July 30, 1935. W. HEINITZ 2,009,925

LACE ATTACHMENT

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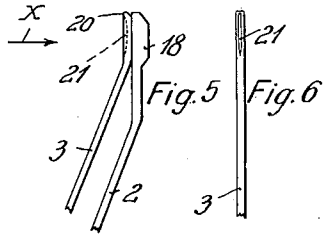


Fig. 5

Fig. 6

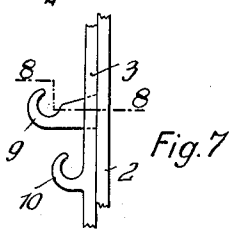


Fig. 7

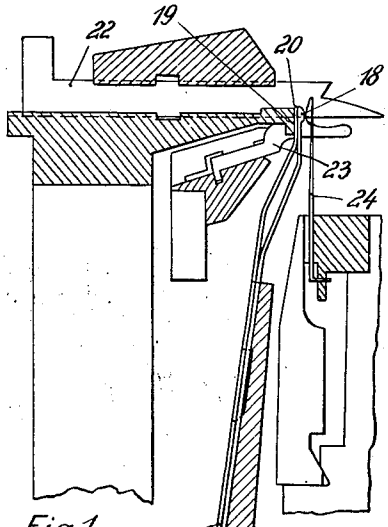
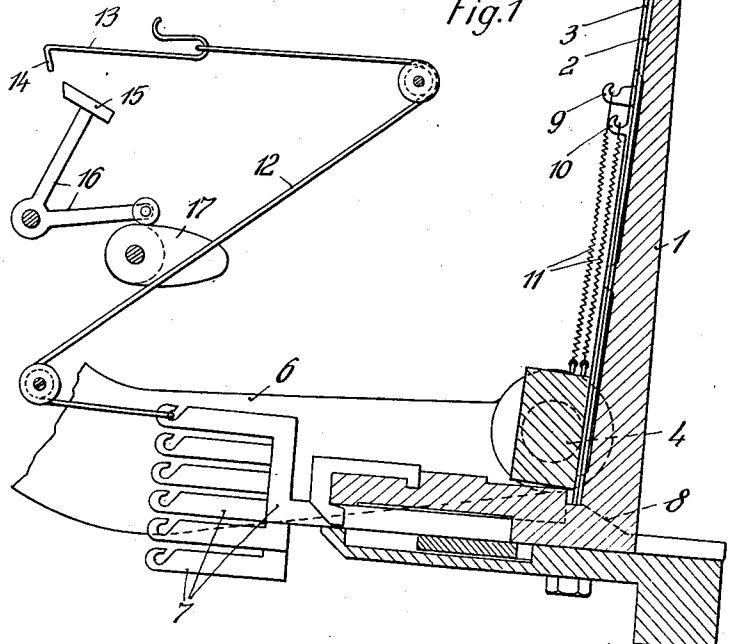


Fig. 1



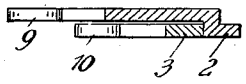


Fig. 8

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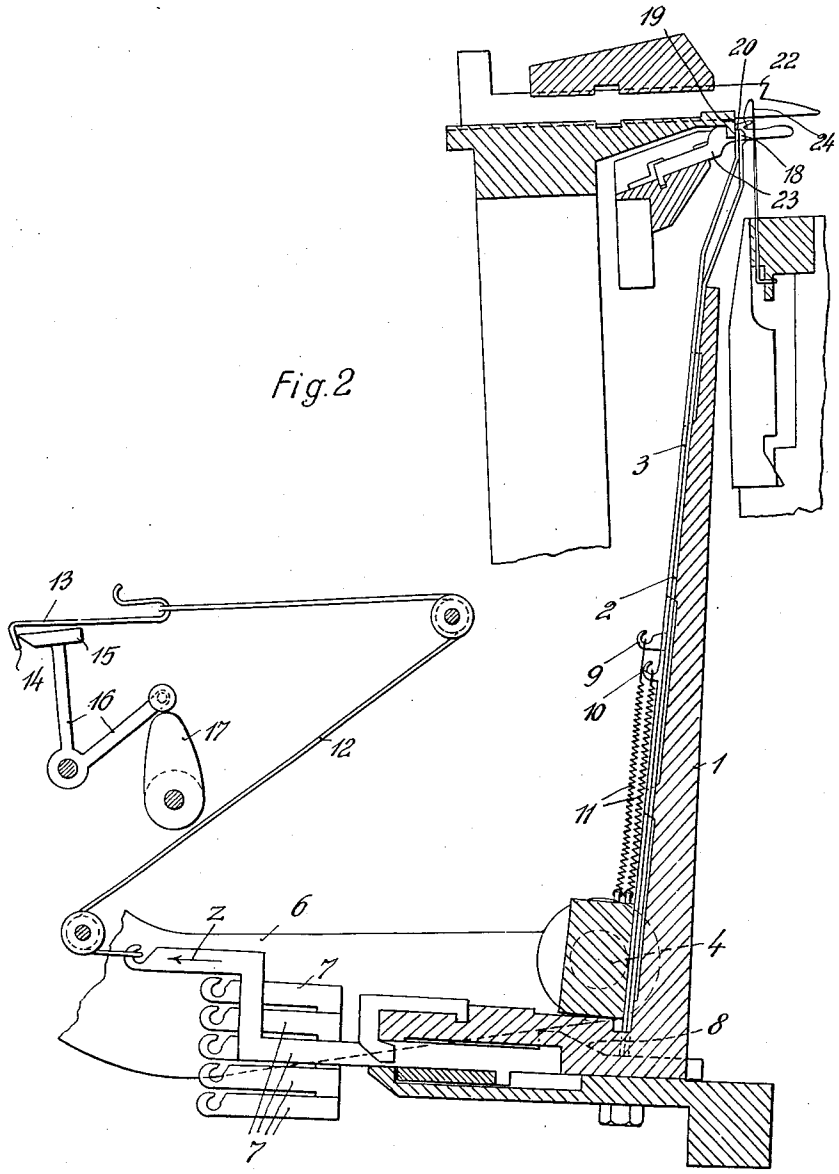
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Attorney.

July 30, 1935. W. HEINITZ 2,009,925

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Fig.2



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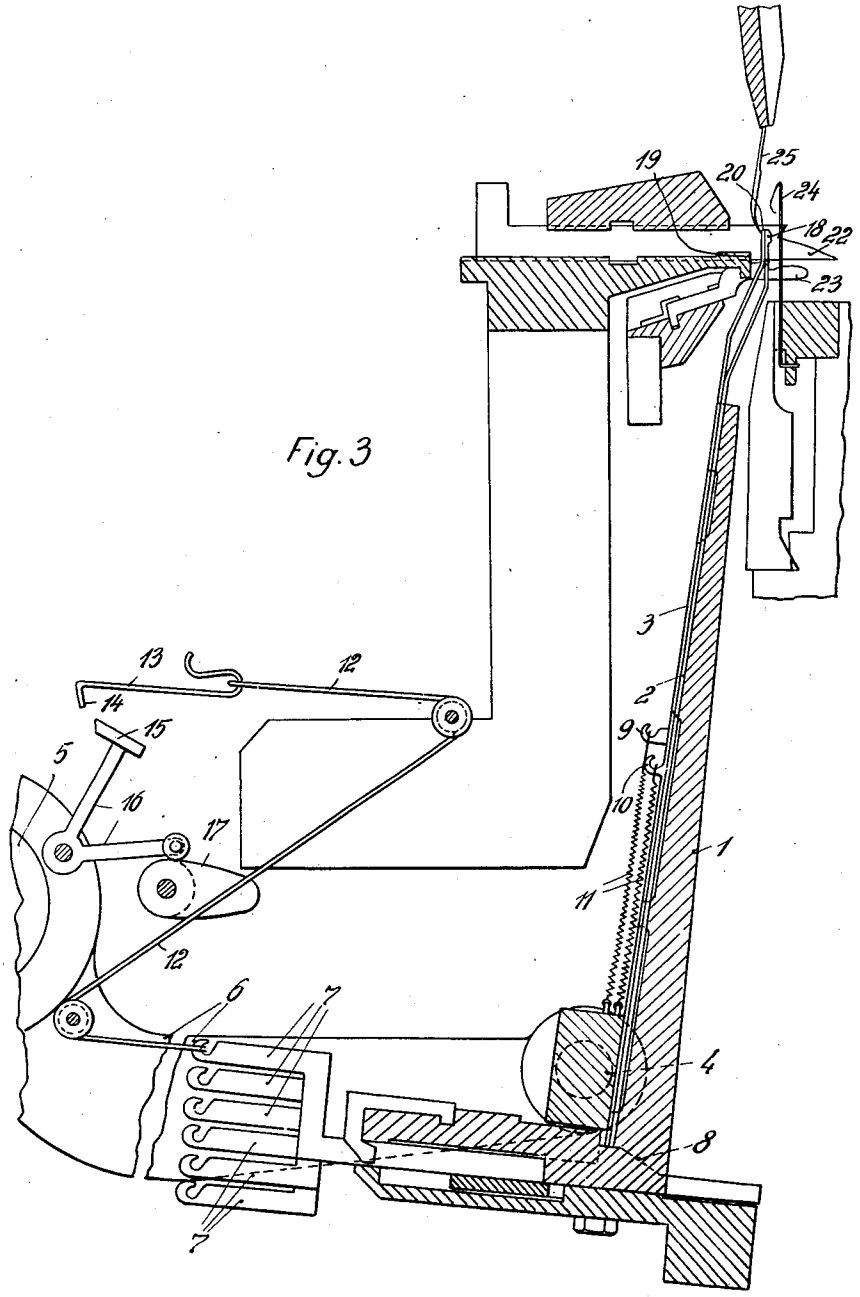
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Fig. 3



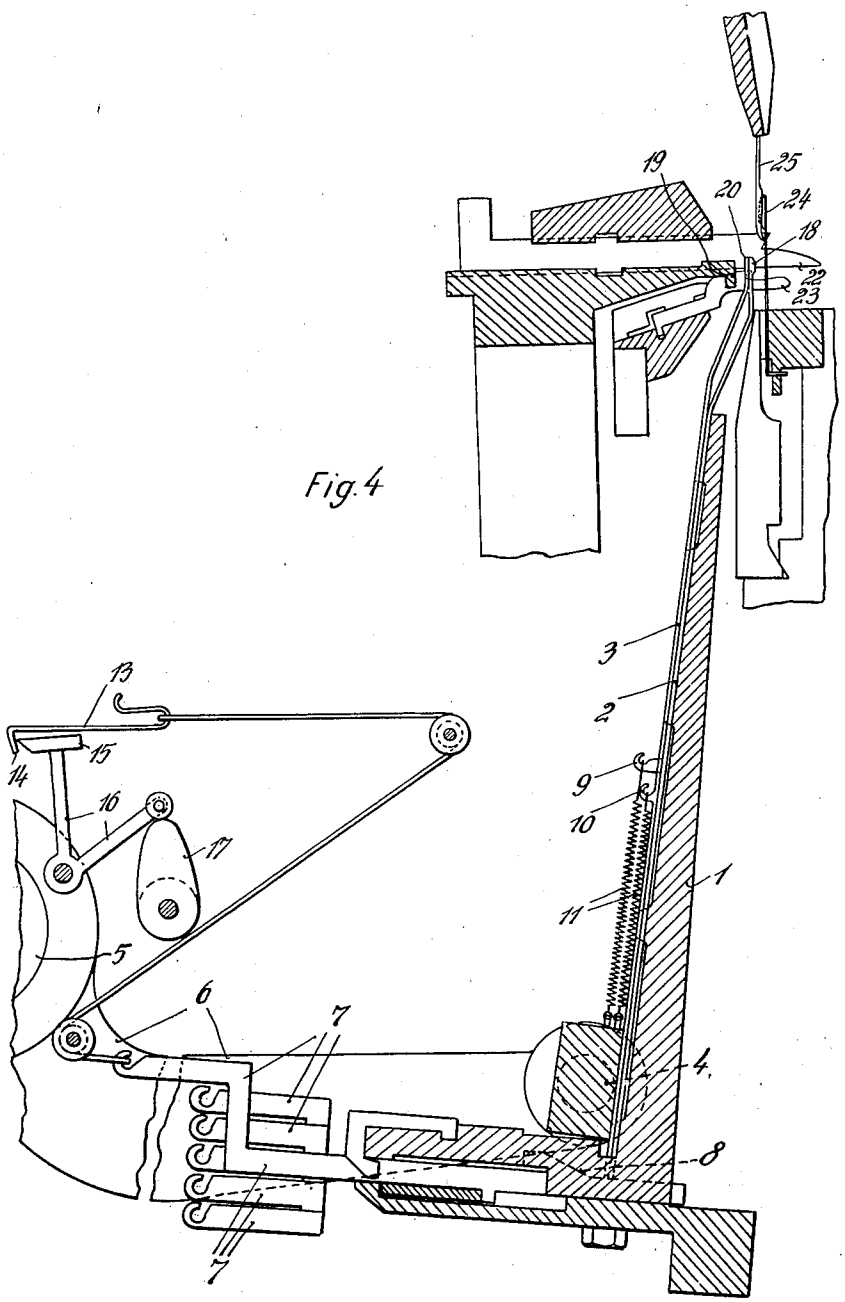
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Fig. 4



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Fig. 9

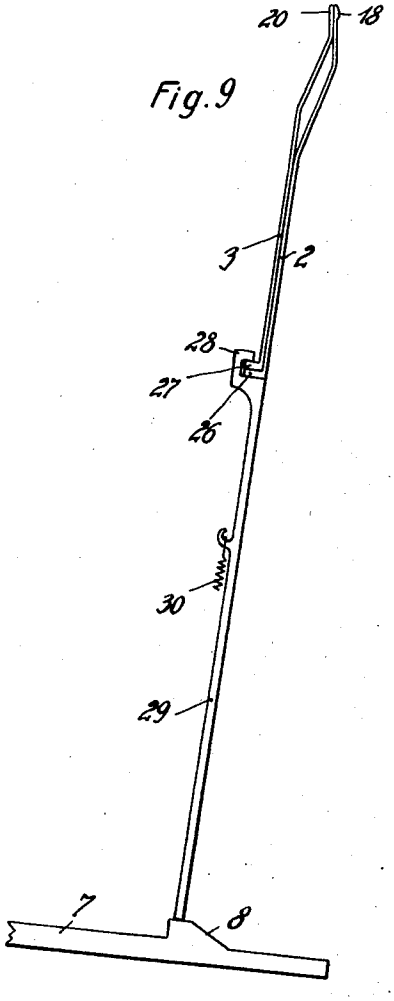
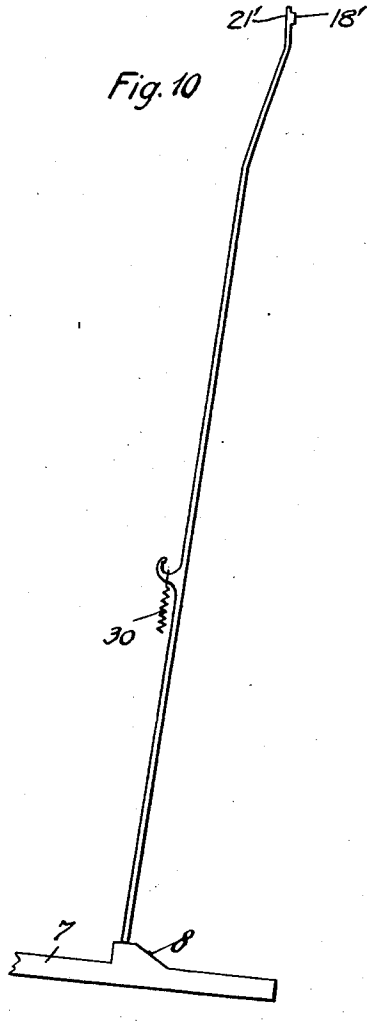


Fig. 10



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2,009,925

UNITED STATES PATENT OFFICE

2,009,925

LACE ATTACHMENT

Woldemar Heinitz, Chemnitz, Germany, assignor to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Chemnitz, Germany

Application October 13, 1934, Serial No. 748,234
In Germany October 14, 1933

2 Claims. (Cl. 66—90)

The present invention relates to a jacquard attachment for moving the pattern sinkers (pattern needles) which in flat knitting machines serve for making jacquard press patterns as well as jacquard lace patterns. The two kinds of patternings may be made in a fabric either each for itself or both together.

Hitherto jacquard press patterns are obtained in flat knitting machines by singly movable press sinkers actuated or lifted by a jacquard attachment, while jacquard lace patterns are made by singly movable blind points actuated or lifted by the jacquard attachment.

This method requires separated double jacquard cards, appertaining double lifting bars and separated eccentrics, i. e. two complete jacquard attachments, one for the jacquard press patterning and one for the jacquard lace patterning.

To obtain press patternings it has also been proposed to cause the singly movable blind points which for the purpose of jacquard lace patternings actuate the petinet tickler, to actuate as auxiliary needles the frame needles also. In carrying out this method the auxiliary needles are lifted upwardly either in a patterning or in a non-patterning sense.

If for the purpose of obtaining lace patternings and press patternings the auxiliary needles are lifted upwardly in a patterning sense, the loops are damaged during the manufacture of lace patternings, while the manufacture of press patternings has the disadvantage, that changes of position of the needle heads are caused by the bending of the knitting needles which results in the formation of vertically striped goods and thread distortions at the needle head.

If for both kinds of patterning the auxiliary needles are shifted upwardly in a non-patterning sense, a change between the number of the bent needles and the non-bent needles causes the formation of striped goods during the manufacture of lace patternings, while during press patternings pressing is effected in an eye. This equals to a worn out press resulting in needle ruptures. Moreover the knock over jacks are also caused to project too far from their normal position.

A further disadvantage during patterning in a non-patterning sense is, that all the non-patterning needles are shifted upwardly, whereby the lifting bar, actuating the great number of draw-sinkers, the eccentrics and associated levers are overloaded.

If, however, shifting upwardly in different sense is effected for both kinds of patterning, i. e. for lace patterning in a non-patterning sense and for press patterning in a patterning sense, the jacquard card for one of the two patterning kinds, in the present case the jacquard card for press patternings, would receive a multiple of the perforations and in any case a far too great number of perforations which under all circumstances is to be regarded as a drawback. In the manufacture of lace patternings, moreover, the disadvantage of overloading the lifting bars etc., mentioned above as occurring during patterning in a non-patterning sense, also is to be expected.

If in performing the well known upward movement of the needles a single jacquard cycle and a single jacquard cylinder only are to be used, the employment of jacquard sinkers in the jacquard attachment becomes necessary which are provided with several projections acted upon by several lifting bars. Such lifting bars further necessitate several groups of eccentrics as always one lifting bar only acts upon the sinkers.

It has further already been proposed to use the singly movable press sinkers for obtaining lace patternings also, the side of the press sinkers situated opposite the press point serving as blind point for the petinet tickler.

In carrying out this method an actuation of the singly movable press sinkers during a change between a patterning and a non-patterning sense is effected in such a manner, that for press patternings during the formation of tuck loops, i. e. loops which are not pressed, the press sinkers are lifted and thereby moved out of the range of the knitting needle head. To obtain lace patternings, such press sinkers are lifted at the knitting needles of which the loops are not to be transferred. These press sinkers thereby intercept the petinet tickler. The press sinkers at which pressing is effected, i. e. at which normal loops are formed, as well as the press sinkers at the knitting needles of which the loops are to be transferred, remain in the lower position of rest.

For carrying out this further well known upward movement of the sinkers also the use of draw sinkers provided with several projections was necessary upon which also several lifting bars were caused to act.

The object of the invention is to obviate all these disadvantages and to allow the manufacture of tuck loops and lace loops in the simplest possible manner in a single jacquard cycle and with a single lifting bar only by altering the direction of movement of the pattern sinkers in such a manner, that in the formation of press patternings as well as lace patternings the pat-

tern sinkers, occupying their starting position, i. e. for both pattern sinkers the position suitable for forming plain loops, are selected to be moved downwardly in a patterning sense. That is to say, in the formation of press patternings, pressing is effected in the starting position and in the formation of lace patternings the petinet tickler is intercepted. From the starting position the press pattern sinkers at which pressing is not to be effected are, for the purpose of forming press patternings, now moved downwardly. whereas in the formation of lace patternings the lace pattern sinkers at the knitting needles of which transfer is to be effected are moved downwardly. If in this operation the press pattern sinkers and the lace pattern sinkers are moved downwardly simultaneously with the knitting needles, i. e. if the sinkers and needles are moved together in the same direction and with the same speed, it is warranted, that on lowering of the knitting needles for the purpose of landing or knocking over the hooks of these needles do not abut against the upper edge of the lowered pattern sinkers selected, whereby damage of the points of the knitting needles is prevented.

In the manufacture of press patternings considerable time is saved as the pattern sinkers moving downwardly may already be selected during the sinking of the loops. If in a known manner the pattern sinkers are moved upwardly, selecting of the sinkers during sinking of the loops is not possible as then the thread would be sunk around these needles selected for upward movement. One eccentric only is hereby required for the lifting movements of the rollers and lifting bars of the jacquard attachment for the formation of press patternings and lace patternings.

Without departing from the spirit of the invention, both pattern sinkers could, for instance, be combined to a single pattern sinker. For the purpose of making press patternings as well as lace patternings it would, in such a case, only be necessary to always move this pattern sinker in the sense stated above, i. e. in a patterning sense downwardly.

In the accompanying drawings some devices for carrying the invention into effect are shown by way of example.

In these drawings:

Figs. 1–4 illustrate the positions of the parts during the several operations.

Fig. 1 is a sectional view of the parts of a flat knitting machine necessary for carrying the invention into effect and showing these parts in the pressing position during the formation of normal loops.

Fig. 2 is a sectional view similar to Fig. 1, showing the several parts in the non-pressing position during the formation of tuck loops.

Fig. 3 is a sectional view similar to Fig. 1, showing the parts effecting no transfer during the formation of normal loops.

Fig. 4 is a sectional view similar to Fig. 1, showing the parts effecting transfer during the formation of lace loops.

Figs. 5–7 show broken away portions of the pattern sinkers on a larger scale.

Figs. 5 and 6 illustrate a side view and a rear view in the direction of the arrow x respectively of the heads of the pattern sinkers.

Fig. 7 shows a side view of a middle portion.

Fig. 8 is a section on line 8—8 of Fig. 7 on a still larger scale and

Figs. 9 and 10 illustrate two modified constructions of the pattern sinkers.

In slots of a bearing block 1 pattern sinkers 2 for press patternings and pattern sinkers 3 for lace patternings are arranged in overlapping position. The bearing block 1 is, in a well known manner, supported by arms 6 arranged upon the shaft 5 and connected to the bearing block 1 by means of a pivot 4. Draw sinkers 7 having an inclined surface 8 are shiftably arranged in the lower part of the bearing block 1.

The pattern sinkers 2 and 3 carry hook-like projections 9 and 10 respectively to which springs 11 are connected the other ends of which engage hooks fixed to the bearing block 1. By this means the sinkers are drawn downwardly and rest upon the draw sinkers 7. The projections 9 of the pattern sinkers 2 for press patternings are bent laterally and pass along the pattern sinkers 3 for lace patternings (see Fig. 8). The projections 10 of the sinkers 3 are preferably staggered with regard to the projections 9 so that the springs 11 do not come into contact with each other (Fig. 7), as is well known.

Connected to the draw sinkers 7 are draw wires 12 carrying the jacquard sinkers 13 the nibs 14 of which may be influenced by a lifting bar 15 which is reciprocated in a well known manner. According to the construction illustrated, this lifting bar 15 is provided at a bell-crank lever 16 actuated by an eccentric 17.

The heads 18 of the press sinkers 2 lie in front of the pressing edge of the sinker head 19. Behind the heads of the press sinkers 2 the heads 20 of the pattern sinkers 3 are arranged which preferably are, as shown in Figs. 5 and 6, provided with a groove or eye 21 at the side directed towards the pressing edge. 22 are the jack sinkers, 23 the knock over jacks, 24 the knitting needles and 25 the petinet tickler.

In Fig. 1 the parts of the device are shown in the position for the manufacture of plain fabric. The draw sinkers 7 are at rest. The pattern sinkers 2 and 3 resting upon the draw sinkers 7 are maintained in the starting position necessary for the formation of plain loops in which the heads 18 and 20 lie in front of the pressing edge of the sinker head 19. During the formation of the loops, the heads of knitting needles are pressed, so that all loops are knocked over.

If press patternings are to be made, the jacquard attachment causes the corresponding draw sinkers 7 to be moved in the direction of the arrow Z (Fig. 2) to the left. Hereby the pattern sinkers 2 resting upon the draw sinkers 7 are moved downwardly along the inclined surface 8 under the action of their springs 11, so that the heads 18 lie below the pressing edge of the sinker head 19 (Fig. 2). The needles arranged at these places are now, during the loop formation, prevented from being pressed, so that tuck loops are formed in a well known manner.

For the manufacture of lace patterns the bearing block 1 is, in a well known manner, raised by an upward swinging movement of the arms 6.

By the pattern sinkers occupying the starting position the head 20 of the pattern sinker 3 comes into the path of the petinet tickler 25 which hereby is prevented from transferring (Fig. 3).

If transfer is to be effected, the corresponding draw sinkers 7 are, as in the case of pressing, drawn forward by the jacquard attachment so that, as already described, the pattern sinkers 2

are lowered. The heads 18 of the pattern sinkers 2 come out of reach of the petinet tickler 25, so that now the lace transfer may be carried out.

From the four positions illustrated, it is to be seen, that with the pattern sinkers 2 in the starting position knitting is effected in a non-patterning sense in both positions of the bearing block 1 (Figs. 1 and 3). With the bearing block 1 in the normal position, the head 18 of the pattern sinkers 2 presses away the needle head 24 and with the bearing block 1 lifted in the usual manner the head 20 of the pattern sinker 3 retains the petinet tickler 25.

If draw sinkers 7 are shifted, whereby the pattern sinkers 2, 3 are lowered from their starting position, knitting is effected in a patterning sense, so that with the bearing block 1 in the normal position, tuck loops are formed, (Fig. 2), whereas lace loops are made with the bearing block 1 lifted in the usual manner (Fig. 4).

For both patterning kinds the pattern sinkers 2, 3 are lowered. Therefore no special movements of the draw sinkers 7 are required which in both cases are moved in the same direction. This movement, therefore, may be effected by the same jacquard attachment.

As the pattern sinkers 2, 3 have the same direction of movement, they may, as shown in Fig. 9, be provided with projections 26, 27 which are engaged by a projection 28 carried by a special member 29 and pressed upon the draw sinkers 7 under the action of a spring 30.

It would also be possible to completely combine the two sinkers 2, 3 in which case, as shown in Fig. 10, the upper end of this sinker is formed at the one side as a pressing head 18' and at the other side as a retaining means 21' for the petinet tickler.

What I claim is:

1. In a jacquard attachment for moving pattern sinkers in flat knitting machines, press pattern sinkers having a head at the side facing the knitting needles, lace pattern sinkers arranged in overlapping position with said press pattern sinkers and having a groove at the side removed from the knitting needles, and draw sinkers each having an inclined surface for guiding downwardly both kinds of pattern sinkers during the displacement of said draw sinkers.

2. In a jacquard attachment for moving pattern sinkers in flat knitting machines, overlapping press pattern sinkers and lace pattern sinkers, draw sinkers and a member controlled by said draw sinkers acting upon said overlapping pattern sinkers during their downward movement.

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