United States Patent [19]

Güell

[11] **3,877,257**

[45] **Apr. 15, 1975**

[54] **ANNULAR CAM BOXES OF CIRCULAR KNITTING MACHINES**

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[22] Filed: **Nov. 20, 1973**

[21] Appl. No.: **417,506**

[30] **Foreign Application Priority Data**

Nov. 20, 1972 Spain 408792
Nov. 20, 1972 Spain 408793

[52] **U.S. Cl.** ..... **66/50 R;** 66/54
[51] **Int. Cl.** **D04b 15/32;** D04b 15/68
[58] **Field of Search** ..... 66/57, 50 R, 38, 54, 40, 66/42 R, 8

[56] **References Cited**

UNITED STATES PATENTS

3,013,418	12/1961	Hill	66/57
3,405,542	10/1968	Beckenstein	66/40
3,590,599	7/1971	Llovet	66/8
3,614,877	10/1971	Radin	66/54
3,696,640	10/1972	Kawase et al.	66/40

FOREIGN PATENTS OR APPLICATIONS

292	1/1879	United Kingdom	66/38
1,580,393	5/1969	France	66/57
925,350	5/1963	United Kingdom	66/38
1,136,387	12/1968	United Kingdom	66/42
327,774	4/1930	United Kingdom	66/42

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[57] **ABSTRACT**

A circular knitting machine in which the two operative regions of the annular cam box which actuate the selector jacks and the selected needles respectively are each constituted by a base ring and a plurality of support columns while the cams actuating the selector jacks and needles are flat plates.

4 Claims, 4 Drawing Figures

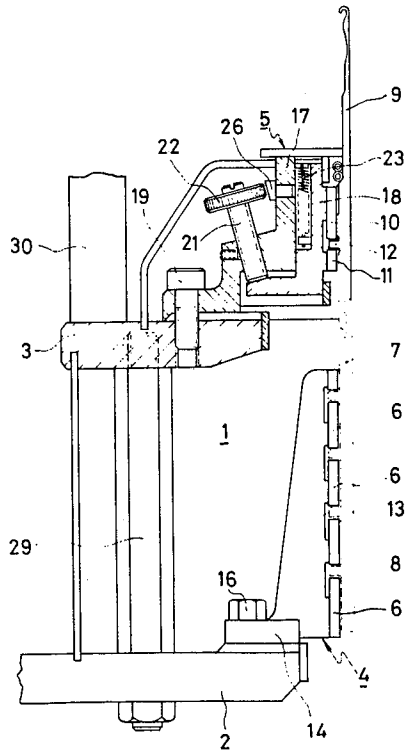


FIG. 1

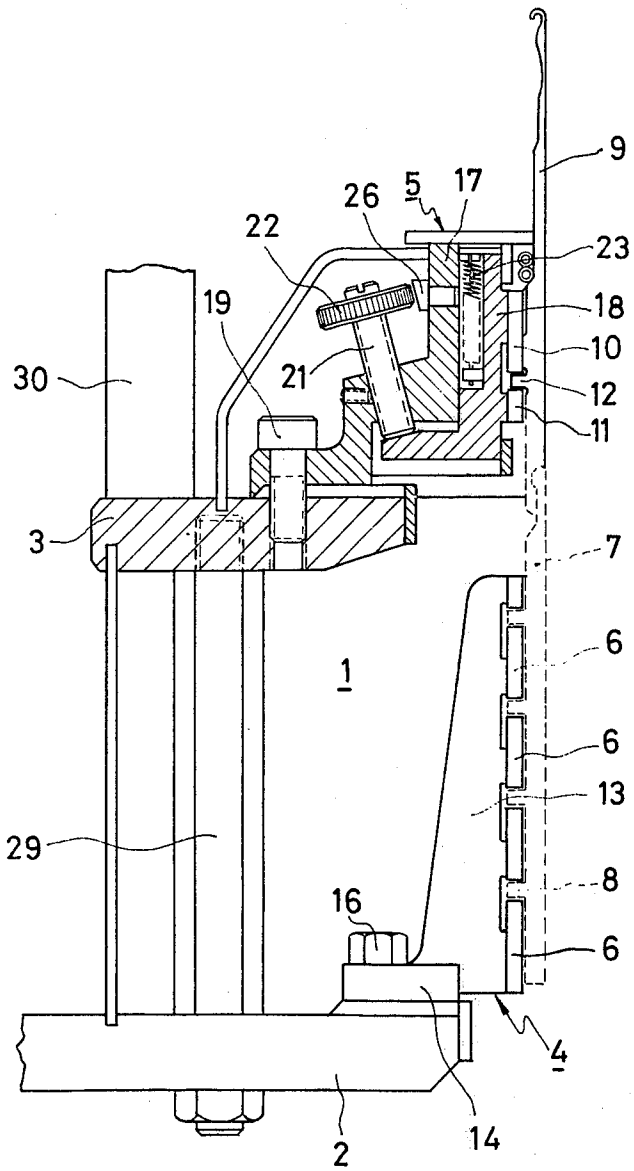


FIG. 2

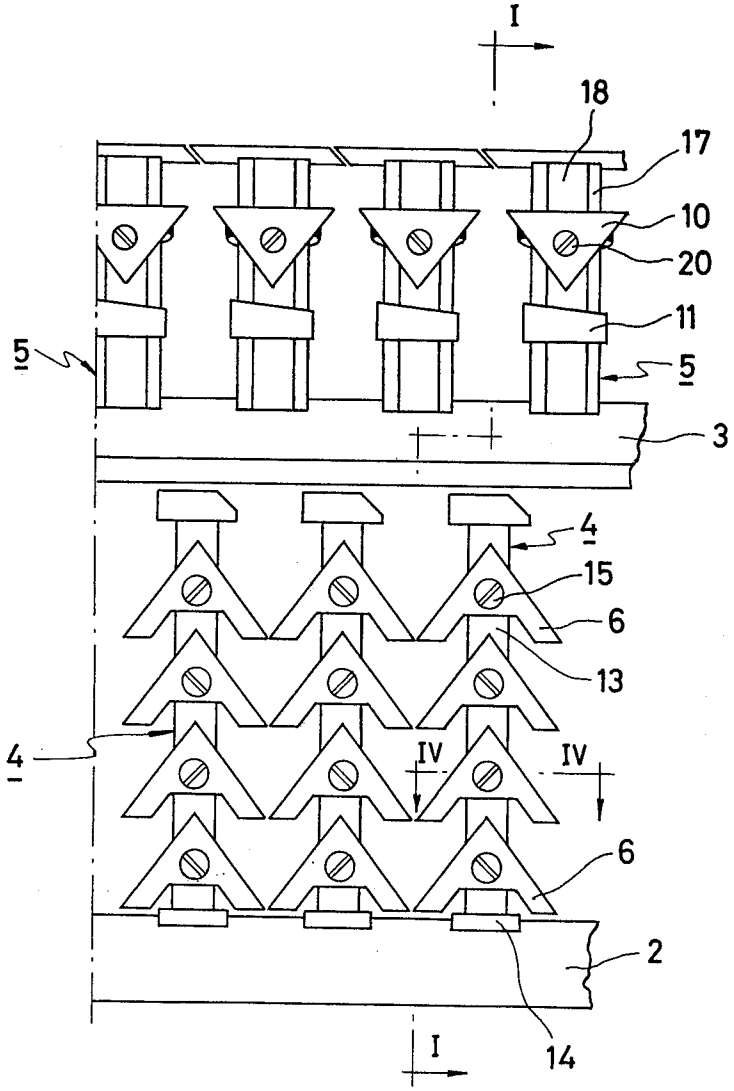


FIG. 3

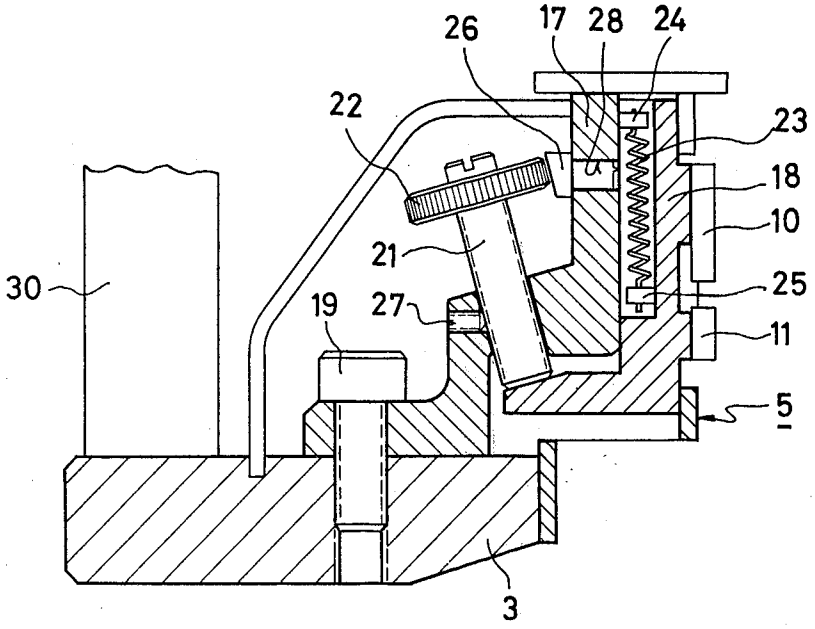
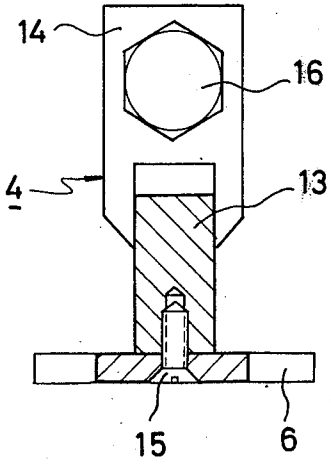


FIG. 4



ANNULAR CAM BOXES OF CIRCULAR KNITTING MACHINES

FIELD OF THE INVENTION

The present invention relates to improvements in annular cam boxes for circular knitting machines.

DESCRIPTION OF THE PRIOR ART

Conventional annular cam boxes are formed from curved segments forming a cylinder when fitted in place. These segments, in turn, carry cams, the innermost radial face of which presented to the selector jacks and/or needles define portions of a common imaginary cylinder. This design has drawbacks in construction since the machining of such curved parts is time-consuming and difficult.

SUMMARY OF THE INVENTION

Such annular cam boxes have two operative regions, a lower region having cams actuating the selector jacks and an upper region having cams actuating the selected needles.

According to the invention, each of said regions is constituted by a base ring and a plurality of column type cam carrying support members which are independent, one from another, and are demountably attached equidistantly around the periphery of said base ring.

Also, according to the invention, the cams of an annular cam box arrangement actuating the selected needles are secured to vertically movable slide members mounted to the support members of the upper operative region secured to the corresponding base ring of said annular cam box, each support member being provided with a manually operable screw pressing on said slide member to counteract the effect of a tension spring so that when the screw is suitably adjusted the corresponding cam set is adjusted at a convenient height within the annular cam box thereby causing the needles actuated by said cams to knit shorter or longer stitches.

Furthermore, according to the invention, the cams in an annular cam box arrangement actuating the selector jacks are secured to columns forming part of the lower operative region support members.

Finally, according to the invention, the cams are formed by flat plates.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features of the invention will be disclosed in the following description with reference to the attached illustrative drawings in which:

FIG. 1 shows diagrammatically and partly in cross section a fragment of an annular cam box arrangement according to the invention;

FIG. 2 shows diagrammatically and in developed form a fragment of the annular cam box arrangement of the previous Figure;

FIG. 3 is a cross sectional view on a larger scale of a support member of the upper operative region of the annular cam box arrangement of FIG. 1;

FIG. 4 is an enlarged sectional view taken along the line IV—IV of FIG. 2 of a lower support member of the annular cam box arrangement of FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

In a circular knitting machine according to the invention, the annular cam box 1 comprises a lower ring 2 and an upper ring 3, on which there are mounted, respectively, lower support members 4 and upper support members 5. Cams 6 for operating selector jacks 7 through butts 8 for selecting needles 9 are mounted to the lower support members 4. Cams 10 and 11 for controlling said needles 9 through butts 12 are mounted to said upper support members 5.

The lower support members 4 comprise a column member 13 and a base 14. Said cams 6 are secured to said column member 13 with screws 15 while said base 14 is secured to the lower ring 2 by screw 16.

Said upper support members 5 comprise a casing 17 and a slide member 18 capable of sliding movement in said casing 17. Said casing 17 is secured to the upper ring 3 by a screw 19, while cams 10 and 11 are secured with screws 20 to slide member 18. A screw 21, having a finger wheel 22 at its upper end for manual operation, is partially inserted into the casing 17, while between the casing 17 and sliding member 18 there is space to house completely a coil spring 23, anchored to pins 24 and 25 of the casing 17 and slide member 18, respectively. Screw 21 is locked in position by a latch member 26 applied against the fingerwheel 22 and a clamping screw 27 applied radially against the threaded shank of screw 21. Latch member 26 is housed in bore 28 of casing 17.

The lower ring 2 is attached to upper ring 3 by conventional columnar members 29 while other columnar members 30 attach the upper ring 3 to other elements of the knitting machine.

As will be observed, the lower and upper support members 4, 5 are separate members mounted at equidistant intervals around their respective base rings 2 and 3, whereby they constitute the operative regions of the annular cam box in substitution of the conventional curved segments.

Likewise, the use of flat plates for the cams 6, 10 and 11 facilitates their machining, in contrast with conventional arcuate faced cams.

The use of the above described structure employing support members 4 and 5 provides the annular cam box arrangement 1 with advantages not capable of being achieved in the prior art, such as simplification of the construction of the support members 4, 5, and cams 6, 10 and 11, together with the possibility of individually removing or fitting said support members thereby facilitating repair, replacement and also maintenance and cleaning operations.

Concerning the upper support members 5, the essential advantage, over and above those used heretofore, lies in achieving stitch size control. The stitch size is easily and quickly adjusted simply by manually turning the fingerwheel 22 of screw 21, which also allows for extremely precise adjustment.

What I claim is:

1. In a circular knitting machine of the type having selector jacks, selectable needles, and an annular cam box having a lower operative region mounted on the lower base ring of the machine structure and having cams actuating the selector jacks, and an upper operative region mounted on the upper base ring of the machine structure and having cams actuating the selected needles, the improvement comprising each of said operative regions comprising a base ring and a plurality of column type cam carrying support members independent from one another and demountably attached to

said base ring, said support members being positioned equidistantly around the periphery of said base ring and projecting outwardly therefrom.

2. The improvement according to claim **1**, wherein said cams of said annular cam box actuating the selected needles are secured to vertically movable slide members mounted to said support members of said upper operative region secured to the corresponding base ring of said annular cam box, each said support member being provided with a manually operable screw pressing on said slide member to counteract the effect of a tension spring, such that when said screw is suitably adjusted the corresponding cam set is adjusted at a convenient height within said annular cam box thereby causing said needles actuated by said cams to knit shorter or longer stitches.

3. The improvement according to claim **1**, wherein said cams in said annular cam box actuating the selector jacks are secured to columns forming part of said lower operative region support members.

4. The improvements according to claim **1**, wherein said cams are flat plates.

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