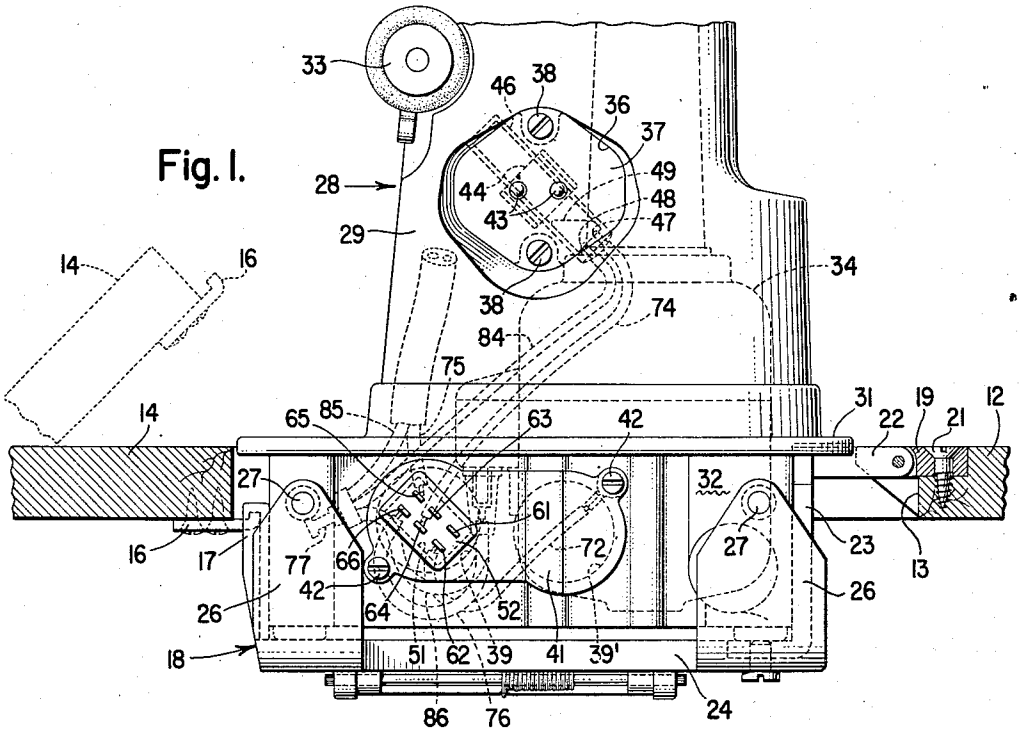
May 6, 1958 L. SMELLIE 2,833,235

SEWING MACHINES EQUIPPED WITH ELECTRIC SWITCH CONTROLS

Filed March 10, 1954 2 Sheets-Sheet 1

Fig. 1.



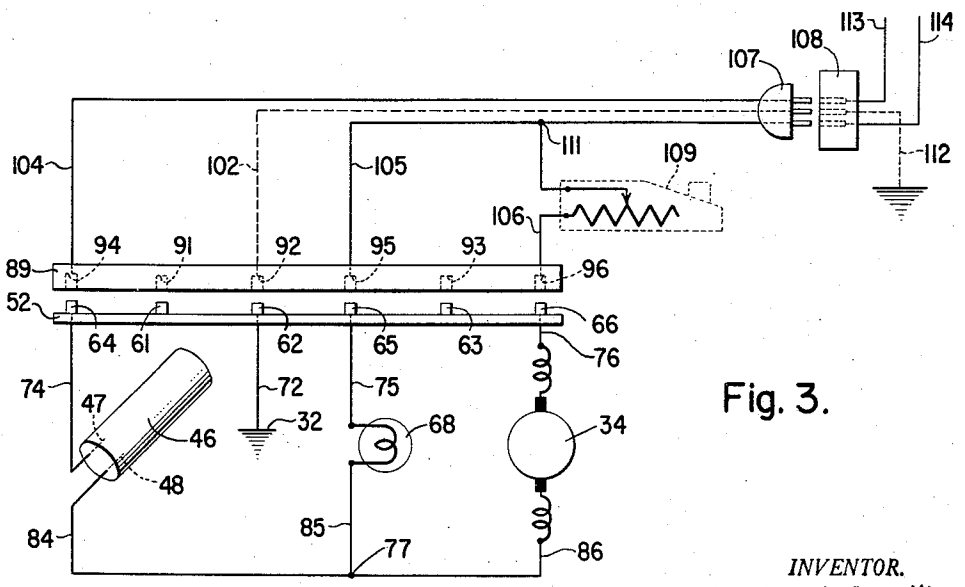


Fig. 3.

INVENTOR.
Leonard Smellie

WITNESS
Nicholas Leszczak

BY
Marshall J. Breen
ATTORNEY

May 6, 1958 L. SMELLIE 2,833,235

SEWING MACHINES EQUIPPED WITH ELECTRIC SWITCH CONTROLS

Filed March 10, 1954 2 Sheets-Sheet 2

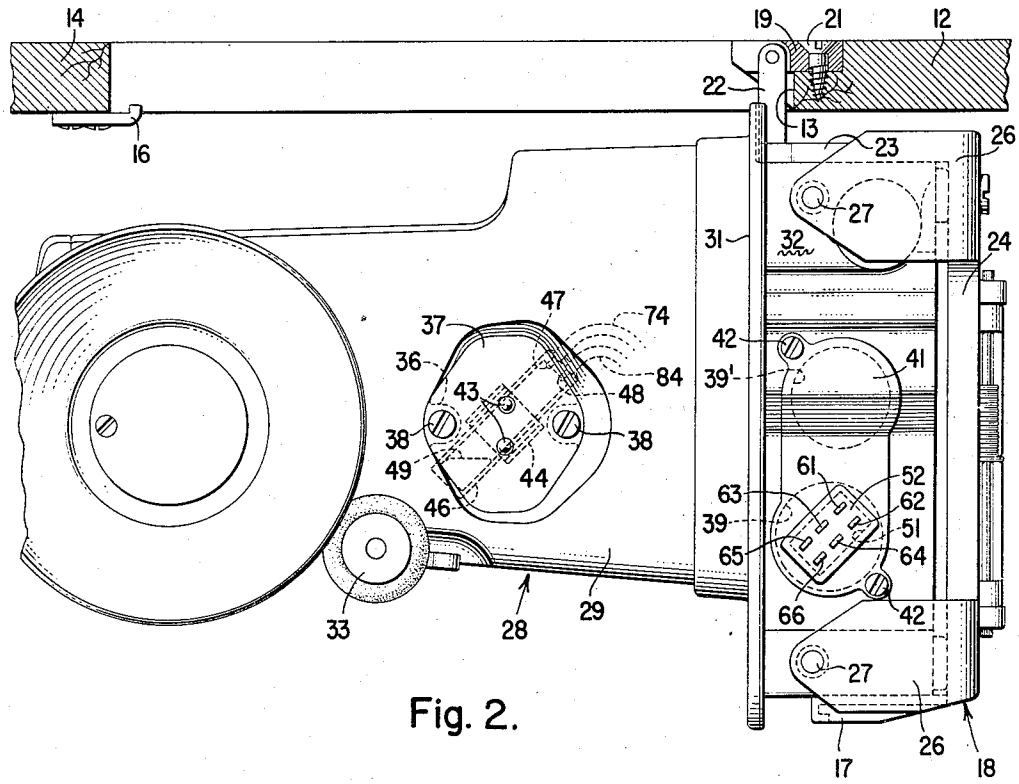


Fig. 2.

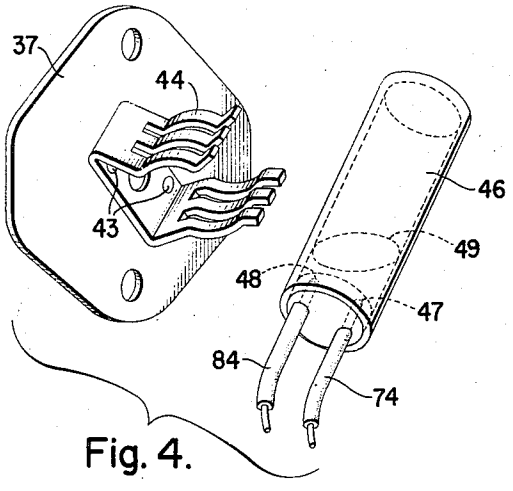


Fig. 4.

INVENTOR.
Leonard Smellie

WITNESS
Nicholas Leszczak

BY
Marshall J. Breen
ATTORNEY

United States Patent Office 2,833,235 Patented May 6, 1958

2,833,235

SEWING MACHINES EQUIPPED WITH ELECTRIC SWITCH CONTROLS

Leonard Smellie, Bound Brook, N. J., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application March 10, 1954, Serial No. 415,214

7 Claims. (Cl. 112—219)

This invention relates to electrically driven family type sewing machines of the class used in drop-head cabinets, and the invention relates more particularly to electric switching controls associated with such machines, whereby the electric motor and light of the sewing machine will be deenergized whenever the machine is lowered into the housing or storage compartment of a drop-head type sewing machine cabinet.

The primary object of the present invention is to provide an improved device of this character.

Another object of the invention is to provide an improved electric switch control that is installed in and is part of the sewing machine head.

A still further object of the present invention is to provide an improved electrically driven sewing machine having incorporated as an integral part thereof, an electric switch arrangement whereby the electric equipment of the sewing machine is deenergized when said machine is moved from the normal operating position in which the base of the machine is horizontal to an inoperative housed position in which the base is not horizontal.

Other important objects of the invention will be apparent from the following specification and claims.

For a complete understanding of the invention, reference should be made to the accompanying drawings which form a part of this specification and in which:

Fig. 1 is an elevational end view of a portion of a sewing machine partly cut away and a portion of a sewing machine supporting table or cabinet in section to show an improved switch control mechanism embodying the present invention,

Fig. 2 is a view similar to Fig. 1, but showing the sewing machine lowered into the housing or storage compartment of a drop-head cabinet or table,

Fig. 3 is a schematic electric wiring diagram showing means for connecting the various electric parts of the equipment, and

Fig. 4 is a perspective view showing the mercury switch of the present device, and a means for mounting the same.

The sewing machine illustrated in the accompanying drawings is similar to the machine which forms the subject of United States Patent No. 2,617,375. This type sewing machine may be used as a portable machine or it may be secured to a movable cradle of the type shown in United States Patent No. 2,527,319, which cradle in turn may be supported in a drop-head cabinet similar to the one shown in United States Patent No. 1,745,781. Specifically speaking, the arrangement illustrated in the drawings accompanying this specification comprises a sewing machine cabinet having a horizontally disposed top wall 12 formed with a suitable opening 13. A leaf 14, by means of a hinge (not shown), is adapted to be swung upwardly, as indicated by dotted lines in Fig. 1. The free edge of the leaf 14 carries a pair of metal plates of which one is shown at 16 and these plates are engaged by a pair of lugs 17 (only one being shown) formed as part of a cradle 18. The cradle 18 is supported from a rear portion of the top wall 12 by means of a pair of

hinges (only one being shown). Each hinge has a leaf 19 secured to the cabinet 12 by means of a screw 21, and a movable leaf 22 formed as a part of the cradle 18. The cradle, which is fully illustrated in Patent No. 2,527,319, includes a back wall 23 connected to the free end of the hinge leaf 22, a bottom wall 24 connected to the back wall 23, and a pair of upstanding lugs 26—26 each having a pin 27 for engaging and holding a sewing machine 28 to the cradle. The sewing machine, which is fully shown in U. S. Patent No. 2,617,375, comprises, among other elements, an upstanding normally vertical hollow standard 29, a bed-plate 31, and a downwardly extending base having an end wall 32. A bobbin winder 33 is supported on the front outer face of the standard 29 and a vertically disposed electric motor 34 is housed within the hollow standard 29. The standard 29 of the sewing machine 28 is provided with an opening 36 which is covered by a plate 37 held in place by a pair of screws 38—38. The end wall 32 of the sewing machine 28 is provided with a pair of openings 39 and 39' and these openings are covered by a single elongated plate 41 held in place by screws 42—42.

The inner face of the plate 37 (Fig. 4), by means of a pair of rivets 43—43, supports a substantially U-shaped clip 44, and the clip 44 supports an electric switch, preferably a hollow sealed mercury switch 46 in the form of a tube of known construction, the switch tube 46 having a pair of contacts 47 and 48 connected to electric conductors presently to be described, and a supply of mercury 49 is held within the tube. When the tube 46 is in the position shown in Fig. 1, the mercury connects contacts 47 and 48 and the switch is said to be closed. When the sewing machine is lowered into the storage or housing compartment of the cabinet and tube 46 is in the position shown in Fig. 2, the mercury moves to the end of the tube remote from the contacts 47—48 and the switch is said to be open. Special attention is called to the fact that the spring clip 44 is so arranged as to mount the mercury switch 46 in the sewing machine so that the axis of the mercury switch 46 will be disposed at an angle of approximately forty-five degrees (45°) to the axis of the standard 29. Attention is also called to the fact that the mercury switch 46 is positioned so that its contacts 47—48 are located at the lowermost end of the tube. This arrangement assures that, when the sewing machine 28 is in its elevated or operative position shown in Fig. 1, the mercury 49 will connect the contacts 47—48 and that when the sewing machine 28 is in its lowered, stored or housed position shown in Fig. 2 the mercury 49 will be in the end of the tube 46 opposite from the contacts 47—48.

The elongated plate 41 is provided with a rectangular aperture 51 into which is fitted a multi-pin terminal 52 having, in the illustrated case, six pins 61, 62, 63, 64, 65 and 66 of known construction. Pins 61 and 63 are not used, but pins 62, 64, 65 and 66 are connected to electrical conductors soon to be described. The mercury switch 46, the electric motor 34, an electric light 68, shown diagrammatically in Fig. 3, the pins on the terminal 52 are electrically joined by a plurality of electrical conductors designated by the numerals 72, 74, 75 and 76. Electric pin 62 is connected by means of conductor 72 to the end wall 32 and thus acts to "ground" the frame of the sewing machine. The electric pin 64, by means of the conductor 74, is connected to one contact 47 of the mercury switch 46. The electric pin 65, by means of the conductor 75, is connected to one contact of the light 68. The electric pin 66, by means of the conductor 76, is connected to one contact of the motor 34. An internal connection 77 joins conductors 84, 85 and 86, which are connected respectively to other contacts of

the mercury switch 46, the electric light 68 and the motor 34.

A six-receptacle terminal 89, shown diagrammatically in Fig. 3 as having conventional receptacles 91, 92, 93, 94, 95 and 96, as adapted to be connected to the six-pin terminal 52. Receptacles 92, 94, 95 and 96 are adapted respectively to engage pins 62, 64, 65 and 66, and these receptacles are connected respectively to electrical conductors 102, 104, 105 and 106, and conductors 102, 104 and 105 are connected to a three prong plug 107 adapted to engage a wall type receptacle 108. Conductor 106 connects receptacle 96 to one side of a foot or knee controller 109 which may be constructed in accordance with United States Patent No. 2,384,772. The other side of the foot controller is connected, as at 111, to the line conductor 105. The wall receptacle 108 is connected to three wires, one of these wires 112 being a ground wire and the other two wires 113 and 114 being line wires connected to any suitable supply of voltage.

The device of the present invention operates in the following manner. If a person wishes to use the sewing machine 28, the three prong plug 107 is connected to the wall receptacle 108, and the six-receptacle terminal 89 is connected to the six-pin terminal 52. Then, if we assume that the sewing machine 28 had previously been lowered to a housed inoperative position in a drop-head cabinet in the manner shown in Fig. 2, the operator will raise the leaf 14 and thereafter will raise the sewing machine 28 above the operative position shown in Fig. 1. Then the leaf 14 is lowered to the position shown in solid lines in Fig. 1 and the sewing machine is placed in the operative position shown in Fig. 1. In this position, the contacts 47—48 of the mercury switch 46 are in a lowered position and the mercury 49 connects these two contacts 47—48, thereby connecting the motor 34 and the light 68 to the electric wires 113 and 114. Then the operator regulates the foot or knee controller 109 to such an extent that the motor 34 becomes energized and drives the sewing machine. If the operator should care to leave the sewing machine for a short or an extended period of time the sewing machine is lowered from the operative position shown in Fig. 1 to the inoperative stored position shown in Fig. 2. This causes the mercury switch 46 to assume a position in which the mercury 49 is removed from contact with the contacts 47—48, thereby causing the light 68 and the motor 34 to be deenergized.

With the arrangement herein described, it will be appreciated that the switch 46 is part of the sewing machine 28 and thus the switch 46 will always be associated with the sewing machine regardless of what cabinet into which the sewing machine 28 may be installed. This is a distinct advantage in that a store, where sewing machines are sold, may carry one or two models of sewing machines which selectively may be installed and sold in any one of several different kinds of drop-head cabinets. Furthermore, it will be appreciated that a housewife, who wants to leave the sewing machine 28 without removing the electric plug 107 from the electric wall receptacle 108, can make the sewing machine safe simply by lowering the machine into the storage compartment of the table or cabinet. Automatic opening of the mercury switch 46 guarantees that a child or other unauthorized person cannot operate the motor 34 or light the light 68 while the machine is tilted in the stored position shown in Fig. 2.

Having thus set forth the nature of the invention, what I claim herein is:

1. In combination a portable sewing machine unit comprising a bed and a standard rising from said bed; an electric motor supported by and movable with said unit; an electric switch, so constructed and arranged as to be capable of being either electrically closed or electrically open, said switch being supported by and movable with said unit, said electric switch being of the type that when said unit is in one selected position said switch will be closed and when said unit is in another selected position said switch will be open; electric conductors for connecting said motor to said switch; and means for supplying electric energy to said motor and said switch.

2. A portable sewing machine unit comprising a head and a base; means for supporting said unit in a first selected position and including means for moving said unit from said first position to a second selected position; an electric motor supported by said unit and arranged to drive said sewing machine; a electric switch, so constructed and arranged as to be capable of being either electrically closed or electrically open, said switch being supported by and movable with said unit and so arranged that when said unit is in the first position said switch will be closed, and when said unit is in the second position said switch will be open; and electric means associated with said electric switch for energizing said electric motor.

3. A portable sewing machine unit comprising a hollow head having a base, said head having an opening therein; an electric motor supported by said head and arranged to drive said sewing machine; a plate covering the opening in said head; a switch, so constructed and arranged as to be capable of being either electrically closed or electrically open, said switch being secured to the inner face of said plate; means for moving said sewing machine from a first selected position to a second selected position, said electric switch being closed when said sewing machine is in said first position and open when said sewing machine is in said second position; and means electrically connecting said switch and said motor with a source of electric power.

4. A portable sewing machine unit comprising a head having a base and a hollow standard rising from said base, said head having an opening therein; an electric motor housed in said head and arranged to drive said sewing machine; a plate covering the opening in said head; a U-shaped spring clip secured to the inner face of said plate; a two-pole mercury switch held by said U-shape spring clip, the axis of said mercury switch being disposed at an angle of forty-five degrees (45°) with respect to the axis of said standard, and so arranged that when said standard is upstanding said mercury switch will be closed, and so arranged that when said standard is moved to a non-upstanding stored position said mercury switch will be open; and electric means associated with said mercury switch for energizing said electric motor.

5. A sewing machine comprising a base having a side wall with an opening therein; a hollow upstanding standard rising from said base, said standard having an opening therein; an electric motor housed within said standard and arranged to drive said sewing machine; a first plate covering the opening in said base and said first plate having an aperture therein; a multi-pin terminal secured in the aperture in said first cover plate; a second plate covering the opening in said standard; a U-shaped spring clip secured to the inner face of said second plate; a two-pole mercury switch held by said U-shaped spring clip, the axis of said mercury switch being disposed at an angle of approximately forty-five degrees (45°) with respect to the axis of said standard, and so arranged that, when said standard is upstanding, said mercury switch will be closed; means for moving said sewing machine to a selected stored position in which said standard is not upstanding and said mercury switch is open; electrical conductors connecting said motor and said mercury switch in series; and means for energizing said series connected elements from said multi-pin terminal.

6. A sewing machine comprising a base having a side wall with an opening therein; a hollow upstanding standard rising from said base, said standard having an opening therein; an electric motor housed within said standard and arranged to drive said sewing machine; a first plate covering the opening in said base and said first plate having an aperture therein; a multi-pin terminal

secured in the aperture in said first cover plate; a second plate covering the opening in said standard; a U-shaped spring clip secured to the inner face of said second plate; a two-contact mercury switch held by said U-shaped spring clip, the axis of said mercury switch being disposed at an angle of approximately forty-five degrees (45°) with respect to the axis of said standard, so that, when said standard is upstanding, said mercury switch will be closed and when said sewing machine is moved to a stored position in which said standard is not upstanding said switch will be open; a first electrical conductor connecting one of the contacts of said mercury switch to one of the pins of said multi-pin terminal; a second electrical conductor connecting the second of said contacts of said mercury switch to said motor; and a third electrical conductor connecting said motor to one of the pins of said multi-pin terminal.

7. In combination, a portable sewing machine unit; a cabinet adapted to house said portable sewing machine unit; hinge means for connecting said portable sewing machine unit to said cabinet; an electric motor supported by and movable with said portable sewing machine unit, said electric motor being adapted to drive said portable sewing machine unit; an electric switch, so constructed and arranged as to be capable of being either electrically

closed or electrically open, said switch being supported by and movable with said portable sewing machine unit when said portable sewing machine unit is moved from place to place, and when said portable sewing machine unit is moved from one position in said cabinet to a second position in said cabinet, said electric switch being of the type that when said portable sewing machine unit is in one selected position in said cabinet said electric switch will be closed, and when said portable sewing machine unit is in a second selected position in said cabinet said electric switch will be open; electric conductors for connecting said electric motor to said electric switch; and means for supplying electric energy to said electric motor and to said electric switch.

References Cited in the file of this patent

UNITED STATES PATENTS

1,349,678	Kopf et al.	Aug. 17, 1920
1,565,362	Hemleb	Dec. 15, 1925
2,057,904	Morse	Oct. 20, 1936
2,320,065	Briscoe et al.	May 25, 1943
2,617,375	Peets	Nov. 11, 1952

FOREIGN PATENTS

890, 444	Germany	Sept. 17, 1953