M. TAIGMAN.

ELECTRICALLY CONTROLLED TRANSMISSION.

APPLICATION FILED MAY 17, 1918.

1,405,640. Patented Feb. 7, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

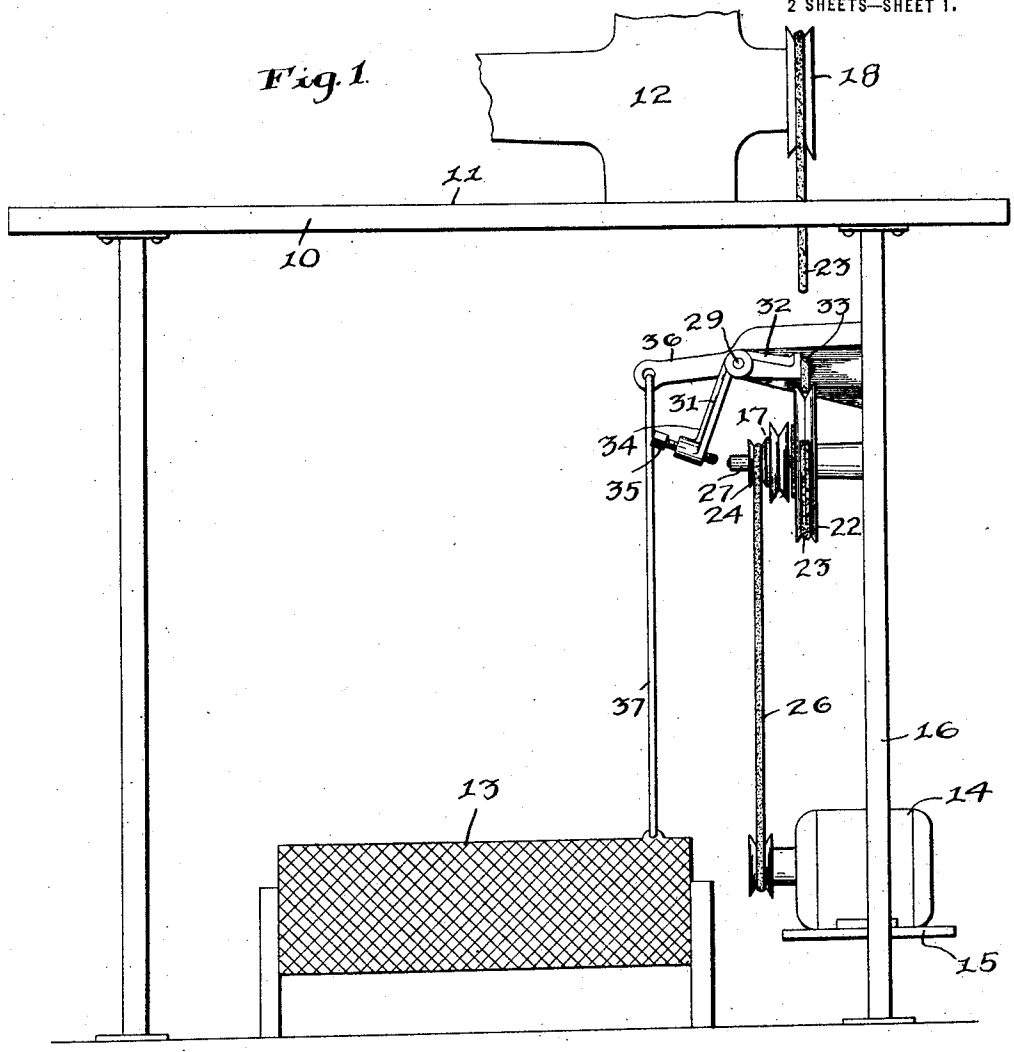
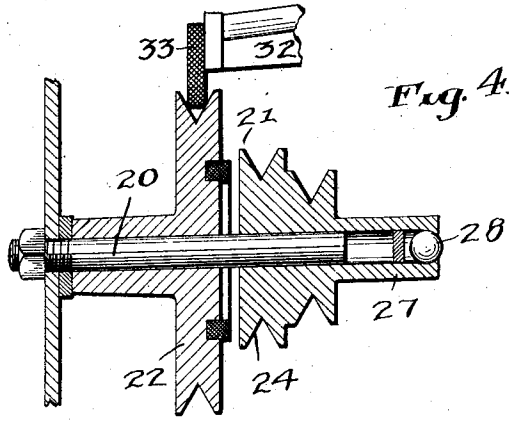



Fig. 4.




INVENTOR

Max Taigman

BY

Hillary E. Messmer

ATTORNEY

M. TAIGMAN.

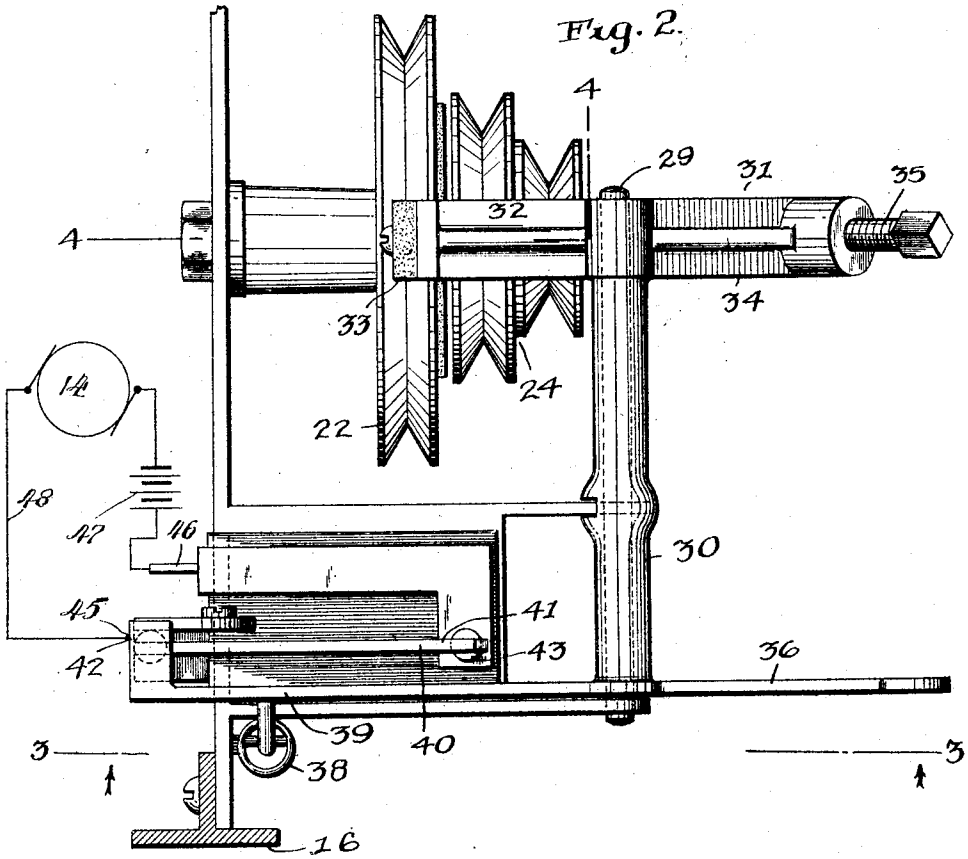
ELECTRICALLY CONTROLLED TRANSMISSION.

APPLICATION FILED MAY 17, 1918.

1,405,640. Patented Feb. 7, 1922.

2 SHEETS—SHEET 2.

Fig. 2.



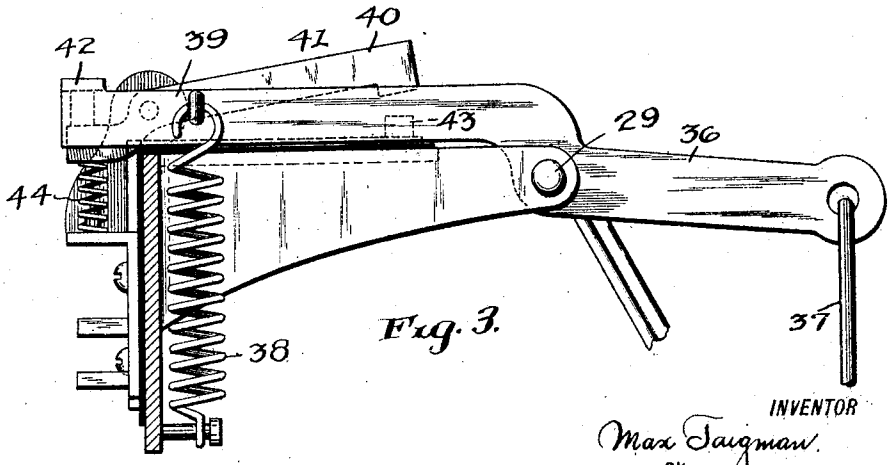




Fig. 3.

INVENTOR

Max Taigman.

BY

Hillary C. Messmer

ATTORNEY

# UNITED STATES PATENT OFFICE.

MAX TAIGMAN, OF NEW YORK, N. Y.

## ELECTRICALLY-CONTROLLED TRANSMISSION.

1,405,640. Specification of Letters Patent. Patented Feb. 7, 1922.

Application filed May 17, 1918. Serial No. 235,220.

*To all whom it may concern:*

Be it known that I, MAX TAIGMAN, a citizen of the United States, and resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electrically-Controlled Transmissions, of which the following is a specification.

The invention relates to a motor driven transmission and control for machines which are subjected to rapidly re-occurring intermissions in their operation and specifically relates to an attachment designed to be mounted on sewing machines.

In sewing machines of the factory type it is usual to actuate the machines at high speed, often attaining as much as three thousand stitches per minute. This high speed operation permits the operator to run along a seam for a few seconds, at the end of which run, and with the needle in locked position engaging the goods, the material is quickly shifted often in a fraction of a second after which the line of stitches is run in another direction. During this shift in direction it is desirous that the machine be positively inactive and with the needle stationary in locking position engaging the material. Heretofore, it has been usual to intercept the passage of the current through the motor actuating the machine, permit the motor to slow down to a dead stop, shift the goods and then speed up the motor, all of which obviously required a material consumption of time.

Further this rapidly repeated starting and stopping placed a severe strain upon the motor parts, necessitated the use of a braking device which wore away rapidly, for it had to resist the torque of the heavy motor parts and necessitated almost constant repairing of the motor.

Accordingly, one of the objects of the invention is to provide a simple form of motor actuated machine drive in which the current is shut off from the motor when not necessary for an active drive and in which the driven machine may be braked without the necessity of braking the massive revolving motor parts which revolve at high speed even when the current is shut off.

I attain this object in general by providing a clutch type of drive between the motor and the machine and a control therefore so organized that the motor is free to revolve while the machine parts are held by a brake and with the control so connected with a circuit closer controlling the motor that the single act of closing the circuit through the motor will simultaneously move the clutch element into driving engagement and release the brake.

Another object of the invention is to provide a simple form of braking means which will promptly stop the action of the relatively light driven parts of the machine when disconnected from the motor and incidental to this object it is a further desideratum to provide a braking arrangement which will have no tendency to slow down the momentum of the unclutched motor.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and in part will be more fully set forth in the following particular description of one form of mechanism embodying my invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.

Referring to the accompanying drawings:—

Figure 1 is a fragmentary view in front elevation of a motor driven sewing machine with a preferred embodiment of my invention attached thereto;

Figure 2 is a plan view of the attachment shown in Figure 1 and with parts of the supporting frame broken away;

Figure 3 is a vertical sectional view taken approximately on the line 3—3 of Figure 2 looking in the direction indicated by the arrows; and

Figure 4 is a similar view taken on the line 4—4 of Figure 2.

In the following description and in the claims, parts will be identified by specific names for convenience of expression but they are intended to be as generic in their application to similar parts as the art will permit.

In the drawings there is shown a conventional form of motor driven sewing machine of the type which is driven by its own motive power and independent of the motive powers of contiguous similar machines. The machine illustrated is in general of conventional form and includes a supporting frame 10 upon the work table 11 of which is mounted a sewing machine head 12 and disposed

beneath which is the control pedal 13. A motor 14 for driving the machine is mounted upon a bracket 15 suspended between the uprights at one end of the support 10 and one of which numbered 16, is shown in Figures 1 and 2. One of the primary features of this invention is to provide a construction so organized that any type of motor 14 may be utilized with the driving and control connection hereinafter described. By this means it is possible not only to utilize a direct current motor but it is also possible to use an alternating current motor with the resulting advantages inherent in the use of such a motor in place of the direct current motor hereinbefore necessary for use in connection with such devices which employ a rheostat type of controller box for making and breaking the current through the motor.

The invention particularly forming the subject-matter of this invention is in the form of an attachment 17 fixed to the upright 16 above the motor 14 and below the driving pulley 18 of the machine 12. The attachment includes a dead, pulley-supporting stub shaft 20 upon which is loosely mounted a clutch 21 of the side-face friction type. This clutch includes a driven pulley 22 in constant driving engagement with the pulley 18 by means of a belt 23. The coacting driving element 24 of the clutch is in the form of a compound pulley slidably mounted on the shaft 20 for movement to and from the friction ring 25 carried in the adjacent face of the pulley 22. Either element of the compound pulley 24 is in constant driving connection with the motor 14 by means of a belt 26. The pulley 24 is provided with a bearing extension 27 projecting beyond the end of the shaft 20 and provided at its outer end with a housed roller bearing 28.

The attachment includes a control shaft 29 mounted in a long bearing 30 and extends at right angles to and spaced above the axis of the shaft 20. A bell-crank lever 31 is fixed to the end of the shaft 29 adjacent the clutch. This lever includes a brake arm 32 overlapping the pulley 22 and is provided at its free end with a removable brake member 33 designed normally to bear on the pulley 22 to brake the action thereof and therethrough to brake the action of the sewing machine 12. The other arm 34 of the lever 31 depends in advance of the projection 27 and is provided at its outer end with an adjustable set screw 35 normally spaced from the bearing 28 and designed to engage the bearing to shift the pulley 24 into clutching engagement with the pulley 22.

The shaft 29 is rocked into operative position by means of an actuating lever 36, the forward end of which is connected to the pedal 13 by means of a link rod 37. The pedal 13 is normally held in elevated position by means of a spring 38 attached to a rearward extension 39 of the lever 36.

The circuit through the motor 14 is controlled by a normally opened switch 40, which includes a movable contact member 41 in the form of a lever held normally in the elevated position shown in Figure 3 by the engagement of a lateral projection 42 from the extension 39 overlapping the rear portion of the lever 41. The movable element 41 is moved in circuit closing engagement with the coacting contact member 43 of the switch by its weight which action is assisted by a spring 44 engaging the end of the lever 41 opposite the end engaging the contact member 43. The contact member 41 includes the terminal plug 45 and the contact member includes the terminal plug 46 designed to be connected to a suitable source of electric energy 47 by means of electric conductors 48.

In operation and assuming that the clutch elements shown in Figure 1 and the circuit closer shown in Figure 3 are in the inoperative position illustrated, with the power circuit to the motor broken at the switch and with the brake member 33 holding the machine inactive, the operator bears down upon the pedal 13. The initial part of this action will raise the extension 39 to the lever 36 a distance sufficient to bring the movable contact member 41 into circuit closing engagement with the stationary contact 43 thus closing circuit through the motor 14 and causing the motor to pick up speed. At the same time the intense braking action of the member 33 against the pulley 22 begins to be reduced and as the operator continues to press down on the pedal 13 the brake is finally moved clear of the pulley at which time the arm 31 has swung its bearing screw 35 into engagement with the bearing 28 and has acted therethrough to move the clutch members into inter-clutching engagement. Power is thus transmitted through the belted connections 26 and 23 from the motor directly through the clutch to the driving pulley 18 on the machine. During this time the movable contact member 41 is maintained in firm bearing engagement against the contact 43 by the spring 44 which thus prevents any jarring of the machine from breaking the circuit.

The sewing machine is operated, as is usual with such devices, and when the operator desires to stop the machine suddenly he releases pressure on the pedal 13, which permits the powerful spring 38 to snap the brake member into firm braking engagement with the pulley 22 thus stopping the machine 12 almost instantaneously. This action will also automatically break the circuit through the motor but the motor and the pulley 24 connected thereto are free to

spin around practically at the high speed at which these devices are usually actuated. Eventually the motor will die down to a stop but in the normal operation of the machine there will be no appreciable diminution of speed of the motor parts during the second or fraction thereof during which the operator is shifting the goods. When the operator again presses down upon the pedal 13 the machine starts up again practically at the high speed at which it was previously driven.

By means of a device of this character it is possible to brake the driven element 22 against the dead shaft 20, which braking action will have no effect, whatsoever, upon the freedom of rotary movement of the motor actuated pulley 24. The whole organization of the parts is primarily directed to a construction which will permit the positive braking of the sewing machine with the least possible braking action on the motor and its driven parts thereby effecting an economy in consumption of electric energy.

While I have shown and described, and have pointed out in the annexed claims, certain novel features of my invention, it will be understood that various omissions, substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described my invention, I claim:—

1. In a device of the class described, the combination with a pulley clutch including two belted pulleys and an electric circuit closer including a movable contact spaced from the clutch, of control means for the clutch and circuit closer mounted for rocking movement about an axis and extending to one side of the clutch and circuit closer at right angles to the axis of rotation of the pulleys forming the clutch said control including a pair of arms movable in a plane containing the axis of rotation of the clutch pulleys, one of said arms provided with a brake for engaging in the peripheral groove of one of the clutch pulleys and the other arm provided with means for engaging the clutch to move the same axially into an operative position, an actuating lever extending in one direction from and spaced longitudinally along the axis from said arms to rock the control means, said lever provided with an extension projecting from the axis in the opposite direction and operatively connected to the movable contact of the switch to move the same into circuit closing position on the release of the brake and the movement of the clutch into operative position.

2. In a device of the class described, the combination of a power transmission and control for a motor driven sewing machine, including a supporting member provided with means for securing the same to the machine to be controlled, a stub shaft fixed to said supporting member, a pair of pulleys each free to rotate on said stub shaft, one of said pulleys being movable along said shaft and the other fixed against longitudinal movement along said shaft, said pulleys provided with clutch faces and co-acting when in contact to form a driving clutch, each of said pulleys provided with a peripheral groove and adapted one to receive a driving belt from the motor and the other to receive a driven belt leading to the machine, a normally closed circuit closer adapted to control the motor which drives the machine, and a single manually actuated control member pivotally mounted on said supporting member for movement about an axis at right angles to the length of the stub shaft, said control member provided with a plurality of arms extending laterally from said axis, one of said arms constituting an actuating lever adapted to be controlled from a foot pedal, another of said arms being operatively connected to the circuit closer to control the same and two others of said arms being each movable with the rotation of the control member in a plane which contains the axis of the stub shaft, one of said two arms adapted to force the movable pulley along the shaft and thus cause the clutch to function, and the other of said two arms provided with a brake movable into the groove of the relatively fixed pulley to brake the same against the fixed stub shaft.

3. In a device of the class described, the combination with a sewing machine and an electric motor, of means constituting a power transmitting control including a pair of grooved clutch pulleys, a belt connecting the motor with one of the pulleys and a belt connecting the sewing machine with the other pulley, a normally closed circuit closer, a single manually controlled member, mounted for rotary movement about an axis extending at right angles to the axis of the pulleys and including four arms extending in pairs in opposite directions from the axis of the controlled member, two of said oppositely extending arms movable in a plane containing the axis of the pulleys, one of said two arms constituting a brake and the other constituting a means for moving the clutch pulleys into clutching position, one of the other two oppositely extending arms constituting an actuating lever and the other arm operatively connected to the circuit closer to actuate the same.

4. An attachment for a sewing machine and including a bracket provided with means for securing the same in place, a circuit closer carried by the bracket, an extension projecting from one side of the bracket, a stub

shaft paralleling the bracket, a pair of clutch pulleys loose on said shaft, a four armed manually controlled actuating member supported from said extension and mounted for rocking movement about an axis and extending at right angles to the pulley axis, said member including an arm with a clutch actuating end movable along the pulley axis to cause the pulleys to form a driving clutch, another arm lapping one of the pulleys and provided with a brake for engaging the periphery of one of the pulleys, another arm lapping the bracket and engaging the circuit closer and still another arm adapted to be engaged by a pedal controlled link to constitute a means for actuating the four-armed member, and a spring engaging one of the arms in spaced relation to the axis of the member and adjacent the free end of the arm to exert a powerful leverage effect on the arms and tending normally to maintain the brake in operative position and the circuit closer in open position.

Signed at New York in the county of New York and State of New York this fourth day of May, 1918 A. D.

MAX TAIGMAN.