Nov. 29, 1949 R. G. MILLER 2,489,584

CLUTCH AND BRAKE FOR SEWING MACHINES OR THE LIKE

Filed May 16, 1947 2 Sheets-Sheet 1

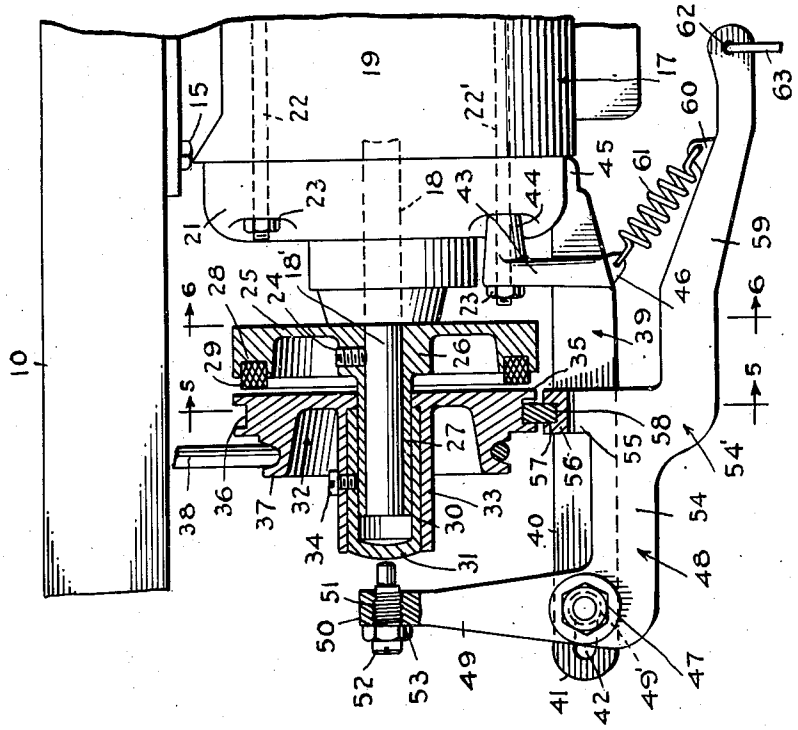


FIG. 2.

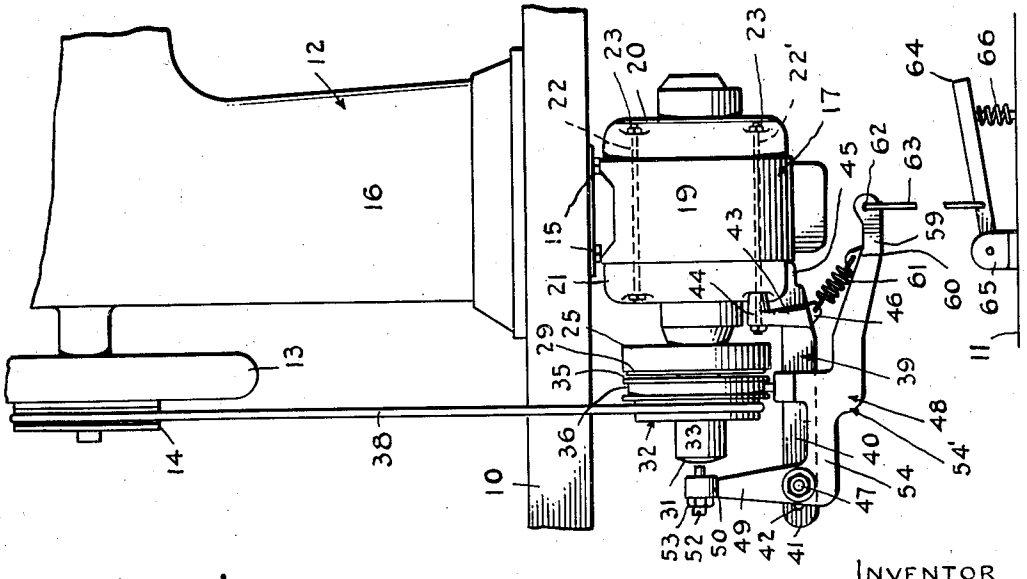


FIG. 1.

INVENTOR
ROBERT G. MILLER

ATTORNEYS

Nov. 29, 1949 R. G. MILLER 2,489,584

CLUTCH AND BRAKE FOR SEWING MACHINES OR THE LIKE

Filed May 16, 1947 2 Sheets-Sheet 2

FIG. 5.

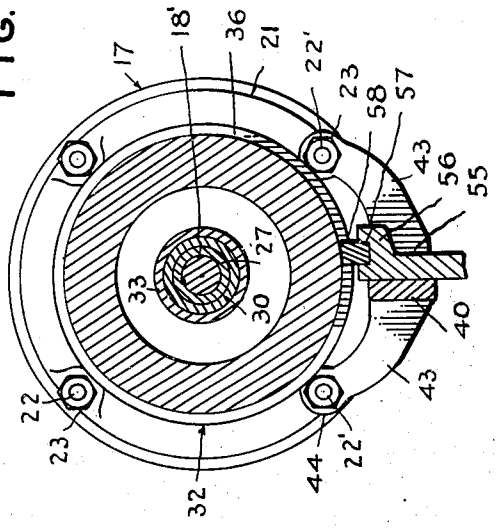


FIG. 6.

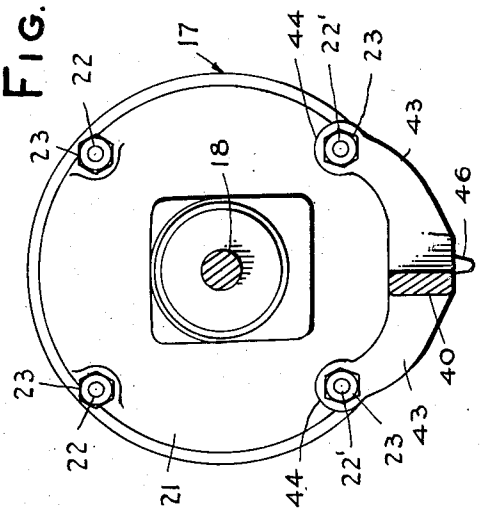


FIG. 3.

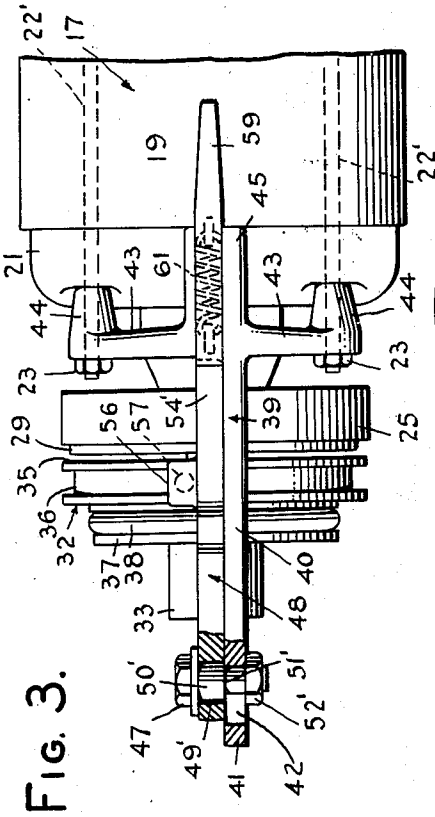
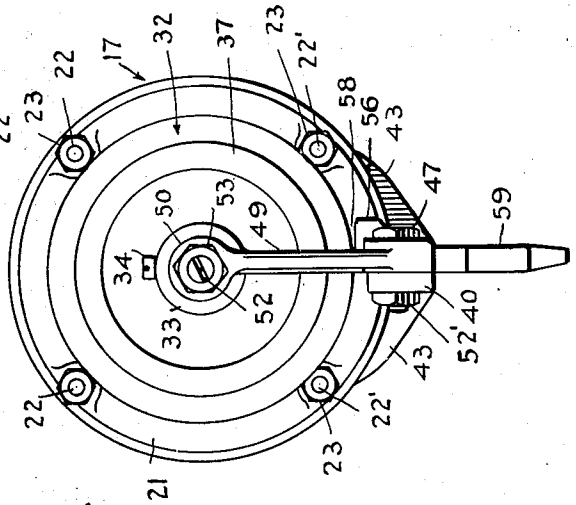


FIG. 4.



INVENTOR
ROBERT G. MILLER

BY [signature]

ATTORNEYS.

Patented Nov. 29, 1949 2,489,584

UNITED STATES PATENT OFFICE

2,489,584

CLUTCH AND BRAKE FOR SEWING MACHINES OR THE LIKE

Robert G. Miller, Dalton, Ga.

Application May 16, 1947, Serial No. 748,558

1 Claim. (Cl. 192—17)

1

My invention relates to a clutch for power driven sewing machines, and the like.

A primary object of the invention is to provide a clutch adapted to change standard fractional horsepower electric motors into drives for power driven sewing machines.

A further object of the invention is to provide a clutch and actuating means therefor, to be mounted directly upon the sewing machine motor, to form with the motor a self contained drive unit for the machine.

A further object is to provide a device of the above mentioned character which is simple in design, comprising few parts, and therefore quite inexpensive to manufacture.

A still further object is to provide a clutch device for sewing machines, which when assembled onto the drive motor provides an extremely compact power unit, adapted to be mounted so as not to interfere with the operator of the machine.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of a sewing machine clutch embodying my invention, the same being applied to a motor disposed beneath a sewing machine table, parts broken away,

Figure 2 is an enlarged side elevation of the clutch, similar to Figure 1, parts in section and parts broken away.

Figure 3 is a bottom plan view of the clutch and motor, parts broken away,

Figure 4 is an end elevation of the same, parts omitted,

Figure 5 is a vertical section taken on line 5—5 of Figure 2, and,

Figure 6 is a vertical section taken on line 6—6 of Figure 2.

In the drawings, where for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates a horizontal table or platform, spaced above a floor 11, and upon which is securely mounted a conventional power driven sewing machine 12. This sewing machine 12 has the usual rotatable hand wheel 13, mounted upon the horizontal drive shaft of the machine for rotation therewith; and rigidly secured to the outer side of the hand wheel is the usual grooved pulley 14, for driving the horizontal shaft of the machine.

2

Rigidly mounted upon the bottom side of the table 10, by means of bolts 15, or the like, and preferably disposed near the vertical post 16 of the sewing machine, is a suitable electric motor 17 for driving the machine. The armature shaft 18 of this motor is disposed horizontally, and includes the usual axial extension 18' at one end of the motor. This shaft extension 18' is disposed beneath the grooved pulley 14. The motor illustrated is of the type having a casing comprising three casing sections, a middle or main casing section 19, and end casing sections 20 and 21. These casing sections are fastened together by a plurality of equally spaced axial through bolts 22 and 22' carrying nuts 23.

Rigidly mounted upon the armature shaft extension 18', for rotation therewith, by means of a set screw 24, or the like, is a fly wheel or clutch disc 25, having a hub 26. The clutch disc 25 is disposed at the inner end of the shaft extension 18', and includes an outwardly axially projecting tubular extension or bearing 27, formed integral with the hub 26. This tubular extension 27 extends substantially to the outer end of the shaft extension 18' and encloses the same. The clutch disc 25 is provided with an annular groove 28 formed in its outer vertical face, and near its outer periphery; and this groove receives an annular clutch element or ring 29, preferably formed of leather. The clutch ring 29 is securely held within the groove 28 by any suitable means, and cannot slide within the groove. The outer annular surface of the leather clutch ring 29 projects axially beyond the outer vertical face of the clutch disc to provide a frictional clutch surface, see Figure 2.

Rotatably mounted upon the tubular extension 27 of the clutch disc, and free to be shifted axially thereon, is an intermediate sleeve or bushing 30, including a curved outer end 31. This bushing 30 extends axially outwardly beyond the end of the armature shaft extension 18' for a short distance. Mounted upon the bushing 30 and adapted to rotate therewith is a combined pulley and clutch disc 32. This element 32 includes an elongated tubular hub 33, to receive the bushing 30 and the hub and bushing are rigidly secured together by a set screw 34, or the like. The combined pulley and clutch disc 32 has a flat vertical inner face 35 for engagement with the leather clutch ring 29, and is provided with an annular brake groove 36, formed in its outer periphery. The groove 36 is rectangular in transverse cross section. The combined pulley and clutch disc further includes a grooved pulley extension 37, formed integral

therewith, and having an outside diameter smaller than the diameter of the face 35. The outside diameter of the element 32 is preferably substantially the same as the outside diameter of the clutch disc 25. The pulley extension 37 is disposed axially outwardly of the brake groove 36, see Figure 2, and is in substantial vertical alignment with the grooved pulley 14. The numeral 38 designates a belt which engages in the grooves of the pulley 14 and pulley extension 37.

Rigidly mounted upon the casing section 21 of the motor 17 is a generally cross-shaped adaptor bracket 39. This bracket includes an elongated horizontal arm 40, parallel to the armature shaft 18, and offset laterally to one side of the longitudinal center line of the armature shaft, see Figure 5. The horizontal arm 40 is disposed beneath the armature shaft extension 18' and the elements mounted thereon, and its outer end 41 projects outwardly beyond the end 31 of the bushing 30. The arm 40 is provided with a longitudinal slot 42, near its outer end. The adaptor bracket 39 further includes upwardly curved arms 43 near its inner end, and formed integral with the horizontal arm 40. These arms 43 are disposed upon opposite sides of the arm 40, and extend laterally and upwardly from such arm. The upper ends of the curved arms 43 carry apertured bosses or sleeves 44, formed integral therewith, and these bosses are disposed adjacent to the through bolts 22' of the motor casing. These through bolts 22', adjacent to the bosses 44, are longer than the outer through bolts 22, and they extend through the apertures in the bosses. A pair of the nuts 23 are employed for rigidly clamping the bosses 44 against the casing section 21. The bracket 39 further includes a horizontal foot 45, integral with the arm 40, and extending inwardly axially beyond the arms 43 to engage beneath the end casing section 21. The foot 45 counteracts bending moment imparted to the arm 40 during the operation of the clutch, and thereby makes the bracket 39 extremely rigid. The bracket 39 is also provided with an apertured ear 46, depending from the arm 40, and adjacent to the curved arms 43.

Pivotally connected to the adaptor bracket 39 by means of a bolt 47, is a bell-crank lever 48. This bell-crank lever includes a substantially vertical upstanding arm 49, provided at its upper end with a head 50, having a screw threaded opening 51 for receiving an adjusting screw 52, carrying a lock nut 53. The length of the arm 49 is such that the adjusting screw 52 is disposed substantially at the axial center line of the armature shaft 18. The adjusting screw 52 is adapted to engage the end 31 of the bushing 30. The lower portion of the upstanding arm 49 is provided with an opening 49', to pivotally receive the smooth shank 50' of the pivot bolt 47. The diameter of the opening 49' is greater than the width of the slot 42 in the arm 40, and the smooth shank 50' forms a lateral shoulder 51' for engagement against the adjacent side of the lever 40. A nut 52' is mounted upon the reduced screw threaded portion 53' of the pivot bolt and clamps the arm 40 against the shoulder 51'. It is thus seen that the bell-crank lever 48 is freely pivotally mounted upon the smooth shank portion 50', and the bolt 47 is fixed with respect to the arm 40 of the adaptor bracket 39. The bolt 47 may be adjusted longitudinally of the slot 42 as required. The bell-crank lever 48 further includes a substantially horizontal arm 54', including a portion 54, adjacent to the arm 49, and disposed at the longitudinal center line of the armature shaft 18. The portion 54 carries a vertical extension 55, having an offset horizontal shoulder 56, provided with a recess 57, for holding a brake element 58. The brake element 58 is adapted to enter the annular brake groove 36, and the width of this groove is greater than the width of the brake element. The horizontal arm 54' further includes a downwardly offset generally horizontal portion 59, extending axially of the motor 17 and beneath the same, and the portion 59 terminates near the longitudinal center of the motor. The portion 59 is provided with an apertured ear 60, disposed below and inwardly of the ear 46. A retractile coil spring 61 has its ends connected with the ears 46 and 60, and tends to maintain the horizontal arm 54' in the upper position. The inner end of the arm portion 59 has an opening 62, pivotally receiving the end of a tension rod 63, extending downwardly near the floor 11. The lower end of the rod 63 is pivotally connected to a foot pedal 64, in turn pivotally connected to a fixed bracket 65. A compressible coil spring 66 may be arranged beneath the foot pedal 64 to resist the downward movement of the same.

In operation, the electric motor 17 may operate continuously, and the clutch disc 25 rotates with the armature shaft 18. When it is desired to drive the sewing machine, the operator depresses the foot pedal 64. When this is done, the rod 63 exerts a downward pull upon the arm 54', and this arm is swung downwardly, Figure 1, against the force of the spring 61. When this occurs the brake element 58 disengages the bottom of the annular groove 36 to free the combined pulley and clutch disc 32 for rotation. Simultaneously, the arm 49 of the bell-crank lever swings to the right, Figure 2, and the screw 52 engages the end 31 of the bushing 30. This bushing is shifted axially inwardly upon the hub 27, and the combined pulley and clutch disc 32 is shifted with the bushing. The face 35 of the element 32 engages against the clutch ring 29 and this causes the element 32 to rotate with the armature shaft. The clutch engagement will be maintained as long as the operator depresses the foot pedal 64. When the element 32 is thus driven, the pulley extension 37 drives the belt 38, driving the pulley 14 of the sewing machine.

When it is desired to stop the sewing machine the operator removes her foot from the pedal 64. When this occurs the spring 61 swings the arm 54' upwardly. The arm 49 swings to the left, Figure 2, and the combined pulley and clutch disc 32 disengages the clutch ring 29 and is no longer driven thereby. Simultaneously, the brake element 58 moves upwardly, Figure 2, and engages the bottom of the groove 36 to hold the element 32 against rotation. The brake element 58 also prevents axial movement of the element 32 with respect to the armature shaft 18. The pulley 14 is now prevented from rotating, and the sewing machine is stopped.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claim.

Having thus described my invention, what I claim is:

In a friction clutch drive mechanism, an electric motor including a horizontal casing and a horizontal armature shaft extending outwardly

beyond one end of the casing, means secured to the top of the casing to attach the same to a support, driving and driven rotary elements mounted upon the armature shaft outwardly of and near one end of the casing, one element being axially movable, a horizontal bracket including a single longitudinal arm, a single transverse arm provided at its ends with openings, and a longitudinal foot, the longitudinal arm and foot being arranged near the longitudinal center of the transverse arm and upon opposite sides of the transverse arm, the longitudinal arm being disposed beneath the rotary elements and the openings of the transverse arm receiving bolts from the casing and the foot engaging the bottom of the side of the casing below the bolts, a bell crank lever including a generally horizontal longitudinal arm and an upstanding arm projecting above the longitudinal arm, the upstanding arm serving to move the axially movable element, the generally horizontal lever arm being arranged beneath the casing and rotary elements, means pivotally connecting the outer ends of the generally horizontal lever arm and longitudinal

bracket arm, an upstanding brake element carried by the generally horizontal lever arm near its longitudinal center for engagement with one rotary element, a retractile coil spring connecting the inner ends of the generally horizontal lever arm and the bracket, and means connected with the inner end of the longitudinal lever arm to move it downwardly.

ROBERT G. MILLER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
909,631	Marx	Jan. 12, 1909
1,510,728	Webb	Oct. 7, 1924
1,647,450	Katzman	Nov. 1, 1927
2,048,501	Goosman	July 21, 1936

FOREIGN PATENTS

Number	Country	Date
420,708	Great Britain	Dec. 6, 1934