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[54] **CONSTRUCTION OF JACK SELECTORS IN CIRCULAR KNITTING MACHINES**

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[52] **U.S. Cl.** ..... **66/50 B**

[51] **Int. Cl.** **D04b 15/74**

[58] **Field of Search** ..... 66/50 R, 50 A, 50 B, 66/25, 156; 267/179; 74/568; 139/330, 333

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[57] **ABSTRACT**

A jack selector device in a circular knitting machine in which a pair of elongated elements define an elongated slit rotatable in a cylinder. A key for making the jack selections is inserted into the slit and has opposite edges extending outwardly of the opposite sides of the slit. The opposite edges of the key have irregularities or teeth that correspond to two patterns of jack selection. The key is rotated so that the edges alternatively engage surfaces on jack selectors to actuate them from a rest position to an operative position in which they are actuated to execute the jack selection. The jack selectors are biased to their rest position by respective biasing springs.

11 Claims, 6 Drawing Figures

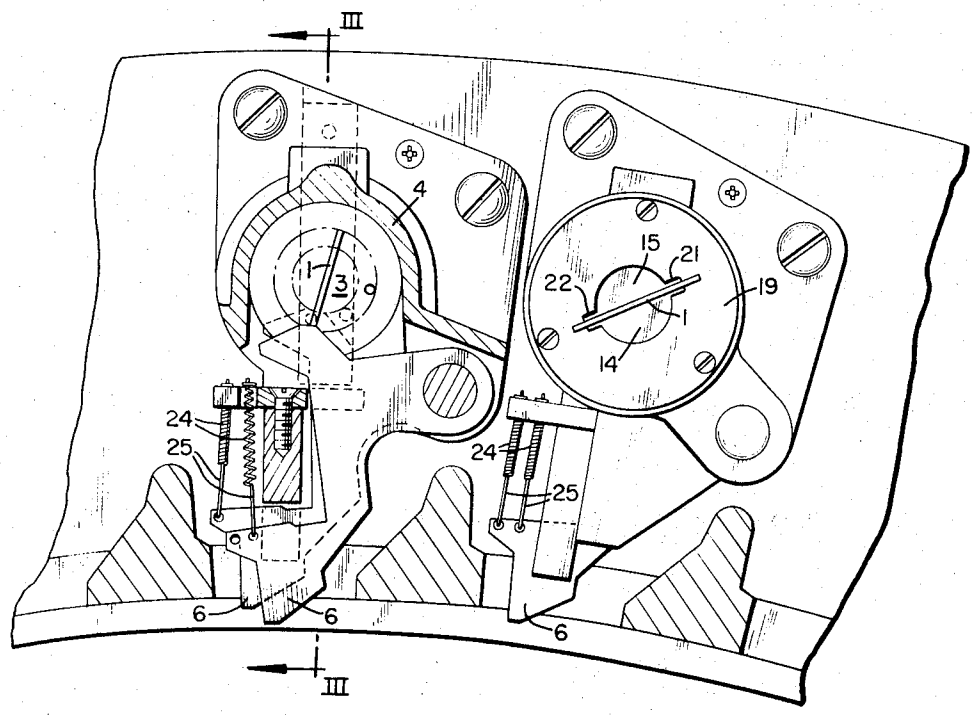


FIG.1

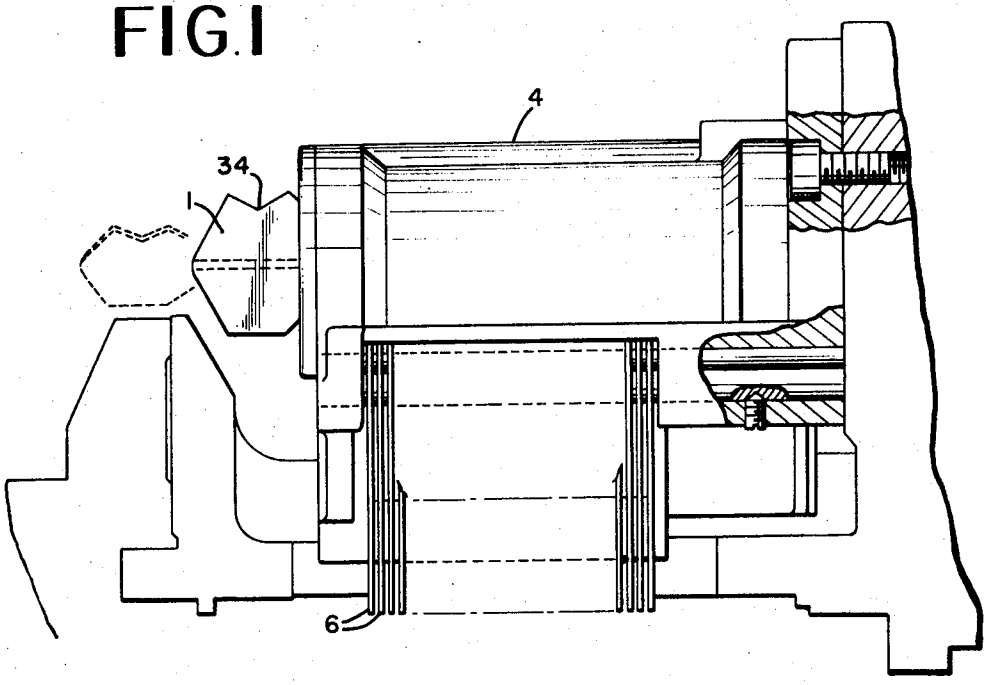


FIG.3

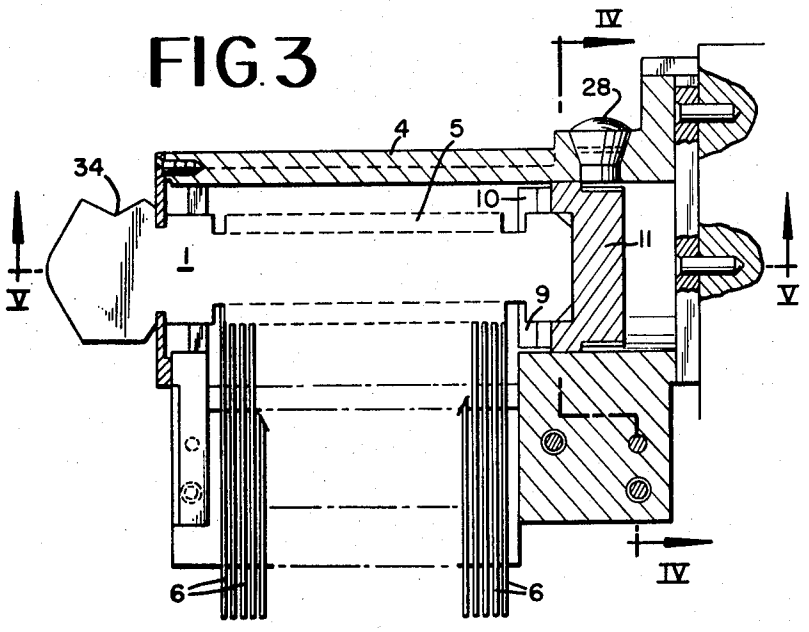


FIG.5

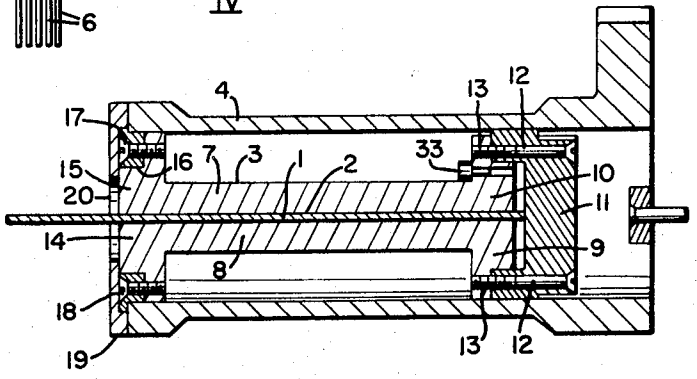


FIG.2

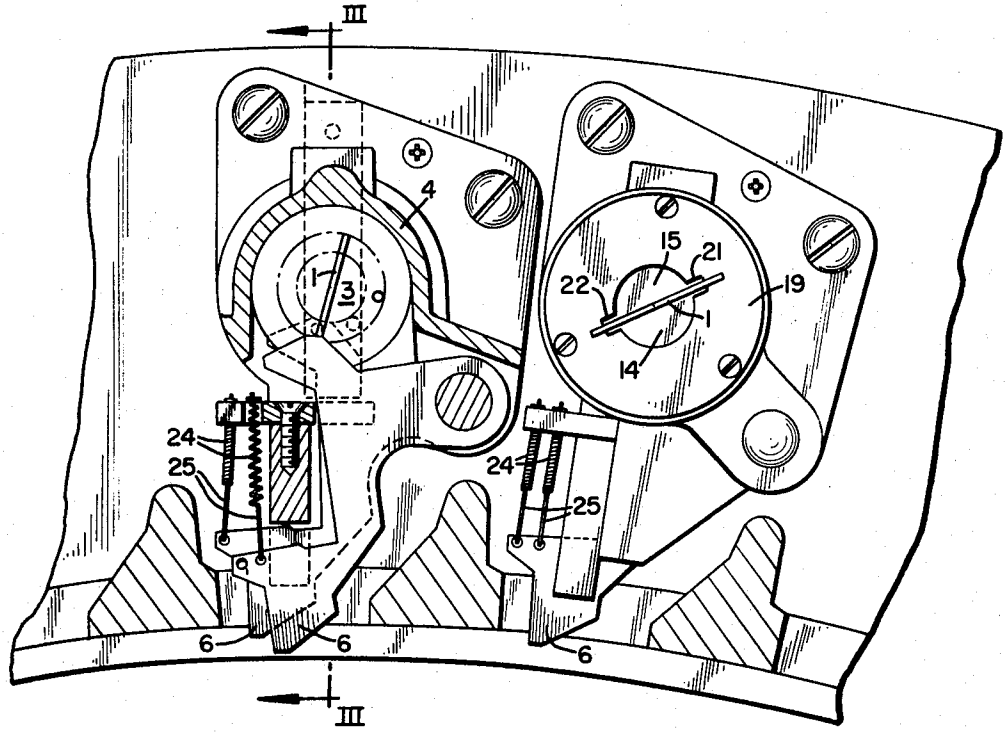


FIG.4

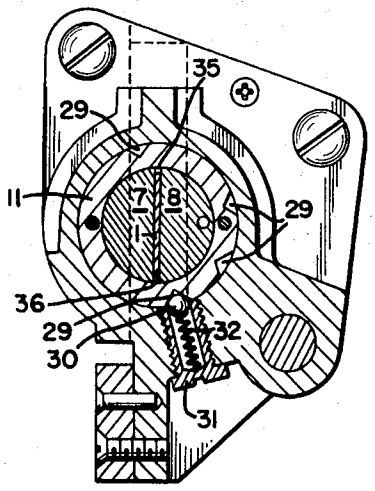
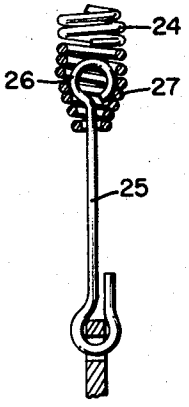


FIG.6



CONSTRUCTION OF JACK SELECTORS IN CIRCULAR KNITTING MACHINES

The subject of the present patent refers to improvements in the construction of jack selectors in circular knitting machines, which present the novelty that the selection of the jack selectors is effected rapidly by means of the introduction into the selector of a toothed key which with its crests and valleys, previously determined according as to whether the jacks emerge or not, and in accordance with the design of the knitted fabric to be obtained, automatically selects the jacks, producing an immediate adjustment of the appropriate jacks and varying this adjustment in accordance with a new design of knitted fabric to be produced only by extracting the key from the interior of the selector and replacing it by another with different valleys and crests in accordance with the design of the new job and the position of the jacks.

At the present time this adjustment is complicated and is, moreover, very laborious, it is necessary to devote a great deal of time to it, and this preparatory work delays the production of the fabric to be obtained, because while the adjustment is being carried out the machine is stopped.

It should be borne in mind that a circular knitting machine has a large number of selectors.

Consequently, in accordance with the present improvements, according to the invention the machine is operating there is already being prepared in the workshop the key with the new arrangement of teeth in accordance with the design of the new fabric that is to be produced in a new phase of work, so that, without loss of time, at the very moment when the last yard of the fabric that was being woven is finished, the key that governed the selector during the job in question is withdrawn and is replaced by the new key with the new arrangement of teeth corresponding to the new design to be produced, and thus the new job is begun immediately, without any loss of time.

In order to enable the invention to be correctly understood, a description is given below of a case of practical implementation, by way of a non-limitative example of the improvements constituting the subject of the present invention, this description is acompanied by a sheet of drawings which represent the following:

FIG. 1 is a partial section view of a jack selector constructed in accordane with the present invention.

FIG. 2 is a plan view of selectors, one of them partially in section.

FIG. 3 is a section view through the line III — III of FIG. 2 of the same selector.

FIG. 4, is a section view through the line IV — IV of FIG. 3.

FIG. 5, is a section view through the line V — V of FIG. 3.

FIG. 6 is an elevation view of a detail, on a larger scale, of the end of a spring and its hook joined to the jack selectors.

The invention consists in the fact that a jack selector is controlled by a key (1) which is introduced into an axial opening (2) which for this purpose has been made in internal element (3) of a cylinder (4), and the teeth (5) of the key on emerging through the longitudinal groove (2) are brought face to face with the rear part of the jacks (6) of the selector, causing them to emerge from their position of rest.

The internal element (3) of the jack selector (4) is constituted by two half rods (7 and 8) with their hal head and foot, which face one another and are joined to one another leaving between both of them a double longitudinal opening (2), so that through one of them there emerges the edge of the key with the teeth (5) corresponding to the job to be done which select the selector jacks (6) pushing them outwards from their rest position.

The pedestal units (9 and 10) of the internal element (3) are joined to a cylindrical base (11) which has on its upper edge the lugs (35 and 36) situated diametrically disposed which are the check-piece separators of the longitudinal edges of the two parts brought face to face (7 and 8) which determine the longitudinal openings (2) of the internal element (3).

The cylindrical base (11) which completely unites the two parts (7 and 8) of the selector is joined to the pedestal units (9 and 10) by appropriate means such as screws (12) threaded into the corresponding holes with an internal helicoidal threading of the base (11) and whose prolongations are introduced into the threaded orifices (13) of each pedestal unit (9 and 10) of the internal element (3).

The head units (14 and 15) of the element (3) are joined and secured by a ring or hoop (16) just as in the pedestals (9 and 10).

In the hoop (16) of union of the head units (14 and 15) of the internal element (3) there is a flange (17 which has an edge bearing on a face or surface (18) of the base of the cylinder (4) of the selector, and this permits the pedestal (11) of the element (3) not to touch the bottom of the cylinder (4).

In the mouth or end opening of the cylinder (4) into which the internal element (3) is introduced, a cover (19) is screwed which prevents the accidental emergence of the internal element (3) when the key (1) is withdrawn from its interior and in addition its central opening (20), of smaller diameter than the head (14 an 15) of the internal element (3) has two radial notches (21 and 22) in two opposite points and these have the purpose of determining the position of release of the key (1) introduced into the internal element (3) in order to permit its withdrawal.

The tension springs (24) of the selector jacks (6) are joined to the jacks not directly by one of their ends, but by means of a small hook (25) with a head (26) which can rotate within the narrowed axial cavity (27) of the end of the said spring (24), so that this head (26) can rotate and consequently does not produce breaking tensions of the end of the spring.

The internal element (3) will have on its internal pedestal signs indicating its position which can be seen from the outside through the appropriate aperture, for which purpose a sighting lens (28) may be employed.

When considered desirable, on the two opposite edges of the laminated key there will be two sets of different teeth (5) for two selections of different jobs, so that by withdrawing the key and rotating it through 180° and again introducing it the selection will be changed using the same key although it will then operate with its teeth of the opposite edge.

The cylindrical base (11) of the element (3) has some angularly spaced notches (29) in which there is partially introduced a ball (30) housed in a radial adjusting screw (31) of the cylinder (4) and biased by an appropriate spring (32) and which serves to maintain

temporarily the angular position of the internal element (3) in the interior of the cylinder (4).

On the same base (9 and 10) of the internal element (3) there is a stop or lug (33) mounted on the surface housed in the cylinder (4), which in a position of the internal element (3) in relation to the cylinder (4) operates as a device for annulling the jacks selected from the drum of the machine in a prior operation, thus permitting that one of the longitudinal edges of the key (1) introduced into the internal element (3) and emerging through its grooves will not have to be utilised as annulled and consequently both edges of the key are usable for two different patterns of selection.

The head of the key (1) has appropriate signalling marks, such as a notch (34) which indicates one of the positions of the element (3) in relation to the cylinder (4).

The nature of the invention having been sufficiently described, together with its practical implementation, it is put on record that the said invention is susceptible to variations of detail, without these altering the fundamental principle which constitutes the essence of the invention.

I claim:

1. In a circular knitting machine having a plurality of jack selectors, a jack selector device comprising, means defining a cylinder, two elongated elements mounted for rotation in said cylinder defining an axial slit therebetween open axially on opposite sides and at opposite ends for removably and interchangeably receiving different keys insertable individually, axially therein, a key insertable axially in said slit and having projections on opposite edges thereof for selection of said jack selectors when in use in said slit, said slit extending axially of said cylinder and dimensioned to allow said teeth of the individual keys inserted therein to project outwardly on opposite sides of said slit for engagement with selected ones of said jack selectors, said selector device being disposed relative to said jack selectors close adjacent thereto to insure that when an individual key is inserted into said slit and rotated the teeth of one edge bear on respective surfaces of said jack selectors and actuate them axially for developing a selected pattern corresponding to jacks selected by said jack selectors.

2. In a circular knitting machine according to claim 1, including means holding said two elongated elements spaced from each other defining said slit and rotationally within said cylinder.

3. In a circular knitting machine according to claim 2, including means maintaining the two elements positioned axially within the cylinder.

4. In circular knitting machine according to claim 2, including lock means on said two elements for rotation therewith, and other lock means on said selector cooperative with said lock means for releasably retaining the two elements in different positions angularly spaced about the longitudinal axis of said cylinder.

5. In a circular knitting machine according to claim 2, including means closing partially an end of said cylinder through which an individual key is inserted into said slit, the last-mentioned means having means retaining the key inserted in said slit and having notches to allow retraction of said key when disengaged from said surfaces of said jack selectors and for insertion into said slit, said notches being disposed angularly spaced from positions in which said key engages said surfaces of said jack selectors.

6. In a circular knitting machine according to claim 2, including means biasing the jack selectors to a retracted inactive position when disengaged from said key.

7. In a circular knitting machine according to claim 2, including means for viewing the angular position of said two elements in said cylinder.

8. In a circular knitting machine according to claim 7, in which the last-mentioned means including a viewing lens.

9. In a circular knitting machine according to claim 2, in which said key insertable into said slit and having different sets of teeth on opposite edges thereof corresponding to two different patterns of actuation of said jack selectors.

10. In a circular knitting machine according to claim 2, including a stop in said cylinder for locating said slit in a position in which the edges of said key are ineffective and said jack selectors are restored to an inactive position, and means on said jack selectors biasing them to an inactive position when disengaged from said key.

11. In a circular knitting machine having a plurality of jack selectors biased to a rest position and movable individually to an operative position for selecting a corresponding jack, a jack selector device comprising, means defining a cylinder, means rotational in said cylinder defining an elongated slit open longitudinally on opposite sides and on opposite ends, a pattern-selector key insertable axially into said slit and having two edges with irregularities thereon corresponding to two different selection patterns for selection of jacks when inserted into said slit for rotation thereof into two angularly spaced positions in which said edges thereon alternatively engage surfaces on said jack selectors for selecting a pattern of jacks corresponding to the irregularities on a corresponding edge, and said edges of said key extending outwardly from the open opposite sides of said slit.

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