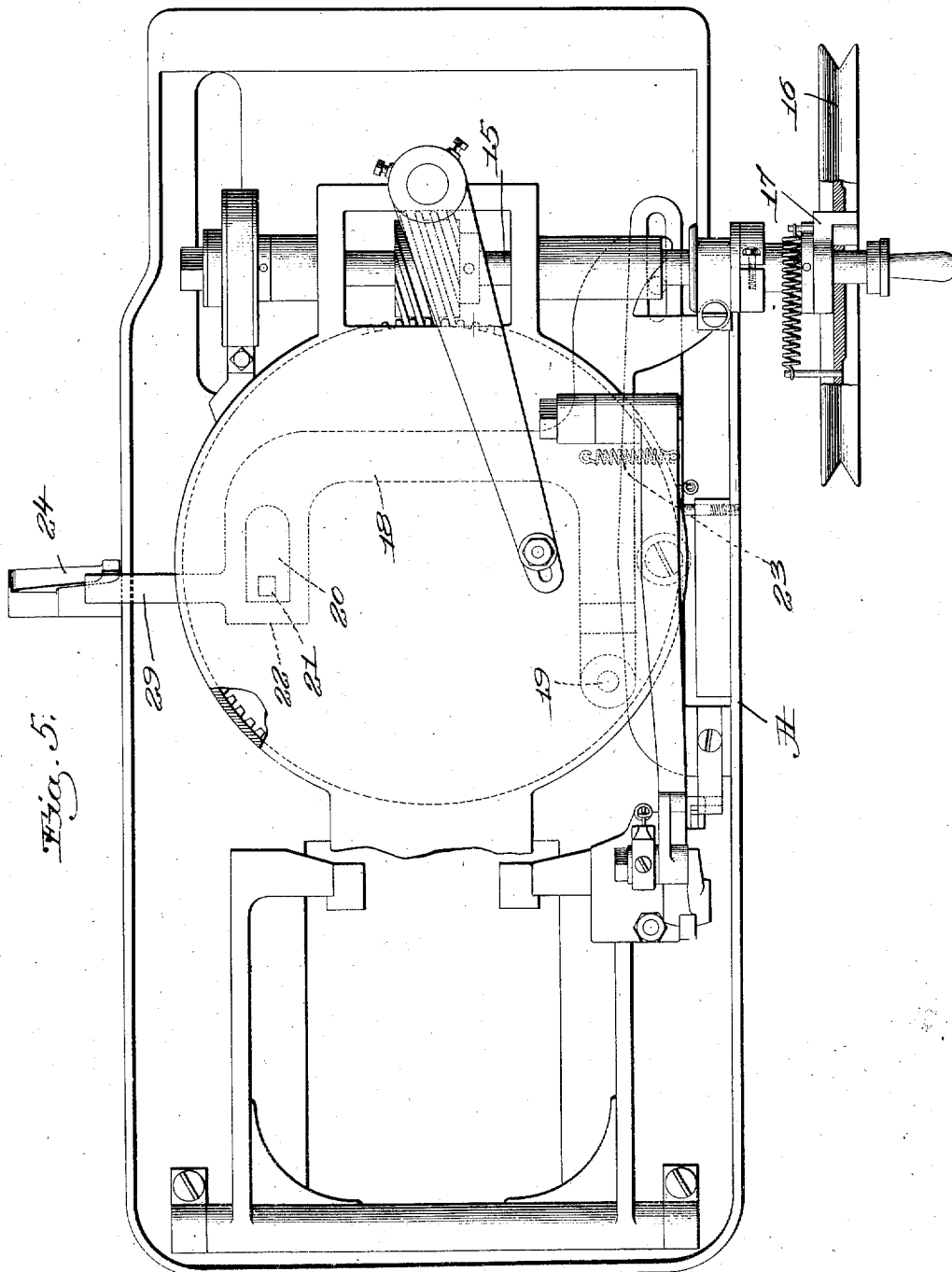


J. KIEWICZ.
 BUTTONHOLE SEWING MACHINE.
 APPLICATION FILED MAY 4, 1911.

1,021,739.

Patented Mar. 26, 1912.

2 SHEETS—SHEET 2.



Witnesses:
 Fred S. Grunbaf.
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Inventor.
 John Kiewicz
 by Edwards Hand & Smith
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UNITED STATES PATENT OFFICE.

JOHN KIEWICZ, OF HYDE PARK, MASSACHUSETTS, ASSIGNOR TO THE REECE BUTTON HOLE MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

BUTTONHOLE-SEWING MACHINE.

1,021,739.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed May 4, 1911. Serial No. 624,940.

To all whom it may concern:

Be it known that I, JOHN KIEWICZ, a citizen of the United States, residing at Hyde Park, county of Norfolk, State of Massachusetts, have invented an Improvement in Buttonhole-Sewing Machines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to buttonhole sewing machines and particularly to that type of buttonhole sewing machine shown and described in United States Letters Patent No. 349,359, No. 665,637 and No. 713,764. In the sewing machines illustrated in these patents the stitch-forming mechanism is sustained by a frame which is movably mounted on the bed of the machine and which has one movement to bring the stitch-forming mechanism into or out of operative position and which has another movement to feed the stitch-forming mechanism while it is operating on the buttonhole. The movement of said frame into and out of its operative position is secured by means of a feed shaft, while the feeding movement of said frame which occurs during the stitching of the buttonhole is secured by other means. In the operation of the sewing machines illustrated in said patents the feed shaft is first connected to its driving mechanism and by its motion it gives said frame a quick movement sufficient to bring the stitch-forming mechanism into proper operative position relative to the buttonhole, and at such time the feed shaft is disconnected from its driving mechanism and the stitching mechanism is automatically set in operation, and during the operation of the stitching mechanism said frame is given a slow intermittent feeding movement to enable the stitching mechanism to properly perform its operation. When the buttonhole is completely stitched the stitching mechanism is automatically thrown out of operation and the feed shaft is again connected to its driving mechanism thereby to cause the frame to have a quick return movement to its initial position. In the operation of these machines it is essential that the stitching mechanism should be brought to rest at the end of the stitching operation and before the feed shaft is clutched to its driving mechanism in order to return said frame to its initial position,

for if the return movement of said frame is commenced before the stitching operation ceases the needle is apt to be caught in the work and become bent or broken, and other injury is likely to occur. Patent No. 713,764 shows and describes in the cam e' and stud e'' a mechanism which is designed to prevent the engagement of the feed shaft with its driving pulley until the stitching mechanism is brought to rest.

My present invention has for its object to provide an improved mechanism for thus preventing the feed shaft from being set in operation until after the stitching mechanism has been brought to rest and a selected embodiment of the invention will first be described and then the novel features will be pointed out in the appended claims.

Figure 1 of the drawings is a side view of one end of the frame showing the clutch mechanism for controlling the stitch-forming mechanism; Fig. 2 is a sectional view of the clutch showing a portion of the controller cooperating therewith; Fig. 3 is a rear view of the clutch with the lever shown in section on the line $x-x$, Fig. 1; Fig. 4 is an enlarged sectional view on the line $y-y$, Fig. 3; Fig. 5 is an under side view of the machine.

In order to illustrate the principle of the invention I have shown it as it might be applied to the machine illustrated in said Patent No. 713,764, and I desire to state that the invention can be readily applied to other sewing machines of this general type.

In the drawings 1 designates a part of the stationary frame of the sewing machine and 2 is the movable frame carrying the stitch-forming mechanism and which is provided with the base 3 that moves back and forth in suitable ways mounted on the sewing machine frame. The stitching mechanism (which is not shown herein as it forms no part of the present invention) is driven by a driving shaft 4 mounted in the movable frame 2 and operated from a driving pulley 5 through a clutch shown best in Figs. 1, 2 and 4 and similar in all respects to the clutch shown in said Patent No. 713,764. Said clutch comprises a clutch dog 6 which is pivoted at 8 to a hub 7 fast on the driving shaft 4 and which is provided with a projecting tail 9 and with a clutch projection 10 that is adapted to engage a cam projection 11 formed on the pulley 5, said clutch dog

being acted upon by a spring 12* which normally throws the projection 10 thereon into position to engage said cam 11. The engagement of the cam 11 with the projection 10 serves to connect the driving pulley 5 to the shaft 4 all as described in said patent. The driving pulley 5 is disconnected from the shaft 4 when the stitching mechanism is to be brought to rest by the engagement of the tail 9 of the clutch dog with a lug 12 yieldingly carried by a lever 13 which is pivoted to the frame 2 at 14 and which derives its swinging movement by the reciprocating movement of said frame 2, all as fully set forth in said Patent No. 713,764, to which reference may be had. The swinging lever 13 and the lug 12 (said parts being lettered *a'* and *a''* in Patent No. 713,764) may be termed a driving clutch disengaging means as they operate to effect the disengagement of the driving clutch when they are moved from their inoperative to their operative position.

The frame 2 is given its movement into and out of operative position by means of a feed shaft 15 which derives its motion from a continuously-rotating pulley 16 that is adapted to be clutched to and unclutched from said shaft through the operation of a suitable clutch shown generally at 17 and described fully in said Patent No. 713,764. This clutch is operated by a lever 18 shown in dotted lines Fig. 5 which is pivoted to the frame at 19 and which is provided with an aperture 20 through which projects the end of an arm 21 rigid with the lever 13. These parts are so constructed that when the lever 13 swings into its operative position shown in Fig. 1 thereby to bring the lug 12 into the path of movement of the tail 9 of the clutch dog and thus effect the unclutching of the pulley 5 from the shaft 4, the arm 21 is moved toward the right Figs. 1 and 5 thereby moving away from the portion 22 of the lever 18 and permitting the spring 23 to come into play to shift the clutch 17 and connect the driving pulley 16 to the feed shaft 15, thus giving to the frame its quick movement into initial position. The construction and operation of these parts which have been above referred to are quite fully set forth in said Patent No. 713,764, and as they do not constitute part of the present invention it is thought that no further description thereof is necessary.

In the operation of the sewing machine the pulley 16 is first clutched to the feed shaft 15 and the latter is operated to give the frame 2 a movement sufficient to bring the stitch-forming mechanism into operative position relative to the work, and at such time the pulley 16 is automatically disengaged from the shaft 15 and the clutch on the shaft 4 is thrown into operation thereby starting up the stitching mechanism. Dur-

ing the stitching of the buttonhole the frame 2 is moved slowly and intermittently to provide the proper feeding movement thereof, and when the buttonhole is completed the lever 13 is thrown into the position shown in Fig. 1 thereby to disengage the clutch on the shaft 4 and permit the stitching mechanism to be brought to rest and at such time the lever 18 is released to permit the clutch 17 to move the frame 2 from the feed shaft 15.

It sometimes happens that for one reason or another the clutch on the driving shaft 4 is not thrown out of operation properly before the clutch 17 on the feed shaft is thrown into operation, and when this occurs the frame 2 is liable to have a quick movement toward its initial position while the needle is still in the work, a condition which will result in a bent needle and broken thread, or possibly a broken needle. To prevent this I have provided a construction which positively locks the lever 18 from movement until the clutch on the shaft 4 is completely released. I secure this end by employing a locking member which is controlled by the clutch on the shaft 4 and which will lock the lever 18 from movement except when said clutch is disengaged. This locking member is shown as a lever 24 pivotally mounted on a stud or shaft 25 extending from the frame and having at its upper end an extension 26 which engages the periphery of the hub 7 of the clutch. Said hub is provided in its periphery with a notch 27 into which the extension 26 may enter, as seen in Figs. 1 and 2 when the hub is in the proper position. When the finger 26 is bearing on the periphery of the hub, as at 28, the lower end of the lever 24 is held in engagement with an extension 29 formed on the lever 18, and said arm 24 thus positively locks the lever 18 from movement in a direction to throw the clutch 17 into engagement. So long as the stitching mechanism is in operation and the hub 7 is rotating, the engagement of the portion 28 of the hub with the extension 29 will positively prevent the clutch 17 from being thrown into engagement. When the clutch on the shaft 4 is disengaged, however, as shown in Fig. 1, and the notch 27 is brought around into alignment with the finger 26, the locking arm 24 is permitted to turn and thereby permit the lever 18 to move to the right, Figs. 1 and 5, under the influence of the spring 23 thereby to throw the clutch 17 into engagement. With this construction it will be seen that the feed shaft 15 cannot be set in operation to give the frame 2 its return movement until the clutch on the driving shaft 4 is disengaged and the locking member 24 is released by said clutch. Perhaps it should be stated that so long as the lever 13 is in the inop-

erative position which it assumes during the stitching operation, the arm 21 will hold the feed-shaft-clutch-controlling lever 18 in the position shown in Fig. 5, and that the locking arm 24 is brought into use only after the lever 13 has swung into the position shown in Fig. 1 and in case the driving clutch on the shaft 4 is not released by this movement of the lever 13. It will thus be seen that I have provided a means controlled by the driving clutch which positively holds the feed shaft-clutch-controlling lever 18 in its inoperative position until the clutch is disengaged and the hub 7 brought to rest.

In Patent No. 713,764 the lever a' (which corresponds to the rocking lever 13 of this application) carries a stud e^5 which serves to prevent the lever a' from turning into its operative position to disengage the clutch, and thereby through the arm a^8 and lever a^9 prevents the feed clutch shaft from being engaged except when the driving clutch is in a predetermined position. My present invention is to be distinguished from this patent in that it provides means for locking the feed shaft clutch disengaged while the driving clutch is in operation, which means are separate and independent from the means for disengaging the driving clutch.

While the construction herein shown is the preferred embodiment of my invention I wish to state that various changes in the constructional details may be made without departing from the invention.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a buttonhole sewing machine, the combination with a frame for sustaining the stitch-forming mechanism, of a driving clutch for operating said mechanism, a feed shaft for moving the frame to carry it into and out of operative position, a feed shaft clutch through which said feed shaft is actuated, driving-clutch-disengaging means movable from an inoperative to an operative position, means associated therewith to hold the feed shaft clutch in inoperative position when the driving-clutch-disengaging means is in inoperative position, and separate and independent means controlled by the driving clutch to hold said feed shaft clutch in inoperative position while the driving clutch is engaged.

2. In a buttonhole sewing machine, the combination with a frame for sustaining stitch-forming mechanism, of a driving clutch for operating said mechanism, a feed shaft for moving the frame to carry it into and out of operative position, a feed shaft clutch through which the feed shaft is actuated, a lever for controlling said feed shaft clutch, a rocking driving-clutch-disengaging member movable from an inop-

erative to an operative position, means associated with said member to hold said lever in inoperative position while said member is in inoperative position, and separate means controlled by the driving clutch and engaging said lever to hold positively the feed shaft clutch disengaged while the driving clutch is in operation.

3. In a buttonhole sewing machine, the combination with a frame for sustaining stitch-forming mechanism, of a driving clutch for operating said mechanism, a feed shaft for moving the frame to carry it into and out of operative position, a feed shaft clutch through which said feed shaft is actuated, a lever for controlling said feed shaft clutch, driving-clutch-disengaging means movable from an inoperative to an operative position, means associated therewith to hold said lever in inoperative position when the driving-clutch-disengaging means is in inoperative position, and separate and independent means controlled by said driving clutch and engaging said lever to hold positively the feed shaft clutch disengaged while the driving clutch is in operation.

4. In a buttonhole sewing machine, the combination with a frame for supporting stitch-forming mechanism, of a driving clutch for operating said mechanism including a hub carrying a clutch dog and provided with a notch, a feed shaft for moving said frame to carry it into and out of operative position, a feed shaft clutch through which said feed shaft is actuated, a lever for controlling said clutch, and a pivoted locking lever adapted to engage said hub and also to engage said clutch-controlling lever and hold the latter positively in inoperative position when said locking lever is in engagement with the periphery of the hub, said locking lever permitting the clutch-controlling lever to move into operative position when said locking lever occupies the notch in said hub.

5. In a buttonhole sewing machine, the combination with a frame for supporting stitch-forming mechanism, of a driving clutch for operating said mechanism, a feed shaft for moving said frame to carry it into and out of operative position, a feed shaft clutch through which said feed shaft is actuated, a lever for controlling the clutch, driving-clutch-disengaging means to disengage the driving clutch at a predetermined point in the movement of the frame, and means controlled by the driving clutch and operating independently of said driving-clutch-disengaging means to hold positively the feed shaft controlling lever in inoperative position while the driving clutch is in operation.

6. In a buttonhole sewing machine, the combination with a frame for supporting

stitch-forming mechanism, of a driving clutch for operating said mechanism and comprising a hub carrying a clutch dog, a feed shaft for moving said frame to carry it into and out of operative position, a feed shaft clutch through which said feed shaft is actuated, a lever for controlling said feed shaft clutch, means to engage said clutch dog and thus disengage the driving clutch during the movement of the frame, a pivoted locking lever having one end adapted to engage said hub and the other end to engage the feed shaft controlling lever and positively hold said latter in inoperative position, said hub having a notch positioned to receive the end of said locking lever when the clutch dog is disengaged whereby the feed shaft clutch controlling lever is released to permit the feed shaft clutch to be engaged.

7. In a buttonhole sewing machine, the combination with a frame for supporting stitch-forming mechanism, of a driving

clutch for operating said mechanism, a feed shaft for moving the frame to carry it into and out of operative position, a feed shaft clutch through which said feed shaft is operated, a rocking driving-clutch-disengaging member movable from an inoperative into an operative position at a predetermined point in the movement of the frame, means associated therewith to hold the lever in inoperative position when said rocking member is in inoperative position, and separate means controlled by the driving clutch and engaging said lever to hold positively the feed shaft clutch disengaged while the driving clutch is in position.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN KIEWICZ.

Witnesses:

THOMAS J. CARTY,
FREDERICK W. DAVISON.

Correction in Letters Patent No. 1,021,739.

It is hereby certified that in Letters Patent No. 1,021,739, granted March 26, 1912, upon the application of John Kiewicz, of Hyde Park, Massachusetts, for an improvement in "Buttonhole-Sewing Machines," an error appears in the printed specification requiring correction as follows: Page 4, line 38, for the word "position" read *operation*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of April, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

stitch-forming mechanism, of a driving clutch for operating said mechanism and comprising a hub carrying a clutch dog, a feed shaft for moving said frame to carry it into and out of operative position, a feed shaft clutch through which said feed shaft is actuated, a lever for controlling said feed shaft clutch, means to engage said clutch dog and thus disengage the driving clutch during the movement of the frame, a pivoted locking lever having one end adapted to engage said hub and the other end to engage the feed shaft controlling lever and positively hold said latter in inoperative position, said hub having a notch positioned to receive the end of said locking lever when the clutch dog is disengaged whereby the feed shaft clutch controlling lever is released to permit the feed shaft clutch to be engaged.

7. In a buttonhole sewing machine, the combination with a frame for supporting stitch-forming mechanism, of a driving

clutch for operating said mechanism, a feed shaft for moving the frame to carry it into and out of operative position, a feed shaft clutch through which said feed shaft is operated, a rocking driving-clutch-disengaging member movable from an inoperative into an operative position at a predetermined point in the movement of the frame, means associated therewith to hold the lever in inoperative position when said rocking member is in inoperative position, and separate means controlled by the driving clutch and engaging said lever to hold positively the feed shaft clutch disengaged while the driving clutch is in position.

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