

[54] **DEVICE FOR PRODUCING SIMULTANEOUSLY TWO SEPARATE FABRICS RIB ON THE SAME HEAD OF A RIB KNITTING MACHINE WITH TWO NEEDLE BEDS**

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[58] Field of Search 66/126, 128, 145, 127, 66/64

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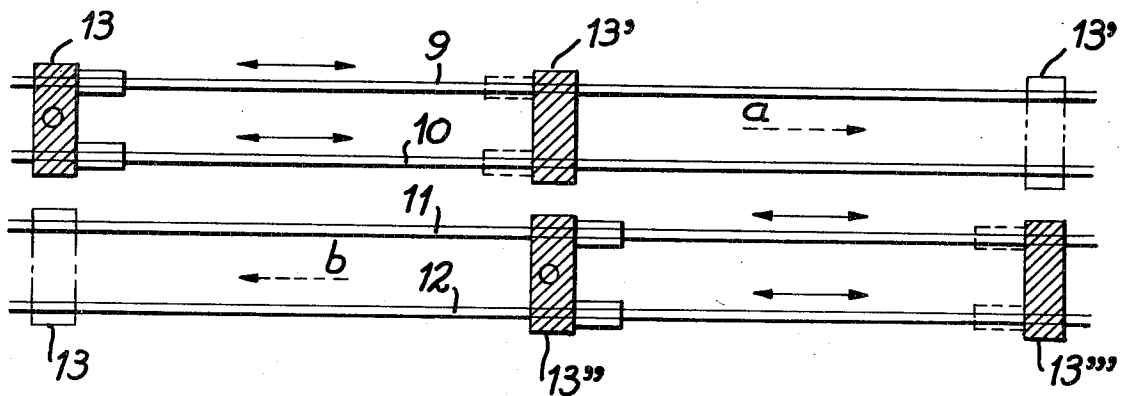
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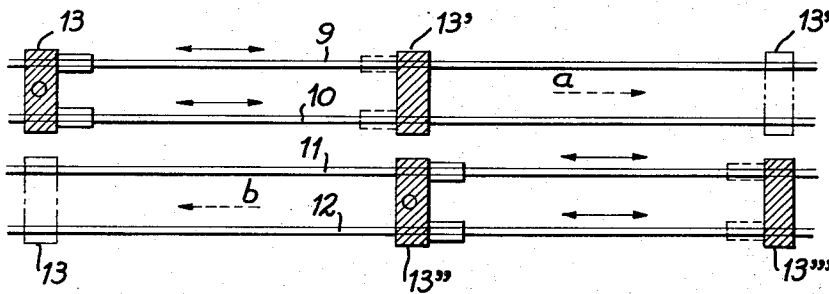
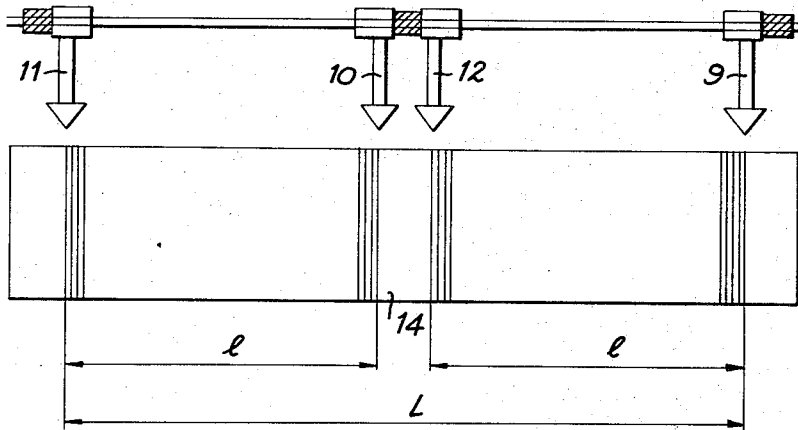
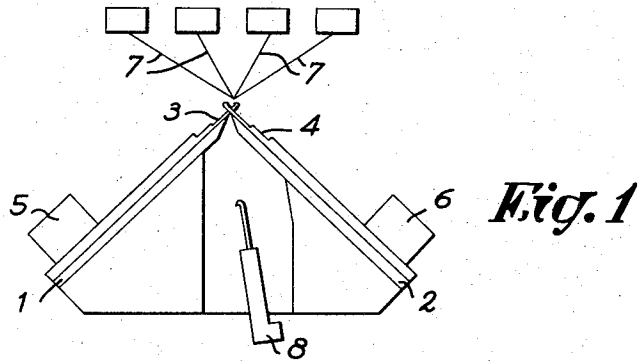
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[57] **ABSTRACT**

The device is adapted to be attached to a conventional flat knitting machine with two V-shaped needle beds and includes a movable thread catcher for catching threads between the needle beds and drawing them downwardly, a thread cutter having open blades between which the threads are drawn downwardly, and control means programmed by the movable thread catcher and the thread cutter for moving the thread catcher between a lowered and a raised position and for actuating the thread cutter to cut the threads drawn downwardly by the thread catcher.

7 Claims, 7 Drawing Figures





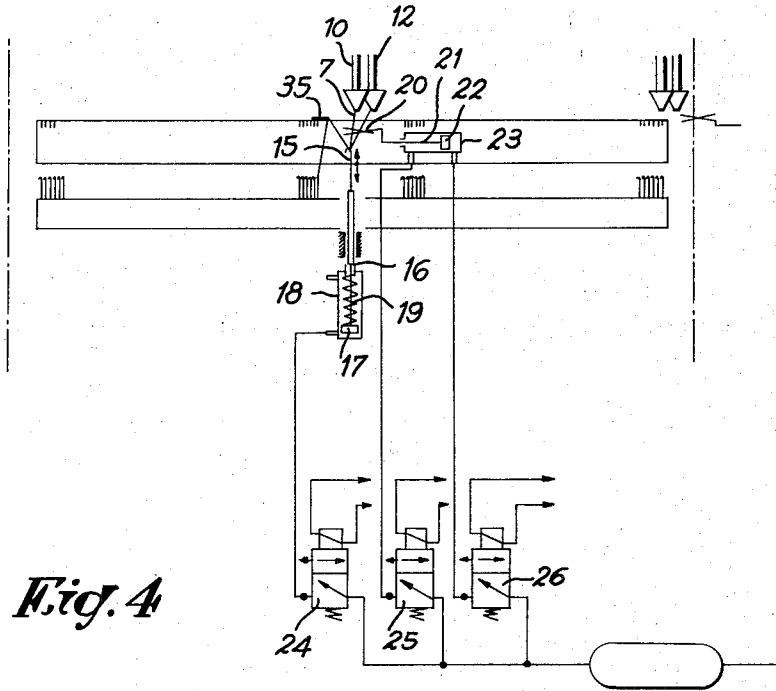


Fig. 4

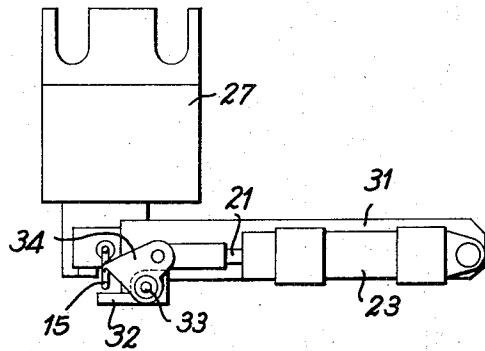


Fig. 7

**DEVICE FOR PRODUCING SIMULTANEOUSLY
TWO SEPARATE FABRICS RIB ON THE SAME
HEAD OF A RIB KNITTING MACHINE WITH TWO
NEEDLE BEDS**

This invention relates to a device for simultaneously producing two rib fabrics on the same head of a flat knitting machine with two V-shaped needle beds for knitting rib fabrics.

Rib fabrics are usually produced on special machines with two needle beds, said rib fabrics being then collected on magazine-combs intended, e.g. for feeding cotton type knitting machines.

The said rib fabric machines comprise one or several knitting heads. The length of a head substantially corresponds to the largest width of the panel being made on the knitting machine or machines being fed with rib fabrics. Accordingly, when knitting relatively narrow rib fabrics such as cuffs, a substantial portion of the needle beds are remaining inoperative.

In fact, heretofore, the rib end knitting machines do not allow simultaneously knitting two rib fabrics on a single knitting head or unit.

The object of the present invention is to prevent said drawback, i.e. to allow an increased production of the concerned machines.

For this purpose, there is provided a novel device comprising substantially the combination of:

1. four thread-guides two of which are provided for the gripping thread and two to the edge thread;
2. a system of adjustable stops allowing to limit the travel of each of said thread-guides only to a portion of the length of the needle beds;
3. a thread catcher situated in the middle of the needle beds and movable therebetween from a low position to a high position and vice versa;
4. a thread cutter associated with the said catcher; and
5. control means programmed by the said catcher and the said associated thread cutter.

In the case of a multiple head rib fabric knitting machine, such device may be provided on any number of knitting heads or units. Preferably, it will be mounted to allow the conventional knitting operation, while being removable.

The present invention will be described hereafter with more details only by way of illustration and without any limitation, reference being made to the enclosed diagrammatic drawings in which:

FIG. 1 is a very simplified cross-section of a knitting unit of a rib fabric knitting machine with two needle beds;

FIG. 2 is a view taken according to the arrow F₁ of FIG. 1;

FIG. 3 is a plane view of the thread-guides and the stops thereof;

FIG. 4 is a basic diagrammatic view of the device according to the invention;

FIG. 5 is a very simplified view of an embodiment of this invention;

FIG. 6 is a view taken according to the arrow F₆ of FIG. 5 and

FIG. 7 is a view taken according to the arrow F₇ of FIG. 6.

As shown in FIG. 1, each knitting unit of the concerned rib fabric knitting machine comprises two needle beds 1 and 2 provided with needles 3 and 4 respec-

tively actuated through locks 5 and 6. The threads are presented to the needles by the thread-guides generally indicated in 7 and each carried by an axially movable bar driven according to the knitting program through a clutch device allowing to stop the bar according to the position of the selvedge blocks (not shown). The lower portion of the knit will be then subjected to a tensile stress through a vertically moving gripping comb 8 on which the gripping rows are looped. At the end of the knitting operation, the loops are brought back on the needles of only one needle bed where they may be manually or automatically sunk, e.g. through a transferring comb by which they are then pushed up on a magazine-comb. All these arrangements are well known and do not form part of the present invention.

In FIG. 2, the maximum knitting width on one unit is indicated in L. The object of this invention is to provide a device allowing to produce two independent knits having a maximum width 1.

For this purpose, the thread-guides 9 and 11 are provided for feeding a gripping thread, while the thread-guides 10 and 12 are feeding an edge thread. Four pairs of stops 13, 13' and 13'', two pairs of which 13' and 13'' are forming a central stop, are limiting the travel of the said thread-guides so that the thread-guides 9 and 10 are feeding a half portion of the head, while the thread-guides 11 and 12 are feeding the other half portion. Between said both half portions, is remaining a central area 14. However, a suitable adjustment of the stops 13 and 13'' allows simultaneously knitting two rib fabrics having different widths on the same head.

The stops 13 are carried by any suitable stationary part of the machine such as bars along which they may be moved and on which they may be wedged by any suitable means.

With the concerned machine, the knitting operation is carried out from the right hand to the left hand as shown in FIGS. 2 and 3. The rows being always in an even number, at the end of the knitting operation, the thread-guides 9 and 12 will be at the right end of the head, while the thread-guides 10 and 11 will be stopped against their respective stops at the edge of the central area 14. The threads of the guides 9 and 12 will be caught and cut by the conventional thread cutter (not shown) of the machine. The same is not true for the threads of the guides 10 and 11 so that an additional device must be provided.

Said device comprises a moving hook 15 carried at the end of a rod 16 integral with the piston 17 of an air cylinder 18, said piston being returned to the low position through a spring 19. The said hook is associated with a thread gripping/cutting device 20 actuated through a rod 21 integral with the piston 22 of a double action air cylinder 23.

The single feeding of the cylinder 18 is controlled through the electromagnetic valve 24, whereas both feedings of the cylinder 23 are controlled respectively through valves 25 and 26. The valves 24-26 are controlled through microswitches actuated, e.g. through the card box, the counter or the cam shaft of the machine.

As shown more particularly in FIGS. 5-7, the whole device is secured on the machine through the single angle-iron 27. The latter supports the cylinder 18 by means of a lug 28 and a bracket 29 to which are secured two superimposed angle-irons 30 and 31, the first angle-iron supporting the stationary blade 32 and the

pivot 33 of the moving blade 34 of the said thread cutter 20, while the second angle-iron supports the cylinder 23. This arrangement is such that the hook 15 passes between the blades 32 and 34 which are opened at the end of the upward travel thereof or at the beginning of the downward travel thereof. 5

The machine provided with the above described device operates substantially as described hereafter.

When the last row or loose row of each of both rib fabrics is knitted, the hook 15 is brought in high position, the thread cutter 20 being opened. When the last row is completed, the hook 15 is lowered under the action of the spring 19. The edge thread extending from such active needle of bed 1 which is the nearest to the central area 14, to the guide 11 as well as the gripping thread extending from the traction comb 8 to guide 10 are caught and driven downwardly between the blades 32 and 34 of the thread cutter 20. The threads are caught more readily owing to the presence of a removable guide 35 carried on the needle bed 1 at the edge of the area 14. 15

The thread cutter 20 is then closed and both threads are cut, the end of the strands coming from the thread-guides being gripped between the blades 32 and 34 profiled therefor. 20

At the right end of the head, the threads are caught, cut and gripped by the conventional thread cutter. 25

All the loops are then brought back on the rear needle bed 2 where they are sunk either manually or preferably automatically. The gripping rows and the first normal rows of two novel rib ends are then knitted and the blades 32 and 34 are subsequently opened, while further knitting normal rows. 30

For switching from the knitting of two rib fabrics to the knitting of a single rib fabric, it is sufficient to realign (according to the arrows *a* and *b*) the stops 13, 13' and 13'' at the ends of the driving field. 35

It should be pointed out that, in very numerous cases, the device according to the invention may be anchored possibly by means of slight modifications to provide the space required for the thread cutter. 40

It is apparent that various modifications may be brought to the above described example. Thus, there are preferably provided double controls for the valves 24-26, thereby allowing also the manual control of the device according to this invention. 45

What I claim is:

1. A device for simultaneously producing two rib fabrics on the same head of a flat knitting machine with two V-shaped needle beds for knitting rib fabrics, characterized by the combination of: 50

1. four thread-guides two of which are provided for the gripping thread and two for the edge thread;
 2. a system of adjustable stops allowing to limit the travel of each of said thread-guides only to a portion of the length of the needle beds;
 3. a thread catcher situated in the middle of the needle beds and movable therebetween from a low position to a high position for catching an edge thread and a gripping thread, said thread catcher being movable from said high to said low position to draw the caught edge and gripping threads downwardly between the needle beds;
 4. thread cutter associated with the said catcher for cutting the edge and gripping threads drawn downwardly by the thread catcher; and
 5. control means programmed by the said catcher and the said associated thread cutter for moving said thread catcher between said low and said high positions and for actuating said thread cutter.
2. A device according to claim 1, characterized in that the said adjustable stop system allows simultaneously knitting two rib fabrics having different widths on the same head.
3. A device according to claim 1, characterized in that the said catcher is under the form of a hook secured at the end of a rod integral with the piston of an air cylinder.
4. A device according to claim 1, characterized in that the said thread cutter and the said catcher are mutually disposed so that the catcher passes between the opened blades of the said thread cutter at the end of the upward travel or the beginning of the downward travel thereof.
5. A device according to claim 1, characterized in that the said thread cutter is actuated by means of an air cylinder.
6. A device according to claim 1, characterized in that the said catcher is under the form of a hook secured at the end of a rod integral with the piston of an air cylinder, the said thread cutter is actuated by means of an air cylinder and the catcher, the thread cutter and the control cylinders thereof are carried by a structure comprising a securing angle-iron being bolted on a stationary part of the machine.
7. A device according to claim 1, characterized in that a removable guide is provided in the central area of the head between both needle beds, said guide providing the correct positioning of the threads being caught by the said catcher.

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