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GUIDE BAR SWINGING MECHANISM FOR A DOUBLE NEEDLE BAR WARP KNITTING MACHINE

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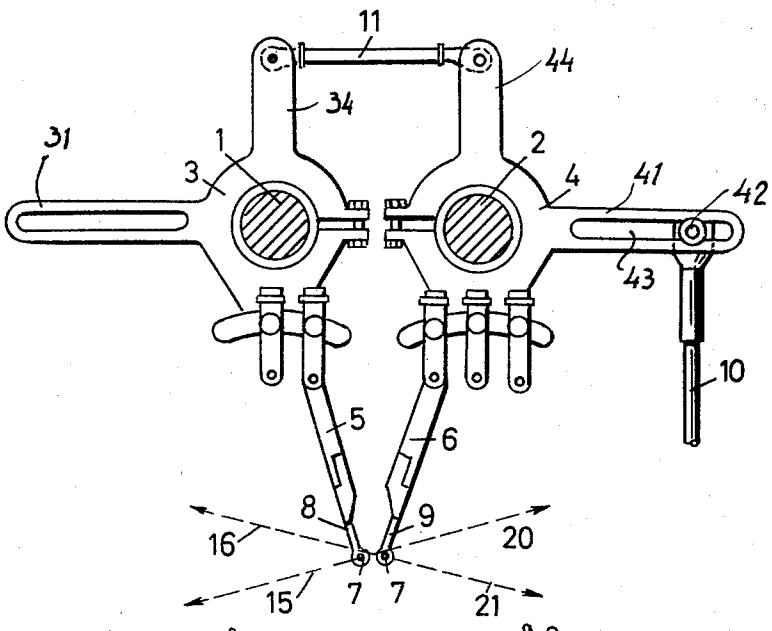
Fig.1.



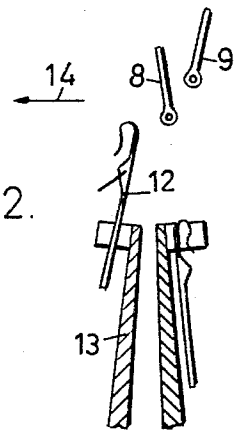


Fig.2.

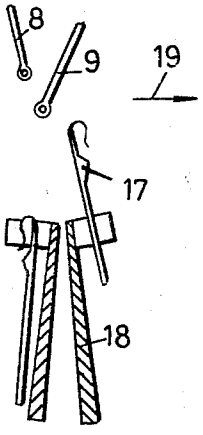


Fig.3.

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GUIDE BAR SWINGING MECHANISM FOR A DOUBLE NEEDLE BAR WARP KNITTING MACHINE

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U.S. Cl. 66—87 2 Claims

ABSTRACT OF THE DISCLOSURE

A Raschel warp knitting machine having two needle bars and two groups of guide bars respectively mounted on two parallel guide bar rocking shafts connected for joint rocking movement.

Background of the disclosure

This invention relates to a guide bar swinging mechanism for warp knitting machines, and particularly to such a mechanism for a double-needle-bar knitting machine.

It is known to offset the several yarn guides of a single-bar warp knitting machine, more specifically a Raschel machine, in the direction of knitting needle movement in order to reduce the time during which the needle stands still for cooperation with several guide bars. If the eyes of the yarn guides are arranged in a straight horizontal row, the needle bar must stand still in its highest position during the entire lapping movement of the guide bars. When the yarn guides are offset vertically, that is, in the normal direction of needle movement, the knitting needles may move continuously, which permits the speed of the knitting machines to be increased to a considerable extent.

The expedient of vertically offsetting the yarn guides is ineffective in conventional double-needle-bar machines because the yarn guides may be properly offset relative to the needles of one needle bar only, but their positions are unsuited for needles of the other needle bar. Conventional double-needle-bar machines, therefore, do not have vertically offset yarn guides, and their rate of output is correspondingly reduced.

It is the primary object of this invention to make the advantages of offset yarn guides available in a double-needle-bar warp knitting machine.

Summary of the invention

According to this invention, a double-needle-bar warp knitting machine is equipped with two parallel guide bar rocking shafts which are spacedly juxtaposed in the direction of lapping movement and carry respective guide bars. The two shafts are connected for joint pivoting movement about the respective axes.

Other features and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description of a preferred embodiment when considered in connection with the appended drawing.

Brief description of the drawing

In the drawing:

FIG. 1 shows the guide bar swinging mechanism of a double-needle-bar Raschel knitting machine of the invention, the view being in side-elevation section;

FIG. 2 illustrates the yarn guides, trick plates, and knitting needles in one operative position of the knitting machine partly illustrated in FIG. 1; and

FIG. 3 illustrates the knitting elements of FIG. 2 in another operative position.

Description of the preferred embodiment

Referring now to the drawing in detail, there is shown only as much of an otherwise conventional double-needle-bar Raschel machine as is needed for an understanding of the invention.

The guide bar swinging mechanism of the invention shown in FIG. 1 has two guide bar rocking shafts **1, 2** which are mounted in the non-illustrated machine frame for pivoting movement about parallel axes spaced in the principal direction of lapping movement, that is, horizontally. Clamping rings **3, 4** releasably fastened to the shafts **1, 2** are equipped to carry several guide bars each, only one guide bar **5, 6** being shown on each ring **3, 4** for thesake of clarity.

Integral, longitudinally slotted arms **31, 41** extend in opposite directions from the rings **3, 4**, and a pivot **42** adjustably secured in the slot **43** of the arm **41** connects the rocking shaft **2** with a connecting rod **10**. The rod **10** is linked in a conventional manner to an eccentric on the drive shaft of the knitting machine (see "Warp Knitting Technology," by D. F. Paling, Columbine Press, London, England, 1965, page 244). As the drive shaft rotates, the arm **41** is oscillated, and the amplitude of its movement may be adjusted by varying the position of the pivot **42** in the slot **43**.

Integral parallel arms **34, 44** extend upwardly from the rings **3, 4**, and are hingedly connected by a link **11**. The shaft **1**, therefore, oscillates jointly with the shaft **2**. The arm **31** is not used in the illustrated mechanism. It may be connected with a separate cam on the drive shaft of the knitting machine by a connecting rod and other motion transmitting elements, as described with reference to the rod **10**. The link **11** may be omitted if joint and synchronous movement of the shafts **1, 2** in the same angular direction is achieved by a dual cam mechanism.

The eyes **7** of yarn guides **8, 9** on the guide bars **5, 6** move in arcuate paths which are angularly offset during the oscillation of the shafts **1, 2**. While the eye **7** of the guide **8** moves in an obliquely downward direction indicated by the arrow **15**, the eye of the guide **9** moves obliquely upwardly in the direction of the arrow **16**. Conversely, the guide **9** moves obliquely downwardly along the arrow **21** while the guide **8** moves upwardly in the direction of the arrow **20** from the neutral or central position of the guide bar swinging mechanism shown in FIG. 1.

The relative positions of knitting implements in the two angularly terminal positions of the shafts **1, 2** are illustrated in FIGS. 2 and 3. When the latch needles **12** mounted on a non-illustrated common needle bar and guided in the trick plate **13** are near their highest position, as shown in FIG. 2, the shafts **1, 2** begin their clockwise stroke, as viewed in FIG. 1, for the backward swing of the yarn guides in the direction of the arrow **14**. The eye in the leading yarn guide **8** is much lower than the eye in the trailing yarn guide **9**.

FIG. 3 shows the position of the knitting implements just prior to the counterclockwise movement of the shafts **1, 2**, which causes forward swinging movement of the guides **8, 9** in the direction of the arrow **19**. The needles **17** in the trick plate **18** are approaching their highest positions, and the needles **12** are fully retracted. The eye of the leading guide **9** is lower than that of the trailing guide **8**.

The several guides are, therefore, vertically offset during their lapping movement in the manner conventional with single-needle-bar machines, but their relative vertical positions are inverted as needed for cooperation with the needles of the two needle bars.

Obviously many modifications and variations of the present invention are possible in the light of the above

teachings. It is therefore to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. In a warp knitting machine having two needle bars, a plurality of guide bars, and a guide bar swinging mechanism, the improvement in said swinging mechanism comprising:

(a) two guide bar rocking shafts elongated in a common direction and spaced transversely of said direction, each shaft carrying at least one of said guide bars, and having an axis; and

(b) actuating means for jointly oscillating said shafts about the respective axes in the same angular direction.

2. In a machine as set forth in claim 1, said axes being parallel, and said actuating means including means for pivoting one of said shafts about the axis thereof, and linking means connecting the other shaft to said one shaft for joint motion.

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