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[54] **ELECTRIC MOTOR MOUNT FOR SEWING MACHINES**

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[52] **U.S. Cl.** **112/220**

[51] **Int. Cl.** **D05b 69/12**

[58] **Field of Search** ..... 112/220, 221, 219 R, 112/218 R; 248/16; 310/91

[56] **References Cited**

UNITED STATES PATENTS

3,141,429 7/1964 Momberg et al. 112/220

3,157,142 11/1964 Birch et al. 112/220

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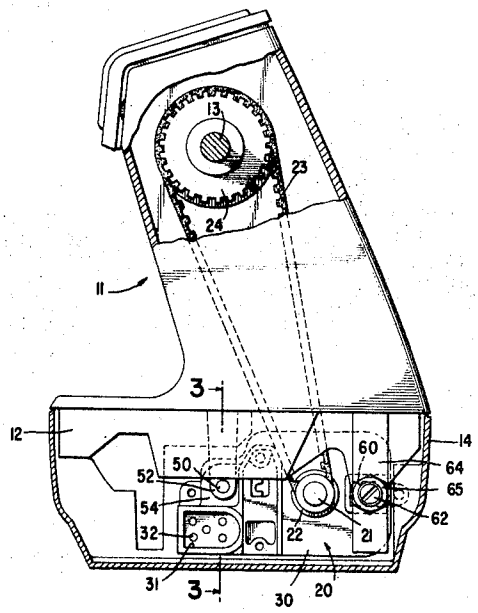
[57] **ABSTRACT**

A mounting arrangement for pivotally supporting an electric motor within the casing of a sewing machine with provision for angular adjustment of the motor to regulate the tension in a belt by which the motor drives the sewing machine and in which the pivotal motor support is arranged to provide for maximum belt tension adjustment with minimum disturbance in the registration of an electrical connector socket on the motor relatively to a clearance opening for the electrical connector in the sewing machine casing.

3 Claims, 3 Drawing Figures



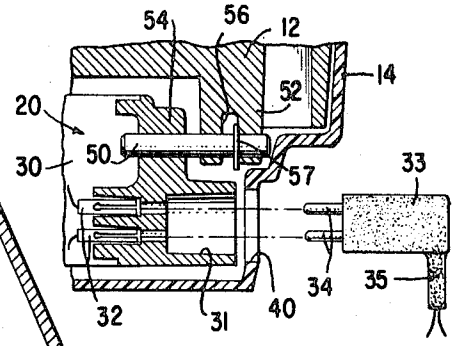
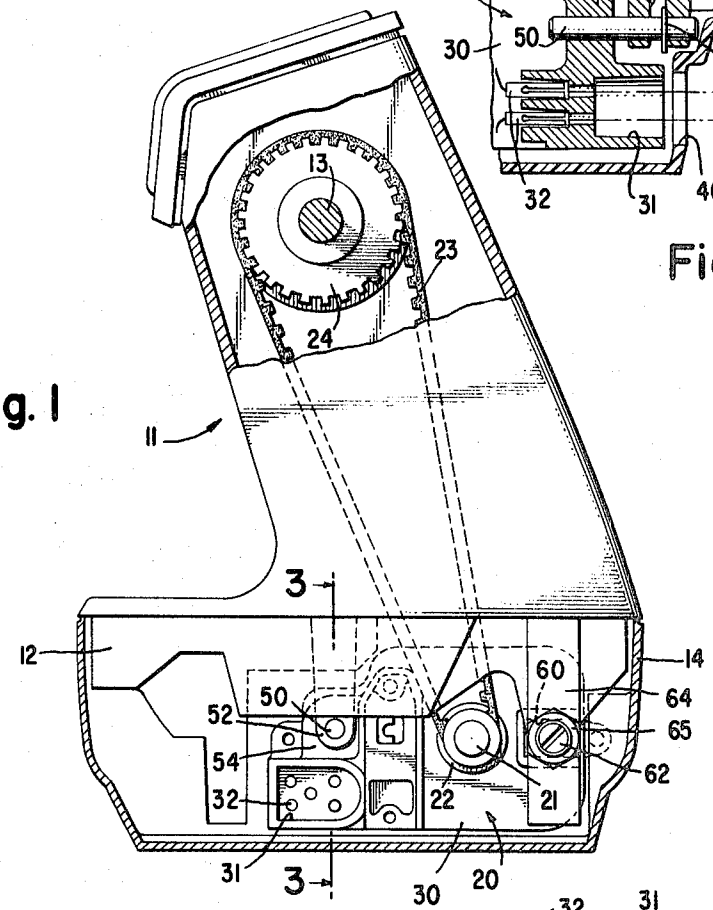


Fig. 3

Fig. 1



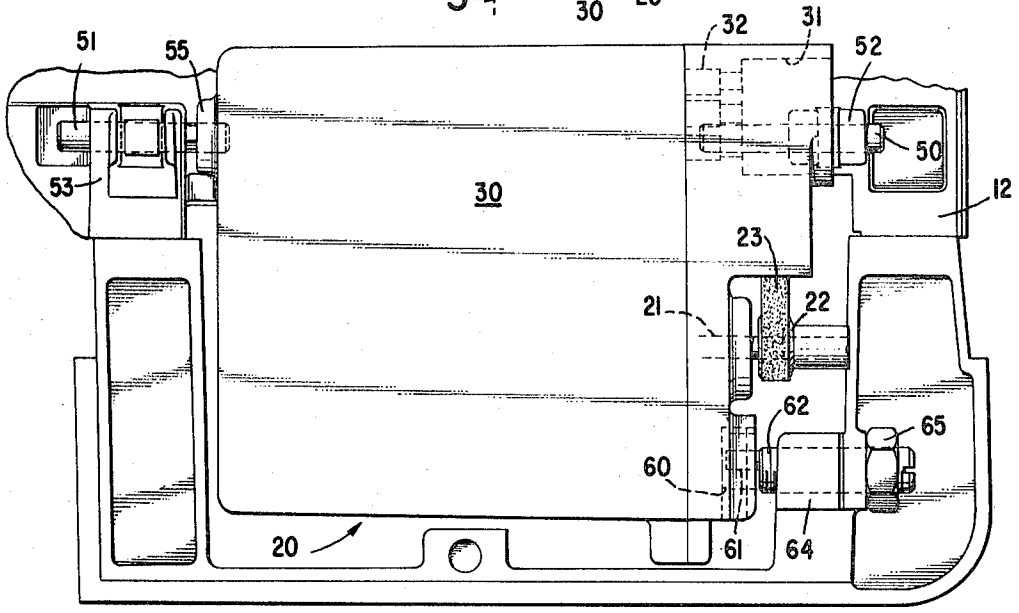


Fig. 2

ELECTRIC MOTOR MOUNT FOR SEWING MACHINES

BACKGROUND OF THE INVENTION

It is conventional in the sewing machine art to provide a separable plug and socket connection in the electrical wiring for the electric sewing machine driving motor so that the supply cord and the speed controller can be detached when it is desired to store or transport the sewing machine. It is also known to form the socket of such separable electrical connection as a part of the electric motor housing, and where the electric motor is supported exteriorly of the sewing machine casing, this arrangement does not present any particular problems.

When the electric motor is to be arranged within the machine casing, however, adjustment of the motor into proper driving relationship, as for instance to regulate belt tension, also shifts the socket of the electrical connection. In order to accommodate the plug in all possible socket positions, a large clearance aperture is required in the sewing machine casing which is not only unsightly but which can expose operating mechanism within the casing.

SUMMARY OF THE INVENTION

It is an object of this invention to provide an adjustable mounting arrangement within the sewing machine casing for an electric motor formed with an integral electrical connection socket cooperable with an electrical plug adapted to engage the socket through a minimum sized clearance opening in the sewing machine casing. This object of the invention is attained by locating the electrical socket remote from the motor drive shaft and by providing pivotal support means for the motor closely adjacent to the electrical socket. Maximum repositioning of the motor shaft for belt tension adjustment can thus be attained with minimum shift of the position of the electrical socket.

DESCRIPTION OF THE DRAWINGS

This invention is illustrated in the accompanying drawing of a perferred embodiment in which:

FIG. 1 represents an end elevational view of a sewing machine having this invention applied thereto with portions of the sewing machine casing broken away,

FIG. 2 is a bottom plan view of the sewing machine of FIG. 1 with the sewing machine bed casing removed, and

FIG. 3 is a cross sectional view taken substantially along line 3—3 of FIG. 1.

In the accompanying drawings a sewing machine is illustrated indicated generally at 11. The sewing machine includes a frame 12 in which the operating mechanism of the sewing machine such as a main shaft 13 is supported. The sewing machine is also provided with an exterior casing 14 which may be formed as a portion of the frame 12 or which may be provided as a separate element covering the frame.

For driving the sewing machine, an electric motor indicated generally at 20 is provided. In accordance with this invention, the motor 20 is mounted on the sewing machine frame within the casing 14, and a drive shaft 21 of the electric motor carries a pulley 22 on which is entrained a belt 23 which drivingly engages a sprocket 24 on the main shaft 13 of the sewing machine.

The electric motor 20 is constructed with a housing 30 preferably formed of an insulating material such as

molded synthetic plastic or the like. The housing is formed integrally with an electric socket 31 in which terminals 32 for electric wiring of the motor as well as any ancillary electrical equipment (not shown) such as lighting devices or the like may be directed. The socket 31 is adapted to accommodate a plug 33 which carries prongs 34 engageable with the terminals 32 thus to provide a separable electric connector so that conductor 35 to a source of supply as well as to a speed controlling instrumentality (not shown) may be readily disconnected from the sewing machine as for storage, transport or the like.

The sewing machine casing 14 is formed with a clearance aperture 40 for the plug 33 which, as best shown in FIG. 3, is arranged in registry with the socket 31 and for appearance and safety should be as small as is possible.

The motor mounting of this invention provides for minimum size of the clearance aperture 40 commensurate with a maximum range of adjustment of the position of the motor drive shaft for belt tension regulation. The motor mount includes a pair of axially aligned pivot pins 50 and 51 which are secured in lugs 52, 53 respectively on the machine frame, and which are enhanced by apertured bosses 54, 55 on the motor housing. For securing the pivot pins 50 and 51 in the machine frame lugs 52, 53, an arrangement as shown in FIG. 3 may be used in which the sewing machine frame lug 52 is formed with a transverse plot 56 within which is situated a spring clip 57 which is snapped onto the pivot pin 50.

The aligned pivot pins 50, 51, as shown in FIG. 1, engage the motor housing closely contiguous to the electric connector socket 31 so that despite pivoted movement of the motor 20, the socket will move only slightly relatively to the clearance aperture 40 and the aperture need only be slightly larger than the plug in order to accommodate the plug in any of a wide range of different angular positions of the motor.

The drive shaft 21 of the motor is preferably arranged at a greater distance from the pivot pins 50 and 51 than the socket. This remote position of the drive shaft provides for increased shift of the drive shaft position when the motor is shifted angularly about the axis of the pivot pins 50 and 51.

For regulating the angular position of the motor 20, the motor housing 30 is formed, at the side of the drive shaft opposite the socket 31, with a guideway 60 which extends radially of the pivotal axis defined by the pivot pins 50, 51. Extending into the guidway 60 is a crank pin 61 carried eccentrically on a threaded stud 62 which is constrained in a threaded bore 63 in a lug 64 on the sewing machine frame. A lock nut 65 serves selectively to clamp the stud 62 in any selected position of the crank pin. Preferably, the guideway 60 and threaded stud 62 are arranged at the opposite side of the motor drive shaft 21 from the socket 31.

Having set forth the nature of this invention, what is claimed herein is:

1. In a sewing machine having a frame with a casing, an electric sewing machine driving motor having a housing, a drive shaft projecting exteriorly of said housing and an electrical socket carried on said housing, means for shiftably supporting said electric motor within said sewing machine casing comprising interengaging pivot means on said sewing machine frame and on said electric motor housing remote from said drive

shaft and contiguous to said electrical socket, and shiftable motor locating means on said sewing machine frame and said motor housing remote from said electrical socket, said sewing machine casing being formed with an electrical plug accommodating clearance aperture arranged in registry with said electrical socket on said motor housing.

2. In a sewing machine as set forth in claim 1 in which said pivot means supports said motor housing on an axis parallel to said drive shaft, and in which said pivot means and said electrical socket are arranged at one side of said drive shaft and said motor locating means is arranged at the opposite side of said drive shaft.

3. In a sewing machine as set forth in claim 2 in which said motor locating means comprises a guideway formed in said motor housing substantially radially of said pivot means, and a crank pin adjustably secured in said sewing machine frame and engaged in said guideway.

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