Oct. 8, 1929. J. F. GAIL 1,731,001

STITCH CONTROLLED STITCHING MACHINE

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Fig. 1

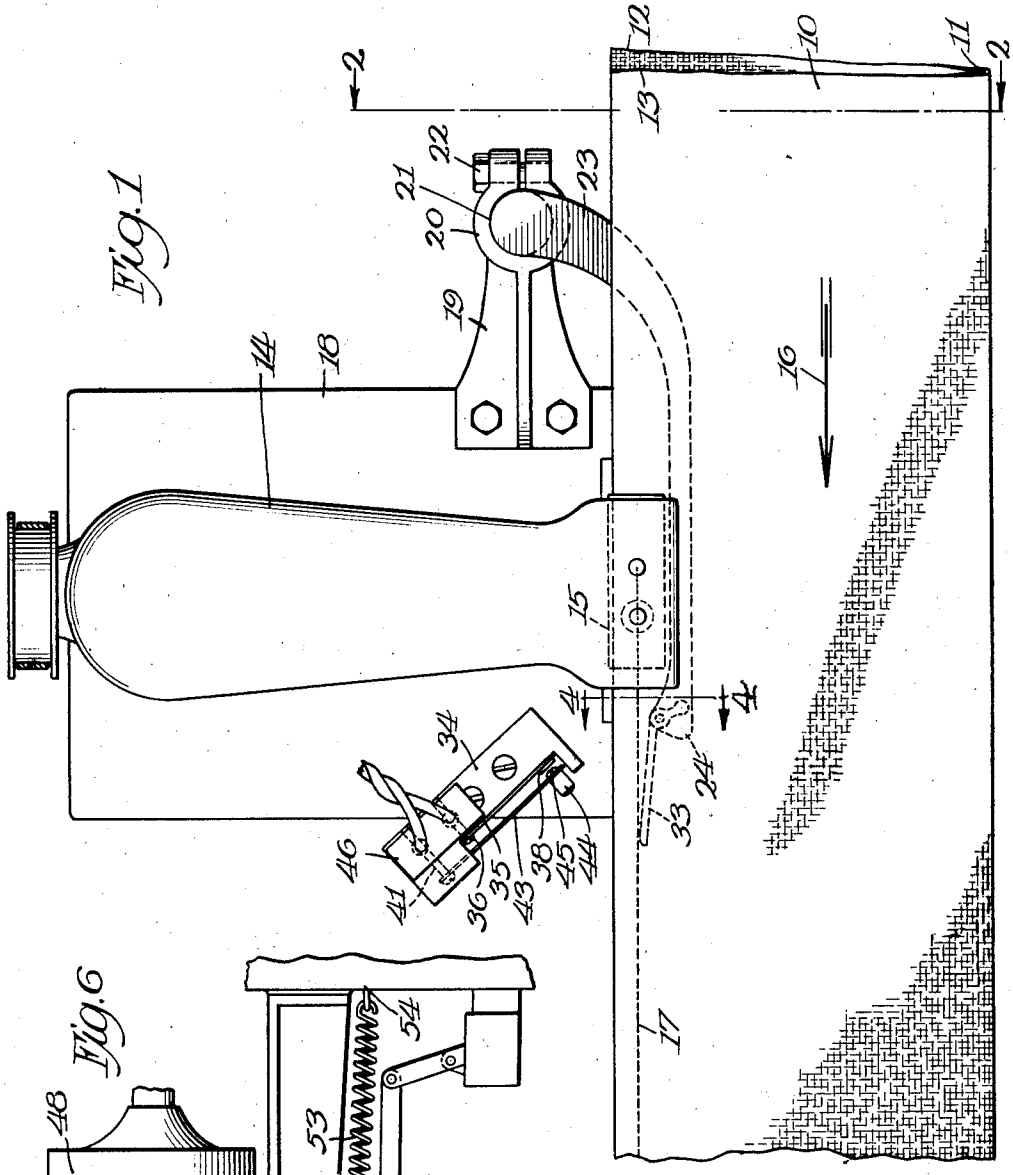
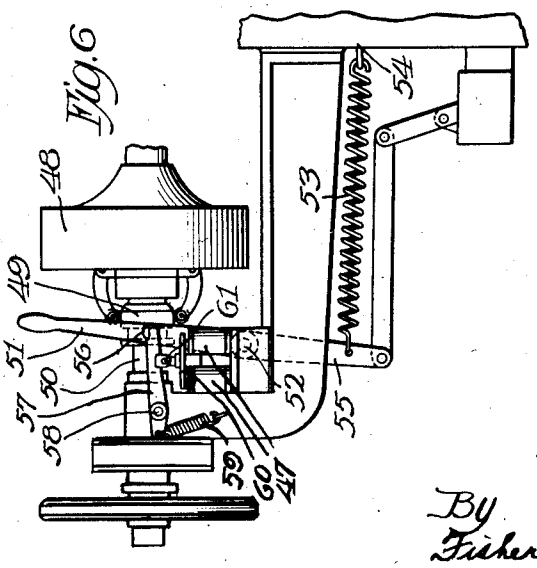


Fig. 6



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Fig. 2

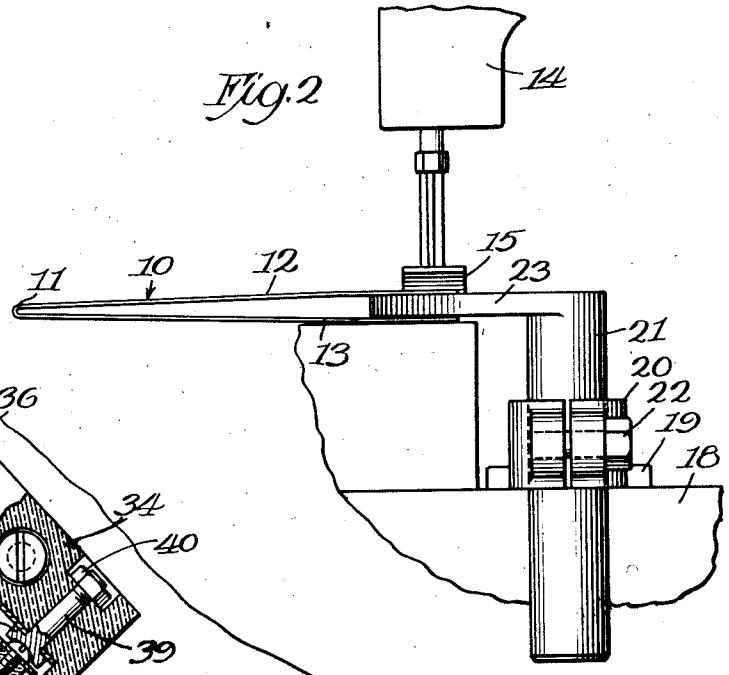


Fig. 3

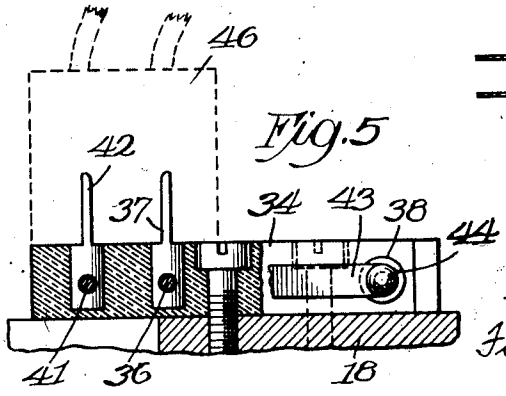


Fig. 5

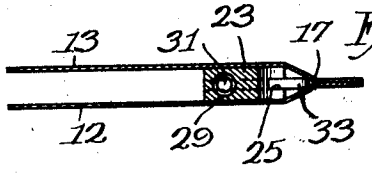


Fig. 4

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UNITED STATES PATENT OFFICE

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STITCH-CONTROLLED STITCHING MACHINE

Application filed April 28, 1928. Serial No. 273,652.

My invention relates to improvements in stitch-controlled stitching machine, and although susceptible of many applications, is of particular value in connection with sewing machines for operating upon textile fabric.

The principal object of the invention is to control the operation of the sewing mechanism in accordance with the work done by said machine. A specific object of the invention is to stop the machine automatically in the event that the machine fails to operate satisfactorily, either due to thread breakage or other causes.

As a specific application of my invention, I have shown the same as applied to a sewing machine employed for the purpose of connecting together, by means of a continuous line or chain of thread stitches, a pair of superposed plies of textile fabric, and in the drawings accompanying this application—

Figure 1 is a plan view of the general arrangement showing the sewing machine and associated apparatus.

Figure 2 is a section taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged plan view of certain parts in Figure 1, portions of the parts shown in Figure 1 being cut away in order to illustrate the construction.

Figure 4 is a section taken on the line 4—4 of Figure 1.

Figure 5 is a section taken on the line 5—5 of Figure 3, and

Figure 6 is an elevation of the magnetic clutch mechanism.

The general arrangement of the sewing machine is substantially as set forth and illustrated in my companion co-pending application, Serial No. 90,892, filed in the United States Patent Office on February 26, 1926. In the machine as illustrated, 10 represents a folded strip of sheeting or other textile fabric, the side edge of which is closed, as shown at 11, while the two ends of the folds 12 and 13 are to be connected together so as to form a tubular strip of fabric. The sewing machine 14, which may be of the double-thread type, is equipped with the usual presser foot 15 and cross feed mechanism not shown, by means of which the fabric 10 is caused to pass through the zone of the sewing machine in the direction of the arrow 16. The dotted line 17 represents the line of stitches inserted through both plies 12 and 13 of the fabric by the stitching mechanism.

Suitable auxiliary feed or conveyer apparatus, as disclosed in said application Serial No. 90,892, but not shown herein as it is not claimed herein, is employed to guide and support the strip 10 in its travel past and through the field of the relatively stationary sewing machine 14, auxiliary feeding mechanism being desirable in order to effect proper travel of the folded strip 10 with whatever parts may be carried in or by the same.

To the base 18 of the sewing mechanism there is bolted a bracket 19 and on the end of that bracket is a spilt bearing or clamp 20 which receives the stem or post 21 normally locked in said split clamp 20 by the bolt 22. On the upper end of said stud or post 21 there is fixed or carried a curved horizontally extending flat arm 23 interposed between the plies 12 and 13 of the strip 10 and extending past the operative parts of the sewing machine and its feed mechanism. The end 24 of said curved arm or plate 23 is enlarged slightly and horizontally slotted, as shown at 25 in Figure 3, so as to freely receive the short arm 26 of a bell crank lever 27 pivoted on a vertical pin or stud 28 extending through the said end 24.

In the end of said arm 23, there is bored or drilled a longitudinally-extending axially horizontal opening 29 for receiving a small coiled compression spring 30, the outer end of which engages the inner end of a small plunger 31 slidably arranged in the end of said opening or bore 29. The bore 29 is so positioned that the outer end of the plunger 31 will engage a ball or enlargement 32 on the end of the short lever 26 of the bell crank, thereby tending to swing the lever 27 in a direction to cause its long blade or arm 33 to assume the position shown in Figure 3.

In the normal operation of the machine, the bell crank 27 and associated parts will be in the position shown in Figures 1 and 4 with the end of the blade 33 held in its illustrated position because of the stitching.

Referring to Figure 3, the numeral 34 represents a block of fiber or other suitable insulating material supported on the base of the sewing machine. One side of said block 34 is cut away and to said cutaway side there is secured a metal plate or strip 35. One end of said plate or strip 35 is secured to the block 34 by means of a screw 36 which incidentally passes through the bottom of a contact pin 37. The other end of the plate or strip 35 is clamped to the block 34 by means of the head 38 of a contact pin or bolt 39 passing horizontally through the block and secured by a nut 40.

Secured to the same side of the block 34 by means of a screw 41 similar to the screw 36 and cooperating with a pin 42 similar to the pin 37, is a light thin switch spring 43. The free end of said switch spring 43 carries a light button or stud of fiber or analogous insulating material 44 which is secured in position by a round-headed screw 45. Said screw 45 is so positioned that when the blade 33 of the bell crank swings into the position shown in Figure 3 of the drawings, the head of said screw 43 will contact with the head 38 of the bolt 39, thus establishing an electrical connection between the springs 35 and 43.

The pins 42 and 37 have their ends suitably shaped to co-operate with a two-conductor connector 46 by means of which an electrical connection is made to energize, from any suitable source of electric power, a magnet 47 (see Figure 6). The clutch 48 of usual form through which the sewing machine 14 is driven by belt or other suitable power-transmitting mechanism is controlled by a clutch collar 49. Said clutch collar 49 is slidable on a shaft 50 and is grooved in the usual manner to receive a relatively rotatable collar connected to the handle 51. The said handle 51 is pivoted on a stud 52, and when moved into the position shown in Figure 6 holds the clutch collar 49 in proper position to maintain the clutch 45 in effective driving condition.

A stout coiled tension spring 53 is connected between the frame 54 of the machine and an extension or lower end 55 of the clutch lever 51, so that normally the spring 53 will tend to disengage the clutch 48 and thus stop the operation of the sewing machine. So long as the machine is operating satisfactorily, however, said lever 51 is locked in the position shown in Figure 6 by means of a lug 56 on said lever which engages a notch in the end of an arm 57 pivoted on a horizontal pin 58 fixed in the frame of the machine. Normally, said arm 57 is maintained in said position by a coiled spring 59. However, when the magnet 47 is energized, its armature 60 will be pulled down, and as the upper end of said armature is connected by a pin 61 to a lug on said lever 57, said arm 57 will be drawn down into such position that the lug 56 will be no longer locked by the arm 57, and the arm or lever 51 will be free to swing into unclutching position under the influence of the powerful spring 53.

Hence, it will be seen that so long as the sewing machine is operating satisfactorily to insert proper stitches connecting the plies 12 and 13 of the folded fabric 10, the blade 33 will merely ride in the seam or crease between the plies 12 and 13, and the automatic stop mechanism will not come into operation. However, as soon as the machine fails to insert such proper stitches, for example, as indicaated in Figure 3 of the drawings, then the blade 33 will swing out into the position shown in Figure 3, establishing a contact which will energize the magnet 47 and throw out the clutch, thus stopping the machine.

The described details of construction and operation are illustrative of one application only of my invention, the scope of which should be determined by reference to the appended claims, said claims to be construed as broadly as possible consistent with the state of the art.

I claim as my invention:

1. In combination, a sewing machine for sewing together two superposed plies of textile fabric, a member interposed between said plies and engaging the stitches so formed by the sewing machine, and stop mechanism for said machine controlled by said member.

2. In combination, a sewing machine for sewing together two superposed plies of textile fabric, a member interposed between said plies and engaging the stitches so formed by the sewing machine and stop mechanism for said machine controlled by said member, the arrangement including means tending to move said member towards the stitches and in the plane of the fabric, and a part adapted to be engaged by said member for actuating said stop mechanism when absence of stitches permits movement of said member.

JOHN F. GAIL.