

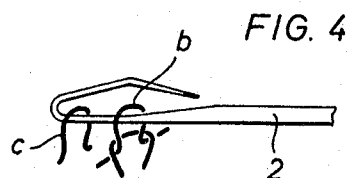
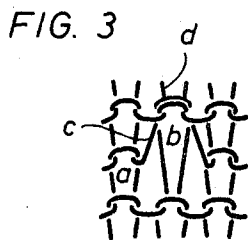
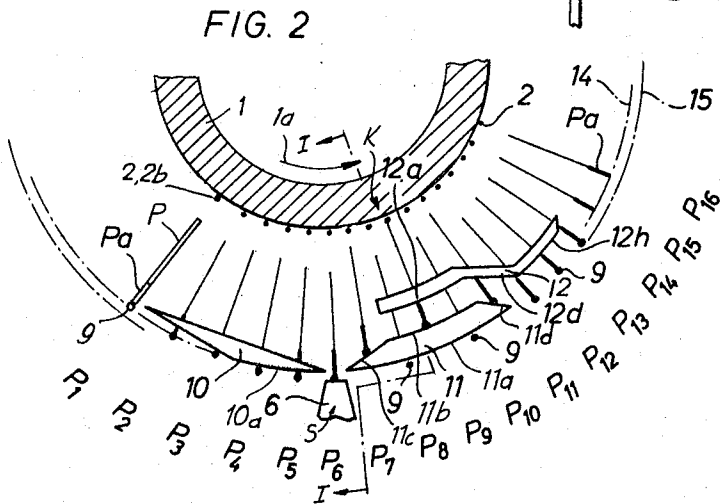
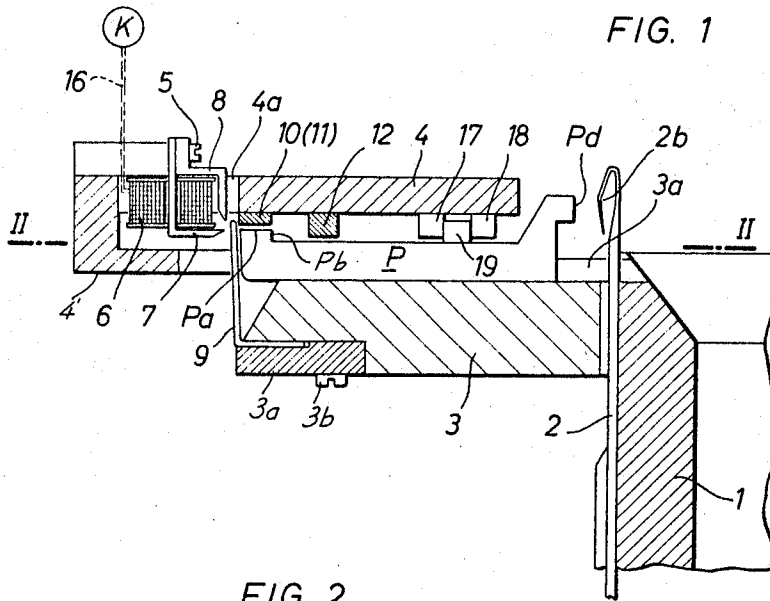
June 6, 1967

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3,323,331

ELECTROMAGNETIC SELECTION OF BEARD PRESSERS

Filed March 1, 1965



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3,323,331

ELECTROMAGNETIC SELECTION OF BEARD PRESSERS

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Filed Mar. 1, 1965, Ser. No. 435,961

Claims priority, application Germany, Mar. 2, 1964, M 60,127

20 Claims. (Cl. 66—102)

The present invention relates to a knitting pattern selecting presser arrangement for knitting machines, and more particularly to apparatus for selecting the pattern to be knitted on a circular knitting machine by pressing the beards of bearded needles.

Circular knitting machines are known in which presser members in the form of thin plates are mounted in a carrier ring surrounding the needle cylinder of the machine for radial movement toward and away from the bearded needles. Due to this movement of the presser members, the free inner ends of selected presser members are positioned to be engaged during the knitting operation by the beards of the cylinder needles so that the respective beards are closed over a new loop and the old loop can be knocked over. The presser members associated with needles whose beards are not to be pressed, remain in the inoperative outwardly retracted position.

In accordance with the prior art constructions, the presser members have butts controlled by stationary cams which cause the movement of the presser members between inoperative and pressing positions.

Known presser arrangements require very complicated mechanical constructions, require a great deal of space, and are unsuitable for producing patterned fabrics.

It is one object of the present invention to provide a knitting pattern selecting presser arrangement which is capable of producing any desired pattern of the knitted fabric.

Another object of the invention is to provide a knitting pattern selecting presser arrangement which requires little space and operates reliably.

Another object of the invention is to carry out the selection of presser members controlling bearded needles by electric selector apparatus which can be controlled by a program tape, or corresponding pattern control apparatus producing electric impulses in accordance with the desired pattern.

With these objects in view, the present invention relates to a presser arrangement for a knitting machine with bearded needles in which the pattern is selected by operation of individual presser members by program controlled selector means.

One embodiment of the invention comprises first carrier means and second carrier means which are movable relative to each other; a set of needles having beards mounted on the first carrier means; a set of presser members mounted on the first carrier means for movement between an inoperative position and a pressing position for closing the beard of a correlated needle; and selector means including electromagnetic means mounted on the second carrier means and being energizable and de-energizable in accordance with a selected knitting pattern.

The first carrier means may be secured to the needle cylinder of a circular knitting machine and rotate with the same in which event the second carrier means and the selector means are stationary. However, the arrangement may be reversed and the needle cylinder with the first carrier means, the needles, and the presser members may be stationary, in which event the second carrier means will rotate.

During relative rotation between the carrier means, the

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presser members successively register with the electromagnetic means. Energization or de-energization of the electromagnetic means determines whether the respective presser member which is at the selecting station, is caused to move to the pressing position, or is maintained in the inoperative position.

The selector magnet is provided at a selector station, and is followed in the direction of rotation by actuating cams which urge the selected presser members gradually to the pressing position which they assume at a knitting station. During continued rotation, return cam means returns the selected presser members from the pressing position to the inoperative position.

Due to the provision of actuating cam means, it is not necessary for the selector magnet means to cause movement of the selected presser members all the way to the pressing position, but the movement is only initiated by the selector magnet means and completed under the control of the actuating cam means.

In the preferred embodiment of the invention, the selecting impulse is not directly applied by the selector magnet means to the presser members, but resilient control members are associated with each presser member, and are moved and selected by the selector magnet means, whereupon they influence the presser members in a corresponding manner to carry out the selection.

In the preferred embodiment of the invention, the control members are resilient rods cooperating with the end of the presser members, respectively. The control members have a normal untensioned position which is intermediate an inoperative tensioned position resiliently retracted from the associated presser member, and another tensioned end position engaging the corresponding presser member and urging the same a short distance toward the pressing position. A guide cam means leading the selector magnet in the direction of rotation urges the control members to the tensioned inoperative position in which they are closely spaced from the selector magnet, and are consequently attracted when the same is energized. A cam trailing the selector magnet, and forming a gap with the guide cam, has a cam track on which attracted control members slide further in the inoperative position past the knitting station so that the corresponding presser members are not moved to the pressing position. Those control members which were not attracted by the selector magnet, move resiliently to the intermediate position, and are engaged by an actuating cam track which urges the same to the other end position engaging the correlated presser member. The actuating cam track has such a shape that the thus selected control members and the presser members engaged by the same are moved toward the needles to the pressing position in which they are held by a cam track portion while passing the knitting station. Return cam means finally engage the presser members for returning the same to the inoperative position, while the resilient control members are released by the actuating cam track and resiliently return to the intermediate untensioned position in which they remain until near the end of a revolution, the guide cam engages all control members and urges the same to the tensioned inoperative end position.

The mechanism operates in a manner similar to the selector arrangement for selecting the jacks which control the pattern selection of latch needles disclosed in the U.S. Patent 3,079,775, issued Mar. 5, 1963, to J. A. Schaefer and applicant. The present invention, however, is not concerned with the selection of jacks in a pattern wheel which raises selected needles to a knitting position due to the fact that the axis of the pattern wheel is inclined to the main axis of the machine, but is concerned with the pressing of bearded needles. The raising and

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lowering of the cylinder needles has to be carried out in knitting machines to which the present invention is applied by means entirely independent of the presser arrangement, and the latch needle machine disclosed in the U.S. Patent 3,079,775 does not require pressing of the needles, or the actuation of selected presser members, since the latches are not closed by presser members, but by the action of the thread engaging the latches of the needles during needle movement.

The knitting machine using bearded needles which are pressed by individual presser members is disclosed in the German Auslegeschrift 1,158,201 which discloses a presser arrangement in which the presser members have a plurality of butts which are engaged by different cam tracks for causing selected operations in accordance with the pattern.

Such an arrangement permits the selection of only a limited number of patterns, and cannot be operated at high speed.

Circular knitting machines of the type to which the present invention is advantageously applied, may have small or large diameters, and may have one or several knitting stations each of which must be preceded by a selector station with a selector magnet according to the present invention. Consequently, a new selection can be carried out for each knitting station permitting a great variety of knitting patterns.

The selection depends on energization or de-energization of the selector magnet, so that all selector stations, and thereby the knitting station, can be controlled from a single command station producing control impulses.

The program is advantageously controlled by a program tape having a number of tracks corresponding to the number of knitting stations, transparent and non-transparent dots alternating in accordance with the pattern on each track. The tracks are electronically sensed, in a known manner by a beam of light, so that impulses are produced in photocells associated with the several tracks for controlling the selector magnet means of the several selector stations. Of course, it is also possible to have mechanical pattern control means which close switches for energizing the electromagnet means. Pattern control arrangements of this type are well known, and not an object of the present invention.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a fragmentary axial sectional view illustrating the pattern selecting presser arrangement in accordance with the invention;

FIG. 2 is a fragmentary schematic cross-sectional view taken on line II—II in FIG. 1, but being shown on a reduced scale;

FIG. 3 is a diagrammatic view illustrating a knitted fabric patterned in accordance with the present invention; and

FIG. 4 illustrates a bearded needle holding two loops during knitting of a pattern fabric.

Referring now to the drawings, a needle cylinder 1 has about its cylindrical periphery axially extending uniformly spaced slots in which needles 2 are mounted for axial movement between higher knit and tuck positions, and the lower pressing position shown in FIG. 1. The lower portion of the knitting cylinder 1 is surrounded by a stationary cam box, not shown, provided with inner circumferentially extending cam tracks engaging butts, not shown, on needles 2 for raising and lowering the same during rotation of the knitting cylinder. A carrier ring 3 surrounds the upper portion of needle cylinder 1 and is secured to the same for rotation therewith. Carrier ring 3 has radially extending slots or grooves 3a respec-

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tively aligned with the needles 2, and a presser member P is mounted in each groove 3a for radial movement towards and away from the associated needle 2. When a needle 2 is in the position shown in FIG. 1, presser member P will engage the beard 2b of the respective needle with the pressing portion Pd, and close the beard so that the point of the beard is located in corresponding groove in the stem of the needle, and a portion of the loop is enclosed in the beard.

The cam of the cam box moves the bearded needles upward before the same arrives at a knitting station where thread is supplied to the needles. The loop formed at the preceding knitting station slides on the needle 10 during the rising of the respective needle. When the needle is in the knit position, the thread is supplied and caught by the beard in the following downward motion of the needle. When the needle arrives with the thread in the beard in the pressing position shown in FIG. 1, the presser member P is moved toward the needle, and presses the beard 2b long enough so that the old loop can slide onto the closed beard during the further downward movement of the needle, and is knocked over.

The operation corresponds substantially to the pressing operation applied by the flat bed Coulier machine of the Cotton type where, however, a presser bar is common to all needles. The pressing of the needle beard by individual presser members is described in the German Auslegeschrift 1,158,201, and not an object of the invention. The present invention is concerned with an improvement of the selector arrangement of knitting machines of this type.

When in accordance with the present invention, the beard of selected needles are pressed, and of other needles are not pressed, the old loops of a selected pressed needle will be knocked over so that a new loop is formed, whereas the beards of non-selected needles will remain open so that the old loop is again caught by the open beard, and the old loop b is located in the beard together with the new loop c, as shown in FIG. 4. Since the old loop is caught by the beard, no loop is formed, and a tuck stitch pattern is formed as shown in FIG. 3. At the next following knitting station, both loops b and c are knocked over the new loop d.

The formation of a tuck stitch pattern is, of course, not an object of the invention, but the operation has been described in order to indicate the result obtained by the selection of presser members in accordance with the invention.

A clamping means 3a is secured by screws 3b to the bottom of carrier ring 3, and clamps resilient control members 9, each of which has a rod portion located at the outer end of a correlated presser member and projecting a short distance above the top face of a projection Pa which forms a shoulder Pb. Control members 9 are resilient, and can be bent away from the respective presser member, or toward the same, the position illustrated in FIG. 1 being the normal intermediate untensioned position of control member 9.

A stationary carrier ring 4 is disposed on top of carrier ring 3, and covers part of grooves 3a and presser members P, as well as most of the control members 9. Carrier ring 4 has a cutout 4a in the region of a selector station where a selector magnet 6 including two pole shoes 7 and 8 is located. A screw 5 secures selector magnet 6 to a bracket 4' on stationary carrier ring 4. The selector station S leads the knitting station K in the direction of rotation of needle chamber 1 with carrier ring 3, presser member P, and control members 9. Only one knitting station K with a selector station F is shown in FIG. 2, but it will be understood that a plurality of knitting stations and selector stations are provided about the periphery of the machine. The actual pressing of the beard of the needles takes place at the knitting station K.

In the region of each selector station and knitting station, a guide cam 10, an actuating cam 11, and a return

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cam 12 are secured to the bottom face of carrier ring 4. Since the cams are stationary, the needles, presser members, and control members move relative to the cam.

Guide cam 10 and actuating cam 11 are flat and have circumferentially extending cam tracks 10a, 11a, and 11b. Since the bottom faces of guide cam 10 and actuating cam 11 are spaced from the top of projections Pa of presser members 2, the presser members can move in radial direction toward and away from needles 2 without interfering with cams 10 and 11. However, the upper end of control members 9 are located at the height of cams 10 and 11, and consequently can be controlled by cam tracks 10a, 11a, and 11b, as will be described hereinafter in greater detail. Return cam 12 projects to the level of shoulder Pb, so that cam tracks 12a, 12b and 12c engage the shoulders of selected presser members, as will be explained hereinafter. Actuating cam has an outer substantially circular cam track 11a, an inner part-circular cam track 11b, and leading and trailing cam track portions 11c and 11d. Cam track portion 12a of return cam 12 is also circular, and is spaced from cam track portion 11b a distance corresponding to the radial extension of projection Pa and the thickness of control member 9. Cam track portion 12a of return cam 12 is positioned to place projection Pa, and thereby the presser members P in the position shown in FIG. 1. The cross section of cam 12 in FIG. 1 shows cam 12 in the region of cam track 12a.

A gap is formed between guide cam 10 and actuating cam 11 in the region of pole shoes 7 and 8 of selector magnet 6 and permits movement of control members 9 in radial direction between a position located inwardly of the pointed end of cam 11, and a position outwardly of the same and in the region of cam track 11a. Control members 9 in the normal intermediate untensioned position shown in FIG. 1, move along the circle 14 shown in FIG. 2. The outer cam tracks 10a and 11a have adjacent the gap circular cam track portions located along a circle 15.

The selector apparatus operates as follows: It is assumed that needle cylinder 1 rotates with carrier rings 3, presser members 2 and control members 9 in the direction of the arrow 1a in FIG. 2, while carrier ring 4, cams 10, 11 and 12, and selector magnet 6 are stationary. Of course, the arrangement may be reversed and the needle cylinder made stationary while the cams and the selector magnet rotate.

During rotation in the direction of the arrow 1a, the presser member in the region P1 of FIG. 2 is in the position shown in FIG. 1 and the corresponding control member 9 is untensioned. The circle 14 is slightly outward of the outer cam track of guide cam 10 so that control members 9 are gradually tensioned and urged to an inoperative position riding on cam track portion 10a which has the same radius as circle 15. Since projections Pa are lower than the bottom face of guide cam 10, presser members P remain in the same position in the region P1 to P6 while control members 9 resiliently move away from the same.

Control members 9 successively arriving in the gap at the selector station are attracted by the energized selector magnet 6, as shown in the region P6, and travel along the pole shoe of the selector magnet until reaching the outer cam track 11a of cam 11 where they continue to travel in the inoperative position.

When selector magnet 6 is not energized when a control member passes over the point of cam 10, the respective control member 9 resiliently returns to its normal intermediate position moving through the gap between the points of cams 10 and 11. During further rotation, the rising cam track portion 11c engages a control member 9 in the normal position, and bends the same resiliently whereby the respective control member presses against the outer end of the correlated presser member P, as shown in the region P7. During further rotation, the

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selected control member rides along the circular cam track 11b of actuating cam 11, and holds the respective presser member in the pressing position required at the knitting station K, as shown in the region P9. The pressing position of the presser member at the knitting station is exactly determined by a circular cam track 12a which engages the shoulder Pb.

During further rotation, the control member 9 of the selected presser member arrives in the region of the descending cam track portion 11d, and gradually resiliently returns to its normal position as shown in the regions P11 and P12.

At the same time, the shoulder Pb of the projections Pa of the corresponding presser members are engaged by the slanted cam track portion 12d so that the presser members are returned to the outer inoperative position as shown in the regions P11 and P12, and then firmly set in the outer inoperative position by the part-circular cam track 12a, as shown in the region P12 and P14. From there on, presser member P remains in the outer inoperative position until the next selection is made at the selector station S.

The control members 9 of non-selected presser members are shown in the regions P8, P10 to ride in the outer inoperative position along cam track 11a. The corresponding presser members remain in the outer inoperative position, with projections Pa traveling below the bottom face of actuating cam 11. When passing beyond the trailing end of cam track 11a, the non-elected control members 9 return resiliently to the normal untensioned position and are located on circle 14. Projections Pa of non-elected presser members also engage cam track portion 12a, so that in regions P13 to P15, it can no longer be determined which presser members and control members were selected at the preceding selecting station S to press the gears of correlated needles in the region of the knitting station K.

The energization and de-energization of electromagnetic selector means 6 is effected through cables 16 from a program control station K, schematically indicated in FIG. 1. At this control station, a program on a program carrier is changed to synchronism with the rotation of the knitting machine to produce impulses which are supplied to an amplifier to the selector magnet at each knitting station.

FIG. 1 also shows knock over members respectively located in the same slot 3a as presser members P, and having butts 19 located between circumferential cams 17 and 18 secured to the bottom face of carrier ring 4. The operation of the knock over members is not an object of the invention, and described, for example, in the German Auslegeschrift 1,158,201.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of knitting machines using bearded needles differing from the types described above.

While the invention has been illustrated and described as embodied in pattern controlling apparatus including a selector magnet controlling presser members for pressing bearded needles, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means;

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second carrier means, one of said carrier means being movable relative to the other carrier means; a set of needles having beards and mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; and selector means including electromagnetic means mounted on said second carrier means and positioned so that during movement of said one carrier means, said presser members successively register with said electromagnetic means, said electromagnetic means being energizable and de-energizable in accordance with a selected knitting pattern for causing movement of selected presser members from said inoperative position to said pressing position; and return means for returning said selected presser members from said pressing position to said inoperative position after pressing of the needle beards.

2. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being movable relative to the other carrier means; a set of needles having beards and mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means in the region of said presser members, respectively, for movement between an inoperative position and an actuating position for moving the correlated presser member to said pressing position; and selector means including electromagnetic means mounted on said second carrier means and positioned so that during movement of said one carrier means, said control members successively register with said electromagnetic means, said electromagnetic means being energizable and de-energizable in accordance with a selected knitting pattern for causing movement of selected control members from said inoperative position to said actuating position for moving correlated presser members to said pressing position; and return means for returning said selected presser members from said pressing position to said inoperative position after pressing of the needle beards.

3. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being movable relative to the other carrier means; a set of needles having beards and mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; and selector means including electromagnetic means mounted on said second carrier means and positioned so that during movement of said one carrier means, said presser members successively register with said electromagnetic means, said electromagnetic means being energizable and de-energizable in accordance with a selected knitting pattern for causing movement of selected presser members from said inoperative position to said pressing position; and return cam means secured to said second carrier means for returning said selector presser members from said pressing position to said inoperative position after pressing of the needle beards.

4. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective

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correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means and located in the region of said first carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof; and selector magnet means secured to said second carrier means and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means.

5. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means and located in the region of said first carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof; and selector magnet means secured to said second carrier means and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means by effecting movement of the same from an initial position to an intermediate position in which selected control members are engaged by said cam means, said cam means moving said selected control members farther to an end position for moving said presser members to said pressing position.

6. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means and located in the region of said first carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof, said cam means having a rising track portion and a circular track portion trailing said rising track portion in the direction of relative movement between said first and second carrier means; and selector magnet means secured to said second carrier means leading said rising track portion and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means by effecting movement of the same from an initial position to an intermediate position in which selected control members are first engaged by said rising track portion and moved to an end position for moving said presser members to said pressing position and are then engaged by said circular track portion for holding said presser members rigidly in said pressing position.

7. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means and located in the region of said first carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof; selector magnet means secured to said second carrier means and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means; and return cam means secured to said second carrier means for returning said presser members from said pressing position to said inoperative position.

8. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means and located in the region of said first carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof; selector magnet means secured to said second carrier means and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means by effecting movement of the same from an initial position to an intermediate position in which selected control members are engaged by said cam means, said cam means moving said selected control members farther to an end position for moving said presser members to said pressing position; and return cam means secured to said second carrier means for returning said presser members from said pressing position to said inoperative position.

9. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means and located in the region of said first carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof, said cam means having a rising

track portion and a circular track portion trailing said rising track portion in the direction of relative movement between said first and second carrier means; and selector magnet means secured to said second carrier means leading said rising track portion and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means by effecting movement of the same from an initial position to an intermediate position in which selected control members are first engaged by said rising track portion and moved to an end position for moving said presser members to said pressing position and are then engaged by said circular track portion for holding said presser members rigidly in said pressing position; and return cam means secured to said second carrier means and having a return track portion trailing said circular track portion and engaging said presser members for moving the same from said pressing position to said inoperative position.

10. In a knitting machine, in combination, a pattern selecting presser arrangement comprising, first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof, said cam means having a first cam track including a rising track portion and a circular track portion trailing said rising track portion in the direction of relative movement between said first and second carrier means, and a second cam track coextensive with said first cam track for engaging and holding non-selected control members in an initial position during relative turning movement of said carrier means; and selector magnet means secured to said second carrier means leading said rising track portion and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means by effecting movement of the same from an initial position to an intermediate position in which selected control members are first engaged by said rising track portion and moved to an end position for moving said presser members to said pressing position and are then engaged by said circular track portion for holding said presser members rigidly in said pressing position.

11. In a knitting machine, in combination, a pattern selecting presser arrangement comprising, first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof, said cam means having a first cam track including a rising track portion and a circular

track portion trailing said rising track portion in the direction of relative movement between said first and second carrier means, and a second cam track coextensive with said first cam track for engaging and holding non-selected control members in said initial position during relative turning movement of said carrier means; selector magnet means secured to said second carrier means leading said rising track portion and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means by effecting movement of the same from an initial position to an intermediate position in which selected control members are first engaged by said rising track portion and moved to an end position for moving said presser members to said pressing position and are then engaged by said circular track portion for holding said presser members rigidly in said pressing position; and return cam means secured to said second carrier means and having a return track portion trailing said circular portion and engaging said presser members for moving the same from said pressing position to said inoperative position.

12. In a knitting machine, in combination, a pattern selecting presser arrangement comprising, first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means for moving said control members during turning movement of said one carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof, said cam means having a first cam track including a rising track portion and a circular track portion trailing said rising track portion in the direction of relative movement between said first and second carrier means, and a second cam track coextensive with said first cam track for engaging and holding non-selected control members in an initial position during relative turning movement of said carrier means, said cam means having a third cam track leading said selector magnet means in the direction of relative movement of said carrier means for guiding said control members, said second and third cam tracks forming a gap for movement of said control members between said first and second cam tracks after leaving said third cam track; selector magnet means secured to said second carrier means in the region of said gap leading said rising track portion and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means by effecting movement of the same from an initial position to an intermediate position in which selected control members are first engaged by said rising track portion and moved to an end position for moving said presser members to said pressing position and are then engaged by said circular track portion for holding said presser members rigidly in said pressing position; and return cam means secured to said second carrier means and having a return track portion trailing said circular portion and engaging said presser members for moving the same from said pressing position to said inoperative position.

13. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first rotary carrier means; second stationary carrier means at least partly surrounding said first carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for move-

ment between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means for movement thereon and respectively connected with said presser members for moving the same to said pressing position; cam means secured to said second carrier means and located in the region of said first carrier means for moving said control members during turning movement of said first carrier means successively relative to said first carrier means so as to move correlated presser members to said pressing position thereof, said cam means having a first cam track including a rising track portion and a circular track portion trailing said rising track portion in the direction of rotary movement of said first carrier means, and a second cam track coextensive with said first cam track for engaging said holding non-selected control members in an initial position during rotary movement of said first carrier means, said cam means having a third cam track leading said selector magnet means in the direction of rotary movement of said first carrier means for guiding said control members, said second and third cam tracks forming a gap for movement of said control members between said first and second cam tracks after leaving said third cam track; selector magnet means secured to said second carrier means in the region of said gap leading said rising track portion and being energizable and de-energizable in accordance with a knitting pattern for selecting control members which are to be moved by said cam means by effecting movement of the same from an initial position to an intermediate position in which selected control members are first engaged by said rising track portion and moved to an end position for moving said presser members to said pressing position and are then engaged by said circular track portion for holding said presser members rigidly in said pressing position; and return cam means secured to said second carrier means and having a return track portion trailing said circular portion and engaging said presser members for moving the same from said pressing position to said inoperative position.

14. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of control members mounted on said first carrier means adjacent said presser members, respectively, for movement between an inoperative position and an actuating position for moving the correlating presser members to said pressing position; selector magnet means mounted on said carrier means and positioned so that during movement of said one carrier means, said control members successively register with said selector magnet means, said selector magnet means being energizable and de-energizable in accordance with a knitting pattern for attracting non-selected control members; actuating cam means mounted on said second carrier means and having one cam track for holding non-selected control members in said inoperative position, and another cam track for guiding selected control members to said actuating position whereby correlated selected presser members are moved to said pressing position; and return cam means mounted on said second carrier means for engaging presser members in said pressing position after pressing of the needle beards for returning said selected presser members to said inoperative position.

15. In a knitting machine, in combination, a pattern selecting presser arrangement comprising first carrier means; second carrier means, one of said carrier means being turnable relative to the other carrier means; a set of needles having beards and being mounted on said first

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carrier means; a set of presser members mounted on said first carrier means opposite said needles, respectively, and for movement between an inoperative position and a pressing position disposed to close the beard of the respective correlated needle; a set of resilient control members mounted on said first carrier means adjacent said presser members, respectively, for movement between an inoperative tensioned position, an intermediate untensioned position, and a tensioned actuating position for moving the correlating presser members to said pressing position; selector magnet means mounted on said carrier means and positioned so that during movement of said one carrier means, said control members successively register with said selector magnet means, said selector magnet means being energizable and de-energizable in accordance with a knitting pattern for attracting non-selected control members in said inoperative position; guide cam means mounted on said second carrier means for guiding said control members from said intermediate position to said inoperative position, said guide cam means leading said selector magnet means in the direction of relative movement between said first and second carrier means and being shaped and positioned so that control members in said inoperative position are closely adjacent said selector magnet means; actuating cam means mounted on said second carrier means trailing said selector magnet means and forming a gap with said guide cam means, said actuating cam means having one cam track for holding non-selected control members in said inoperative position, and another cam track for guiding selected control members from said intermediate untensioned position resiliently assumed after leaving said guide cam means to said actuating position whereby correlated selected presser members are moved to said pressing position; and return cam means mounted on said second carrier means for engaging presser members in said pressing position after pressing of the needle beards for returning said selected presser members to said inoperative position, said selected control members resiliently returning to said intermediate untensioned position at the end of said other cam track of said actuating cam means.

16. A pattern selecting arrangement as set forth in claim 15 wherein said first carrier means comprises a needle cylinder supporting said needles, and a carrier ring surrounding said needle cylinder and being secured to the same for rotation therewith, said carrier ring having radial grooves for guiding said presser members for movement toward and away from the correlated needles, said needles being located at the inner ends of said grooves, and said control members being resilient control rods located adjacent the outer ends of said presser members; said second carrier means including a plate at least partly surrounding said needle cylinder and located above said grooves and said presser members; said guide cam means, said actuating cam means, and said return cam means being secured to the underside of said carrier plate and extending in circumferential direction.

17. A pattern selecting arrangement as set forth in claim 16 wherein said presser members have a projection at the outer ends thereof forming an abutment, said resilient control rods projecting beyond said projection into the region of said guide cam means and actuating cam means which are spaced from said projection; said return cam means projecting into the region of said abutment to cooperate with the same for moving selected presser members after the pressing of the needle beards to said inoperative position.

18. A pattern selecting arrangement as set forth in claim 17 wherein said carrier plate has a cutout; said selector magnet means being mounted on said second carrier means at least partly located in said cutout and including armature means located in the region of the ends of said resilient control rods.

19. A pattern selecting arrangement as set forth in claim 15 wherein said one cam track of said actuating cam means extends along a part of a circle, and wherein said other cam track of said actuating cam means has a rising portion trailing said selector magnet means for moving selected control members to said actuating position, and a circular track portion trailing said rising track portion and adapted to hold said control members in said actuating position so that said presser members are held in said pressing position, and a falling track portion trailing said circular track portion and extending to said one cam track for permitting said resilient control members to resiliently return to said intermediate untensioned position.

20. A pattern control arrangement as set forth in claim 19 wherein said return cam includes a circular track portion parallel with said circular track portion of said actuating cam means and guiding said presser members in said pressing position, a second track portion for guiding said presser members from said pressing position to said inoperative position, and a third track portion for holding said presser members in said inoperative position and trailing said actuating cam means so that at the end of said third track portion of said return cam means, said presser members are in said inoperative position and said control members are in said intermediate untensioned position in which they remain until at the end of one revolution of said one carrier means, said guide cam means move said control members from said intermediate untensioned position to said tensioned inoperative position for selection by said selector magnet.

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