of their needle channels 2 during the looping operation. The clamping bar 6 is mounted in such a way that it does not contact the needle board 3 and thus it can fulfil its function with virtually no wear and does not impede the movement of the sliding carriage.

As the needles 2 can only be displaced when they are within the range of the breech parts 4, it is sufficient for the length of the clamping bars 6 to correspond to the breech width. FIG. 2 shows clearly that the length of the clamping bar 6 corresponds approximately to the width of the breech mechanism. The needles 2 are thus only clamped in the region of the sliding carriage. Outside of the range of sliding carriage, the needles can be removed without difficulty from the needle board 3, for example, when a needle breaks, when making a pattern change which depends on the needles and when cleaning the needles.

FIG. 3 shows a modified assembly of a clamping bar 7 on the cam box 5. The clamping bar 7 is mounted on the sliding carriage or cam box 5 by means of guide bolts 8 and springs 9 which hold the clamping bar under a predetermined tension. The flexible mounting of the clamping bar 7 has the advantage that needles which have been raised and which are not pressed down when passing by the clamp, for example, because they are locked in position owing to dirt in the machine, will cause the clamp to yield. This largely avoids needle breakage and any damage to the pieces between the needle channels.

To prevent the needle board 3 from being damaged by clamping bars 6 or 7, the bars are mounted on the cam box 5 in such a way that they do not contact the needle board 3. A small space x is provided between the clamping bars 6 or 7 and the needle board 3.

What is claimed is:

1. A straight knitting machine comprising at least one needle board having a plurality of needle channels, a

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plurality of needles displaceably mounted in said channels, an elongated sliding carriage mounted in said machine for movement relative to said needle board along the length thereof, a clamping bar, means for flexibly mounting said clamping bar on said sliding carriage lengthwise thereof in normally closely spaced proxim-

- ity to said needles.
- 2. A straight knitting machine as set forth in claim 1 wherein said clamping bar is made of metal material.
 - 3. A straight knitting machine as set forth in claim 1 wherein said clamping bar is made of plastics material.

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