

Feb. 25, 1936.

G. SAUPE

2,032,152

FLAT WARP KNITTING MACHINE.

Filed April 20, 1934

2 Sheets-Sheet 1

FIG. 1

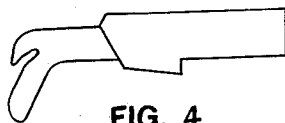
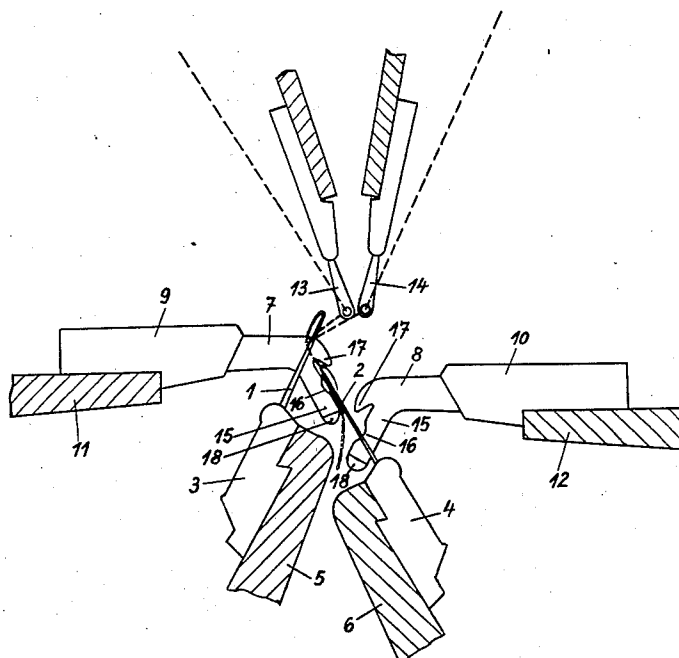


FIG. 4

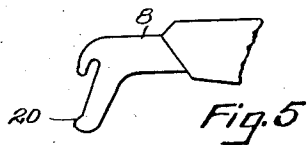


Fig. 5

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2 Sheets-Sheet 2

FIG. 2

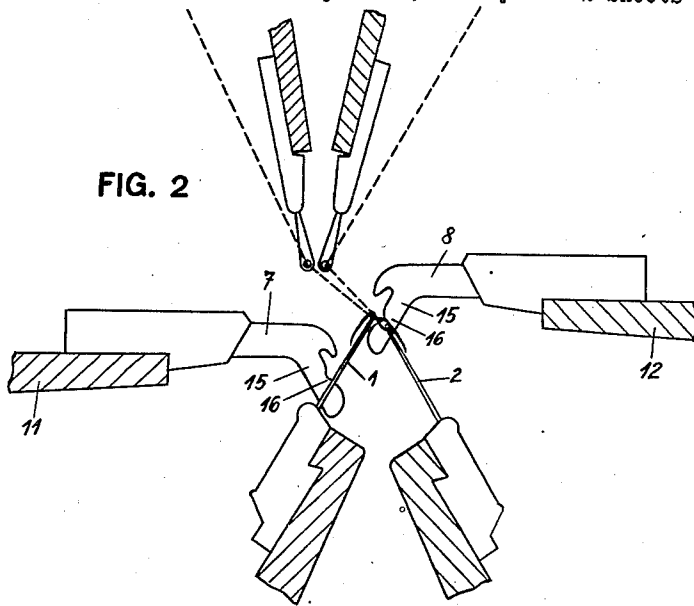
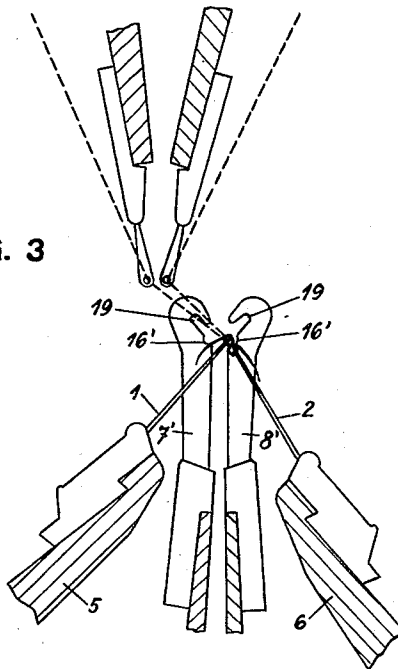


FIG. 3



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UNITED STATES PATENT OFFICE

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FLAT WARP KNITTING MACHINE

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4 Claims. (Cl. 66—87)

This invention relates to a flat warp frame, in which at the knocking over moment the two needle rows are arranged relative to one another at an acute angle and the knocking over edge-piece of the sinkers is disposed rectangularly to the respective needles.

In flat double warp knitting machines the needle row, at the moment when knocking over takes place, should be positioned, so far as possible, vertically to the knocking over edge of the adjacent sinkers, as otherwise the meshes to be knocked off will be displaced to a greater or lesser extent along the knocking over edge and the forces effecting knocking over will become active relative to the needles obliquely to the longitudinal direction thereof with the result that the needles are bent. Furthermore, the course will be knocked over unevenly and defects in the fabric will be produced. Since the beak of the sinker should be preferably parallel to the opposite needle row, it was hitherto necessary to incline the needles to a considerable extent at the knocking over time, whereas they were to be as steep as possible during lapping.

In order to comply with these requirements the needle bars must carry out a swinging motion during ascent, which demands a cumbersome gear system, because it is impossible to arrange the needle bar at the point forming the center of the requisite swinging motion.

To avoid the above-mentioned drawbacks of known double warp frames the invention provides at the knocking over edge of the sinker edges extending as parallel as possible to the longitudinal direction of the opposite needles a notch or a corresponding deflection, so that the knocking over edge-piece, in known manner, will be disposed vertically to the longitudinal direction of the adjacent needles, but obliquely to the longitudinal direction of the beak of the sinker.

By way of example, one form of the invention is illustrated in the accompanying drawings, in which Figure 1 shows the position of the knitting tools at the time when the threads are placed on the left needle row; Fig. 2, the knocking over of newly formed loops at the right-hand row of sinkers, the sinkers, in the same way as in Fig. 1, being disposed outside the angular space enclosed by the needle bars; Fig. 3 shows the sinker bars arranged between the needle bars; and Figs. 4 and 5 show modified forms of sinkers.

Referring to the drawings, the two needle rows 1 and 2 are secured to the needle bars 5 and 6 by the leads 3 and 4. Outside the angular space enclosed by the bars 5 and 6 the sinkers 7 and 8

are secured to the bars 11 and 12 by the leads 9 and 10. Above the sinker bars 11 and 12 a plurality of lapping machines are arranged, two machines 13 and 14 being shown in the construction illustrated. The presser bars are omitted in the drawings for the sake of simplicity.

During the knitting process the two needle rows 1 and 2 carry out the usual motions both in their longitudinal direction and transversely thereto, and are slightly swung if necessary. In known manner, the sinkers with their beards have to be adjusted now to the longitudinal axis of the opposite needle row and then again transversely to the adjacent needles, and for this purpose, according to the invention, the sinker beard 15 is arranged so that its longitudinal direction is approximately parallel to that of the opposite needles, but extends for a short distance 16 with its top edge approximately vertically to the longitudinal direction of the appurtenant needles, so that at this special edge portion the meshes can be knocked over in satisfactory manner according to Fig. 2. For example, the beard 15 of the sinkers 7 is disposed approximately parallel to the longitudinal direction of the needles 2 whereas the edge portion 16 has an approximately vertical direction to the longitudinal direction of the needles 1. Correspondingly, in the sinkers 8 the beard 15 is approximately parallel to the longitudinal direction of the opposite needles 1 while the edge portion 16 is arranged approximately vertically to the longitudinal direction of the adjacent needles 2. The knocking over edges 16 of the sinker beards 15 are then perfected either by the provision of notchlike recesses (Figs. 1 to 3) in the upper sinker edge or by projecting noses 20 on the latter (Fig. 5).

In addition to the beard 15, the sinkers 7 and 8 possess an enclosing nose 17 disposed approximately parallel to the beard 15 of the respective sinker. At their free ends the sinkers 7 and 8 are kept at the proper distance from one another by the leads 18.

Instead of disposing the sinkers 7 and 8 outside the space limited by the needle bars 5 and 6, they could be arranged also between the needle bars, as shown in Fig. 3. Even in this case, the enclosing throat 19 of each sinker 7' and 8' should be arranged approximately in the longitudinal direction of the opposite needles and in the portion of the sinker edge adjacent to the enclosing throat a part 16' should be provided approximately vertically to the longitudinal direction of the adjacent needles.

Instead of providing for the bend in the sinker 55

edge, which is to be disposed vertically to the respective needle, below the enclosing throat, it could be placed, according to Fig. 4, in the throat itself, particularly in the uppermost portion thereof, in which case the sinkers and needles must be moved relative to one another in such a way that knocking over is effected within the enclosing throat.

I claim:

- 10 1. A warp knitting machine comprising needle bars; needle rows secured to said bars and at knocking over time being disposed at an acute angle to one another; and sinker bars and sinkers secured to said bars, each of said sinkers having a throat, the lower edge of which forming
- 15 the upper edge of the beard of the sinkers being arranged approximately parallel to the stems of

the opposite needles and being formed with a deflection and a part of said deflection forming the knocking over edge-piece being extended approximately at right angles to the stems of the adjacent needles.

2. A warp knitting machine according to claim 1, in which the deflection of the lower edge of the sinker throat is formed by a notch.

3. A warp knitting machine according to claim 1, in which the deflection of the lower edge of the sinker throat is formed by a projection.

4. A warp knitting machine according to claim 1, in which the deflection of the lower edge of the sinker throat is formed by inclining the throat at its upper end.

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