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ADJUSTABLE CARRIER RING

Filed Oct. 4, 1944

FIG. 1.

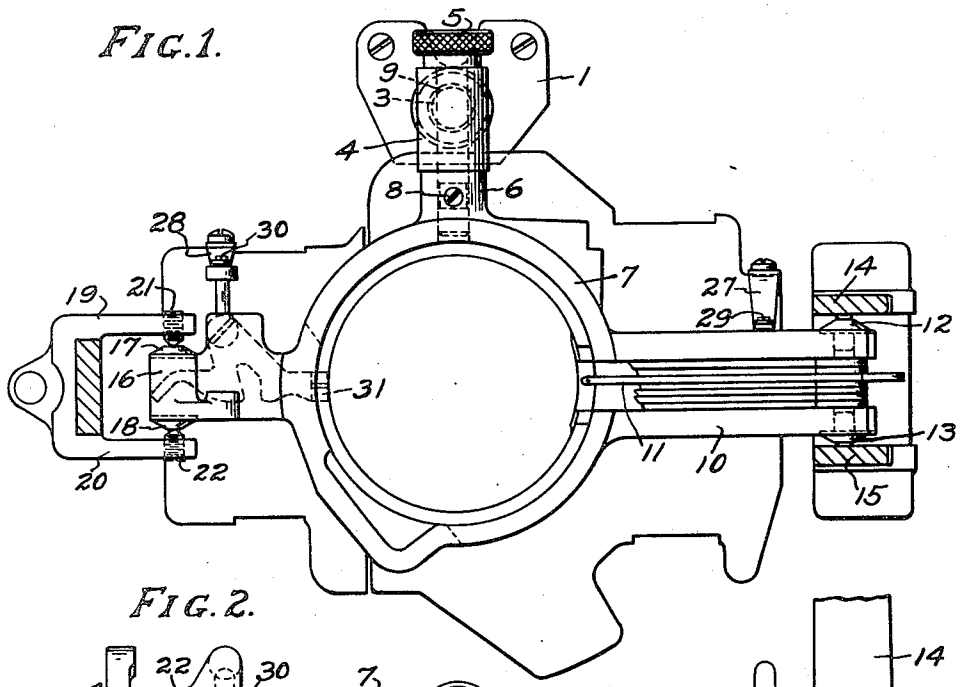


FIG. 2.

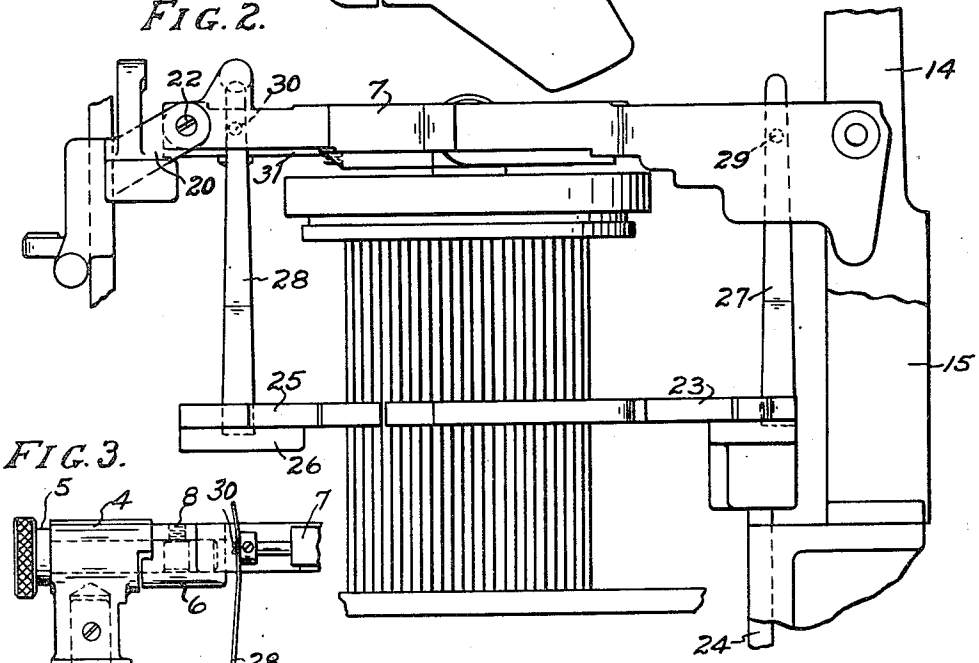
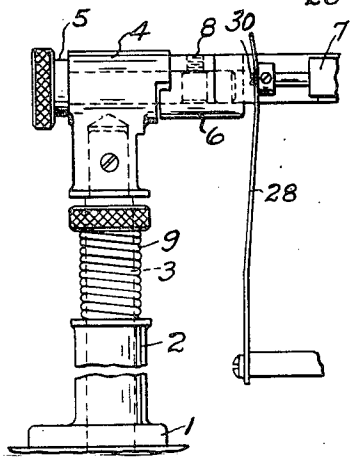


FIG. 3.



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ADJUSTABLE CARRIER RING

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7 Claims. (Cl. 66—8)

This invention relates to a new and useful improvement in a carrier ring for circular, independent needle, knitting machines and in the manner in which it is adjustably supported. The form of the invention selected for description herein is adapted for use on the Banner type of circular knitting machines but the invention is not limited thereto since it is adaptable to other types of machines.

In modern circular, independent needle, knitting machines in which the needles are carried by one or more rotatable cylinders and in which the needles derive their knitting motions from a cam assembly which does not rotate, the cam assemblies are automatically adjustable, vertically, so that the length of the stitches can be altered from time to time by changing the heighths of the cams in relation to the sinkers. Such an adjustment is shown, for example, in Patent #2,208,307.

Similarly, in two feed knitting when two yarns are simultaneously knit and fed at opposite sides of the machine both the main and auxiliary cam blocks should be provided with automatic adjustments so that the length of the stitches produced at each block can be automatically controlled at will. A device of this character is shown in co-pending application #532,082, filed April 21, 1944.

An important factor not heretofore provided for is the maintaining with exactitude the angle at which the yarn or yarns are fed to the needles regardless of the adjustment of the knitting cams. Any change in the vertical adjustment of the knitting cams obviously alters, vertically, the path followed by the needle hooks and, consequently, the angle at which the yarn is fed to the needles. For coarse gauge work these alterations are of no particular importance but for fine gauge knitting to produce, for example, sheer ladies' hosiery fabric, the slightest variation in loop structure is clearly apparent. Therefore, every factor influencing the length or other characteristic of every loop must be considered.

By this invention the yarn feeding devices are maintained in essentially the same vertical relation to the needle hooks regardless of changes in the heighths of the knitting cams and regardless of how often these changes occur or whether they take place at one cam block or at two opposed cam blocks. More specifically, the carrier ring or other part upon which the yarn levers or feeding devices are mounted is caused to move in substantial harmony with movements of the cam block or cam blocks as the case may be.

One form of the invention is shown in the drawing of which:

Fig. 1 is a plan view of a carrier ring and the manner in which it is mounted and guided;

Fig. 2 is a similar view in elevation;

Fig. 3 is a detail view of the carrier ring support or mount.

As shown in Figs. 1 and 3 there is a bracket 1 rigidly fastened to any suitable part of the machine and provided with a tubular extension 2 within which a shaft 3 is slidably fitted. At the upper end of shaft 3 is attached a head 4 having a horizontal tubular bearing for a pin 5 rotatably mounted therein and projecting far enough beyond head 4 towards the cylinder of the machine to enter extension 6 of latch ring 7 to which it is rigidly attached by any suitable means such as set screw 8. Normally shaft 3 is urged upwardly by a spring 9. This provides a support which holds the carrier ring in a horizontal position but permits it to move up and down or to tilt towards the front or rear of the machine.

Carrier ring 7 has an extension 10 forming the support for the main yarn levers 11. These levers feed the yarn or yarns through the mouthpiece for knitting at the main cam block of the machine. The outer extremity of extension 10 is provided with conical bearings 12 and 13 which have a free sliding fit with guides 14 and 15, respectively.

The opposite side of latch ring 7 is also provided with an extension 16 which also has conical bearings 17 and 18 having a free sliding fit between guides 19 and 20, respectively. Preferably although not necessarily, guides 14, 15, 19 and 20 are provided with set screws such as those shown at 21 and 22 positioned so as to engage conical bearings 12 and 13 and 17 and 18 when carrier ring 7 is in its operating position. These set screws and set screw 8 provide a means whereby minor adjustment of the stitch ring can be made.

The main cam block (not shown) is mounted upon a plate 23 adapted to be moved vertically at any time by suitable mechanism indicated by the numeral 24. The auxiliary cam block (not shown) is mounted upon a similar plate 25 also vertically movable by suitable mechanism herein indicated by the numeral 26. A preferred form of mechanism for effecting these vertical movements of plates 23 and 25 whereby the heighths of the stitch cams of the main and auxiliary cam blocks are varied is fully described in co-pending application #532,082 already referred to.

To the two plates 23 and 25 are attached spring latches 27 and 28, respectively, the upper ends of which engage pins 29 and 30 projecting from the main and auxiliary sides of latch ring 7. Thus the carrier ring is rigidly but disconnectably attached to plates 23 and 25.

Since the carrier ring 7 can pivot about head 4 and since head 4 is mounted upon rod 3, which can move vertically, the mounting of the carrier ring is semi-universal in that it can move up and down vertically, can tilt towards the left upon pin 29 as a pivot or towards the right upon pin 30 as a pivot or can have a compound movement having components of all of these. In other words, any movement of plate 23 or plate 25 or both of them is communicated to carrier ring 7 through spring latches 27 and 28 and pins 29 and 30. Therefore, the yarn feeding angle is maintained with respect to any yarn lever such as an auxiliary yarn lever 33 mounted on the carrier ring which feeds its yarn directly to the needles or any yarn lever such as those comprising main yarn levers 11 which feeds its yarn through the mouthpiece of the carrier ring. In this way, an important factor in the production of fabric of fine quality, hitherto a variable, has been made a constant.

Whenever it is desired to raise carrier ring 7 out of knitting position it is only necessary to release spring latches 27 and 28 manually whereupon the entire carrier ring will rise bodily under the urge of spring 3. To restore the ring to its operating position it is only necessary to push it down until the spring latches engage again. Extensions 18 and 16 will be guided automatically into guides 14 and 15 and 19 and 20 by the conical bearings described.

We claim:

1. In a circular, independent needle, knitting machine having a plurality of independently and vertically adjustable knitting cam supports, the combination of a carrier ring provided with yarn levers above each of said knitting cam supports and means for maintaining said yarn levers at definite vertical distances above their respective knitting cam supports irrespective of alterations in the vertical position of said knitting cam supports.

2. In a circular, independent needle, knitting machine having a vertically adjustable knitting cam support, the combination of a resiliently and pivotally mounted carrier ring and means connecting said knitting cam support and said carrier ring whereby any vertical alteration in the position of the knitting cam support produces a substantially identical alteration in the position of the corresponding side of the carrier ring.

3. A carrier ring assembly for a circular, independent needle, knitting machine which includes a vertically movable support, means for pivotally connecting a carrier ring thereto and means for connecting said carrier ring to the knitting cam support so that any vertical movement of said knitting cam support will produce a corresponding vertical movement of the corresponding part of said carrier ring.

4. In a circular, independent needle, knitting machine having vertically adjustable knitting cam supports upon the main and auxiliary sides, the combination of a resiliently and pivotally mounted carrier ring and means connecting each knitting cam support to said carrier ring whereby any vertical alteration in the position of either knitting cam support will produce a substantially identical alteration in the position of the corresponding part of the carrier ring.

5. A carrier ring assembly for a circular, independent needle, knitting machine which includes a vertically movable support, means for pivotally connecting a carrier ring thereto and means for connecting said carrier ring to the main and auxiliary knitting cam supports so that any vertical movement of either of said knitting cam supports will produce a corresponding vertical movement of the corresponding side of said carrier ring.

6. A carrier ring assembly for a circular, independent needle, knitting machine which includes a vertically movable support, means for pivotally connecting a carrier ring thereto, yarn levers supported by said carrier ring and means for connecting said carrier ring to the knitting cam support so that the vertical relation between the yarn levers and the needles remain substantially unchanged regardless of alterations in the heights of the knitting cam support.

7. A carrier ring assembly for a circular, independent needle, knitting machine having main and auxiliary cam blocks which includes a vertically movable support, means for pivotally connecting a carrier ring thereto, main and auxiliary yarn levers supported by said carrier ring and means for connecting said carrier ring to the main and auxiliary knitting cam supports so that any vertical movement of either of said supports will produce a corresponding vertical movement of the corresponding yarn levers.

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