

[54] **KNITTING MACHINE**

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[51] Int. Cl..... **D04b 7/00**

[58] Field of Search..... **66/64, 60 H, 60 R,**
66/75, 154 R, 156

[56] **References Cited**

UNITED STATES PATENTS

3,120,114	2/1964	Sasaki.....	66/60 H
3,250,093	5/1966	Tanaka	66/60 R
3,225,568	12/1965	Tanaka	66/60 H
3,103,110	9/1963	Erb	66/64
3,358,473	12/1967	Suzuki.....	66/60 R

FOREIGN PATENTS OR APPLICATIONS

303,801	3/1930	Great Britain.....	66/75
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45/9903 4/1970 Japan..... 66/75

OTHER PUBLICATIONS

1,935,533, 1-1971 German Application (MADAG)
66-75

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[57]

ABSTRACT

For reading or memorizing a pattern perforated in rows in a card, pattern-reading members having pointed ends in a row are successively fed from a first to an arbitrarily selectable last row of the irregular perforations making up the pattern. The thus memorized pattern is conveyed to needle-selecting members including pattern plates which have projections formed at constant spacings thereon. Some of the pattern plates associated with those of the pattern-reading members which correspond to the perforations in each row are operated to select needles that are required for the knitting operation in accordance with the pattern, the selected needles being urged to their operative positions by the projections on the pattern plates.

9 Claims, 10 Drawing Figures

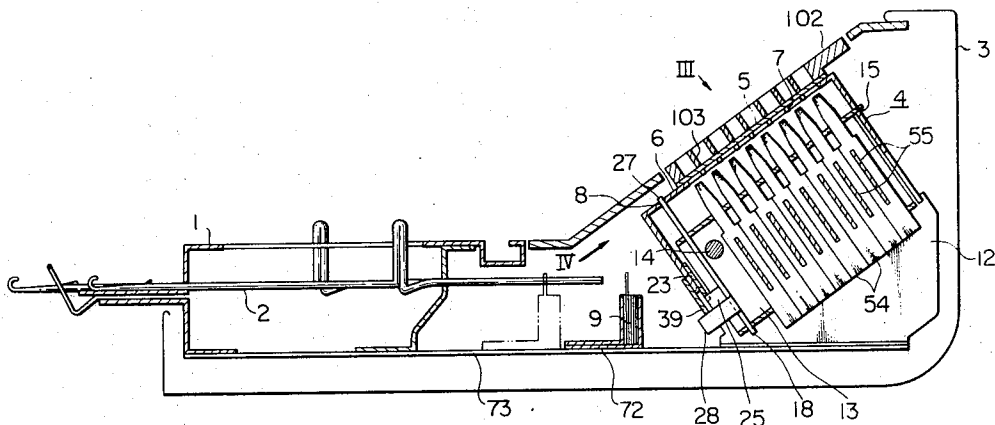


FIG. 1

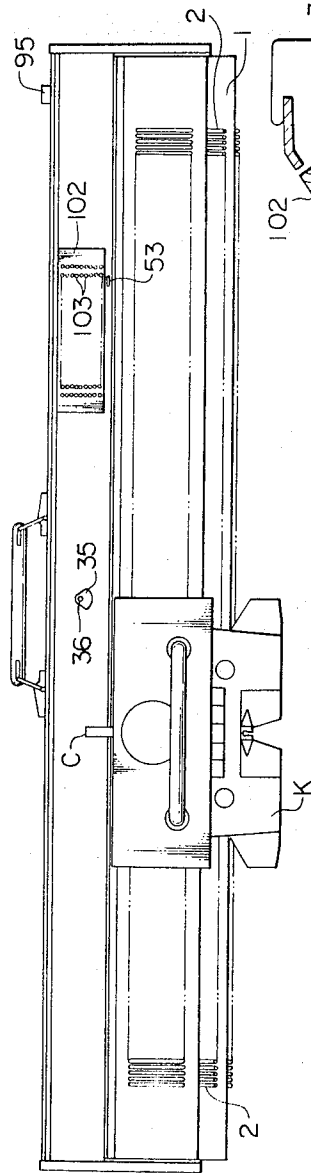
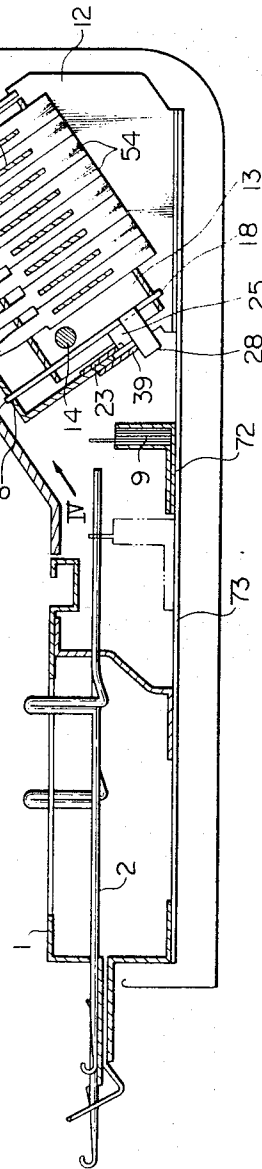


FIG. 2



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FIG. 3

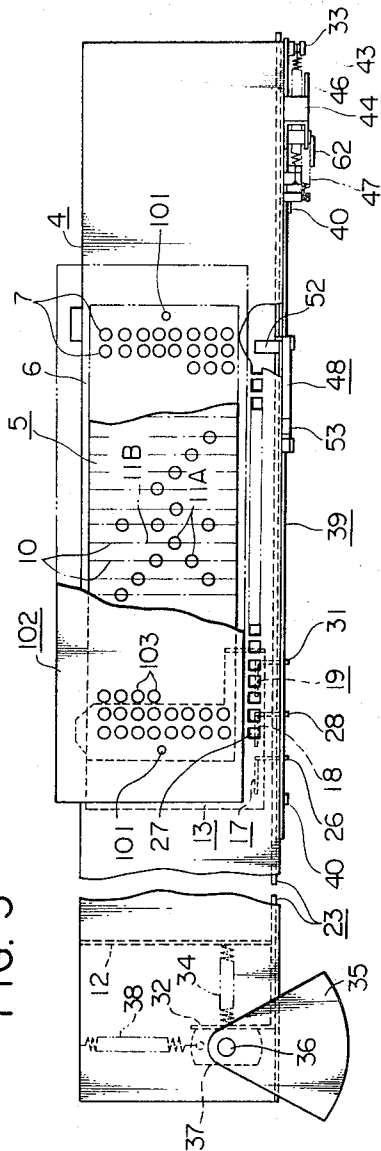
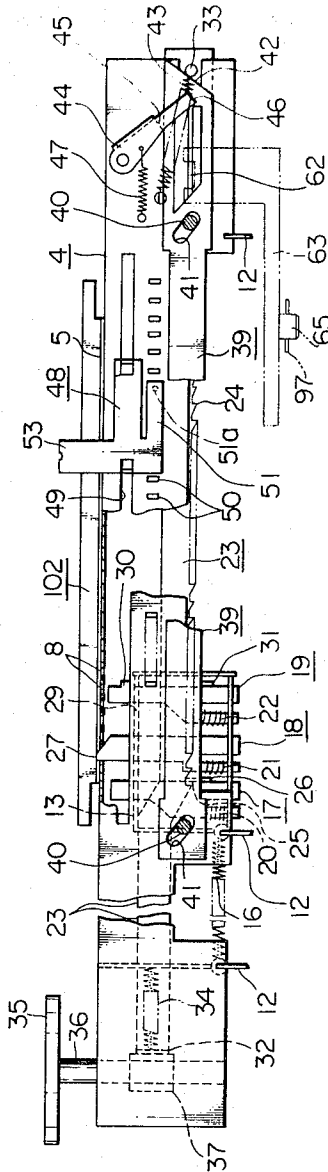


FIG. 4



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FIG. 5

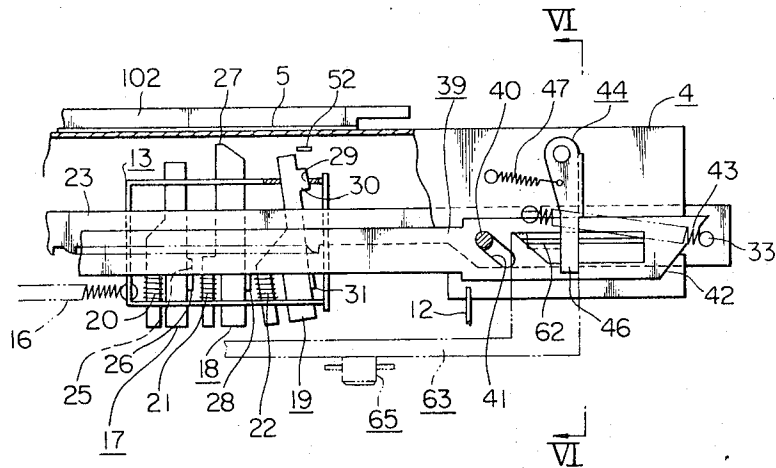
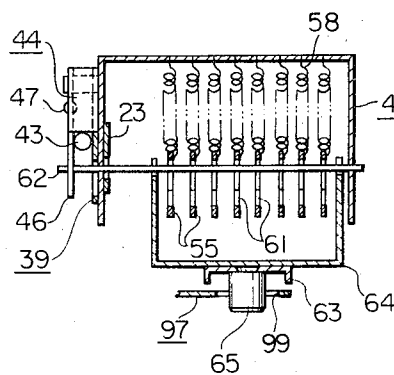


FIG. 6



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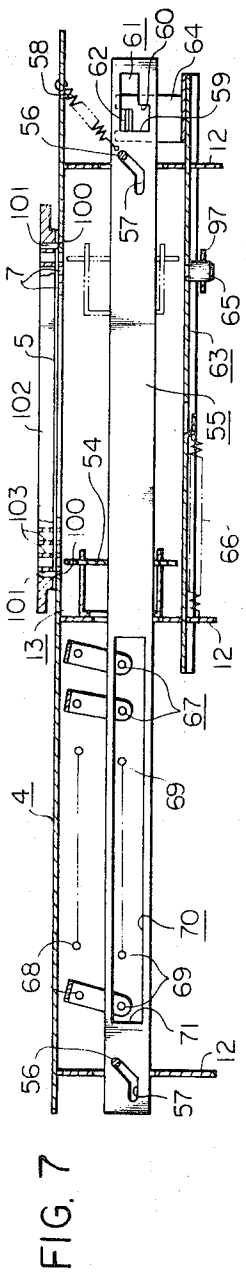
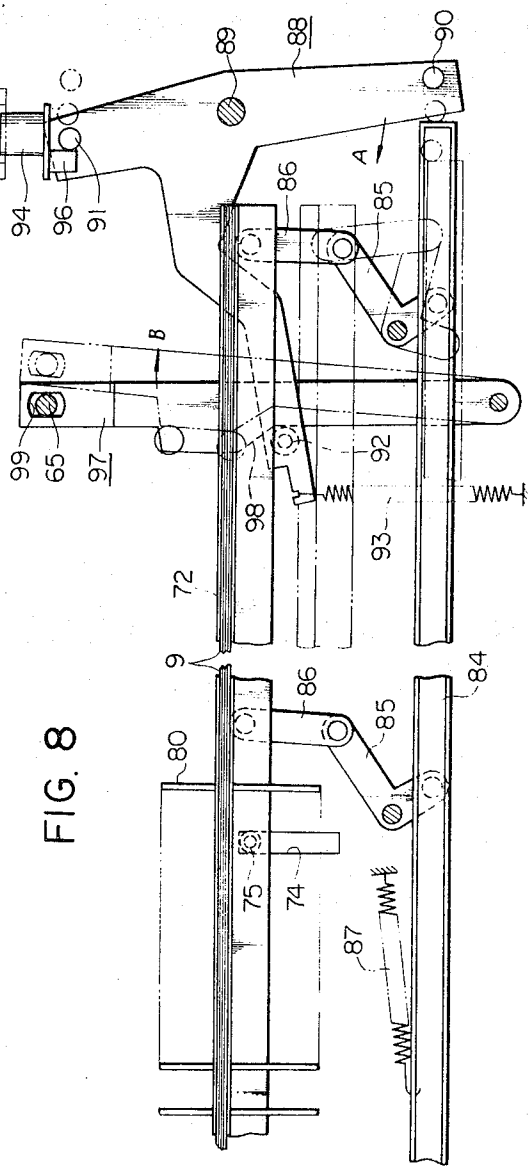


FIG. 8



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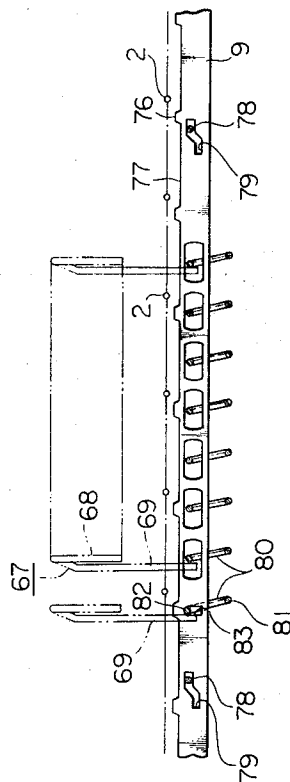
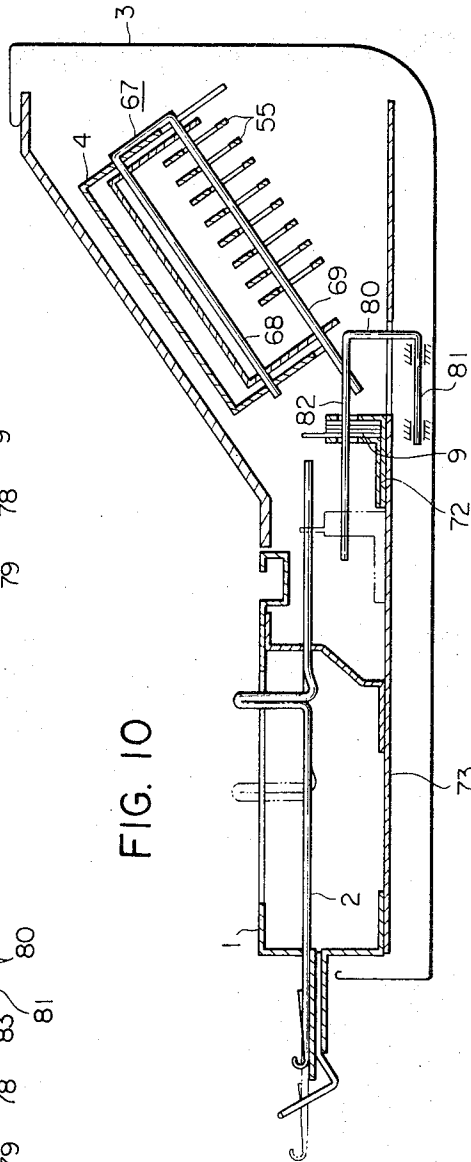


FIG. 10



KNITTING MACHINE

BACKGROUND OF THE INVENTION

This invention relates generally to knitting machines, and more specifically to improvements in or relating to a knitting machine of the type comprising a number of knitting needles and means for selective use of the knitting needles in accordance with a pattern to be developed in knitted fabric.

Knitting machines of the above stated type are known. However, in these machines the devices for the selective use of the knitting needles are complicated and sometimes produce an incorrectly produced pattern of the knitted fabric.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a knitting machine wherein a pattern-retaining member typically supplied in the form of a card having a number of rows of irregular perforations is supported on a supporting member, while means for reading or memorizing the pattern is fed across the rows, so that the pattern can be correctly produced in knitted fabric.

Another object of the invention is to provide a knitting machine wherein the irregular perforations making up a pattern can be read from its first to any other preselected row, so that only a desired part of the pattern may be developed in the product.

A further object of the invention is to provide a knitting machine wherein a preselected part of the pattern on a pattern-retaining member can be read repeatedly through a simple procedure.

A still further object of the invention is to provide a knitting machine wherein means for reading a pattern is readily returned to an initial position by simple and inexpensive means after travelling to a preselected final row of the perforations to be read.

With the above objects in view, the present invention provides, in a knitting machine having a plurality of knitting needles and a plurality of needle-selecting members for selective use of the knitting needles according to a pattern supplied, the combination of a supporting means, a pattern-retaining member on the supporting means having a plurality of rows of elements forming a pattern, a plurality of pattern-reading members adapted to read the successive rows of the elements on the pattern-retaining member, the pattern-reading members being mounted in the supporting means for reciprocation between a first and a preselected last row of the elements, means for transmitting the pattern read by the pattern-reading members to the needle-selecting members, means for feeding the pattern-reading members through the successive rows of the elements from the first to the preselected last row, means for locking the pattern-reading members at each of the successive rows of the elements, and stop means movable on the supporting means to stop the pattern-selecting members at the preselected last row of the elements.

The novel features which are considered as characteristic of the invention are set forth in appended claims. The invention itself, however, together with additional objects and advantages thereof, will be best understood from the following description of a specific embodiment when read in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a top plan view of a knitting machine embodying the novel concepts of the present invention;

FIG. 2 is a vertical transverse section of the knitting machine of FIG. 1;

FIG. 3 is a view as seen in the direction of arrow III in FIG. 2, in which some parts are shown broken away to illustrate other parts in detail;

FIG. 4 is a view as seen in the direction of arrow IV in FIG. 2, in which some parts are shown broken away to illustrate other parts in detail;

FIG. 5 is a fragmentary view similar to FIG. 4, showing a different condition;

FIG. 6 is a section taken on the line VI-VI in FIG. 5;

FIG. 7 is a longitudinal section showing means for transmitting a pattern as memorized by pattern-reading members to needle-selecting members;

FIG. 8 is a fragmentary horizontal section showing means for operating the needle-selecting members;

FIG. 9 is a fragmentary vertical section showing one of the needle-selecting members with associated parts; and

FIG. 10 is a vertical transverse section of the knitting machine showing the relationship between first and second cranks.

DETAILED DESCRIPTION

Referring first to FIGS. 1 and 2 of the drawings, the knitting machine has an elongated needle bed 1 on which a number of knitting needles 2 are mounted so as to be movable in a transverse or lateral direction. A cover 3 is provided to shield the back and bottom sides of the needle bed. A support member 4 of substantially channel- or U-shaped transverse section is fixedly mounted within the needle bed. A flat surface 6 is formed on the support member 4 in order to support a card or pattern-retaining member 5 which will hereinafter be described in detail. A number of transversely extending parallel rows of circular perforations 7 are formed through the flat surface 6 at predetermined spacings in a longitudinal direction. A rectangular opening 8 for a locking purpose, as to be described later, is formed ahead of each row of the circular perforations 7.

The aforementioned card 5 is in the form of a thin sheet and, as shown in FIGS. 3 and 4, is provided with a number of rows of pattern 10 serving for selectively dividing a number of pattern plates or needle-selecting members 9 into two groups, as hereinafter described in greater detail. Each of the pattern rows 10 is aligned with each row of the circular perforations 7 in the support member 4, and comprises a perforation or perforations 11A and an unperforated portion or portions 11B which are respectively in alignment with the circular perforations 7.

Several longitudinally spaced-apart support walls 12 are fixedly attached to the support member 4. A movable frame 13 in the form of a box is slidably supported by a guide rod 14 secured to the support walls 12 and by a guide slot 15 (FIG. 2) formed in the support member 4, the frame 13 being thus permitted to reciprocate between a first left-hand position, as in FIG. 3, and a second right-hand position relative to the card 5.

As shown in FIG. 4, a coil spring 16 is secured at one end to the frame 13 and at the other end to the support

member 4 whereby the frame 13 is normally kept in its left-hand first position. Also as best illustrated in FIG. 4, an engaging member 17, a locking member 18, and a lock-retaining member 19 are supported within the frame 13 so as to be separately vertically movable while being resiliently urged upward by spring members 20, 21 and 22, respectively.

The engaging member 17 is provided with a click 25 for engagement with teeth 24 on a longitudinally extending elongated feed plate 23 which is longitudinally movable along the support member 4 (refer also to FIG. 2), and is provided with a first pressure-bearing element 26. The locking member 18 is provided with a projection 27 having an inclined end to be thrust into one of the aforesaid rectangular openings 8, and with a second pressure-bearing element 28 at the same height as the first element 26. The lock-retaining member 19 is provided with a projection 30 for engagement with the right-hand edge, as seen in FIG. 4, of an opening 29 formed in the movable frame 13, and with a third pressure-bearing element 31 formed at the same height as the first and the second elements 26 and 28.

The left-hand end 32, as viewed in FIG. 3, of the feed plate 23 is rearwardly bent at a right angle, whereas a pin 33 is secured at the right-hand end of the feed plate. A helical compression spring 34 is disposed between the bent end 32 of the feed plate 23 and the support wall 12 positioned adjacently, so that the feed plate is urged leftward as viewed in the same figure.

A lever 35 (FIGS. 3 and 4) which is adapted to move the feed plate 23 rightward against the spring 34, is fixedly mounted on the upper end of a shaft 36 rotatably supported by suitable means and securely provided with a cam 37 in the mid-part thereof, the cam 37 being adapted for the desired rightward travel of the feed plate 23. These lever 35 and cam 37 are kept in their neutral positions by a spring 38. As shown in FIG. 1, this lever 35 is positioned approximately in the middle of the needle bed 1 and is turned upon contact with an actuating member C on a carriage K slidable on the bed.

As seen in FIGS. 2 and 3, and most clearly in FIG. 4, a releasing plate 39 extends longitudinally of the support 4 and is formed with a pair of guide slots 41 respectively receiving pins 40 fixedly planted in the support member 4 and with an inclined edge 42 engaging the aforesaid pin 33 on the feed plate 23, the releasing plate 39 being adapted to release the locking member 18 when required. By cooperation of the pairs of guide slots 41 and pins 40, the releasing member 39 is movable obliquely and, when carried to its lowermost position, lowers the three pressure-bearing elements 26, 28 and 31 against the force of the springs 20, 21 and 22, which condition is illustrated in FIG. 5.

An extension spring 43 shown in FIGS. 3, 4 and 5 extends between the releasing member 39 and the pin 33 on the feed plate 23. In order to keep the member 39 in its lowermost position, a lever 44 is provided which is swingable on the support member 4 and which is formed with a surface 45 for contact with the upper edge of the releasing member 39. Further below surface 45, the lever 44 is provided with an extension 46. A spring 47 imparts a clockwise turning force, as viewed in FIGS. 4 and 5, to the lever 44 thereby to keep its surface 45 in contact with the upper edge of the releasing member 39.

A stop member 48 (FIGS. 3 and 4) is adapted to abut and stop the movable frame 13 at a selected one of the pattern rows 10 between the aforementioned first and second terminal positions of its reciprocation, and is slidable along an elongated slot 49 formed in the support member 4. The stop member includes a resilient projecting portion 51 having a peg 51a to be resiliently received in a number of apertures 50 formed in the support member 4 which is at the same spacings as the rectangular openings 8. By the engagement of one of the apertures 50 by the peg 51a, the stop member 48 can be retained at a position corresponding to the selected one of the pattern rows 10. The stop member 48 is further provided with an abutment 52 (FIG. 3) for contact with the upper right-hand edge of the lock-retaining member 19, and a portion 53 to move the stop member along the elongated slot 49 against the resiliency of the projecting portion 51.

Referring back to FIG. 2, pattern-reading members 54 are movable up and down within the frame 13 and also horizontally therewith between the first and the second positions. The number of these pattern-reading members in a row is equal to the number of pattern forming elements in each row, that is, the number of perforations 11A and unperforated portions 11B that are present in each row.

As shown in FIGS. 2 and 7, control plates 55 equal in number to the pattern-reading members 54 movably support the latter. FIG. 7 best illustrates the manner of motion allowed to each control plate 55, which is defined by cam slots 57 receiving pins 56 secured to the support member 4. A tension spring 58 between the support member 4 and each of the control plates 55 restricts the motion of the latter. Each control plate is further formed with an aperture 61 at its right-hand end as viewed in FIG. 7, the aperture including a first edge 59 and a second edge 60 for a purpose hereinafter referred to.

An operating member 62, longitudinally movably supported by the support member 4, extends through the apertures 61 of all the control plates 55 and has one end disposed on the left side, as viewed in FIGS. 4 and 5, of the extension 46 of the lever 44. An elongated member 63 longitudinally movably supported by the support walls 12 is fixedly provided with a connection member 64 on one end thereof that is connected to the operating member 62, and provided with a pin 65 in the mid-part thereof, as shown in FIG. 7. A spring 66 extends between the member 63 and one of the support walls 12 to pull the former leftward as viewed in FIG. 7 and hence to urge all the control plates 55 in the lower, left-hand positions illustrated in the same figure.

First cranks 67 that are equal in number to the control plates 55 include upper legs 68 rotatably supported by the support member 4 and lower legs 69 swingable about the upper legs 68 (refer also to FIG. 10). The lower legs 69 loosely pass through slots 70 formed in the respective control plates 55 as in FIG. 7. It is to be noted that each control plate 55 has its slot 70 of different length. Each first crank 67 is operated or turned by each control plate 55 associated therewith, when its lower leg 69 is engaged by the left-hand edge 71, as viewed in FIG. 7, of the slot 70.

A pattern plate holder 72 (FIG. 2) which supports the aforesaid pattern plates or needle-selecting members 9 equal in number to the number of control plates 55, is transversely movable on a bottom 73 of the nee-

dle bed 1, while being guided by a slot 74 receiving a pin 75 on the holder 72, as illustrated in FIG. 8. As best shown in FIG. 9, each of the pattern plates 9 is formed with needle-selecting projections 76 adapted to contact the rear ends of the knitting needles 2 and thus to press them forward, and with recesses 77 which do not contact the knitting needles, the projections 76 and the recesses 77 being formed alternately at predetermined spacings. More specifically, the projections 76 on each of the pattern plates 9 are arranged at spacings which are equal to the spacings between extreme ends of successive knitting needles 2 that are greater in number by one than the control plates 55 and are further arranged correspondingly to the respective knitting needles 2. Guided by cam slots 79 respectively receiving pins 78 secured to the holder 72, each pattern plate 9 is movable between an operative position, where its projections 76 are contactable with the knitting needles, and an inoperative position, where the projections are kept out of contact with the needles.

Also as shown in FIGS. 9 and 10, second cranks 80, which are equal in number to the pattern plates 9, each include an upper leg 82 swingable about a lower leg 81. The upper legs 82 are each received in an opening 83 formed in each pattern plate 9, while contacting the right-hand edges, as viewed in FIG. 9, of the lower legs 69 of the respective first cranks 67. These second cranks 80 resiliently urge the respective pattern plates 9 to the aforesaid inoperative position, and keep the first cranks 67 in the position illustrated in FIGS. 7 and 9.

A driving rod 84 shown in FIG. 8 is adapted to move the holder 72 forward in the transverse direction through a plurality of linkages 85 and 86. This rod 84 is normally urged rightward, as viewed in FIG. 8, to its retracted position by a spring 87. A substantially T-shaped lever 88 is swingable on a pin 89 fixedly mounted in the bottom 73 of the needle bed. Three pins 90, 91 and 92 are secured at the ends of the three arms of the lever 88, the pin 90 being adapted to actuate the driving rod 84. A spring 93 imparts a counter-clockwise turning force, as viewed in FIG. 8, to the lever 88.

A shaft 94 is pivotally mounted in the back part of the cover 3, and is equipped with a lever 95 (refer also to FIG. 1) adapted to turn the T-shaped lever 88 and with an eccentrically positioned pin 96 for contact with the pin 91 on one end of the lever 88. A lever 97 which is turnable about a suitably fixed pin 97a is formed with a cam face 98 for contact with the pin 92 on the lever 88 and with a slot 99 to receive the pin 65 on the elongated member 63 (FIGS. 4, 5, 6 and 7).

As illustrated in FIG. 7, pins 101 on the flat surface 6 of the support member 4 are fitted in holes 100 in the card 5 in order to retain the same in position. A cover 102, adapted to hold the card upon the flat surface 6, is formed with a number of perforations 103 in alignment with the circular perforations 7 that are formed through the flat surface.

In the knitting machine of the above described construction, the selection of knitting needles for use is first made, and then the carriage K is manually moved to and fro to start making a knitted fabric in accordance with a preselected pattern. It is assumed that the movable frame 13 is first located at its first or left-hand end position shown in FIG. 4. As seen in the same figure, the frame 13 in this instance is in contact with one

of the support walls 12, while the projection 27 of the locking member 18 has its inclined end engaged in one of the rectangular openings 8 positioned at the extreme left in the figure. The pattern reading members 54 are then aligned with the left-hand end row 10 of the pattern in the card 5.

If, in this condition, the lever 95 of FIG. 8 is manually operated to turn the T-shaped lever 88 in the direction of the arrow A, the pin 92 on one of its arms presses the cam face 98 of the lever 97 thereby turning the latter in the direction of the arrow B in the same figure. As a result, the elongated member 63 coupled to the lever 97 by the pin 65 and the operating member 62 are moved rightward as seen in FIG. 7. In this manner, all the control plates 55 are released from the pressure of the operating member 62 through the connective member 64 and thus permitted to move rightward as viewed in FIG. 7 by the tension spring 58, accompanied by upward movement of all the pattern-reading members 54.

However, those of the pattern-reading members 54 which moved into contact with the unperforated portions 11B of the card 5 are prevented from further upward movement, so that the control plates 55 supporting these pattern-reading members 54 are also prevented from further movement to their upper, right-hand position as viewed in FIG. 7. The other pattern-reading members 54 are allowed to enter the perforations 11A, so that the control plates 55 supporting these latter members 54 are permitted to travel to their upper, right-hand position. Succeedingly, the fully raised control plates 55 are carried horizontally further in the right hand direction by the operating member 62 which is now in contact with the second edges 60 of the apertures 61 formed in the control plates 55. The first cranks 67 corresponding to these control plates 55 are then swung rightward by the left-hand edges 71 of the slots 70 formed also in the control plates, so that the second cranks 80 and the pattern plates 9 corresponding to these first cranks 67 are moved rightward as viewed in FIG. 9. These pattern plates 9 are now in their operative positions, while the other pattern plates corresponding to those of the pattern-reading members 54 which have been prevented from fully moving upwards by the unperforated portions 11B of the card 5 are kept in their inoperative positions.

As the T-shaped lever 88, FIG. 8, is further turned by the lever 95, the pin 90 on the former presses the driving rod 84 leftward, whereupon the holder 72 travels to its forward position. By this forward travel of the holder 72, those of the knitting needles 2 which correspond to the projections 76 on the pattern plates 9 previously carried to their operative positions are moved forward, whereas the other knitting needles corresponding to the recesses 77 of the pattern plates are not moved. In this manner the knitting needles 2 are divided into two groups, one moved forward for operation and the other left behind.

Thereafter, upon release of the lever 95, the holder 72, the T-shaped lever 88, and the rod 84 are returned to their respective initial positions illustrated by the solid lines in FIG. 8 by the springs 87 and 93. Thereafter the spring 66 (FIG. 7) returns the lever 97, the control plates 55, the pattern reading members 54, etc., to their initial positions. The first and the second cranks 67 and 68 and the pattern plates 9 also take their initial positions again.

After selecting some of the knitting needles 2 for use in a manner described hereinbefore, a desired fabric is formed in accordance with the selected pattern by manually moving the carriage K (FIG. 1). As the lever 35 is turned counterclockwise by the actuating member C on the carriage K, the cam 37 moves the elongated feed plate 23 in the right-hand direction, so that its teeth 24 carries the click 25 of the engaging member 17 in the same direction (see FIG. 4). Thus the frame 13 is moved for a distance equal to the spacing between two adjoining ones of the rows 10 of pattern. Also the inclined end 27 of the locking member 18 is now received in the next rectangular opening 8, while the pattern reading members 54 are aligned with the next pattern row.

Thereafter the above described operations of needle selection and carriage movement are repeated alternately. After the pattern-reading members 54 have read the final row of pattern in the card 5, the carriage K is manually moved to start knitting in accordance with the pattern, and its actuating member C moves the feed plate 23 in the right-hand direction, as viewed in FIG. 3 and 4. Then, the frame 13 can be returned to the illustrated first position by the tensile force of the coil spring 16. To describe its procedure more specifically, the lock-retaining member 19 which is movable with the frame 13 first contacts the abutment 52 on the stop member 48 (FIGS. 3 and 5) so that the projection 30 of the lock-retaining member is released from the opening 29. Since then the releasing member 39 which has been supported by the third pressure-bearing element 31 of the lock-retaining member 19 is permitted to move downwardly, the tension spring 43 pulls the releasing member 39 to its lower, right-hand position as viewed in FIGS. 4 and 5. In this instance, the first, second and third pressure-bearing elements 26, 28 and 29 are also lowered by the releasing member 39, so that the click 25 of the engaging member 17 is released from the teeth 24 of the feed plate 23, while the inclined end 27 of the locking member 18 moves out of the opening 8. As a consequence, the frame 13 is rapidly returned to its initial position by the coil spring 16 as previously mentioned.

When the releasing member 39 is moved to its lower, right-hand position as aforesaid, the lever 44 is turned clockwise to its position illustrated in FIG. 5, with the result that its surface 45 retains the member 39 in its lowered position. Accordingly, even after the return of the frame 13 to the initial position, the engaging member 17, locking member 18 and lock-retaining member 19 are kept in their lowered positions. The feed plate 23 is kept in its right-hand position because its pin 33 is arrested by the inclined edge 42 of the releasing member 39.

When the above described operation of needle selection is again carried out, the operating member 62 turns the lever 44 counterclockwise from its position of FIG. 5 to that of FIG. 4 against the force of the spring 47. The releasing member 39 and the feed plate 23 are then returned to their left-hand positions by the compression spring 34 (refer to FIG. 4), while the first, second and third pressure-bearing elements 26, 28 and 31 are elevated by the springs 20, 21 and 22, respectively. As a result, the click 25 of the engaging member 17 engages the teeth 24 on the feed plate 23. The inclined end 27 of the locking member 18 is received in the left-hand end opening 8, and the projection 30 of the lock-

retaining member 19 is retained by one edge of the opening 29 formed in the frame 13.

As described hereinbefore, the pattern as defined by the perforations in the card 5 can be repetitively read or memorized by the pattern-reading members 54 simply by the alternate operation of the carriage k and the lever 95, and the pattern can be repetitively developed in knitted fabric. It will be noted that the aforesaid second position of the frame 13 can be set to any row 10 of pattern by moving the stop member 48, thus engaging its resilient projection 51 with a corresponding one of the apertures 50. In this manner, the rows of patterns between the first position and the thus-modified second position of the frame 13 can be repetitively memorized by the pattern-reading members 54 therewithin.

Although the present invention has been shown and described in terms of a specific embodiment thereof, the invention, itself, is not considered to be restricted by the exact showing of the drawings and the description thereof, but is assumed to include a latitude of modifications, substitutions, and changes. It is therefore appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein disclosed.

I claim:

1. In a knitting machine having a plurality of knitting needles, and a plurality of needle selecting members for selecting said knitting needles, the combination of:

a supporting means,

a pattern retaining member supported on said supporting means and provided with a plurality of rows of patterns which select some of said needle selecting members for their operation,

a plurality of pattern reading members for reading each of the rows of the patterns in said pattern retaining member,

said pattern reading members being mounted in said supporting means and adapted to move reciprocally between two spaced positions across the rows of said patterns,

means connecting said pattern reading members to said respective needle selecting members to transmit the patterns retained in said pattern retaining member to said needle selecting members,

means for feeding said pattern reading members step by step from one position toward the other position of said two spaced positions by a distance corresponding to that between the rows of said patterns, means for temporarily locking said pattern reading members fed by said feeding means at each of the successively fed positions thereof, said locking means being capable of unlocking the pattern reading members when the members are to be fed further by said feeding means from a temporarily locked position, and

means for predetermining a final position of said pattern reading members fed by said feeding means between said two spaced positions to stop the feeding movement of said pattern reading members at said final position and for making said feeding means inoperative at said predetermined position, said means for predetermining a final position of said pattern reading members being mounted on said supporting means to set a predetermined final position of said pattern reading members with respect to the rows of said patterns.

2. The knitting machine as claimed in claim 1, wherein said means for predetermining a final position of said pattern reading members is capable of making stepwise displacement on said supporting means to provide different final positions of the pattern reading members.

3. The knitting machine as claimed in claim 2, wherein said means for predetermining a final position of said pattern reading members includes resiliently yieldable engaging means and said supporting means includes successively formed apertures which said engaging means engages.

4. The knitting machine as claimed in claim 1, further including means for making said locking means inoperative in order to enable said pattern reading members to return to said one position from said predetermined final position.

5. The knitting machine as claimed in claim 1, further including means for releasing said locking means, and means for returning said pattern reading members toward said one position whereby the pattern reading members are allowed to return to said one position from said predetermined final position when said releasing means is operated.

6. The knitting machine as claimed in claim 5, further

including means for retaining said locking means in an unlocked condition after the locking means is released by said releasing means until said feeding means is re-operated after said pattern reading members have returned to said one position.

7. The knitting machine as claimed in claim 5, wherein said returning means is a tension coil spring connecting said supporting means and said pattern reading members to resiliently urge the pattern reading members toward said one position.

8. The knitting machine as claimed in claim 5 wherein said releasing means includes an abutment formed on said means for predetermining a final position of said pattern reading members, and means acted upon by said abutment at the final position of the pattern reading members to release said locking means.

9. The knitting machine as claimed in claim 1, wherein said supporting means is mounted in an elongated needle bed and provided with a flat supporting surface for supporting said pattern retaining member, and wherein said pattern reading members are movable in parallelism with said flat supporting surface in a longitudinal direction of said needle bed under said flat supporting surface.

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