April 29, 1958 F. GEGAUF 2,832,302

SEWING MACHINE

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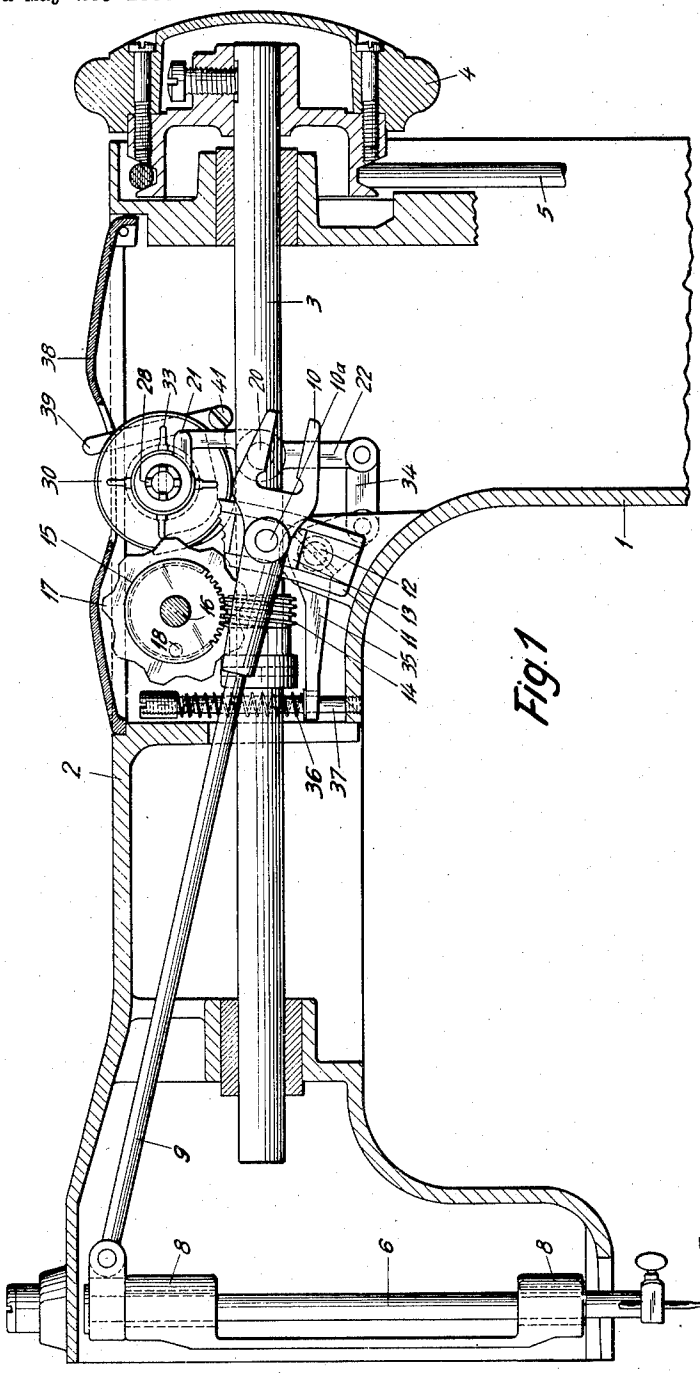


Fig. 1

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April 29, 1958 F. GEGAUF 2,832,302

SEWING MACHINE

Filed May 29, 1953 6 Sheets-Sheet 2

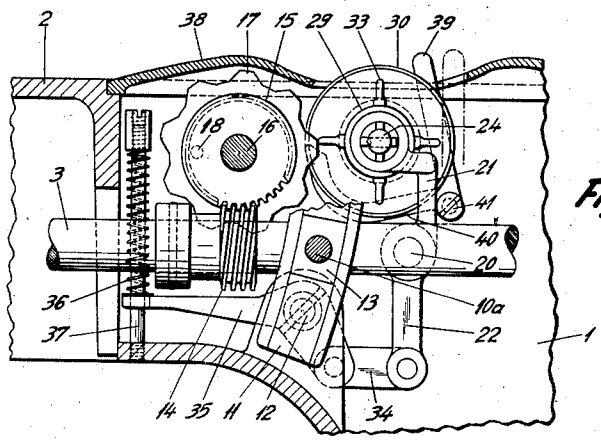


Fig. 2

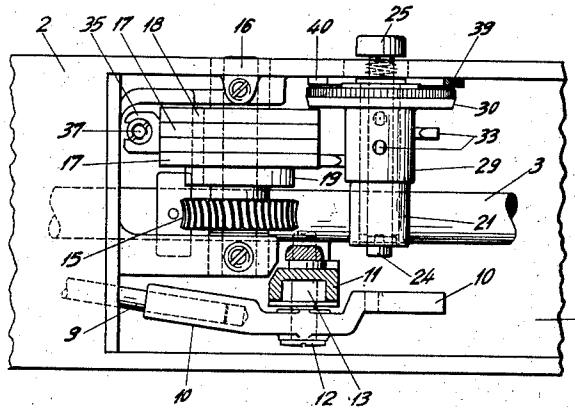


Fig. 3

Fig. 8

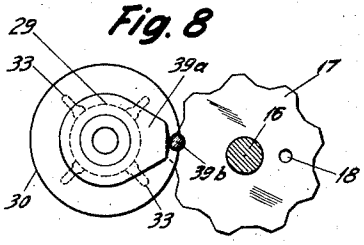


Fig. 9

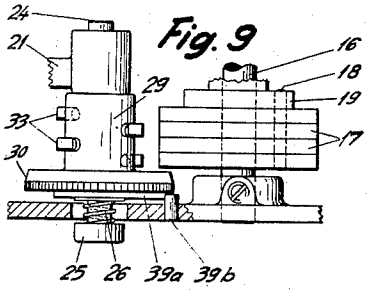
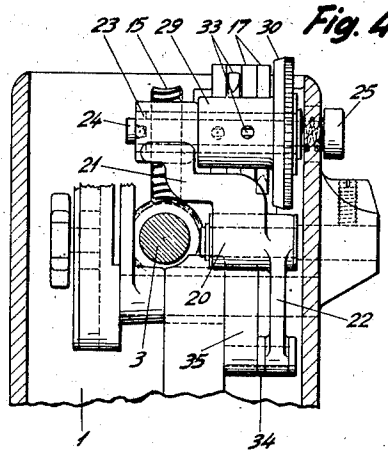


Fig. 4



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April 29, 1958 F. GEGAUF 2,832,302

SEWING MACHINE

Filed May 29, 1953 6 Sheets-Sheet 3

Fig. 5

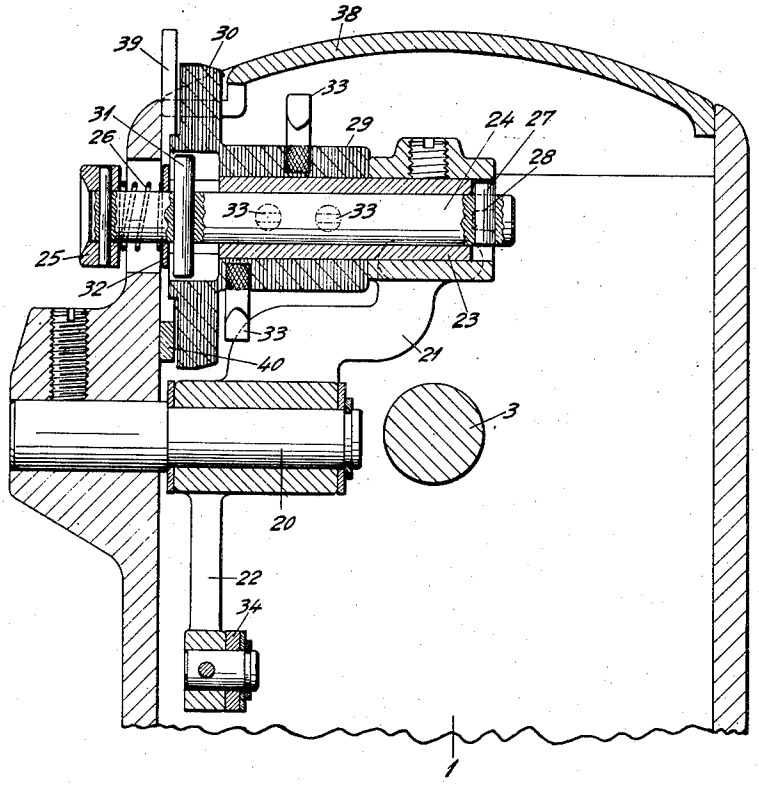


Fig. 6

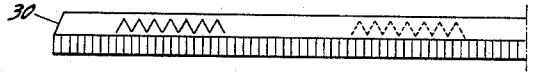
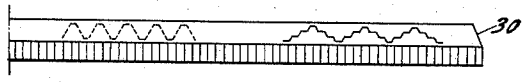


Fig. 7



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April 29, 1958 F. GEGAUF 2,832,302

SEWING MACHINE

Filed May 29. 1953 6 Sheets-Sheet 4

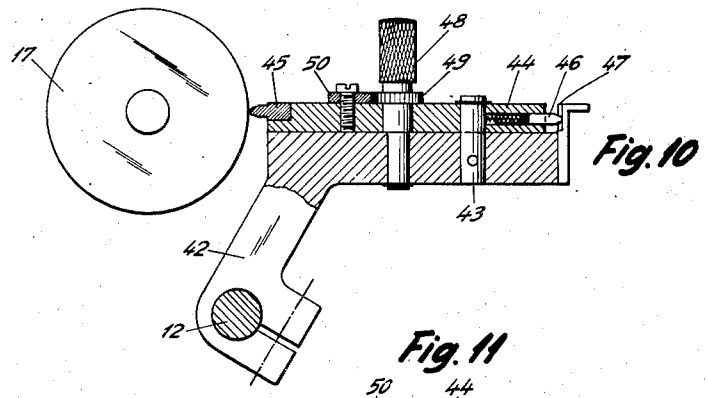
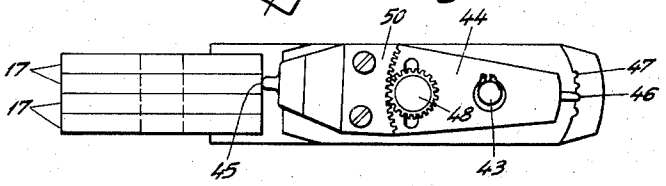


Fig. 10

Fig. 11



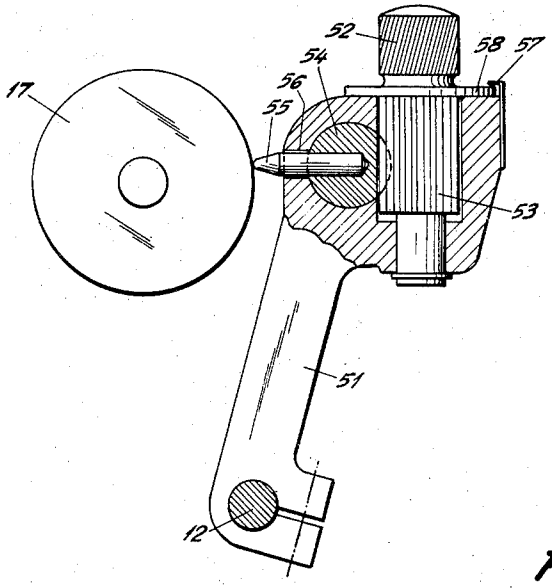
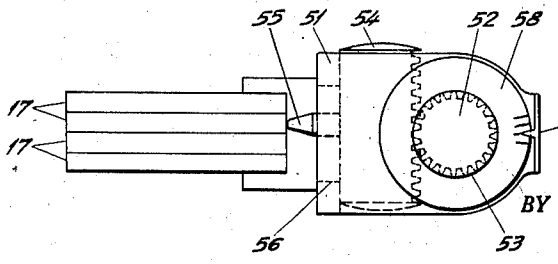


Fig. 12

Fig. 13



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April 29, 1958 F. GEGAUF 2,832,302

SEWING MACHINE

Filed May 29, 1953 6 Sheets-Sheet 5

Fig. 14

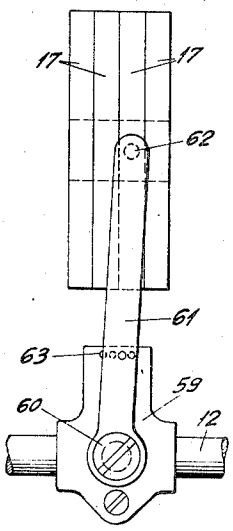


Fig. 15

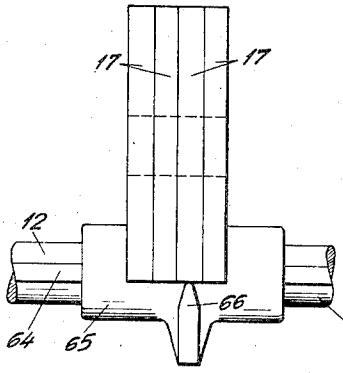


Fig. 16

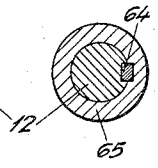


Fig. 17

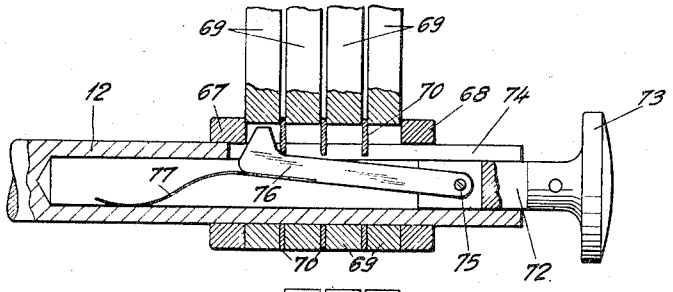
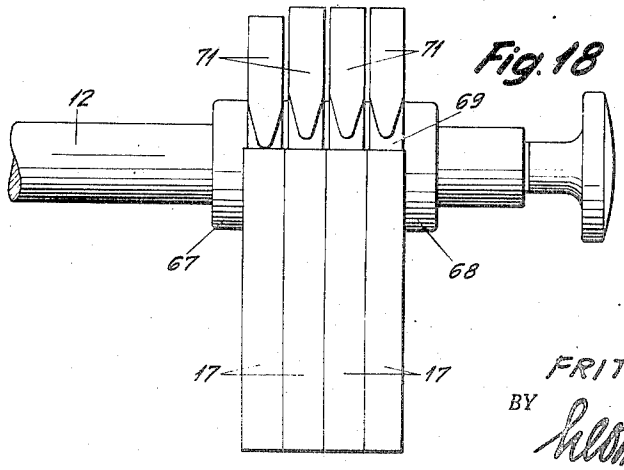


Fig. 18



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April 29, 1958 F. GEGAUF 2,832,302

SEWING MACHINE

Filed May 29. 1953 6 Sheets-Sheet 6

FIG. 19

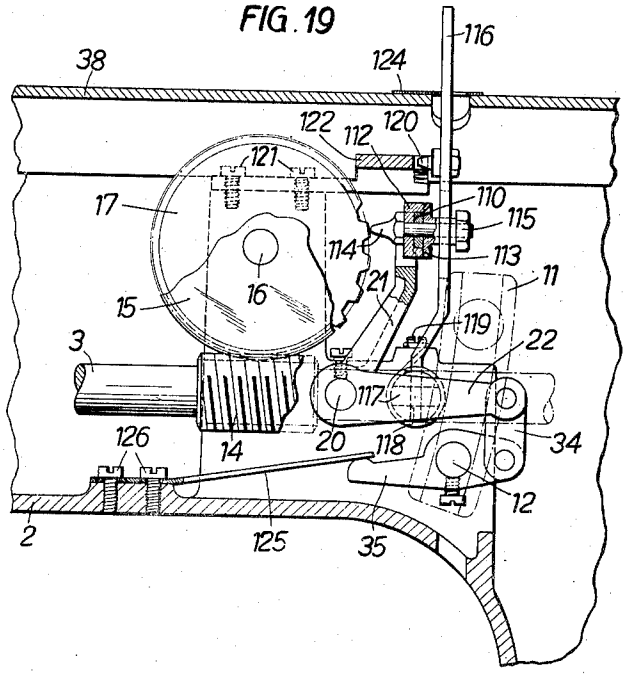
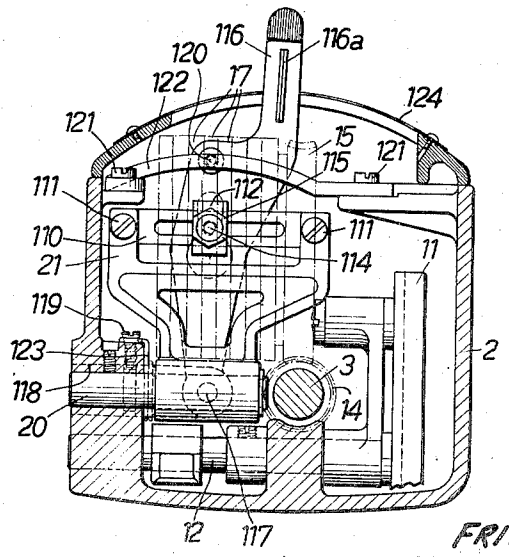


FIG. 20



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United States Patent Office 2,832,302 Patented Apr. 29, 1958

2,832,302

SEWING MACHINE

Fritz Gegauf, Steckborn, Switzerland, assignor, by mesne assignments, to The Singer Manufacturing Company, a corporation of New Jersey

Application May 29, 1953, Serial No. 358,377

Claims priority, application Switzerland May 31, 1952

8 Claims. (Cl. 112—158)

The present invention relates to a sewing machine and more particularly to a sewing machine of the kind permitting zig-zag stitching by combined reciprocation and transverse oscillation of its needle bar. In accordance with known practice, such a zig-zag sewing machine may comprise a needle bar guide, in which the needle bar is longitudinally reciprocable and which is oscillatable transversely to the direction of reciprocation of the needle bar.

In sewing machines of this kind, it is known to use interchangeable cam members for oscillating the needle bar guide to permit various stitch patterns to be obtained. In order to produce the most usual stitch patterns, a corresponding number of cam members are to be interchanged. As these cam members are lodged within the upper arm of the machine frame interchanging thereof can only take place upon uncovering an opening provided for this purpose in said arm, e. g. by swinging open a hinged cover.

This interchange of cam members, however is, troublesome and time-wasting. It is more inconvenient in so far as the cam members to be interchanged are covered with oil. Also, the cam members when removed from the machine may often be lost, or they may be damaged as they usually are made from plastic material rather than from metal.

The main, though not the sole object of the present invention is to provide a mechanism for oscillating the needle bar guide as required for producing various decorative stitch patterns without the necessity of interchanging cam members each time another stitch pattern is to be selected.

According to the invention, the sewing machine comprises a drive shaft, on which a plurality of cam members are mounted, and oscillatable means in driving connection with said needle bar guide said, means being adapted to be oscillated selectively by one of said cam members on rotation of the latter with the drive shaft. These oscillatable means may comprise one cam follower element which can be made to cooperate with any one of the cam members, or a plurality of cam follower elements each adapted to cooperate with one of the cam members and which selectively can be made to actually cooperate with their corresponding cam members, or a plurality of cam follower elements each permanently cooperating with one of the cam members, means being provided for deriving the oscillatory motion, to be transmitted to the needle bar guide, selectively from any one of these cam followers.

The set of cam members may comprise a pack of assembled cam discs permanently or removably mounted on the drive shaft, which may be horizontal or vertical. This renders it possible to produce more than one hundred of the most current stitch patterns without any interchange of parts. Moreover, the arrangement can be such that the member controlling the selection of the respective pattern to be obtained is actuatable from the outside of the machine frame. Also, the cam follower or cam followers may be mounted on an oscillatable lever

forming part of said oscillable means, which permits a a particularly convenient construction of the various accessory parts required for producing decorative stitch patterns.

Other objects and advantages of the invention will become apparent from the description now to follow, of various embodiments thereof shown by way of examples in the accompanying, partly diagrammatic drawings. In these drawings:

Fig. 1 is a logitudinal section of the upper part of a sewing machine made according to a first embodiment of the invention, in which the oscillation of the needle is controllable by an angularly adjustable control member cooperating with cam members arranged side by side;

Fig. 2 is a partial longitudinal section corresponding to Fig. 1;

Fig. 3 is a partly sectional top view of the mechanism shown in Fig. 2, with a top cover omitted;

Fig. 4 is a sectional view as seen from the right of Fig. 2, the said top cover being again omitted;

Fig. 5 is a larger size sectional view corresponding to part of Fig. 4 but as seen from the opposite side;

Figs. 6 and 7 show, in development, two halves of the periphery of a flange on the adjustable control member, with stitch patterns marked thereon;

Figs. 8 and 9 show in sectional elevation and in a view from above, respectively, an alternative arrangement of a disengaging device cooperating with the control member;

Figs. 10 and 11 show in sectional elevation and in a top plan view, respectively, an embodiment comprising one cam follower mounted on a lever;

Figs. 12 and 13 are corresponding views of an embodiment in which the cam follower is mounted on a slide member;

Fig. 14 shows part of a further embodiment in which the cam follower is mounted on a lever;

Fig. 15 illustrates an embodiment having the cam follower mounted on a sleeve;

Fig. 16 is a cross-section corresponding to Fig. 15;

Figs. 17 and 18 are a partly sectional view and a corresponding view from outside, respectively, of a further embodiment comprising a plurality of cam followers selectively couplable to an oscillatable shaft;

Fig. 19 shows still another embodiment of the invention in a partly sectional view of the upper part of a sewing machine; and

Fig. 20 is a cross-section corresponding to Fig. 19, with the oscillatable lever and other parts seen from the right of Fig. 19.

In the first embodiment shown in Figs. 1 to 7, the reference numeral **2** designates an upper arm integral with the frame post **1** of the sewing machine. In this arm **2**, the upper drive shaft **3** of the machine is supported, this shaft carrying the conventional handwheel **4** and being movable by a transmission element **5** from conventional driving means (not shown). The drive is transmitted by conventional means (not shown) to the needle bar **6** (Fig. 1) so as to impart thereto a reciprocating up-and-down motion. The needle bar **6**, which carries the sewing needle **7** is movably guided, according to known practice, in a swingable frame **8** which receives its oscillatory motion from a bar **9** forming an extension of a link member **10** pivoted on a pin **10***a*. By this oscillatory motion of the frame, the needle bar **6** receives in known manner, the transverse motion necessary for producing a zig-zag seam. The amplitude of this transverse motion can be varied from zero to a certain upper limit, for which purpose a block **13** carrying the said pin **10***a* is slidably mounted in the usual swingable guide lever **11**, the latter being supported on a shaft **12**. Adjustment of the block **13** is possible, in known manner, by means of a ro-

tatable knob (not shown), arranged outside the machine frame and coupled to the forked end of the link member **10**.

The drive shaft **3** transmits its rotary motion by a worm **14** to a worm wheel **15** mounted on a horizontal shaft **16** so that the latter is driven at reduced speed. On this shaft **16**, four cam discs **17** (Figs. 2 to 4) are supported, each having its periphery shaped as a different curve or guiding track. The various cam discs **17** are angularly coupled to a ring **19** by means of a pin **18** carried by this ring and extending parallel to the said shaft **16**, and the ring **19** is in fixed relation to the worm wheel **15**, so that the discs **17** partake in the rotation of the latter.

On an axle **20**, a double-armed oscillating lever **21**, **22** is rockably mounted. Its upper arm **21** provides a lodging for a fixed bushing **23** in which a lock pin **24** is supported, as shown in Fig. 5. One end of this pin **24** projects outwardly from the machine casing and carries a press button **25**, forming an abutment for a helical spring **26** which presses the button **25** and pin **24** outwardly, thereby normally keeping a cross-pin **27** in engagement with one of four notches **28** provided in the opposite end of the bushing **23** so as to locate the lock pin **24** against rotation.

The provision of four notches **28** arranged crosswise in the face of bushing **23** enables the lock pin **24** to be arrested in four angular positions at 90 degrees from each other. The pin **24** may be placed in any of these four positions by pressing it back by means of the button **25**, against the pressure of the spring **26**, and then rotating it into the desired angular position. The bushing **23** carries a control cylinder **29** which has a flange **30** and which by two diametrically opposite recesses engages another cross-pin **31** of the lock pin **24**, so that the control cylinder **29** is angularly coupled to the lock pin **24**. On the corresponding end face of the control cylinder **29**, a washer **32** provides an abutment for the inner end of spring **26**. Four pin-shaped cam followers **33** are fixed at equal angular intervals in the periphery of control cylinder **29**. Axially of the said cylinder **29**, these cam followers are offset in relation to each other in such a way that each is in the plane of one of the aforesaid cam discs **17** so that it can be made to cooperate by its flattened free end with the circumference of that disc.

By corresponding adjustment of the angular position of control cylinder **29** on the bushing **23**, which is possible after unlocking the lock pin **24**, any one of the four cam follower pins **33** can be brought into operating position, i. e. made to cooperate with the corresponding cam disc **17**. As the worm wheel **15** to which the cam discs **17** are angularly coupled, is rotated by the worm **14**, the oscillating lever **21**, **22** is therefore rocked about its supporting axle **20** according to the profile of that cooperating cam disc **17**, by means of the cam follower pin **33** in question and the control cylinder **29**. The lower arm **22** of the oscillating lever **21**, **22** is connected by a link **34** to an angle lever **35** which is fixed on the shaft **12** carrying the guide lever **11**. Thus, the motion of the oscillating lever **21**, **22** is transmitted to the guide lever **11** and from the latter to the swingable frame **8** in which the needle bar **6** is guided. The other arm of the angle lever **35** is loaded by a compression spring **36** supported on a fixed rod **37**. This spring **36** urges the oscillating lever **21**, **22** towards the shaft **16** which carries the cam discs **17** so as to hold the respective operative cam follower **33** in resilient engagement with the circumference of the selected cam disc **17**. The flange **30** provided on the control cylinder **29** projects outwardly through an opening **33***a* in the upper cover **38** which if desired may be swung open to provide access to the control cylinder **29**, to the cam discs **17** and to their associated parts. On the periphery of the flange **30**, four stitching patterns as shown in Figs. 6 and 7 are engraved in positions corresponding to the angular positions of the four cam followers **33** provided on the control cylinder **29**, these patterns indicating those which can be obtained by using the cam disc **17** cooperating with the respective cam follower **33**. That pattern which is produced by means of the cam follower **33** happening to be in operative position, and of its cooperating cam disc **17**, is visible on the portion of the circumference of the said flange **30** which projects through the opening in the cover **38**. The flange **30** is knurled so that it may be moved easily by hand, from its outwardly projecting and accessible portion, to rotate the control cylinder **29** and the lock pin **24** coupled thereto by cross-pin **31**, after the cross-pin **27** has been disengaged from the notches **28** of bushing **23** by pressure on the button **25**, overcoming the action of spring **26**.

In Figs. 1 to 3, the numerals **39**, **40** indicate a two-armed disengaging lever supported on a pivot **41**. The arm **39** of this lever also projects upwardly beyond cover **38**, while its opposite arm **40** embraces part of a step provided on the flange **30** of control cylinder **29** (Fig. 5). If this disengaging lever is swung from its inactive position shown in full lines, into the active position indicated in dash-and-dot lines in Fig. 2, its arm **40** engages the cylinder **29** and lifts it, thus causing the oscillating lever **21**, **22** which supports it and which indirectly is loaded by spring **36**, to move in such a way that the active cam follower **33** is retained out of engagement with its cooperating cam disc **17**, whereupon influence of the latter on the guide lever **11** ceases. If the disengaging lever **39**, **40** is returned to its full-line position, the control cylinder **29** reverts to its active position. Means (not shown) are provided for arresting the disengaging lever **39**, **40** in either of its active and inactive positions. Disengagement of the control cylinder **29** is to take place when the machine is used for normal straight sewing, for mending, and the like.

Figs. 8 and 9 show an alternative arrangement for disengaging the control cylinder **29**. This arrangement includes an eccentric cam **39***a* adapted for cooperation with a fixed abutment **39***b*. The eccentric cam **39***a* can be rotated on the locking pin **24** by means of the cylinder **29** and its flange **30** to engage the abutment **39***b*, whereby the said cylinder **29** is swung away from the shaft **16** carrying the cam discs **17**. By corresponding rotation of the cam **39***a*, the cylinder **29** can be caused to be swung back to its initial or operative position by means of the oscillating lever **21**, **22**.

In the embodiment of Figs. 10 and 11, the shaft **12** on which the guide lever (not shown in these figures) is mounted, carries a bent supporting arm **42** on the horizontal portion of which a control lever **44** is mounted by means of a vertical pivot **43**. At one of its ends, the control lever **44** carries a cam follower **45** fixed to it, and at the opposite end of lever **44** a spring-loaded lock pin **46** is mounted; the latter cooperates with locking notches **47** provided on the arm **42**. Parallel to the said pivot **43**, a knurled pin **48** is rotatably supported in arm **42**; this pin traverses a slot in the control lever **44** and has an integral tooth rim **49** which engages a toothed segment **50** screwed to the control lever **44**.

By corresponding manual rotation of the pin **48** with its knurled end portion serving as a grip, the control lever **44** can be swung about its pivot **43** and adjusted as desired for positioning its cam follower **45** opposite one or the other of the four cam discs **17**, so that it cooperates with this disc for transmitting the control motion to the shaft **12** of the guide lever. In each selected position, the control lever **44** is arrested by the engagement of its lock pin **46** in the corresponding locking notch **47**.

In the embodiment according to Figs. 12 and 13, an arm **51** is fixed to the aforesaid shaft **12** carrying the guide lever, and supports a manually rotatable pin **52**. This pin has an integral pinion **53** which engages a cylindrical control bolt **54** provided with lateral teeth and which is

axially slidable in a transverse bore of the arm **51**. On its side opposite the said teeth the slidable bolt **54** carries a pin-shaped cam follower **55** which extends through a slot **56** in the arm **51**.

By corresponding rotation of the pin **52**, the control bolt **54** can be displaced axially of the bore in which it is lodged, so as to place the cam follower **55** in alignment with any of the four cam discs **17** and cause it to cooperate with the latter in order to transmit the control motion to the shaft **12**. An index **57** fastened to the arm **51** shows, on a dial engraved on a flange **58** of pin **52**, what position the cam follower **55** occupies in relation to the set of cam discs **17**, it being assumed that the cam follower **55** is hidden within the casing of the machine. Of course, means (not shown) may be provided for arresting the control bolt **54** in its selected axial position.

Fig. 14 shows an alternative arrangement differing from that represented in Figs. 10 and 11 by having a control lever **61** pivoted on a pin **60** itself fixed to a support **59** carried by the shaft **12** on which the guide lever is mounted. At its free end, the lever **61** has a transverse pin **62** serving as a cam follower. By suitable rotation of the lever **61** on its pivot pin **60**, the cam follower pin **62** can be made to cooperate with any of the four cam discs **17** shown. **63** are four locking depressions in the support **59**, which depressions can be engaged by a nose on the control lever **61** to secure the latter in its selected position.

In the embodiment represented in Figs. 15 and 16, a control sleeve **65** is slidably mounted on the shaft **12** which carries the guide lever, and angularly coupled to said shaft by means of a key **64**. The sleeve **65** carries a cam follower **66** and can be slid axially into selected positions for which the cam follower **66** engages the periphery of one or the other of the cam discs **17**. Automatic arresting means (not shown) are provided for maintaining the control sleeve **65** against axial displacement in any of the selected positions.

According to Figs. 17 and 18, four levers **69** are rotatably maintained on the said shaft **12** one beside the other between two positioning rings **67** and **68**, with washers **70** interposed between the individual levers **69**. Each of these levers has a cam follower finger **71** at one end and a cut out portion **69***a* adjacent the other end. In an axial bore of the said shaft **12**, a slide **72** provided with an external hand knob **73** is axially displaceable. In the region of the levers **69**, the shaft **12** has a longitudinal slot **74**, into which an inner tongue or projection **70***a* of each of the washers **70** extends. Opposite this slot, the levers **69** each have a radial recess **69***a*. In the forked inner end of slide **72**, a flat coupling lever **76** is articulated on a transverse pin **75**. The free end of this lever **76***a* forms a coupling head having opposite sloping faces. A leaf spring **77** fixed to the lever **76** urges the latter into such a position that its coupling head **76***a* projects outwardly through the slot **74**, so that by suitable axial displacement of the slide **72**, by means of the hand knob **73**, any one of the four levers **69** can be angularly coupled to the shaft **12**, as the said coupling head **76***a* of the lever **76** engages the radial recess **69***a* of the lever **69** in question. Thus, the oscillating motion which is imparted to that lever **69** by the corresponding cam disc **17** is transmitted to the shaft **12** and to the guide lever carried by the latter. When the slide **72** is axially displaced, the coupling lever **76** is retracted by the sloping face of its coupling head **76***a* as the latter meets the inwardly projecting tongue **70***a* of any of the washers **70** in its way, so that the coupling head may contact any of the other levers **69**, as desired, after which the knob **73** is axially rotated for engagement therewith.

The embodiment shown in Figs. 19 and 20 which now will be described is remarkable by the compact, yet plain construction and the good accessibility of the parts provided for producing decorative seams.

12 again indicates the shaft carrying the guide lever **11**. The two-armed oscillating lever **21**, **22** is again supported on the axle **20**; its upper arm **21** is widened as shown in Fig. 20 and in its top portion forms a fork supporting guide plate **110** fixed by a pair of screws **111** and provided with slot **110***a*. This guide plate **110** carries a slidable cam follower support which comprises a slide member **112** U-shaped in cross-section and a counterplate **113** having an integral sleeve plug **113***a*. The parts **112**, **110** and **113** are traversed by the stem of a screw **114**, the head of which is shaped to form a cam follower and which, when untightened, permits displacement of the cam follower support, i. e. parts **112** and **113**, along the slot **110***a* of the guide plate **110**. By tightening a nut **115** on this screw **114**, the said cam follower support can be arrested in desired position on the guide plate **110**.

To displace the cam follower support **112**, **113** on the guide plate **110**, a control lever **116** is pivoted on a pin **117** in a longitudinal slot of a stub shaft **118** which is rotatably supported in the wall of the upper arm **2** forming part of the machine casing. A screw bolt **119** screwed into the casing wall engages a circumferential groove of the stub shaft **118** and secures the latter against axial displacement.

The control lever **116** has a longitudinal slot **116***b* through which said sleeve plug **113***a* provided on counterplate **113** extends. The upper end of lever **116** carries a tapered screw bolt **120** adapted to engage a corresponding notch **122***a* of a plurality of notches in a fixed locking segment **122**. The engagement of screw bolt **120** in any of the said notches is produced by a torsion spring **123** acting on shaft **118**. For manual actuation, the lever **116** has an end portion projecting beyond the slotted top of casing arm **2**. If the lever **116** is swung to the right (Fig. 19) about the axis of shaft **118**, until it abuts the edge of slot **124***a* in the graduated plate **124** fixed at the top surface of arm **2**, this lever **116** first abuts the nut **115** on screw **114** and thereafter carries the screw **114** and the cam follower support **112**, **113** with it, thereby rocking the oscillating lever **21**, **22** about its supporting axle **20**. The cam follower portion of screw **114** is thus lifted off the periphery of the cam disc **17** with which it was in engagement; simultaneously, the tapered screw **120** is moved out of engagement with the locking segment **122**. The control lever **116** then can be swung laterally about its pivot pin **117** to bring the cam follower portion of screw **114** in front of another selected cam disc **17**. On being released, the lever **116** automatically swings back towards the group of cam discs, so that the head of screw **114** comes into contact with the periphery of the newly selected cam disc **17**, and the tapered screw **120** engages the corresponding notch in the locking segment **122**.

Through its connected linkage, comprising the link **34** and the two-armed lever **35** mounted on the shaft **12** which carries the guide lever **11**, the oscillating lever **21**, **22** is acted upon by a flat spring **125** which is fixed to the casing **2** by two screws **126**. The profiles of the cam discs **17** are characterized by diagrammatic representations of the corresponding sewing patterns, engraved on the outside of the graduated plate **124**. The mark **116***a* engraved on the control lever **116** indicates, for each position of the latter, which pattern will be obtained from the cam disc **17** cooperating with screw **114** in that particular position of the lever.

This embodiment of the invention has the particular advantage that the auxiliary parts provided for sewing ornamental patterns can be produced in a comparatively easy way. Of course, the specific execution may depart somewhat from that shown in the drawing. For instance, the oscillating lever **21** could be supported directly on the shaft **12** carrying the guide lever **11**, whereby the arm **22**, the link **34** and one arm of the double-armed lever **35** could be omitted.

As the foregoing examples will make clear to anybody skilled in the art, the invention can be carried out

in many other ways within the scope of the claims now to follow.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. An ornamental stitch sewing machine for selectively producing a plurality of different stitch patterns and comprising, a hollow frame, a needle pivotally carried by said frame and mounted for endwise reciprocation and for lateral swinging movements, a rotary shaft mounted in said frame for reciprocating said needle, means for rotating said shaft, a series of rotary cams having different stitch patterns carried by said frame and mounted about a common axis, means connected with said shaft for rotating said cams about said common axis, a cam follower, means mounting said cam follower in said frame for movement radially of said common axis, said follower having a single cam-engaging head with its one end engaging and responding to the surface of a cam of said series, means enabling a selected cam to be engaged by said single cam-engaging head, spring means normally urging said single cam-engaging head into engagement with said selected cam surface, means releasably locking said cam-engaging head and said selected cam surface against movement relative to each other lengthwise of said common cam axis during the normal operation of the machine, a manually operable member carried within said frame and having a portion positioned adjacent to and movable with said cam follower for withdrawing said cam-engaging head from and radially of said selected cam surface, a handle formed on said member and extending outside the confines of said frame, said series of cams and said single cam-engaging head being relatively shiftable lengthwise of the common cam axis after said cam follower has been withdrawn radially from a selected cam thereby to effect a partial or a complete traverse of said series of rotary cams whereby the single cam-engaging head can be manually engaged with one cam after the other in any desired sequence, and a pitman having one end connected with said needle at a point spaced from the pivot and its other end operatively connected with the other end of said single cam-engaging head thereby to impart lateral swinging movement to said needle in response to the surface of said selected cam.

2. An ornamental stitch sewing machine according to claim 1, wherein said cam follower comprises a stem, said manually operated member having a slot, said stem extending through said slot in said manually operated member, whereby movement of said stem along its longitudinal axis due to engagement of said cam follower with one of said cam members will pass freely through said slot of said manually operated member upon said movement of said stem through said slot.

3. A sewing machine for producing a plurality of different stitch patterns; comprising in combination, a hollow frame, a needle pivotally carried by said frame permitting endwise reciprocation and lateral swinging movements to define a plurality of different stitch patterns, a shaft rotatably mounted in said frame for causing reciprocation of said needle, means connected to said shaft for rotating said shaft, rotary cams defining different stitch patterns carried by said frame, said cams being mounted about a common axis, means connected with said shaft for rotating said cams about said common axis, a cam follower engageable with said cams, means mounting said cam follower in said frame for movement radially of said common axis, said mounting means including a control lever having a slot therethrough, spring means engaging said cam follower for urging said cam follower through said slot and against a selected cam, said cam follower having a cam engaging head contacting and responding to a surface of said selected cam, said cams and said cam engaging head being relatively shiftable lengthwise of said common axis subsequent to withdrawal of said cam follower from said selected cam to effect at least a partial traverse of said cams whereby the cam engaging head can be manually brought into contact with said cams singly in any desired sequence of said cams, and a pitman having one end connected with said needle at a point spaced from the pivot and its other end operatively connected with the other end of said cam engaging head thereby to impart lateral swinging movement to said needle in response to the surface of said selected cam.

4. A sewing machine for producing a plurality of different stitch patterns; comprising in combination a hollow frame, a needle pivotally carried by said frame permitting endwise reciprocation and lateral swinging movements thereof to define a plurality of different stitch patterns, a shaft rotatably mounted in said frame for causing reciprocation of said needle, means connected to said shaft for rotating said shaft, rotary cams each defining a different stitch pattern carried by said frame, said cams being mounted about a common axis, means connected with said shaft for rotating said cams about said common axis, a cam follower engageable with said cams, means mounting said cam follower on said frame for movement radially of said common axis and including a control lever having a slot therethrough, spring means engaging said cam follower for urging said cam follower through said slot and against a selected cam, said cam follower having a cam engaging head contacting and responding to a surface of said selected cam, said cams and said cam engaging head being relatively shiftable lengthwise of said common axis subsequent to withdrawal of said cam follower from said selected cam to effect at least a partial traverse of said cams whereby the cam engaging head can be manually brought into contact with said cams singly in any desired sequence of the latter, a pitman having one end connected with said needle at a point spaced from the pivot and its other end operatively connected with the other end of said cam engaging head thereby to impart lateral swinging movement to said needle in response to the surface of said selected cam, said cam follower including a stem extending through said slot in said control lever whereby a movement of said stem lengthwise of its axis due to engagement of said cam follower with said selected cam will unaffect said control lever due to movement of said stem through said slot, said frame having a slot therein through which said control lever extends from within said frame therewithout, and indicia means on said frame cooperative with said control lever for indicating that said selected cam is set for contact by said cam engaging head.

5. An ornamental stitch sewing machine for selectively producing a plurality of different stitch patterns and comprising, a hollow frame, a needle carried by said frame and mounted for endwise reciprocation and for lateral swinging movements, a rotary shaft mounted in said frame for reciprocating said needle, means for rotating said shaft, a series of rotary cams having different stitch patterns mounted within the hollow frame about a common axis fixed by the frame, means connected with said shaft for rotating each cam through a fraction of a revolution for each complete needle reciprocation, a cam follower, means mounting said cam follower within said frame for movement radially of said common axis, said follower having a single cam-engaging head with its one end engaging and responding to the surface of a cam of said series, means enabling a selected cam to be engaged by said single cam-engaging head, means releasably locking said cam-engaging head and said selected cam surface in active cam tracking relation during the normal operation of the machine, first manually operable means carried within said frame and movable with said cam-engaging head for withdrawing said cam-engaging head from and radially of said selected cam surface, said series of cams and said single cam-engaging head being relatively shiftable lengthwise of the common cam axis after said cam-engaging head has been withdrawn radially from a selected cam thereby to effect a partial or a com-

plete traverse of said series of rotary cams whereby the single cam-engaging head can be manually engaged with one cam after another in any desired sequence, second manually operable means disposed within said frame for relatively shifting the cams and the cam-engaging head lengthwise of the common cam axis, handle means connected within the frame with the said first and second manually operable means and extending outside the confines of said frame for operating said two manually operable means, and means connecting the cam-engaging head with the needle thereby to impart lateral swinging movements to said needle in response to the surface of said selected cam.

6. An ornamental stitch sewing machine for selectively producing a plurality of different stitch patterns and comprising, a hollow frame, a needle carried by said frame and mounted for endwise reciprocation and for lateral swinging movements, a rotary shaft mounted in said frame for reciprocating said needle, means for rotating said shaft, a series of rotary cams having different stitch patterns mounted within the hollow frame about a common axis fixed by the frame, means connected with said shaft for rotating each cam through a fraction of a revolution for each complete needle reciprocation, a cam follower, means mounting said cam follower within said frame for movement radially and lengthwise of said common cam axis, said follower having a single cam-engaging head with its one end engaging and responding to the surface of a cam of said series, means enabling a selected cam to be engaged by said single cam-engaging head, means releasably locking said cam-engaging head against movement relative to and lengthwise of said common cam axis during the normal operation of the machine, first manually operable means carried within said frame and movable with said cam-engaging head for withdrawing said cam-engaging head from and radially of said selected cam surface, second manually operable means disposed within said frame and connected with said cam-engaging head for shifting the latter lengthwise of said common cam axis after said cam-engaging head has been withdrawn radially from a selected cam thereby to effect a partial or a complete traverse of said series of rotary cams whereby the single cam-engaging head can be manually engaged with one cam after another in any desired sequence, handle means connected within the frame with the said first and second manually operable means and extending outside the confines of said frame for operating said two manually operable means, and means connecting the cam-engaging head with the needle thereby to impart lateral swinging movements to said needle in response to the surface of said selected cam.

7. An ornamental stitch sewing machine according to claim 6, and wherein the machine is provided with an arm pivotally mounted at one end about an axis fixed by the frame in parallelism with the common cam axis, and the single cam-engaging head is shiftably mounted upon the other end of the arm for movements lengthwise of the common cam axis.

8. An ornamental stitch sewing machine according to claim 6 and wherein the machine is provided with an arm whose one end is pivotally mounted about and slidably lengthwise of an axis fixed by the frame in parallelism with the common cam axis, and the single cam-engaging head is mounted upon the other end of the arm.

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