March 31, 1942. C. W. STRZALKOWSKI 2,277,797

MULTIPLE SECTION FLAT KNITTING MACHINE

Filed April 15, 1940 2 Sheets-Sheet 1

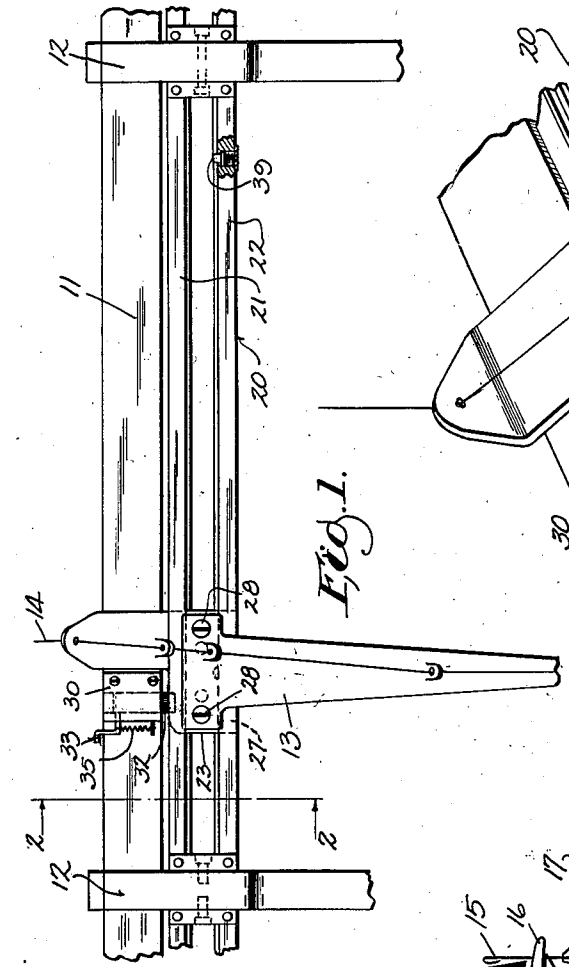


Fig. 1.

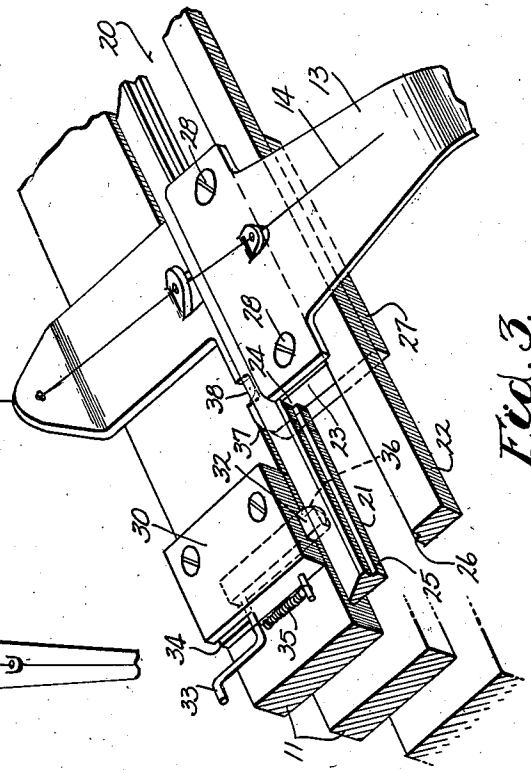


Fig. 3.

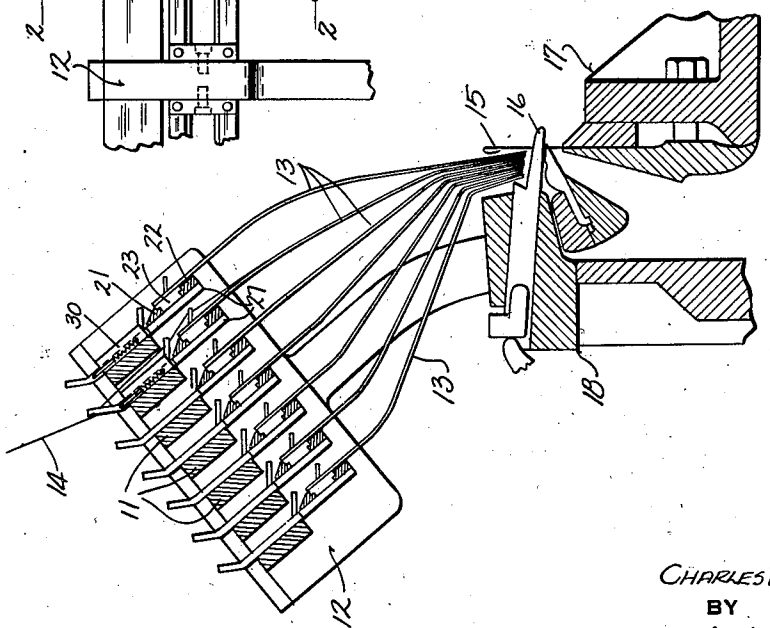


Fig. 2.

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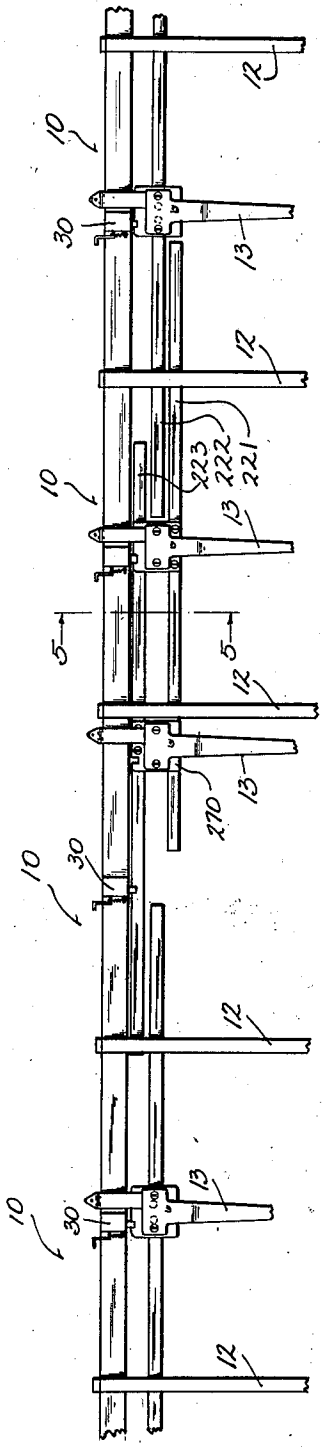


Fig. 4.

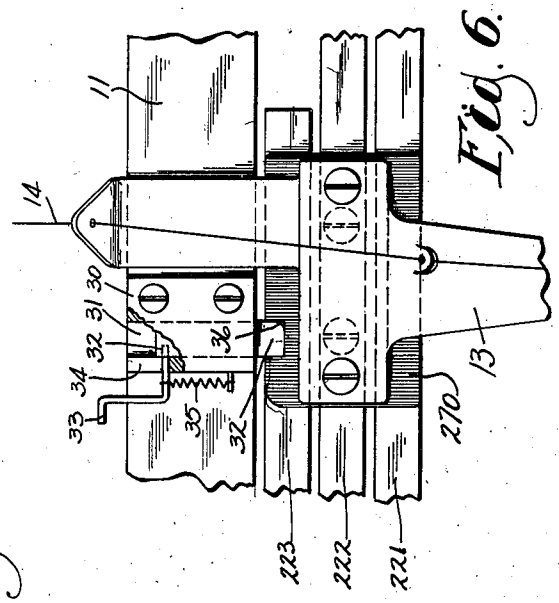


Fig. 6.

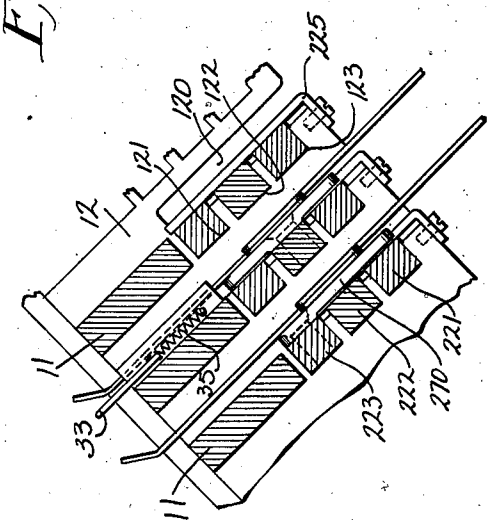


Fig. 5.

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MULTIPLE SECTION FLAT KNITTING MACHINE

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Application April 15, 1940, Serial No. 329,647

7 Claims. (Cl. 66—126)

My invention relates to improvements in multiple section flat knitting machines.

The object of my invention is to provide means whereby the knitting of a defective blank may be stopped without stopping the machine, or, at least, without stopping it for an objectionable length of time.

Modern flat knitting machines have multiple sections, frequently twenty-four in number, whereby twenty-four blanks may be simultaneously knitted. In any section, if a needle breaks, the blank which is being knitted in that section becomes defective, and to avoid stopping the entire machine it has been customary to continue to knit the defective blank and the yarn used for that purpose has been wasted. Such defects frequently occur and the total waste is large.

Therefore it is my object to provide means whereby the guide employed to distribute yarn to the needles in any given section may be manually released from the yarn guide actuator, either without stopping the machine or during a momentary stoppage thereof.

In the drawings:

Figure 1 is an elevation showing the yarn carrier and associated parts of one section of a flat knitting machine, the actuating bar and the ways being extended and broken away beyond the frame members defining the limits of that section.

Figure 2 is a sectional view drawn generally to line 2—2 of Figure 1.

Figure 3 is a fragmentary perspective view of those portions of the section to which my invention has been applied.

Figure 4 is a view similar to Figure 1, showing several sections, and embodying a modified form of construction.

Figure 5 is a sectional view drawn generally to line 5—5 of Figure 4.

Figure 6 is a detail view showing a fragment of one of the thread carriers, its associated latch mechanism, and fragments of the actuating bar and the ways.

Like parts are identified by the same reference characters throughout the several views.

In the conventional full-fashioned knitting machine in which I have incorporated my invention a plurality of sections 10 are arranged end to end, and to reciprocate the yarn carriers, actuating bars 11 extend throughout the length of the entire machine. Each bar 11 is constantly reciprocating during normal knitting operation, and the extent of its reciprocation is somewhat less than the length of the complete section between frame members 12 which provide bearing support for the bars.

The yarn carriers 13 guide the yarn 14 to needles 15 and sinkers 16 carried by the usual needle bar assembly 17 and sinker head assembly 18, respectively, as shown in Figure 2.

In the conventional machine the yarn carriers 13 are directly connected to the bars 11 and must constantly reciprocate therewith and it is with this phase of knitting machine construction and operation that my invention is concerned.

Adjacent each of the bars 11 I provide a yarn carrier guide 20 including spaced ways 21 and 22 which are fixedly supported by frame members 12. Upon the guide thus provided I mount my yarn carrier for free sliding reciprocation, and for accuracy and stability of mounting I provide a slide 23 shaped, as shown in Figure 3, to provide shoulders 24 to ride between the ways 21 and 22 and to rest upon flanges 25 and 26. Beneath the ways a coupling plate 27 is secured to the slide 23 to prevent its upward displacement. Upon the slide 23 the yarn guide is secured by the screws 28, Figure 3, which extend through the slide into the coupling plate 27.

Upon each actuating bar 11 I secure a latch block 30 which is channeled at 31 for reception of a latch 32. A latch arm 33, secured to the latch, extends through a side slot 34 in the block 30 to provide for easy manual retraction of the latch into the block against pull of a light spring 35.

The nose 36 of the latch 32 is rounded as shown in the drawings, and one corner of coupling plate 27 is rounded at 37 and notched at 38 to cause the latch 32 to automatically engage the plate and its yarn carrier whenever the yarn carrier and its plate 27 are thrust to the left against the nose 36 of the latch, or when the slide bar 11 is moved far enough to the right to cause its latch to ride over the rounded margin of the plate 27 and engage in the notch 38.

Whenever a blank becomes defective by reason of a broken needle, or for any other reason, the operator lifts latch arm 33 to release the latch 32 from its socket 38 in the slide 23. Thereupon the slide and its associated yarn carrier 13 may be freely moved along the ways into contact with or proximity to the right-hand frame member 12, in which position it may be securely held by a spring-actuated detent 39, and therefore distribution of yarn to the needles ceases in that particular section and allows a broken or defective needle to be replaced preparatory to knitting the next set of blanks.

However, in machines of the described type the bars 11 have a normal range of reciprocation during knitting operations, and in the interval between knitting operations they may have an extreme traverse toward the right (in Figure 1), preparatory to the knitting of the next set of blanks, and this movement is sufficient to carry the latch bar 32 into a position for re-engagement with slide 23. In the drawings I have shown my invention as it is applied to the standard parts of a knitting machine of the type disclosed in the Reading High Production Full Fashioned Knitting Machine Catalogue, copyright 1940, published by Textile Machine Works, Reading, Pennsylvania. As explained on pages 15, 48 and 58 of said catalogue, the carrier rod or rods corresponding to the above mentioned bar 11 are connected by friction boxes with an actuator referred to in said catalogue as a friction box rod or splicing shaft. A similar structure is described in lines 10 to 45, page 15, of the patent to A. E. Ischinger, dated December 7, 1937, and numbered 2,101,048. In such machines it is common practice to employ an adjustable stop to normally limit the movement of the carrier rod or slide bar 11 in accordance with the width of the blank, or portion of the blank, which is being knitted. The friction box allows the splicing rod to continue its motion notwithstanding the fact that the stop has arrested the movement of the slide 11. In all such machines, if the stop is sufficiently retracted, the bar 11 will carry the thread carrier to the end of its section, or until its movement is arrested by the right hand frame bar 12. Therefore, in machines embodying my invention, a carrier which has previously been moved to inoperative position may be reconnected by retracting the aforesaid limiting stop and moving the slide 11 to the right until its latch 32 re-engages in the notch 33. When the latch bar contacts with the rounded end of the slide it is lifted, thus allowing it to move into a position of registry with the slide socket or notch, and the latch thus automatically re-connects the slide with the bar 11.

If the thread carriers have been disengaged in more than one section as above described, they will thus automatically be simultaneously restored into operative relation with the actuating bar 11 during this extreme traverse of the bar, and all of the sections will then operate in unison for knitting the next set of blanks.

In the modification shown in Figures 4, 5 and 6, yarn carriers 13 are directly secured to their respective latch plates 270, which in turn are secured to yarn guide carrier bars 221, 222 and 223. These carrier bars are mounted for reciprocation in frame members 12 and they are staggered as shown clearly in Figure 4, so that in their reciprocation they will not interfere with one another.

The frame member 12 is notched at 120 as shown in Figure 5, so that the bars 221, 222, 223 can be inserted into their respective bearing grooves 121, 122 and 123, when their replacement or repair is necessary. They are retained in their respective grooves by clip 225.

I claim:

1. A flat knitting machine having a reciprocable thread carrier actuating bar provided with a plurality of thread carriers each mounted to slide along the bar into and out of operative position and each having a manually releasable latch connection with the bar when in operative position.

2. A flat knitting machine having a reciprocable thread carrier actuating bar provided with a plurality of thread carriers, each manually releasable from the bar while the machine is in continuous operation, and means for guiding a released thread carrier along a line parallel to the bar when so released, whereby it may be supported in position for operative connection with the bar when again brought in registry with the portion thereof from which the carrier has been released.

3. A flat knitting machine having a reciprocable thread carrier actuating bar provided with a plurality of thread carriers, each manually releasable from the bar while the machine is in continuous operation, and latching and guiding means for automatically restoring the connection of a released carrier by additional movement of the bar in one direction.

4. A flat knitting machine having a reciprocable thread carrier actuating bar in combination with ways, slides each provided with a thread carrier and movable along said ways, and latches carried by the actuating bar and each adapted to engage one of the slides for transmission of movement from the bar to the thread carrier, said latches being each manually releasable and its associated slide and thread carrier being manually movable to an inoperative position when so released.

5. A flat knitting machine having a reciprocable thread carrier actuating bar in combination with ways, slides each provided with a thread carrier and movable along said ways, and latches carried by the actuating bar and each adapted to engage one of the slides for transmission of movement from the bar to the thread carrier, said latches being each manually releasable and its associated slide and thread carrier being manually movable to an inoperative position when so released, one of said ways being provided with a spring-actuated detent for holding the slide and carrier in the inoperative position against accidental displacement pending a re-connection of the latch.

6. In a flat knitting machine having multiple sections for simultaneously knitting a plurality of blanks, the combination of a thread carrier for each section, a mounting guide for each thread carrier, a slide bar common to all of the sections and provided with latch means in each section engageable with the associated thread carrier in that section for operatively connecting the bar and thread carrier, each thread carrier when released from the latch means being movable along its guide beyond the range of its movement with the bar during knitting operations.

7. In a flat knitting machine having multiple sections for simultaneously knitting a plurality of blanks, the combination of a set of reciprocable thread carriers, an actuating bar for simultaneously actuating the thread carriers in a predetermined range of reciprocation, said bar being movable beyond its ordinary range during intervals between knitting operations, a latch for each thread carrier adapted to automatically couple it to the bar when the bar and thread carrier are in normal relationship, each latch being manually adjustable to a position of carrier release during knitting operation, and means for supporting a released carrier for automatic coupling engagement with the bar when the latter is moved beyond its ordinary range to bring the bar and carrier into coupling relationship.

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