

Dec. 12, 1961

E. GRÜNKE

3,012,442

MANUALLY OPERABLE PATTERN SELECTOR DEVICE FOR AN
ORNAMENTAL STITCH SEWING MACHINE

Filed July 14, 1959

3 Sheets-Sheet 1

FIG. 1

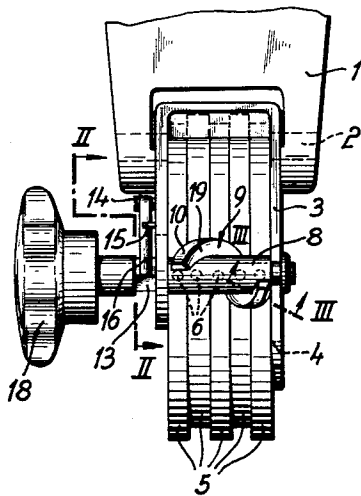


FIG. 4

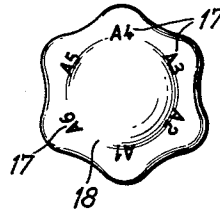


FIG. 3

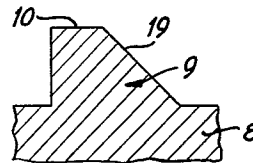
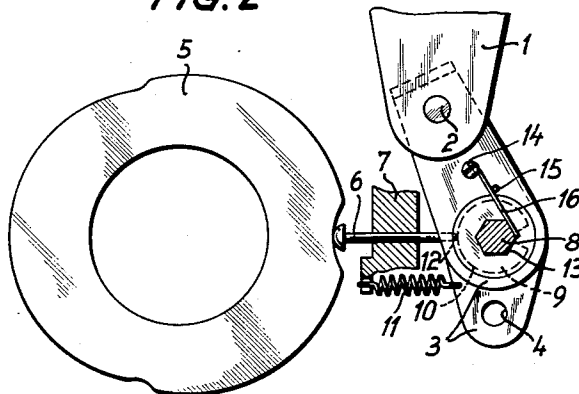


FIG. 2



INVENTOR
Erich GRÜNKE

BY

Heinrich Strauss
AST.

Dec. 12, 1961

E. GRÜNKE
MANUALLY OPERABLE PATTERN SELECTOR DEVICE FOR AN
ORNAMENTAL STITCH SEWING MACHINE

3,012,442

Filed July 14, 1959

3 Sheets-Sheet 2

FIG. 5

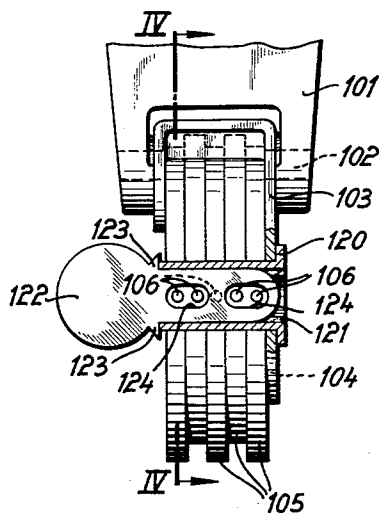


FIG. 7

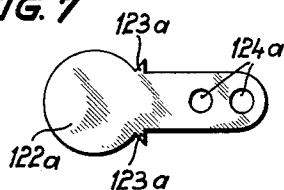
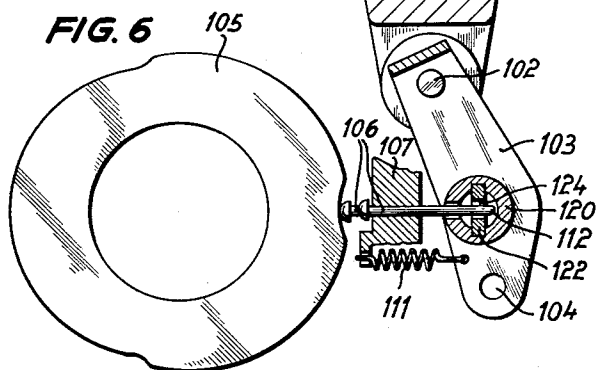


FIG. 6



INVENTOR
Erich GRÜNKE

BY

Leon M. Strauss
ATT.

Dec. 12, 1961

E. GRÜNKE

3,012,442

MANUALLY OPERABLE PATTERN SELECTOR DEVICE FOR AN
ORNAMENTAL STITCH SEWING MACHINE

Filed July 14, 1959

3 Sheets-Sheet 3

FIG. 8

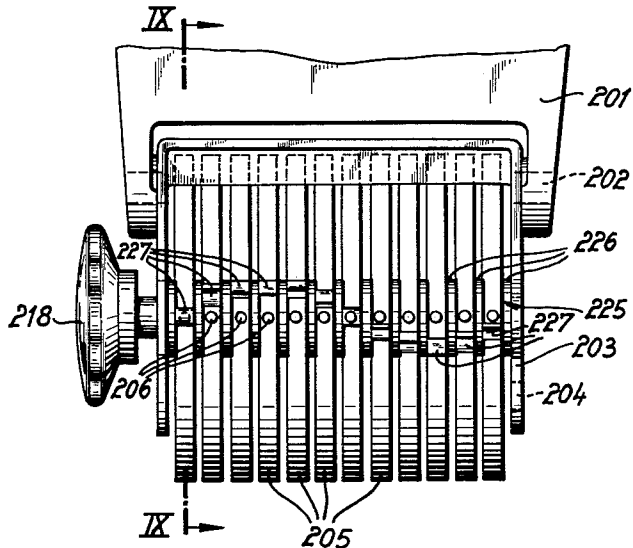
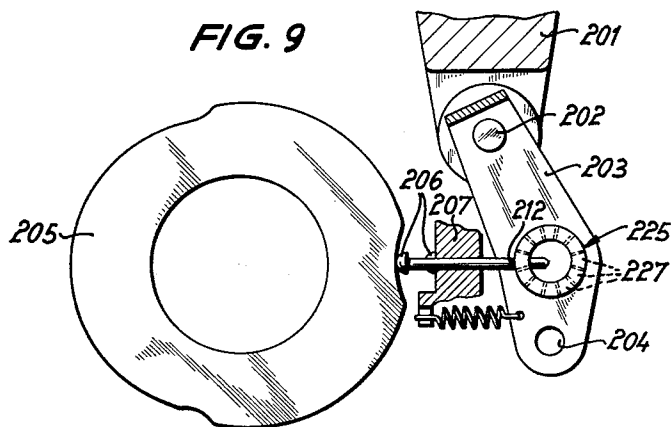


FIG. 9



INVENTOR
Erich GRÜNKE

BY

Heinrich Strauss
ATT

1

3,012,442

MANUALLY OPERABLE PATTERN SELECTOR DEVICE FOR AN ORNAMENTAL STITCH SEW- ING MACHINE

Erich Grünke, 240 Im Haldenholz, Hinwil,
Zurich, Switzerland

Filed July 14, 1959, Ser. No. 827,008

Claims priority, application Germany July 15, 1958

7 Claims. (Cl. 74—54)

The present invention relates to ornamental stitch sewing machines and particularly to devices for the selection of predetermined ornamental stitches to be sewn by the machines.

Generally ornamental stitch devices comprise a number of rotating pattern cam discs and a transmission rocker connected to one or more devices for influencing the formation of the ornamental seam and carrying a hand-operated pattern selector. The known pattern selectors arranged on the transmission rocker are, however, comparatively complicated to operate and are suitable only for scanning a small number of pattern cam discs.

The primary object of the present invention is to provide a device for the selection of possible sewing patterns which is of simple construction yet is not subjected to any limitations in connection with the use of greatly varying contours of cam discs.

This object is achieved according to the present invention in that a device of the kind described is provided between the transmission rocker and the pattern cam discs with transmission means located in guides in fixed housings, said guides being displaceable independently of one another and corresponding in number to the number of the cam discs.

According to another feature of the invention an extremely simple construction of the selector switch is obtained by the feature that an operating shaft journaled to rotate on the transmission rocker is provided with a helix or worm of coarse pitch, the ridge of which forms the contact surface for the transmission members associated with the cam discs, it being possible to provide the worm with at least one inclined side face which operates as an ascending surface for the pointed end of the appropriate transmission member during the switching operation.

It is further possible in accordance with the present invention to provide a selector device which, despite its simplicity of construction, permits the combined scanning of several cam discs, the transmission rocker being provided with means for the reception of an interchangeable insertion blade which serves as a contact surface for the operative transmission means and has perforations for the passage therethrough of those transmission means which temporarily are to be made inoperative.

Further features of the invention and details of the advantages achieved thereby will be apparent from the following description of three examples of the pattern selector device which are illustrated in the accompanying drawings in which:

FIGURE 1 is a view in elevation of one embodiment.

FIGURE 2 is a section on the line II—II of FIGURE 1.

FIGURE 3 is a section on an enlarged scale taken on the line III—III of FIGURE 1.

FIGURE 4 is a view in front elevation of the control knob of the selector device shown in FIGURE 1.

FIGURE 5 is a view in elevation partly in section of a second embodiment.

FIGURE 6 is a section taken on the line VI—VI of FIGURE 5.

2

FIGURE 7 shows a detail constituted by an insertion blade which is constructed differently from that of the device illustrated in FIGURE 5.

FIGURE 8 is a view in elevation of a third embodiment of the invention.

FIGURE 9 is a section on the line IX—IX of FIGURE 8.

In the construction illustrated in FIGURES 1—4, a transmission rocker arm 3 is pivotally mounted on a spindle 2 of a bearing block 1 in a fixed housing on an ornamental sewing machine. The rocker 3 has a bore 4 which serves for the attachment of rods (not shown) for establishing the required connection with known devices of the sewing machine which influence the ornamental seam formation thereof. The swinging movements of the transmission rocker 3 about its spindle 2 thus have the necessary effect on the shape and appearance of the ornamental seam to be sewn.

In the particular construction illustrated, the necessary swinging movements are imparted to the transmission rocker 3 under the control of five pattern cam discs 5 which are mounted on a common driving shaft (not shown). In FIGURE 1, these pattern cam discs are shown schematically, but in FIGURE 2 only one of them is illustrated. Each cam disc 5 is associated with a transmission member 6 each of which is constructed as a pin, the individual transmission members being arranged to slide longitudinally independently of one another in a guide 7 in a fixed housing.

Rotatably journaled on the transmission rocker 3 is a control shaft 8 which is provided over a part of its length, namely in the region of the transmission members 6, with a coarse pitch endless helix or worm 9. According to the angular position of the control shaft 8 about its own axis, any given point of the ridge 10 of the worm 9 lies adjacent one of the cam discs 5, whilst by submitting the entire transmission rocker 3 to the action of a draw spring 11 (FIGURE 2) the worm 9 at the point in question is maintained in contact with a pointed end 12 of the appropriate transmission member 6. The cam disc associated with this member thus determines, as it rotates, the swinging movement of the transmission rocker 3, whilst the other cam discs remain inoperative since the transmission means 6 associated with them lie out of contact with the worm 9.

A short portion of the shaft 8 is constructed as a hexagon 13 which is engaged by a leaf spring 16 which is mounted on the transmission rocker 3 by means of a screw 14 and abuts against a pin 15 on said rocker. In the result the control shaft 8 is held in each of its selected angular positions about its own axis in which one of the transmission means 6 co-operates with the worm screw 9.

Consistent with the six control positions of the shaft 8 established by its hexagonal faces six different indicator markings 17 are disposed on a selector control knob 18 connected to one end of the shaft 8. Since the six control positions of the shaft 8 are associated merely with five cam discs, likewise having five transmission members, the worm 9 extends only over substantially five-sixths of the circumference of the shaft as shown in FIGURE 1. Thus, when the last or free one-sixth of the circumference of the shaft lies opposite the series of transmission members 6, none of the five cam discs 5 is operative and the devices connected to the transmission rocker 3 and influencing the ornamental seam formation may be adjusted and locked as desired.

As shown more particularly in FIGURE 3 the worm 9 has an inclined flank 19. Thus when the control shaft 8 is turned clockwise (FIGURE 2) the ends 12 of the transmission means 6 may ride up flank 19. In this respect it will be appreciated that, in the absence of an

inclined surface 19, the transmission rocker 3 would have to be raised from the transmission members 6 before switching over to a particular pattern.

The described arrangement has the further advantage that it contributes to a very simple construction of the actual selector device in the form of the worm 9, the ridge or operative contact surface of which includes contact positions for the transmission members 6 which are only slightly offset radially, namely, from the inoperative surface. However, despite the small annular clearance between the two surfaces those of the respective transmission means other than that in contact with the ridge surface remain inoperative because the transmission means 6 at the ends remote from the cam discs 5 are provided with pointed ends 12.

In the embodiment illustrated in FIGURES 5-7 a bearing block 101 in a fixed housing has a spindle 102 about which is pivotally mounted a transmission rocker 103. Here again a bore 104 is formed for the attachment of a connecting rod to the devices (not shown) for influencing the shape and appearance of the ornamental stitching which is to be performed by the sewing machine. Similarly five pattern cam discs 105 are also arranged on a common driving shaft (not shown). They act on an equal number of pins or the like transmission means 106 journaled in front of them and arranged to slide independently of each other in a guide 107 (FIGURE 6) in a fixed housing.

A hollow bush 120 mounted on the transmission rocker 103 is internally provided with a slot or other supporting means 121 (FIGURE 5) for an interchangeable blade 122, having two shoulders 123 formed thereon, and which may be inserted into the bush 120 until the shoulders abut against the end of the bush.

The blade 122 has perforations 124 for the passage therethrough of the pointed ends 112 (FIGURE 6) of such transmission members 106 which are to remain inoperative, whilst, in the region of the particular transmission member 106 which is to establish the operative connection with the cam disc associated therewith the blade 122 is not perforated (FIGURE 5) so that it serves as an effective contact surface, which is pressed by the force of a spring, 111 (FIGURE 6), located between the rocker arm 103 and the fixed guide 107, against this single transmission member to hold the latter against its cam disc 105.

This particular cam disc as it rotates thus determines the required swinging movement of the transmission rocker 103. In FIGURE 5, it is the centre disc 105 of the series which operates in this manner.

Each blade of course is distinguished from the others by virtue of its perforation or perforations, and FIGURE 7 shows an insertion blade 122a which illustrates this. It differs from the blade 122 of FIGURE 5 in that it has a different formation and arrangement of perforations 124a. If after previous raising of the transmission rocker 103 against the action of the spring 111, the blade 122a, as distinct from the blade 122, is inserted into the supporting means 121 of the bush 120 until it strikes against its shoulders 123a, then only the third and fifth from the left of the cam discs 105 become inoperative, while the first, second and fourth from the left are jointly operable in such manner that the disc which momentarily has greatest effective radius is decisive for the deflection of the transmission rocker 103.

The arrangement shown in this embodiment has the further advantage that, by means of a set of differently constructed blades, a selection of a comparatively large number of cam discs, either singly or collectively, may be adopted.

Although in the construction illustrated in FIGURE 5 only five pattern cam discs are shown it is clear that this number may be increased. This additional advantage is achieved by the extremely simple form of construction and by the fact that the perforations in the

longitudinal surfaces of the selected blade are only very slightly displaced relatively to the imperforate contact surface or surfaces effective at the time. Despite their very slight lateral displacement, they remain inoperative because the transmission members 106 at their ends 112 remote from the cam discs 105 are pointed.

In the embodiment shown in FIGURES 8 and 9 a bearing block 201 in a fixed housing has a spindle 202 for pivotally mounting a transmission rocker 203 with respect to the block. Here again a bore 204 is formed in the rocker 203 to serve for the attachment of a connecting rod to the devices (not shown) for effecting the selected ornamental seam. In this instance however twelve pattern cam discs 205 are arranged on a common driving shaft (not shown). They act on an equal number of transmission members 206 journaled in front of them and arranged to slide independently of one another in a guide 207 in a fixed housing.

Rotatably journaled on the transmission rocker 203 is a control member 225 which, in the manner of a crank shaft, has crank cheeks 226 (FIGURE 8) and is fitted with connecting members 227 which correspond to the crank pins and are eccentrically arranged. The connecting member 227 which happens to be nearest to the cam disc 205 by turning the control members 225 by means of an operating knob 218, serves as a contact surface for the pointed end 212 (FIGURE 9) of the appropriate transmission member 206, and the other cam discs remain inoperative.

An additional advantage of this arrangement lies in that any one of a very large number of pattern cam discs can be selectively scanned. The appropriate effective contact surface in the form of an eccentric connecting member 227 has in fact only a very small annular clearance from the connecting members adjacent thereto. Despite their extremely slight radial displacement the latter remain inoperative because the transmission members 206 on the side remote from the cam discs 205 are provided with pointed ends 212.

In the foregoing, the invention has been described with reference to three specific illustrative devices. It will be evident, however, that variations and modifications, as well as the substitution of known elements and devices for those shown herein for illustration, may be made without departing from the broader scope and spirit of the invention, as set forth in the appended claims. The specification and drawings are accordingly to be regarded in an illustrative rather than in a restrictive sense.

Again it will be appreciated that the control device for the selection of the patterns of stitching to be performed may be fitted in any desired position in or on the sewing machine itself. Thus for example it may be placed in the same position in an ornamental sewing machine as the selector control of the zig-zag sewing machine according to United Kingdom Patent No. 792,328, i.e. on the arm and beneath a flap of the cover thereof as illustrated in FIGURES 2 and 9 of the drawings of said patent.

I claim:

1. A manually operable pattern selector device for an ornamental stitch sewing machine, comprising a plurality of coaxial conjointly rotatable axially adjacent pattern cam discs; a single transmission rocker pivoted about an axis in spaced parallel relation to that of said cam discs and having a free portion adapted to be connected to ornamental seam formation influencing means of a sewing machine; a plurality of substantially identical reciprocable transmission members equal in number to said cam discs and each associated with a different respective cam disc for reciprocation thereby; said transmission members being disposed between said cam discs and a selector portion of said transmission rocker spaced from both its pivot axis and said free portion, and having operating ends extending toward said selector portion and substantially equidistant from the pivot axis of said transmission rocker; selector means displaceably mounted in said

5

selector portion of said transmission rocker and extending along said operating ends, said selector means having contact surface portions each associated with a different respective transmission member and each selectively positionable in engagement with the operating end of the associated transmission member by displacement of said selector means relative to said transmission rocker; whereby said selector means may be manually displaced to effect engagement between the operating end of at least one selected transmission member and its associated contact surface portion of said selector means; and means biasing the free portion of said transmission rocker toward said cam discs for rocking of said transmission rocker by the selected transmission member and its associated respective cam disc; said selector means having surface formations providing for free reciprocation of the non-selected transmission members by their respective cam discs, with their respective operating ends out of operating contact with said selector means.

2. A pattern selector device as set forth in claim 1, in which said selector means comprises a control shaft rotatably channeled in said transmission rocker, said control shaft having a worm of coarse pitch on its surface, and the ridge of said worm forming, at the nearest point to the cam discs, the contact surface portion for the selected transmission member.

3. A pattern selector device as set forth in claim 1, in which said transmission members comprise relatively elongated rods longitudinally slidably mounted through openings in a support means disposed between said cam discs and said transmission rocker.

4. A pattern selector device as claimed in claim 1, in which said selector means comprises a shaft rotatably displaceable in said transmission rocker.

5. A pattern selector device as set forth in claim 2, in

6

which said worm is provided with at least one oblique side for forming an ascending surface for said transmission members to bring said transmission members selectively into operative engagement for displacing said transmission rocker.

6. A pattern selector device as set forth in claim 1, in which said transmission rocker has a recess therein, said selector element comprising interchangeable blade means received in said recess for providing the contact surfaces for the operating ends of selected transmission members, said blade means having perforations therein for the passage therethrough of the operating ends of the non-selected transmission members which are to be inoperative, each of said blade means being distinguished from the others by the position and characteristics of its perforations.

7. A pattern selector device as set forth in claim 1, said transmission rocker having a bore therethrough, a bushing in said bore, said selector means comprising interchangeable blade means in said bushing, said blade means having perforations therein, the operating ends of the selected transmission members engaging said blade means while the operating ends of the non-selected transmission members reciprocate through said perforations.

References Cited in the file of this patent

UNITED STATES PATENTS

2,706,973	Russell	Apr. 26, 1955
2,810,360	Perla	Oct. 22, 1957
2,854,935	Benink et al.	Oct. 7, 1958

FOREIGN PATENTS

549,548	Italy	Oct. 15, 1956
1,139,759	France	Feb. 18, 1957