April 4, 1961 K. WINZ ET AL 2,977,908

CLOTH GUIDE CONTROL FOR SEWING AND THE LIKE MACHINES

Filed Sept. 9, 1957

2 Sheets-Sheet 1

FIG. 1

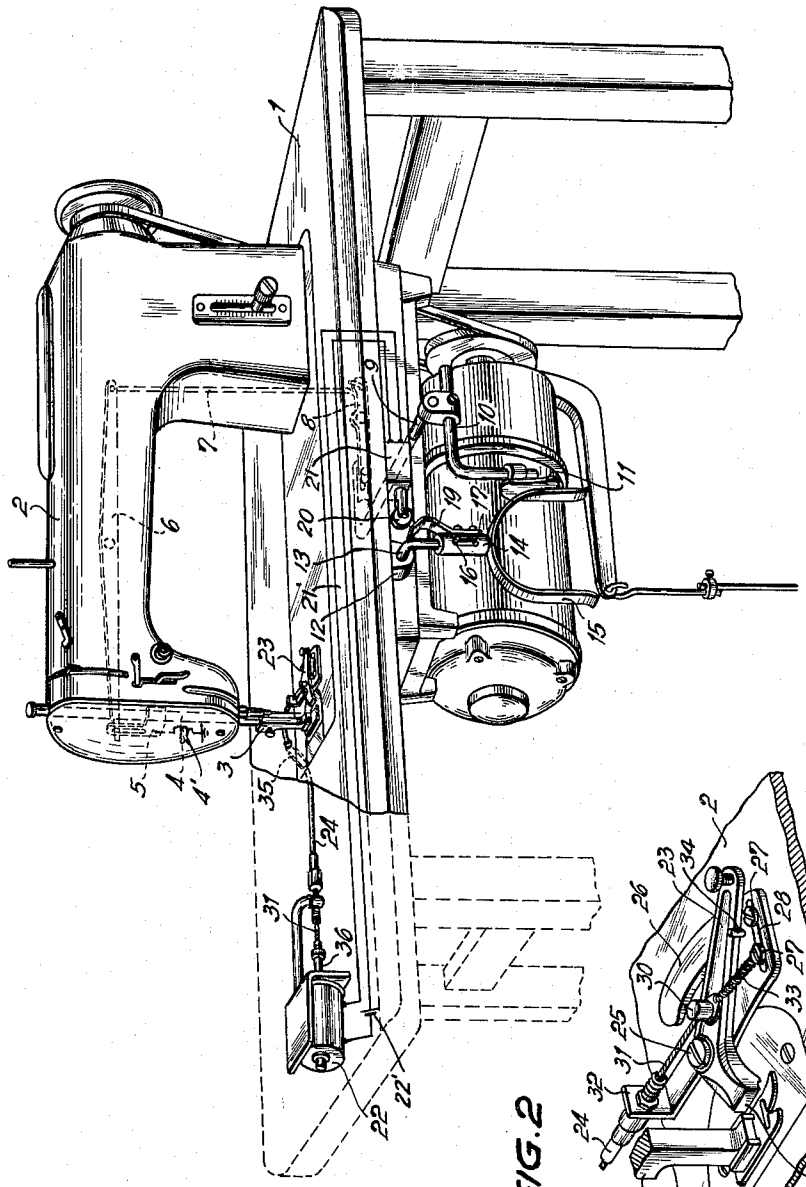


FIG. 2

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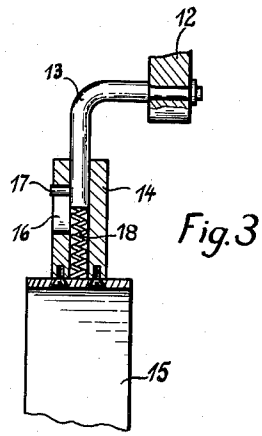


Fig.3

Fig.4

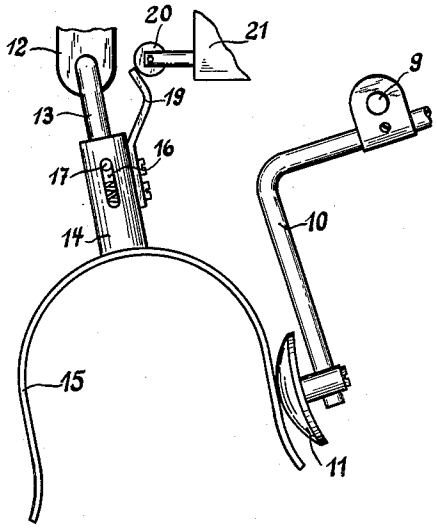


Fig. 5

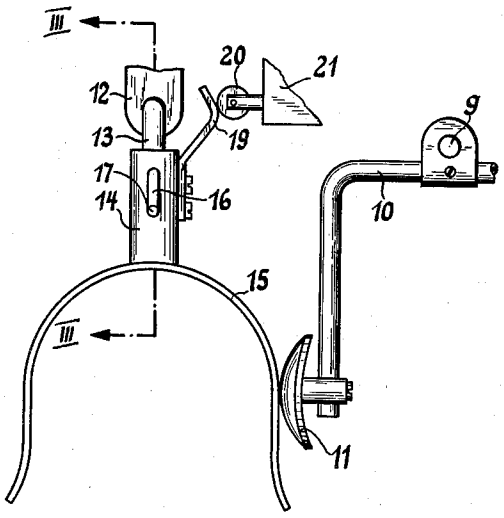
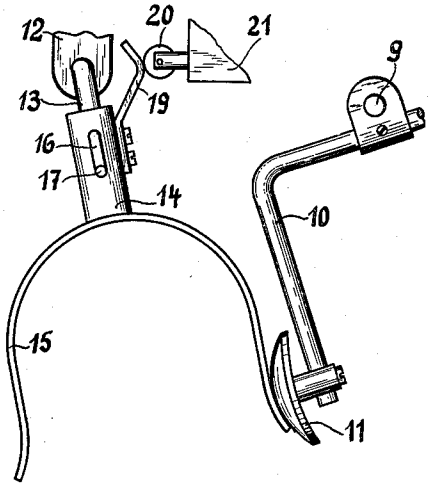


Fig. 6



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United States Patent Office 2,977,908
Patented Apr. 4, 1961

2,977,908

CLOTH GUIDE CONTROL FOR SEWING AND THE LIKE MACHINES

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Filed Sept. 9, 1957, Ser. No. 682,787

Claims priority, application Germany Sept. 14, 1956

5 Claims. (Cl. 112—153)

The present invention relates to an arrangement for the control of the retractable cloth guide of a sewing or the like machine, more particularly to a cloth guide control combined with the operation of the work presser foot of the machine.

During the stitching of the corners of cuffs or collars it is often required to temporarily retract the cloth guide in the course of a sewing operation, while leaving both hands of the operator free for handling and properly guiding of the work. Moreover, in stitching of two-layer work pieces, such as collars, it is often desirable to lift the presser foot from time to time, to check the folding and guiding of the work, while retaining the cloth guide in its operative position.

There are already known sewing machines wherein the operation of the work presser foot and cloth guide is effected by a common foot treadle, in such a manner that the cloth guide may be retracted separately or together with the raising of the presser foot.

While the known arrangements allow of the retraction or lifting of the cloth guide and presser foot without requiring any additional manual operation, they do not provide any possibility to lift or raise the presser foot without simultaneous retraction or swinging the cloth guide from its operative to its inoperative position.

Accordingly, an object of the present invention is the provision of a unitary control device, suitable for incorporation in a conventional sewing machine, to enable a control of both the cloth guide and presser foot substantially independently of one another.

A more specific object of the invention is the provision of a unitary knee control lever or the like control member operable in two coordinate directions and adapted to independently control the cloth guide in both the lowered and raised positions of the presser foot of a sewing or the like machine.

Yet another object of the invention is the provision of a unitary control member of this type which is both simple in construction as well as easy and expeditious in operation.

The invention, as to its further objects and novel aspects, will be better understood from the following detailed description taken in reference to the accompanying drawing, forming part of this specification and wherein:

Fig. 1 is a perspective view of a sewing machine embodying combined cloth guide and presser foot control mechanism constructed in accordance with the principles of the invention;

Fig. 2 is a partial perspective view of Fig. 1, showing in greater detail and on an enlarged scale the cloth guide and presser foot of the machine;

Fig. 3 is a sectional view taken on line III—III of Fig. 5, more clearly showing the knee control mechanism of Fig. 1; and

Figs. 4 to 6 are partial diagrams illustrating different operation positions of the knee control lever.

Like reference numerals denote like parts in both views of the drawing.

With the foregoing objects in view, the invention involves generally the provision of electrically operable actuating means, such as an electro-magnet or solenoid, to operate a retractable cloth guide of a sewing or the like machine, said control means being operatively connected with the knee lever or the like control member serving to raise and lower the work presser foot of the machine, in such a manner as to enable a control of the cloth guide in both the raised and lowered positions of the presser foot by operation or displacement of said knee lever or equivalent control member in different coordinate directions. According to a preferred embodiment, the knee control lever provided in a known manner with a suitably shaped loop or stirrup for receiving the knee of the operator, upon deflection about a pivot controls the raising and lowering of the presser foot and, upon longitudinal displacement at right angles to its deflecting movement serves to operate a control switch energizing the solenoid to control the cloth guide substantially independently of the presser foot control or portion. As a result, the cloth guide may be operated or controlled independently of the position of the presser foot without requiring any additional manual operation, to suit existing sewing conditions and sewing requirements. The cloth guide may be coupled or operatively connected with the solenoid plunger or armature through a flexible wire or Bowden cable or in any other suitable manner.

Referring more particularly to the drawing, Fig. 1, the reference numeral 1 represents a support such as a table top carrying a conventional sewing machine 2 having a work presser foot 3 secured to the lower end of a presser foot bar 4. Further secured to the presser foot bar 4 is a slotted lost-motion coupling member 5 in operative or motion transmitting connection with one end of a two-arm lever 6 rotatably mounted upon the machine 2. The opposite end of the lever 6 is connected through a pull rod 7 to one end of a further two-arm lever 8 rotatably mounted upon the support 1. The opposite arm of the lever 8 has connected to it a shaft 9 to which is secured an angular lever 10 having a depending lever arm to which is secured the pressure plate 11 of a knee lever or loop 15.

Further mounted upon the underside of the table top 1 is a bearing 12 supporting a rotatable angular lever 13 whose depending arm carries a displaceable sleeve 14 to which is secured the loop or stirrup 15 of a knee lever adapted to receive the knee of the operator, one shank of said loop normally engaging or resting against the pressure plate 11 of the lever 10. The sleeve 14 has a slot 16 through which protrudes a pin 17 projecting from the lever arm 13, to limit and guide the movement of the sleeve and in turn of the knee lever or loop 15. The sleeve 14 and loop 15 are normally urged in a downward direction by the provision of a return spring 18 or the like (Fig. 3).

Further secured to the sleeve 14 is a contact member 19 in the form of a curved flat spring or the like adapted to cooperate with a roller or the like actuator of an electric switch 21 which advantageously may be a well-known snap or micro switch. The switch 21 is connected to an electromagnet or solenoid 22 through leads 21' and a suitable current source shown as a battery 22' in the drawing, said electromagnet being mounted upon the under side of the table top 1 and having an armature or plunger 36 connected or coupled with the cloth guide 23 through the flexible wire 31 or Bowden cable 24, or in any other suitable manner.

The cloth guide 23 being shown in the form of an angular lever rotates about a fulcrum screw or equivalent pivot 25 upon a support 26 being removably mounted

upon or adjacent to the cloth plate of the machine by means of fastening screws 27. A slot 28 provided in the support 26 serves for displacing or adjusting the guide 23, in such a manner as to have its edge 29 engage the edge of the work to be guided, in a manner readily understood.

The cloth guide 23 is further provided with a projecting pin 30 to which is attached one end of the wire 31 of the Bowden cable 24, the latter being secured to an upstanding lug 32 of the support 26. A spring 33 serves to urge the guide 23 towards its operative position shown in the drawing and determined by a stop 34.

The Bowden cable 24, Fig. 1, is passed through an opening 35 in the table top 1 to the magnet or solenoid 22 having its armature 36 connected to the opposite end of the wire 31.

In operation, if no pressure is applied by the operator upon the knee lever 15, the latter remains in the neutral or rest position shown in Fig. 1, that is, with the pressure foot 3 engaging the work by the action of the presser foot spring 4' provided in a conventional sewing machine. In order to lift the presser foot 3, the lever 15 is deflected towards the right or in anti-clockwise direction, Fig. 4, whereby to transmit this movement to the presser foot bar 4 through the kinkage or coupling mechanism comprising the lever 10, shaft 9, lever 8, rod 7, lever 6 and member 5. The presser foot is held in its raised position as long as the pressure is maintained upon the knee lever 15. Upon release of the pressure, the presser foot returns to its lowered or work engaging position by the action of the presser foot spring, in a manner readily understood.

If it is desired to retract the cloth guide 23, pressure is applied upon the loop 15 in an upward or longitudinal direction of the lever arm 13, whereby to cause the actuating member 19 to close the switch 21 upon engaging the roller 20, Figs. 5 and 6, thus energizing the electromagnet 22 by a suitable current source (not shown) and causing the armature 36 and Bowden cable 24 to retract the cloth guide 23 or to rotate it about the pivot 25 from operative to an inoperative position against the action of return spring 33. Release of the upward pressure on the lever 15 results in an opening of the switch 21, causing de-energizing of the solenoid 22 and return of the cloth guide 23 to its operative position by the action of the spring 33.

If the cloth guide 23 is to be retracted without lifting the presser foot 3, this may be accomplished simply by exerting upward pressure against the knee lever or loop 15, that is, without deflecting the lever from its neutral position, Fig. 5, whereby again to close the switch 20 by the contact 19 and to energize the electromagnet 22. It is thus possible by the provision of control as described to both lift the presser foot and to retract the cloth guide by means of a single or unitary control member, as shown in Fig. 6, or to lift the presser foot and to retract the cloth guide independently of one another as shown in Figs. 4 and 5, respectively.

In the foregoing the invention has been described with reference to a specific illustrative device. It will be evident, however, that variations and modifications as well as the substitution of equivalent elements 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 drawing are accordingly to be regarded in an illustrative rather than in a restrictive sense.

We claim:

1. The combination with a sewing and the like machine having a retractable presser foot and a retractable cloth guide and means to normally urge both said presser foot and cloth guide to operative position, of a unitary control member, first motion transmitting means between said member and said presser foot, said member being operable along a first path from a rest position to a first actuating position to retract said presser foot to its inoperative position and to allow the return of said pressure foot to its operative position upon release of said member to its rest position, and further motion transmitting and control means between said member and said cloth guide, said member being operable also along a second path different from said first path from its rest position to a second actuating position to retract said guide to an inoperative position and to allow the return of said guide to its operative position upon release of said member from said second actuating position, said last means being effective in both the rest and first actuating positions of said member, whereby to enable retraction to inoperative position and to allow return to operative position of said cloth guide by said member in both the operative and retracted positions of said presser foot.

2. The combination with a sewing and the like machine having a retractable presser foot and a retractable cloth guide and means to normally urge both said presser foot and cloth guide to operative position, of a knee control lever, first motion transmitting means between said lever and said presser foot, said lever being operable by transverse pressure from a rest position to a deflected position to retract said presser foot to its inoperative position and to allow the return of said presser foot to its operative position upon release of said lever to its rest position, control means yieldably slidably mounted upon said lever and operable by longitudinal pressure upon said lever, and further motion transmitting means between said control means and said cloth guide, said control means being actuatable to retract said cloth guide to inoperative position and to allow the return of said cloth guide to its operative position upon release of said control means, said control means being effective in both the rest and deflected positions of said lever, whereby to enable retraction to inoperative position and to allow return to operative position of said cloth guide by said lever in both the operative and retracted positions of said presser foot.

3. In a control system for sewing and the like machines as claimed in claim 2, said further motion transmitting means including an electric switch controlled by said lever, an electromagnet to retract said cloth guide, and means to control said electromagnet by said switch.

4. In a control system for sewing and the like machines as claimed in claim 2, said lever including a knee piece and said control means comprising an extension of said knee piece longitudinally displaceable upon and spring-urged in a direction towards the free end of said lever, a stationary electric switch and actuating means therefor upon said extension, said further motion transmitting means comprising an electromagnet to retract said cloth guide, and means to control said electromagnet by said switch.

5. In a control system for sewing and the like machines as claimed in claim 2, said lever including a knee piece and said control means comprising a sleeve longitudinally displaceable upon and being spring-urged in a direction towards the free end of said lever, stationary electric switch means and actuating means therefor upon said sleeve, to operate said switch by displacement of said sleeve by longitudinal pressure upon said knee piece, said further motion transmitting means comprising an electromagnet to retract said cloth guide, and means to control said electromagnet by said switch.

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