

Jan. 5, 1932.

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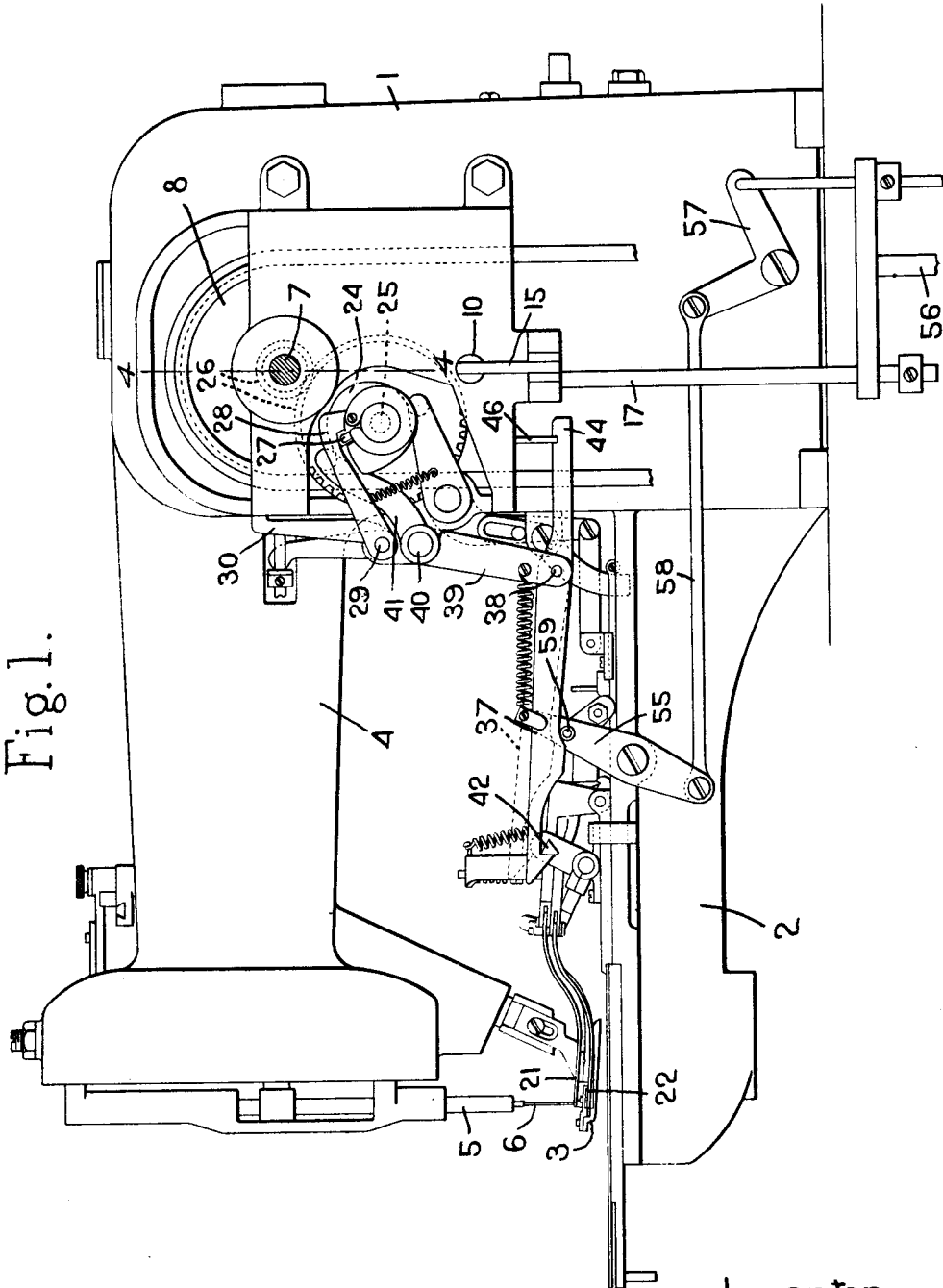
1,839,524

SEWING MACHINE

Filed March 20, 1928

3 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

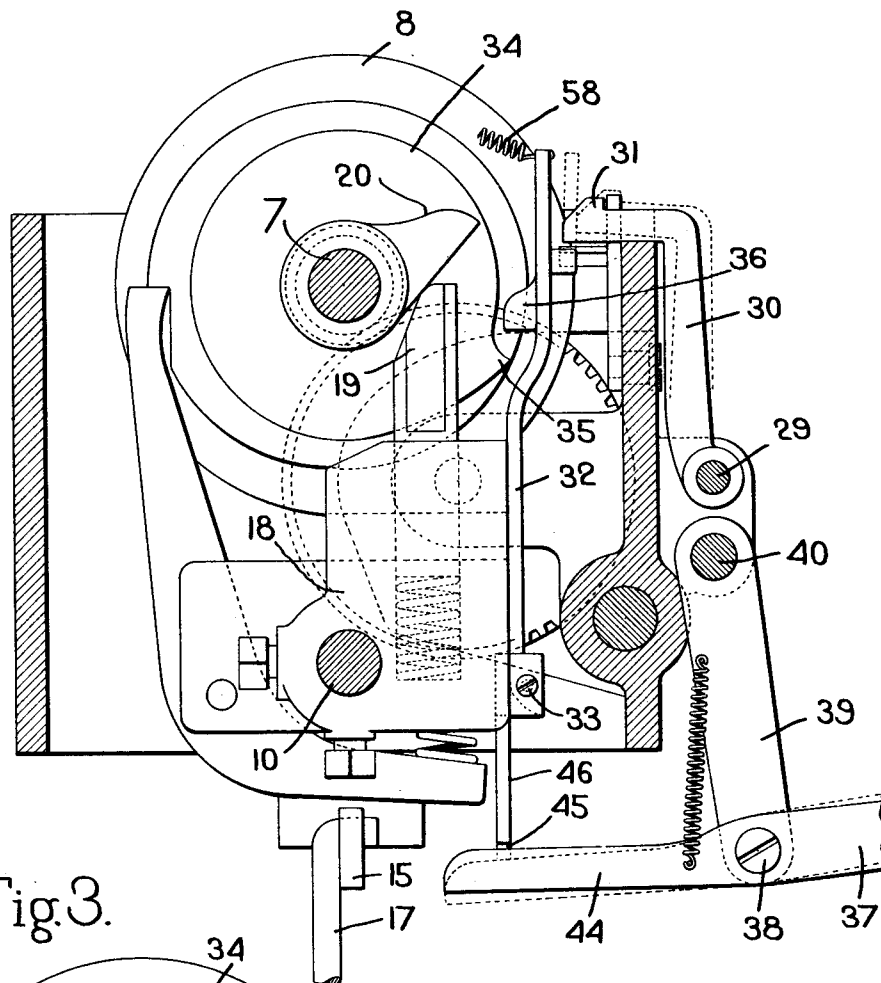
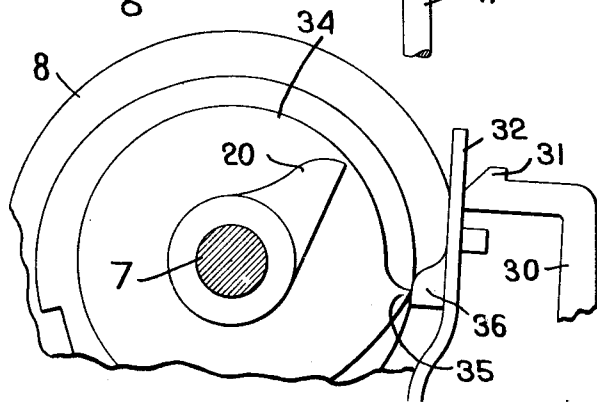


Fig. 3.



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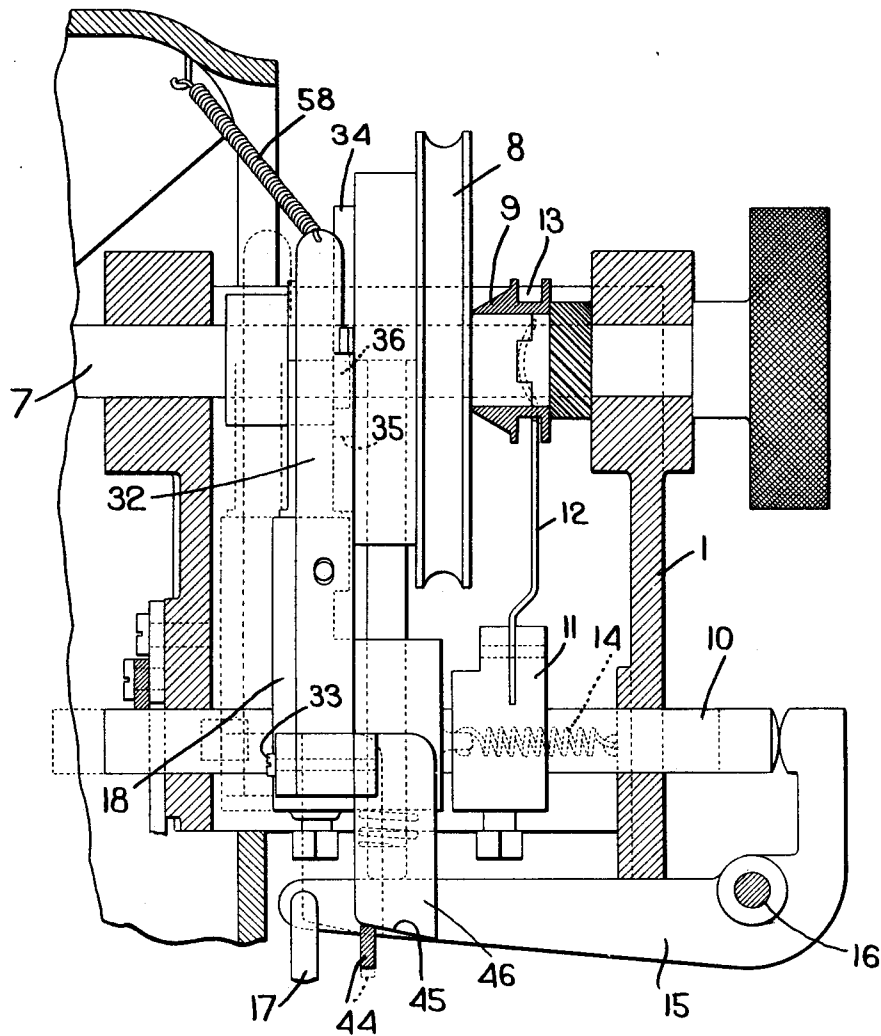
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3 Sheets-Sheet 3

Fig. 4.



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UNITED STATES PATENT OFFICE

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SEWING MACHINE

Application filed March 20, 1928. Serial No. 263,122.

This invention relates to sewing machines adapted to perform a predetermined sewing operation, such for instance as sewing a buttonhole, and then come to rest. Some sewing machines of this type are arranged to perform a supplementary operation, such for instance as pulling off a length of thread or trimming the thread, or cutting the buttonhole, etc., after the main sewing operation has been completed and one feature of the present invention relates to novel means for initiating the performance of such supplementary operation.

The invention is shown as it might be embodied in a sewing machine constructed substantially as shown in Patent No. 1,571,670, July 29, 1930.

In said patent the devices for performing such supplementary operations are actuated by a cam device which is normally idle during the sewing of the buttonhole but which is set in operation by the stop motion as it brings the stitch-forming mechanism to rest and one feature of my present invention relates to a novel means for thus setting the cam in operation which is more positive in its action than the means described in the above-mentioned patent.

In the machine shown in said patent the work clamps are raised or opened at the end of the sewing operation and are held so raised by a latch device until the machine is started on the next sewing cycle at which time the latch is released to allow the clamps to close onto the work.

Another feature of my present invention relates to a novel means associated with the driving and stopping mechanism of the machine by which the latch will be held raised while the clutch is operating to drive the stitch-forming mechanism thus avoiding any possibility that the latch will be actuated to raise the clamps while the stitching is in progress.

In order to give an understanding of the invention I have illustrated in the drawings a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

In the drawings, Fig. 1 is a side view of a buttonhole sewing machine having my improvements applied thereto;

Fig. 2 is a section taken at right angles to the driving shaft and illustrating the stop motion and the means for positively setting the supplementary devices in operation;

Fig. 3 is a fragmentary view illustrating the action of the cam 35;

Fig. 4 is an enlarged fragmentary section on substantially the line 4-4, Fig. 1.

In the drawings 1 indicates the frame of the sewing machine which is provided with the work-supporting arm 2 on which the work is clamped by means of the work clamps 3, said frame also having the overhanging arm 4 which supports the usual needle bar 5 that carries the upper needle 6.

The under thread mechanism, which may be in the form of a bobbin or shuttle, is located within the work-supporting arm 2.

The stitch-forming mechanism is actuated from a driving shaft 7 which is driven from a continuously rotating driving pulley 8 by means of a suitable clutch, which is not shown herein, but which is thrown into clutching engagement by means of a clutch cone 9 which is movable longitudinally of the shaft 7, movement of the clutch cone to the left Fig. 4 serving to throw the clutch into engagement and said Fig. 4 showing the position of the clutch cone when the clutch is disengaged. The clutch cone is actuated to start the clutch from a clutch-controlling member 10 in the form of a rod slidably mounted in the frame 1; said rod having fast thereon a block 11 to which is secured a forked arm 12 that engages a groove 13 of the cone 9 so that when the rod 10 is moved to the left Fig. 4 the clutch cone will be actuated to throw the clutch into operation.

The rod 10 is normally held in its retracted position by a suitable spring 14 and it is actuated to throw the clutch into operation through an elbow lever 15 pivoted to the frame at 16 and having a link 17 connected thereto by which it may be manually operated. The controlling rod 10 also carries the stop motion device for bringing the machine to rest. This is in the form of a block 18

fast on the shaft 10 and carrying a stop dog 19 which is adapted to be engaged by a stop cam 20 fast on the shaft 7.

The clutch-actuating mechanism and stop motion device above referred to are similar to the corresponding devices illustrated in the above-mentioned Patent No. 1,771,670 and form no part of the present invention.

It will be understood that when the actuating rod 10 is shifted to the left Fig. 4 to throw the clutch into engagement the stop dog 19 is moved longitudinally of the shaft 7 and out of the path of movement of the clutch dog 20 but when the clutch is disengaged and the parts are brought into the position shown in Figs. 2 and 4 the stop dog 19 will be brought into the path of movement of the stop cam 20 and will thus bring the shaft 7 to rest at a predetermined point in its rotative movement.

In the machine illustrated in said Patent No. 1,771,670 the work clamps 3 have associated with them a thread gripper 21 and a thread trimmer 22, both of which are actuated after the machine comes to rest through the medium of a cam device 24. This cam device is loosely mounted on a shaft 25 which is continuously driven from the driving pulley 8 through suitable gearing 26.

The cam device 24 is disconnected from the shaft 25 during the operation of the stitch-forming mechanism but is adapted to be clutched to the shaft 25 and to make one revolution when the shaft 7 and the stitch-forming mechanism come to rest upon the completion of the sewing operation.

The clutch by which the cam device 24 is clutched to the shaft 25 may be all as illustrated in the above-mentioned Patent No. 1,771,670 and it includes a clutch pin 27 which is normally held inoperative by a clutch dog 28 in the form of an arm fast on a shaft 29 journaled in the frame 1. When the shaft is turned to raise the clutch dog 28 and release the clutch pin 27 the clutch will be automatically engaged thus coupling the cam device 24 to the shaft 25. The clutch device is of the one-revolution type so that it will be disengaged automatically when the cam device has made one rotation, all as described in said above-mentioned Patent No. 1,771,670.

In said patent the clutch dog 28 is released from the clutch pin by the shock given to the stop dog 19 when it is engaged by the stop cam 20 in bringing the shaft 7 to rest.

According to my present invention I have provided a cam device for positively releasing the clutch dog 28.

The shaft 29 has fast thereto an upstanding arm 30 which is bent laterally at its upper end as shown at 31. The block 18, which carries the stop dog 19, has an arm 32 pivotally mounted thereon at 33, said arm being held against the side face of the block by a spring 58. When the clutch-controlling member 10

is in clutch releasing position shown in Fig. 4 the upper end of the arm 32 stands opposite and in line with the offset end 31 of the arm 30.

The shaft 7 has fast thereon a cam member 34 provided with a cam portion 35, said cam portion 35 being so placed that when the clutch-controlling member 10 is in clutch-disengaging position the arm 32 is situated in line with the cam 34 so that as the cam rotates the cam projection 35 will strike the lug 36 on the arm 32 and swing the latter forwardly as shown in Fig. 3. During this forward movement of the arm 32 it will engage the bent end 31 of the arm 30 and thus rock the shaft 29 thereby raising the clutch dog 28 and releasing the clutch pin 27. This release of the clutch pin is, therefore, positively accomplished and is not dependent on any shock or jar given to the stop dog or any other part during the stopping of the machine.

It will be understood, of course, that when the clutch-controlling member 10 is in the position it occupies when the clutch is engaged that the arm 32 is out of line with both the cam 34 and the arm 30 and that said arm 32 is only brought into position to be actuated by the cam 35 when the clutch is disengaged and the shaft 10 is in the position shown in Fig. 4.

In the sewing machine illustrated in the above-mentioned Patent No. 1,771,670 the work clamps are normally held in their raised position by a latch 37 which is pivotally mounted at 38 on the lower end of an arm 39 that is fast on a rock shaft 40, said rock shaft having another arm 41 thereon which is adapted to be actuated by the cam device 24, this construction being such that when the cam device 24 is given its one revolution after the stitch-forming mechanism has come to rest the rock shaft 40 will be rocked thereby giving the latch 37 a to-and-fro movement to cause it to engage the lug 42 carried by the work clamp arm and to pull said lug backwardly thereby raising the clamps. This operation is described in detail in the above-mentioned Patent No. 1,771,670.

One feature of my present invention relates to a novel means associated with the driving and stopping mechanism for maintaining the latch 37 raised while the driving clutch is engaged. The latch 37 is shown as provided with a tail portion 44, the end of which is adapted to be engaged by a cam face 45 formed on an extension 46 that is secured to the block 18.

The parts are shown in Fig. 4 in the position they occupy when the clutch is disengaged. When the driving clutch is engaged by shifting the controlling member 10 to the left Fig. 4 the cam face 45 engages the tail 44 of the latch 37 and depresses the latter thereby raising said latch and said latch will be held raised by the engagement of the tail 44

with the surface 45 so long as the clutch is in its operative driving condition. The advantage of this is that since the latch is positively held in its raised or inoperative position while the sewing machine is in operation there is no danger that the latch can be actuated accidentally to raise the clamps and release the work while the sewing is in progress.

While it would be possible to rely upon the engagement of the cam surface 45 with the tail 44 of the latch to release the work clamps when the clutch is thrown into operation yet I prefer to release the latch to allow the clamps to close by means of the swinging lever 55 which is actuated by the connection 56 leading to the starting treadle in the manner illustrated in the above-mentioned Patent No. 1,771,670. This connection 56 is designed so that when it is moved downwardly it will first operate the lever 55 through the connections 57, 58 thereby to cause the roll 59 of said lever to raise the latch and release it from the lug 42, this release of the latch occurring before the connection 56 actuates the link 17.

While I have illustrated herein a selected embodiment of my invention I do not wish to be limited to the constructional features shown.

I claim:

1. In a sewing machine adapted to sew a seam and then come to rest, the combination with stitch-forming mechanism, of a stop motion to bring the stitch-forming mechanism to rest at the end of the seam, supplementary devices for performing a supplementary operation after the completion of the seam, a normally-idle cam device for actuating said supplementary devices, a clutch for the cam, a clutch-controlling member, and a cam associated with the stop device to positively actuate said clutch-controlling member just prior to the action of the stop device in bringing the stitch-forming mechanism to rest.
2. In a sewing machine adapted to sew a seam and then come to rest, the combination with stitch-forming mechanism, of a driving shaft for operating the same, a stop motion device to bring the shaft to rest at the end of the seam, supplementary devices for performing a supplementary operation after the completion of the seam, a normally-idle cam device for actuating said supplementary devices and a cam on said driving shaft separate from said stop motion to render the normally-idle cam device operative just before the stop motion brings the shaft to rest.
3. In a sewing machine adapted to sew a seam and then come to rest, the combination with stitch-forming mechanism, a driving shaft by which said mechanism is operated, a stop motion device to bring the driving shaft to rest at the end of the seam, supplementary devices for performing supplementary operations after the completion of the seam, a normally-idle cam for actuating said

supplementary devices, a clutch by which said cam is rendered operative, a swinging lever by the swinging of which said clutch is actuated from its inoperative position to its operative position, and a latch separate from the stop motion device for actuating said clutch just before the shaft comes to rest.

4. In a sewing machine adapted to sew a seam and then come to rest, the combination with stitch-forming mechanism, a stop motion device to bring the shaft to rest at the end of the seam, supplementary devices for performing a supplementary operation after the completion of the seam, a clutch for operating said supplementary devices including a clutch pin, a clutch dog movable from its operative position in which it holds the clutch pin inoperative to its inoperative position in which it releases said pin, and a cam on said shaft for positively moving the clutch dog into inoperative position before said shaft comes to rest.

5. In a sewing machine, the combination with stitch-forming mechanism, of work clamps, a clutch for operating the stitch-forming mechanism, a clutch-controlling member, a latch separate from said clutch-controlling member and which in its operative position holds the work clamps open, and means associated with the clutch-controlling member to hold the latch in its inoperative position while the clutch is engaged.

6. In a sewing machine, the combination with stitch-forming mechanism, of work clamps, a latch which in its operative position holds the work clamps open, said latch having a tail, a clutch by which the stitch-forming mechanism is operated, a clutch-controlling member for actuating the clutch, and means associated with the clutch-controlling member to engage the tail of the latch when the clutch is in engagement thereby to hold the latch in its inoperative position.

7. In a sewing machine, the combination with stitch-forming mechanism, of a clutch by which the stitch-forming mechanism is operated, a movable clutch-controlling member by movement of which the clutch is engaged or disengaged, a work clamp, a latch for holding the work clamp open when the machine is at rest, and means moving with the clutch-controlling member to hold the latch positively in inoperative position while the clutch is engaged.

8. In a sewing machine, the combination with stitch-forming mechanism, of a clutch for operating said stitch-forming mechanism, a clutch-controlling member, work clamps, a latch movable relative to the clutch-controlling member and which in its operative position holds the work clamps open, and means associated with the clutch-controlling member to hold the latch in its inoperative position while the clutch is engaged.

9. In a sewing machine, the combination
with stitch-forming mechanism, of a clutch
by which the stitch-forming mechanism is
operated, a clutch-controlling member by
which the clutch is engaged or disengaged,
a work clamp, a reciprocating clamp-opening
member, means to actuate the same at the
end of the sewing operation to open the work
clamp, and means associated with the clutch-
controlling member to hold the clamp-open-
ing member in inoperative position while the
clutch is engaged.

In testimony whereof, I have signed my
name to this specification.

HERBERT E. ALTHENS.