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## (54) Improvement to a cotton loom

(57) A Cotton loom having a beam and a plurality of sinkers, characterized in that the sinkers (6) have, below their end portion (beak) (8), a tab (17) protruding forwards beyond the end of the end portion (8) and forming a recess (18) together with the end of the end portion, the sinkers (6) being actuated so as to perform an advancing motion to distribute the thread among the needles (14), a retracting motion combined with the descent of the needles so as to form a row and deposit it on the tab (17), and a subsequent advancing motion so as to cause the lowering of the row inside the recess (18).

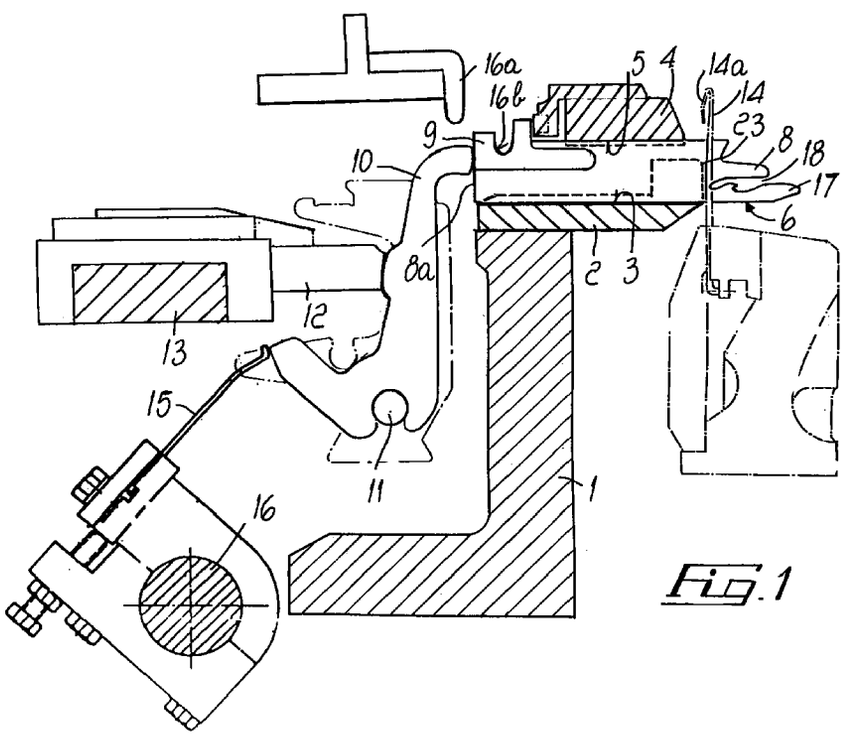


Fig. 1

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## Description

The present invention relates to an improvement to a Cotton loom.

It is known that in conventional Cotton looms there is provided, for each fabric forming head, a bar provided with grooves in which the sinkers that distribute the thread between the needles slide and a bar for the lowering sinkers, which help to form the rows once thread distribution has ended. In particular, the sinkers have a horizontal and vertical motion that allows the needles, after engaging the thread and while the tab is closed, to pass through the fabric and form the new stitch.

In order to retract the sinkers, usually there is provided a so-called collector bar which is actuated with a composite motion that comprises a vertical and a horizontal components.

In Cotton looms of the described type, the lowering sinker bar and the corresponding actuation mechanisms entail considerable structural complexity, not only from a merely constructive point of view but also because the sinkers require troublesome assembly and tuning operations, in addition to the fact that they must be replaced in case of wear or damage.

A principal aim of the present invention is to improve a Cotton loom so as to eliminate the presence of the lowering sinker bar and therefore of all the kinematic elements that control its movements, so as to provide a considerable constructive simplification that advantageously affects the purchase costs of a Cotton loom and the maintenance and tuning operations.

This aim is achieved with a Cotton loom having a beam and a plurality of sinkers, characterized in that the sinkers have, below their end portion (beak), a tab protruding forwards beyond the end of the end portion and forming a recess together with said end of the end portion, said sinkers being actuated so as to perform an advancing motion to distribute the thread among the needles, a retracting motion combined with the descent of the needles so as to form a row and deposit it on said tab, and a subsequent advancing motion so as to cause the lowering of the row inside said recess.

Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred embodiment thereof, illustrated by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a schematic sectional view of a Cotton loom at the region of the needles, including the improvement according to the invention;
figure 2 is a side view of a sinker according to the invention;
figures 3 to 10 are views of successive steps for the formation of the fabric with the improved loom according to the invention.

With reference to figures 1 and 2, the reference numeral 1 designates the longitudinal beam of a Cotton loom. The beam 1 has an L-shaped cross-section, and the sinker bar 2 is fixed to the top of the vertical wing of the beam 1; hereinafter, for reasons of clarity in description, said bar will be termed sinker comb.

The comb 2 has, on its upper face, a plurality of equidistant grooves 3 that lie at right angles to the extension of the comb 2.

The so-called cover 4 is arranged above the comb 2 and is rigidly coupled thereto; on the lower face of said cover 4, which is directed towards the comb 2, there is provided a plurality of grooves 5 that are parallel to the grooves 3. Each groove of the comb 2 is superimposed on a respective groove 5 of the cover. The upper and lower edges of the sinkers 6 are guided in the grooves 3 and 5 (figure 2) and are provided, at the front, with a groove 7 and, below said groove, with a beak 8, whereas at the rear they have a heel 8a the thickness whereof is increased by applying two lateral plates 9 to its opposite faces.

The so-called waves 10 act on the heels 8a, are articulated on a shaft 11, and are adapted to be actuated by the couliering cam 12 that runs on the rail 13. The cam 12, by acting on the waves 10, actuates the forward movement of the sinkers 6, so that a thread deposited on the beaks of the sinkers can be gripped by the grooves 7 and be pushed between the needles 14 of the needle plate that are interposed between the sinkers.

In order to keep the sinkers in their advancement position, to prevent them from retracting due to the action of the thread as a consequence of the evolution of the needles during the formation of a new row, the waves 10 are retained by appropriate tongs 15 that are fixed on a shaft 16. The shaft 16 is actuated by the main cam shaft so that it can be turned into a position that allows the tongs 15 to disengage from the waves 10 and thus affect the collecting bar 16a which, by engaging in the notches 16b of the sinkers 6, causes said sinkers to retract to the starting point for the subsequent thread deposition cycle.

In conventional looms, the needles 14 cooperate with the lowering sinkers for the formation of the fabric. According to the present invention, the sinkers 6 have a special shape that allows to fully eliminate the lowering sinkers and the corresponding actuation elements.

According to the invention, the sinkers 6 have, below the beak 8, a tab 17 that protrudes forwards beyond the end of the beak 8.

An elongated recess 18 remains between the beak 8 and the tab 17 and is delimited by the lower edge of the beak at the top and by the upper edge of the tab at the bottom.

Inside the recess, the upper edge of the tab 17 has a tooth 19 that separates a hollow 20 formed in front thereof from a groove 21 that runs from the tooth 19 beyond the overlying groove 7, i.e., up to a point that is closer to the heel 8a than the groove 7.

The operating method of the described loom is as follows.

At the beginning of each cycle, the operating situation of the loom is the one shown in figure 3, in which the sinkers 6 are in retracted position and the needles 14 intersect the sinkers at the end portion of the beaks 8. The previously formed fabric, the last row of knitting whereof is engaged on the needles 14, is designated by T and protrudes from the recesses 18. In this situation, the thread guide 22 lays the thread F on the beaks 8.

During the deposition of the thread F, the sinkers 6 are actuated forwards (figure 4), so that the thread F engages the groove 7 lying above the beak 8 and is pushed between the needles. At the same time, the fabric T enters the recesses 18 until it reaches the grooves 21.

At this point, the descent of the needles 14 is actuated; after engaging the thread F and after being closed by the abutment of their beaks 14a against the appropriately rounded front edge 23 of the comb 2, said needles pass the thread through the stitches of the last row of the fabric (figure 5). While the needles 14 continue to move downwards (figure 6), retraction of the sinkers 6 is actuated, so that the thread F disengages from the beaks 8 and rests on the tabs 17. Accordingly, the situation of figure 7 is reached and the method moves on to the lowering step, which begins with the subsequent step for the advancement of the sinkers 6.

As shown by figure 8, the advancement of the sinkers 6 causes the insertion of the fabric in the hollow 20 until the formed row, by abutting on the teeth 19 (figure 9), is lowered against the previously formed fabric. The cycle is completed by means of a small retraction of the sinkers (figure 10) and a lifting of the needles 14 that restores the starting situation of figure 1.

Figure 10 also shows, in dashed lines, the path followed by the tops of the needles, which substantially duplicates the shape of a double figure-of-eight due to the need to move the needles into abutment against the edge 23 during descent.

It is evident that the invention allows to fully eliminate the conventional lowering sinker shafts, with all the actuation lever systems associated therewith, required to perform the composite movements that are necessary to assist the action of the needles. The absence of these elements not only leads to a substantial reduction in the manufacturing costs of the loom but also allows greater access to the other elements, with the corresponding facilitations in assembly and tuning.

Numerous modifications and variations are possible in the practical embodiment of the invention, all of which are within the scope of the same inventive concept. In particular, the shapes and the dimensions of the tabs 17 can vary according to the requirements of the fabric and to the movements performed by the sinker collector bar and by the needle bar.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

1. A Cotton loom having a beam and a plurality of sinkers, characterized in that the sinkers (6) have, below their end portion (8), a tab (17) protruding forwards beyond the end of the beak (8) and forming a recess (18) together with said end of the end portion, said sinkers (6) being actuated so as to perform an advancing motion to distribute the thread (F) among the needles (14), a retracting motion combined with the descent of the needles (14) so as to form a row and deposit it on said tab (17), and a subsequent advancing motion so as to cause the lowering of the row inside said recess (18).

2. A Cotton loom according to claim 1, characterized in that said recess (18) is delimited by the lower edge of the end portion (8) of the sinker (6) at the top and, at the bottom, by the upper edge of the tab (17) which, inside the recess (18), has a tooth (19) that separates a hollow (20), formed in front thereof, from a groove (21) that runs from the tooth (19) beyond the groove (7) lying above the end portion (8) of the sinker (6), said groove (21) being adapted to receive the fabric (T) during the penetration of the thread (F) between the needles (14), said tooth (19) being adapted to abut against the last row formed during lowering.

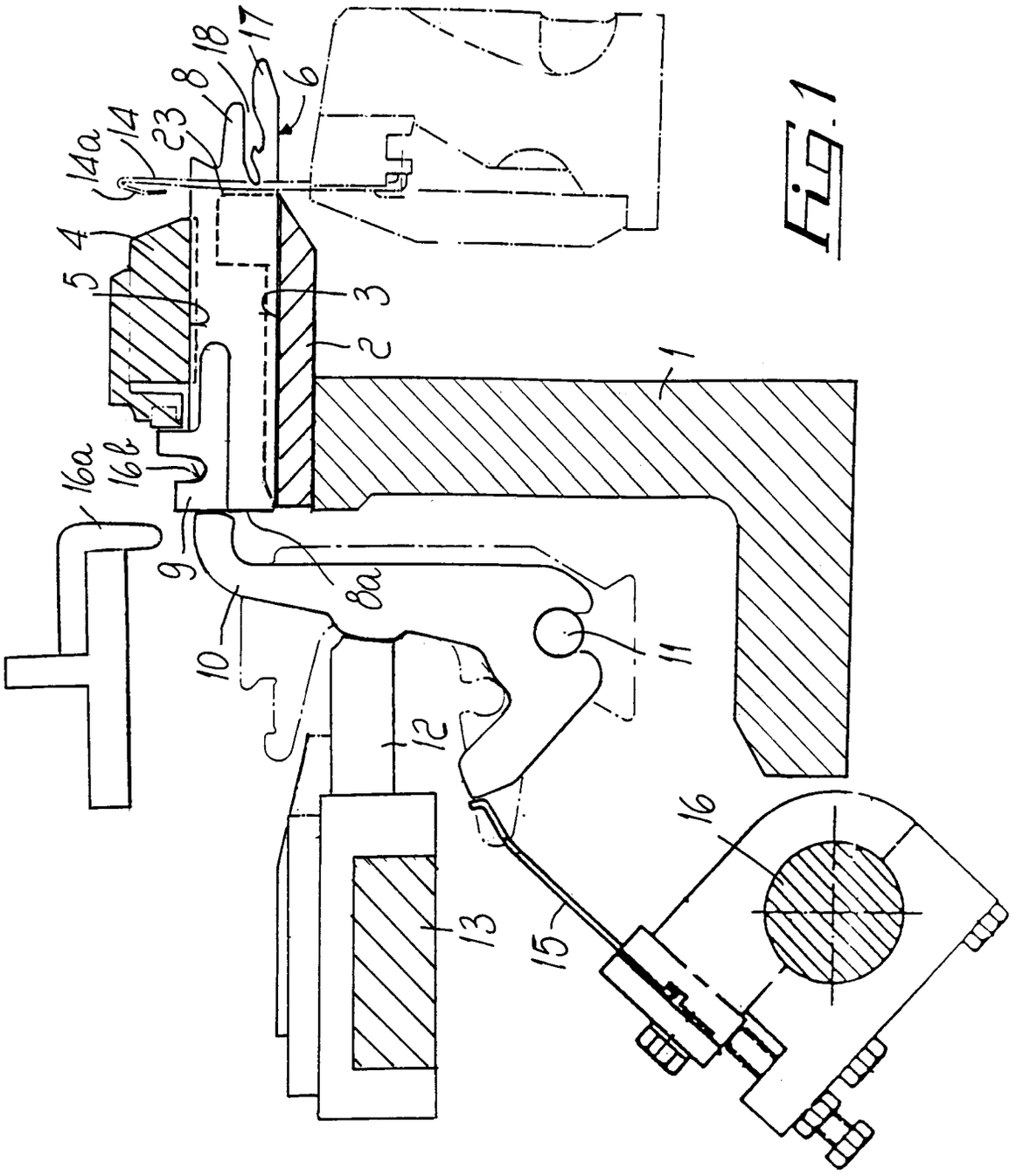


Fig. 1

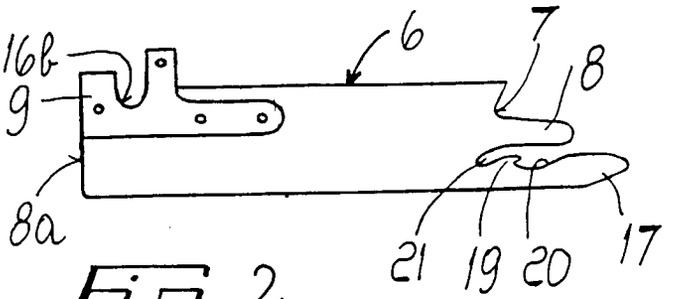


Fig. 2

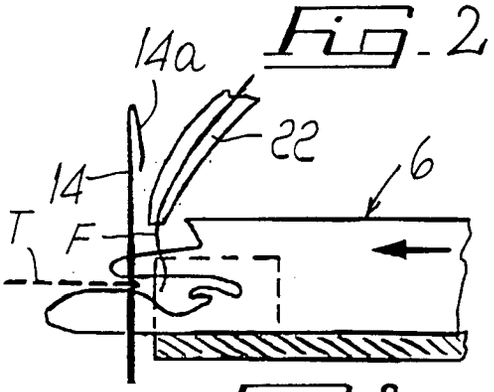


Fig. 3

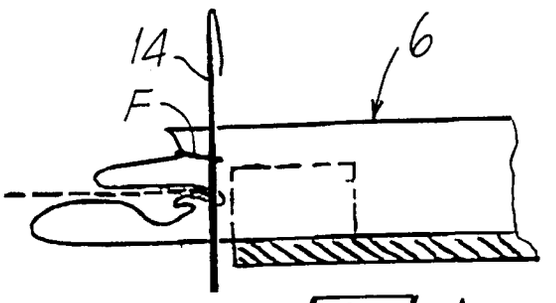


Fig 4

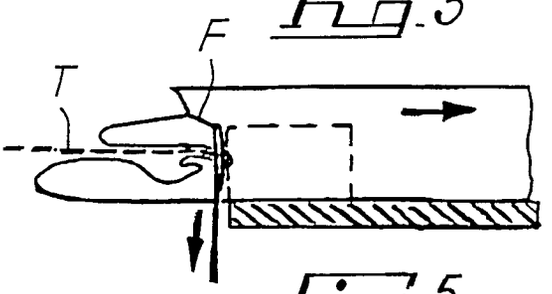


Fig.5

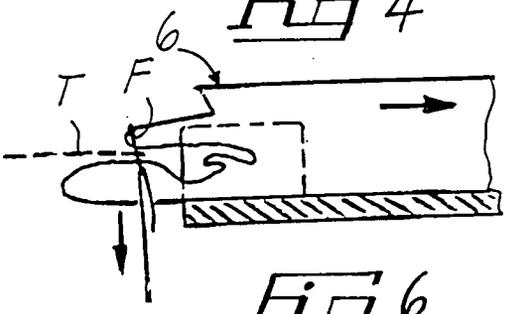


Fig.6

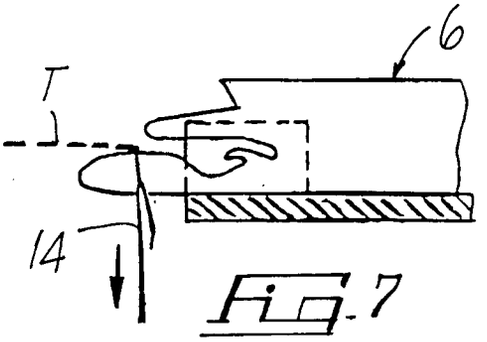


Fig.7

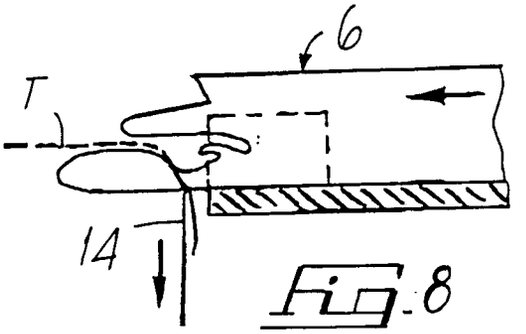


Fig.8

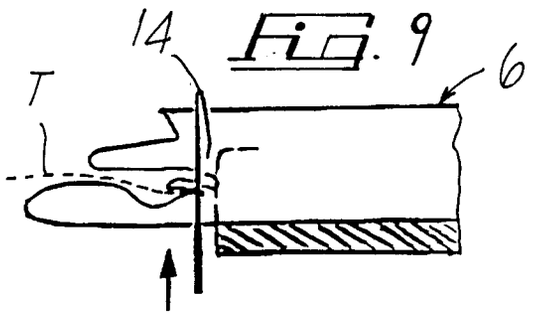


Fig. 9

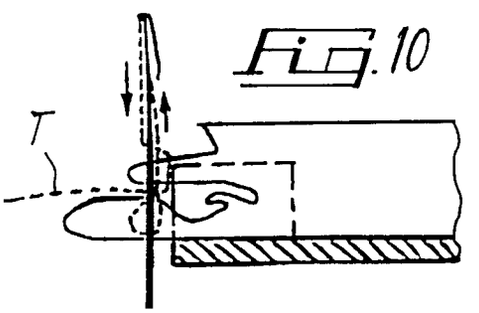


Fig.10