This invention relates to an electrical control system for a sewing machine and has for its primary object to provide an electrical control system for a sewing machine which is equally well adapted for use as a portable machine and as a cabinet-type machine.

Another object of the invention is to provide a simple means for controlling the driving motor in place in the sewing machine frame.

A further object of the invention is to provide shielding means for exposed electrical connections.

A still further object of the invention is to provide a mounting plate for an electrical receptacle.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings, Fig. 1 is a front elevation of a sewing machine embodying the present invention and giving a portion of a cabinet, a portion of the motor and the cabinet being broken away to expose the component parts.

Fig. 2 is an end elevation of the sewing machine.

Fig. 3 is an enlarged sectional view taken on the line 3-3 of Fig. 2.

Fig. 4 is a rear elevation of the bed electrical receptacle.

Fig. 5 is a fragmentary bottom plan view of the sewing machine with its bottom closure plate removed.

Fig. 6 is a sectional view taken on line 6-6 of Fig. 5 showing the bottom closure plate in place.

Fig. 7 is a perspective view of the motor plating clamp.

Fig. 8 is a schematic wiring diagram of the electrical control system when the machine is applied to a sewing machine cabinet.

Fig. 9 is a schematic wiring diagram of the electrical control system when the sewing machine is used as a portable machine.

More specifically according to the drawings, the invention is disclosed as being embodied in a sewing machine having a bed supporting a curved bracket-arm 11. The bracket-arm 11 terminates at its free end in a head 12 which carries a needle-bar 13. A three-pin contact plug or terminal 14 is mounted in the bracket-arm 11 and is provided with three contacts or terminal pins 15, 16 and 17. The plug is recessed in the end wall of the bracket-arm standard and is held in place by screws 18.

A two-pin receptacle or terminal 19 is fastened to a cover-plate 20 by screws 21. The cover-plate 20 is formed to fit the contour of the end wall 22 and to cover the access hole 23 in the end wall 22. Screws 24 fasten the cover-plate 20 to the end wall 22 so that the rear of the receptacle 19 protrudes through the clearance hole 25 in the end wall 22. The receptacle 19 is provided with two pin-sockets or terminals 26 and 27 to receive the connector pins from a motor-controller to be described later.

A driving electric motor 28 is positioned in the bed 10 with the rotor axis extending vertically into the bracket-arm standard 11. Clamping ridges 29 are provided on the periphery of the motor housing and are engaged by an upstanding flange 30 of a clamping plate 31. A positioner ear 32 on the flange 30 extends between the ridges 29. The clamping plate 31 engages the end of a stiffening rib 32 in the bed 10 and is provided with an upstanding guard-flange 36 which extends behind the exposed terminals 37 and 38 of the receptacle 19. A boss 33 depends from the bed 10 and is provided with a threaded hole 34 which receives a screw 35 holding the clamping plate 31 in position. A closure-plate 39 for the bottom of the bed 10 protects the operating parts of the machine.

The electrical connections in the machine are as shown in Fig. 8. Electrical energy is normally supplied to contacts or pins 15 and 17 from the three-pin terminal plug 14 by the motor controller 52. The conductors 40 and 41 attached to the receptacle 40, which sockets are connected to a source of electric power (not shown) by conductors 41 and 42 respectively. Conductors 43 and 44 extend from the contact pins 15 and 17 respectively, to a lighting unit 45 carried by the horizontal portion of the bracket-arm 11. The motor 28 is connected to contact pins 15 and 16 by conductors 46 and 47, respectively, and the pin sockets 26 and 27 are connected to the contacts 16 and 17 by the conductors 50 and 51, respectively. A motor speed controller 52 is connected to the sockets of the receptacle 19 by means of conductors 53 and 54 and the two-pin plug 55. The motor controller may be of any well-known type such as that disclosed in the U. S. Patent No. 2,117,257, dated May 10, 1938, issued to C. R. Schenk.

The sewing machine may be supported by a cabinet 56, a fragment of which is shown in Fig. 1, in which case, the motor speed controller is attached to a side wall 57 of the cabinet and is operated by a knob 58 such as that shown in the U. S. Patent No. 2,065,428, dated December 22, 1936, issued to H. D. Chason. When used in this manner, the receptacle 19, to which the motor controller 52 is connected, is located below the base surface of the cabinet 56. If desired, the motor controller 52 may be detached from the cabinet wall 57 and placed on the floor at the operator's feet, whereby it may be operated by foot power.

If it is desired to use the sewing machine as a portable machine, the motor speed controller conductors 60 and 61 and the conductors 41 and 42 from the electric power source (not shown) are attached to the receptacle 40 which is engaged with the plug 14 as shown in Fig. 9. The conductors 41 and 42 carrying the input current are attached to the contacts 15 and 16, respectively, as previously described. The conductors 60 and 61 from the motor controller 52 are connected to the contacts 16 and 17, respectively, of the receptacle 40. It should be noted that the wiring in the sewing machine remains the same as that illustrated in Fig. 8, for use when the machine is employed in a cabinet. It is also possible to use the machine as a portable machine with the wiring connections shown in Fig. 8. To use the machine in this manner, it is only necessary to remove the machine and the motor speed controller from the cabinet and place the speed controller on the floor, to be used as a foot controller, and place the machine on any suitable supporting surface.

From the foregoing description, it is believed that the advantages of our invention will be readily apparent. By placing the two-pin receptacle 19 in the wall 22 of the machine bed and connecting it to the three-pin terminal plug 14 carried by the bracket-arm 11, a simple electrical wiring system is provided whereby the machine may be readily operated either as a portable machine or as a cabinet. By placing the receptacle 19 below the top surface of the machine bed 10, it is possible to run the conductors 53 and 54 directly from the motor speed controller 52 to the two-pin receptacle 19, when the machine is in a cabinet, without having these conductors pass through or over the top surface of the cabinet. Previous machines adapted for portable use, the two-pin receptacle 19 was omitted and the motor speed controller 52 and electrical power source were both connected to the three-pin terminal plug 14, as described in connection with Fig. 9. When this type of wiring is used with the machine in a cabinet and the motor controller installed in the position shown in Fig. 1, the conductors 60 and 61 leading from the motor controller to the three-pin terminal plug 14 must extend around the top of the cabinet and over the top working surface of the cabinet or a special hole must be provided in the top surface.
face of the cabinet to permit the conductors to pass through. This is a very inconvenient and cumbersome arrangement. Our invention, as described above, eliminates the need for attaching the motor controller conductors directly to the three-pin terminal and threading these conductors over the top surface of the cabinet. Thus we have provided a sewing machine which is easily adapted for either portable use or for use installed in a cabinet.

Other advantages are obtained from the particular means of mounting and shielding the two-pin receptacle. The two-pin receptacle 19 is attached to the cover-plate 20 which is formed to follow the contour of the bed wall 22. This plate 20 serves as a mounting plate for the receptacle 19 and also as a cover-plate for the access hole 33. Thus, if the receptacle 19 and plate 20 may be attached to the wall 22 as an assembled unit by means of the screws 24. It should be noted that the receptacle 19 has two exposed wiring connection terminals 37 on its rear or inward face. To protect these terminals, we have provided the special motor clamping plate 31, which serves the two-fold purpose of holding the motor 28 in position and, also, of shielding the connections 37. As described above, the plate 31 engages the motor rides 29 and the rib 32 and is secured to the bed by the screw 35. The ear 30 extends between the ridges 29 and prevents the motor from turning. The upper guard flange 36 extends vertically up behind the receptacle 19 and effectively shields the connections terminals 37. Thus, when the plate 31 is removed, the motor 28 may be readily removed and the receptacle connection terminals 37 are readily accessible. Having thus set forth the nature of our invention, what we claim herein is:

1. A sewing machine having a frame comprising a bed and a bracket-arm carried by said bed, a three-pin terminal carried by said bracket-arm, a two-pin receptacle carried by said bed and having exposed terminals, electrical conductors operatively connecting said three-pin terminal and said exposed terminals on said said two contact receptacle, a driving motor positioned in said bed adjacent to said receptacle, a clamping plate engaging said motor, and said bed having clamping plate extending under and behind said exposed terminals, means securing said plate to said bed, and operative electrical connections between said motor and said three-pin terminal.

2. A sewing machine having a frame comprising a bed and a bracket-arm carried by said bed, said bed having an end wall provided with holes, a cover-plate extending over the holes in said end wall, a two-pin receptacle carried by said cover-plate and positioned in one of the holes in said end wall, means securing said cover-plate to said end wall, a three contact terminal carried by said bracket-arm, electrical conductors operatively connecting said three contact terminal to said two-pin receptacle, an electric motor positioned in said bed adjacent to said receptacle, a clamping plate engaging said motor and extending under and behind said two-pin receptacle, means securing said clamping plate to said bed, and operative electrical connections between said motor and said two contact terminal.

3. In a sewing machine having a frame comprising a bed and a bracket-arm carried by said bed, a lighting unit carried by said frame, a motor positioned in said frame, an electric plug carried by said bracket-arm; an electrical receptacle carried by said bed adjacent to said motor and having exposed electrical connections; operative electrical connections between said plug and said motor, light and receptacle; an electrical connection between said receptacle and said motor; a clamping plate engaging said motor and said frame and having an upward flange extending behind said exposed connections; and means securing said plate to said frame.

4. In a sewing machine having a frame comprising a bed and a bracket-arm carried by said bed, said bed having a flat top surface and side and end walls, an electric motor positioned in said bed and extending vertically through the top surface of said bed into said bracket-arm, an electrical receptacle carried by one end wall of said bed adjacent to said motor and having exposed electrical connections, a clamping plate engaging said motor and said bed and having an upward flange extending behind and shielding said electrical connections, and means securing said clamping plate to said bed.

5. In a sewing machine having a frame comprising a bed and a bracket-arm carried by said bed, said bed having a flat top surface and side and end walls, an electric motor positioned in said bed and extending vertically through the top surface of said bed into said bracket-arm, an electrical receptacle carried by one end wall of said bed adjacent to said motor and having exposed electrical connections, a clamping plate engaging said motor and said bed and having an upward flange extending behind and shielding said electrical connections, and means securing said clamping plate to said bed.

6. In a sewing machine as specified in claim 5, an electrical conductor adapted to supply electric power to said bed and having electrical contacts carried by said bracket-arm, electrical terminals carried by said bed, electrical connections extending from a first of said contacts to said motor and said lighting unit, electrical connections extending from a second of said contacts to said motor and to one of said terminals, and electrical connections extending from a third of said contacts to said lighting unit and a second of said terminals.

7. In a sewing machine having a frame comprising a bed and a bracket-arm carried by said bed, an electric motor carried by said frame, electrical contacts carried by said bracket-arm, electrical terminals carried by said bed, electrical connections extending from a first of said contacts to said motor, electrical connections extending from a second of said contacts to said motor and to one of said terminals, and electrical connections extending from a third of said contacts to a second of said terminals.

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