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DRIVING MECHANISM FOR SEWING MACHINES.

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1,406,933. Patented Feb. 14, 1922.

Fig. 1.

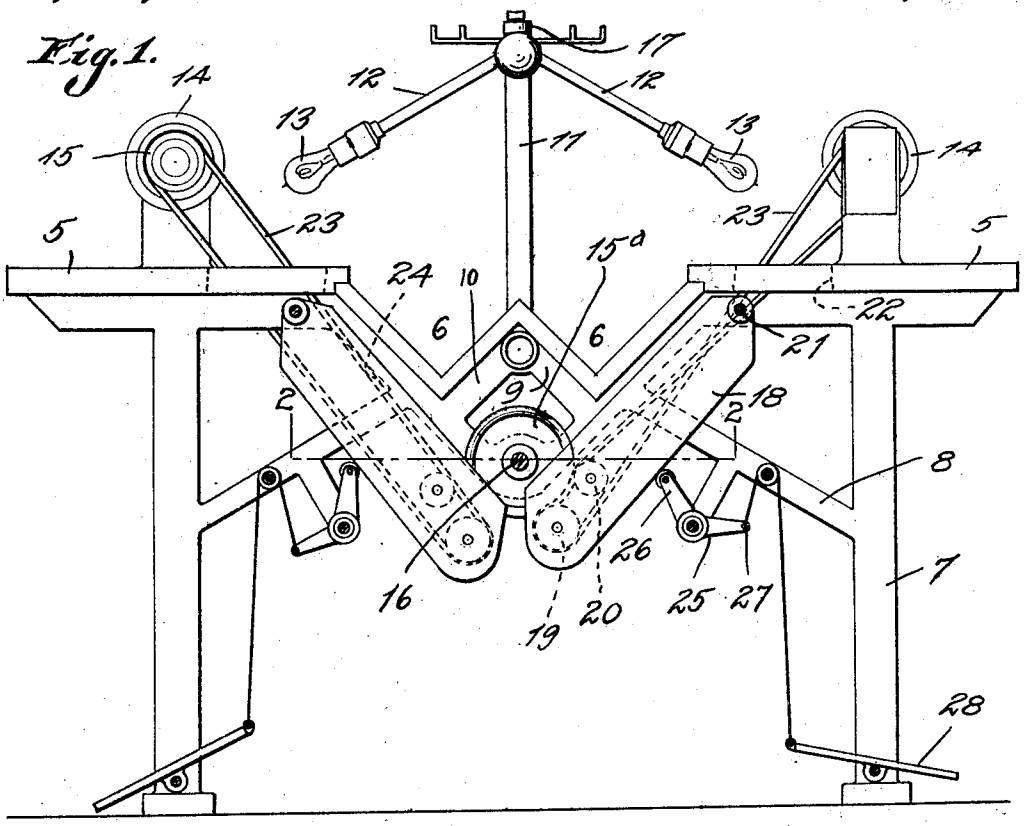
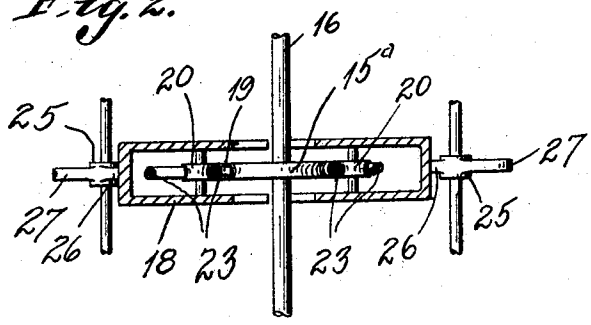


Fig. 2.



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DRIVING MECHANISM FOR SEWING MACHINES.

1,406,933. Specification of Letters Patent. Patented Feb. 14, 1922.

Application filed June 21, 1919. Serial No. 305,735.

To all whom it may concern:

Be it known that I, ALEXANDER B. COHN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Driving Mechanisms for Sewing Machines, of which the following is a specification.

This invention relates to driving mechanism for sewing machines and particularly to mechanism adapted to be employed in connection with an arrangement of machines as shown in my co-pending application Serial No. 165,947, filed May 2, 1917, the latter being somewhat of the nature and construction of the invention disclosed in my application Serial No. 300,823, filed May 31, 1919. In each of the copending applications aforesaid, use is made of a driving member with which devices were adapted to be thrown respectively into and out of driving engagement therewith, the position of the respective parts being such that when the devices were in operative relation to the driving member the friction between the parts served to transmit power from the driver to the machines to be driven. In each of these prior machines, the driven devices were independently associated with power transferring means.

In the improvement which I will presently describe in full detail, I have re-arranged and established new combinations of parts so as to provide for greater compactness, while adding to the general efficiency of the structure so that maximum operating force may be derived from the driving member with a minimum utilization of power.

One of the features which I desire to emphasize in the present form of invention is the utilization of a power transferring means as a combined power transferring means and friction member adapted to be respectively moved into and out of engagement with the driver.

Another feature upon which I wish to attach importance resides in the arrangement of driver and driven mechanisms beneath a supporting table; arranging said driven mechanisms so as to reduce the number of parts of the machine to a minimum and further arranging the driven mechanisms so that they mutually constitute a concealing means and protector for the driving means to thereby reduce the danger of accidents through contact therewith by the operators.

In the drawings:—

Figure 1 is an end view of the apparatus.

Figure 2 is a transverse section on the line 2—2 of Figure 1.

The table structure herein shown is quite similar to the one shown and described in my co-pending application filed May 31, 1919, Serial No. 300,823 in that I employ spaced top members 5—5 which are separated by a substantially W-shaped member which sub-divides the intervening space between said tops into separate compartments 6—6, one for each of said tops. The supporting frame 7 may be of any suitable well known design except for the provision of a superstructure 8 which I preferably provide for supporting the trough forming elements and as illustrated, the walls of the latter are supported by the branches 9 and 10 of said superstructure. Rising from the center of the trough portion is a suitable standard 11 which constitutes part of a lamp fixture, the said standard having arms 12—12 whose outer ends are disposed above the table tops 5—5 and provided with lamps 13 whereby the tops will be illuminated in proximity to the operatives.

The tops 5—5 support sewing machines 14 having operative pulleys 15 by means of which machines may be actuated when the pulleys are driven.

Beneath the substantially inverted V-shaped center of the trough member is a relatively small driving pulley 15^a, the same mounted upon a suitable shaft 16 adapted to receive its power from an electric motor or the like (not shown). The motor can be manually controlled by providing a switch mechanism 17 at the upper end of the standard 11 where it will be in convenient reach of the operatives when it is desired to throw the current off or on. While I have illustrated a set of two sewing machines, I wish it to be understood that as many of such machines as may be desired can be mounted upon the tops 5—5 as may be found expedient. In any instance, however, I find it desirable to arrange the machines at one side of the structure in positions directly opposite or nearly so to those at the other side of the structure.

The driven mechanisms whereby power from the driving pulley 15ª is conveyed to the machines 14—14, each consist of a swinging shield 18 of substantially U-shaped form in transverse section as shown in Figure 2 of the drawing. These shields support directional pulleys 19 at their lower ends and at points in close proximity to said pulleys the shields carry tensioning or idle pulleys 20.

The shields are pivoted at 21 to the supporting frame 7 at points outwardly of the vertical center of the shaft 16 and above the plane thereof so that they are free to move by their own weight in directions away from the pulley 15ª for a purpose to be hereinafter explained.

Passing over the pulleys 15 and through slots 22 in the table tops 5—5 and thence over the pulleys 20 and around the directional pulleys 19 are driven belts 23. These belts are disposed at a tangent to the pulley 15ª and the leads 24 of said belts are arranged with such regard to the pulley 15ª as to engage therewith when the shields 18 are adjusted to driving positions. The width of the pulley 15ª is slightly less than that of the space between the side walls of the shields 18 so that when said shields are in driving positions the pulley 15ª will be housed in a practical manner by said shields. The arrangement herein shown constitutes a novel driving means whereby the sewing machines may be operatively driven with a material saving in power.

Lost motion between the respective machine elements employed is eliminated by the arrangement of the belts 23 and the means whereby said belts are adapted to be brought into positive frictional contact with the peripheral surface of the driving pulley 15ª. The pulleys 19 and 20 are disposed with such reference to the pulley 15ª as to cause the inner lead of the belt 23 to be flexed and tensioned slightly where it conforms with the contour of the pulley 15ª to maximize the driving efficiency of the latter. I find that this arrangement is highly advantageous in that the friction surfaces between the respective driving and driven devices is increased.

Mounted from the frame 7 at points to one side of the rocking shields 18 are bell cranks 25 the arms 26 of which are arranged in free engagement with the adjacent walls of said shields, while the arms 27 thereof are connected with actuating treadles 28 arranged at the base of the frame 7 at points beneath the table tops 5—5. By pressing upon these treadles the bell cranks are rocked so as to advance the arms 26 thereof against the shields and consequently cause the inner leads of the belts 23 at points between the pulleys 19 and 20 to press against the peripheral surface of the driving pulley 15ª. When pressure is released from the treadles the shields act by gravity to move the inner leads of the belts away from driving engagement with the mentioned pulley 15ª.

Aside from the fact that the inner leads of the belts are satisfactorily flexed to maximize the friction surfaces when the belts are brought into contact with the pulley 15ª, it will be observed that this arrangement also serves as a means for always keeping the driving belts under a proper tension.

The U-shaped construction on the shields 18 and the co-acting relation of the shields to the pulley 15ª, cause all of the moving devices of the structure beneath the table to be concealed where they will not come in contact with the operatives.

What is claimed as new is:

1. In a device of the class described, the combination with a table, a sewing machine provided with a driven pulley mounted on said table and a power pulley positioned below the level of the table of manually controlled power transmitting means for driving the machine pulley at will from the power pulley, said means including an endless belt having a portion of one reach thereof below the table movable from an inoperative position, past a tangential position into driving engagement with the periphery of the power pulley, a pair of pulleys engaging the belt reach on the side thereof opposite the power pulley and coacting to move the belt into frictional engagement with the power pulley, the axes of said pair of pulleys being spaced apart a distance less than the diameter of the power pulley, thereby to limit the possible length of belt reach beween said pulleys engaging the periphery of the power pulley, and manually actuated control means disposed below the table for controlling the engagement of the belt with the power pulley.

2. In a device of the class described, the combination with a power pulley and a machine having an operating pulley, of means operatively connecting said pulleys to drive one from the other, and said means including an endless belt, a directional pulley at the lower end of the belt loop and below the level of the axis of the power pulley, a tensioning pulley within the belt loop and in close proximity to the directional pulley and coacting therewith to cause a part of the belt to be moved into engagement with the power pulley, said belt part being normally spaced from the power pulley so as to be free of the same, and manually actuated means acting on the directional pulley to raise the same from its normal position and thus bring the belt into driving relation with the power pulley as long as said means is actuated.

3. The combination with a driving pulley, of driven belts co-acting therewith and arranged at a tangent thereto, and swinging

shields concealing portions of said belts and carrying the same, and means for moving said shields to change the position of the belts with respect to said pulley.

4. The combination with a sewing machine table having a top on which machines to be driven are adapted to be mounted and arranged opposite the operatives, swinging shields mounted beneath the top of said table, a driving mechanism supported from the table beneath said top, diverging belts co-acting with said mechanism and carried by said shields, the belts having upper portions freely movable through the table top and adapted to be connected with the machines to be driven, and means for swinging said shields.

5. The combination with a sewing machine table having a top on which machines to be driven are adapted to be mounted and arranged opposite the operatives, swinging shields mounted beneath the top of said table, a driving mechanism supported from the table beneath said top, diverging belts co-acting with said mechanism and carried by said shields, the belts having upper portions freely movable through the table top and adapted to be connected with the machine to be driven, and means for swinging said shields, the shields having walls serving to house the driving mechanism.

6. In a device of the class described, the combination with a power pulley, a hanging belt normally falling clear of the power pulley, spaced apart belt engaging means for moving the portion of the belt therebetween in a direction having an upward component and into driven engagement with the periphery of the power pulley, manually actuated mechanism for positively moving said belt engaging means into operative position, and means, operating automatically on the release of said manually actuated mechanism, for permitting the belt to fall away quickly to its normal position clear of the power pulley.

7. In an organization which includes a pair of spaced apart machines each provided with a driven pulley and a single power pulley disposed between the machines and in the plane of the two machine driving pulleys, the combination of means for selectively driving either or both machines from the same power pulley, said means including a pair of frames depending from each machine, and movable to and from opposite sides of the power pulley, manually controlled means for actuating said frames, each frame provided with a pair of pressing pulleys spaced apart and adapted to be moved with their respective frames into close relation to the contiguous side of the power pulley, and means for driving the machine pulleys from the power pulley, said means including belt reaches passed across each of the pressing pulleys and movable thereby into frictional engagement with the power pulley and clear of each other.

8. A structure of the class described embodying a sewing machine provided with an operating pulley, a directional pulley spaced therefrom, a belt passing over both pulleys, a driving pulley, means for mounting the directional pulley for movement toward and away from the driving pulley to bring one reach of the belt into and out of substantially tangential frictional driving relation with the driving pulley, and a sustaining pulley positioned between the operating and directional pulleys and movable with the latter for tensioning the belt to maintain driving relation between the belt and driving pulley when the belt is in driving engagement therewith.

9. A structure of the class described embodying a sewing machine having an operating pulley, driving mechanism embodying a driving pulley, a directional pulley positioned below the operating pulley and movable toward and away from the driving pulley, a belt passing over the operating and directional pulleys, and normally free from engagement with the driving pulley, means for moving the directional pulley toward the driving pulley to bring one reach of the belt into frictional driving relation with the latter, and an intermediate pulley positioned between the operating and directional pulleys and cooperating with the reach of the belt adapted for engagement with the driving pulley for effecting the adaptation of a portion of that reach of the belt to the driving pulley while in engagement therewith.

10. A structure of the class described embodying a sewing machine provided with a driven pulley, a table for supporting said machine, a driving pulley positioned at a distance from the driven pulley of the sewing machine, a swinging bracket pivoted to the table, a directional pulley carried by the swinging bracket, a belt passing over the driven pulley of the machine and over the directional pulley of the swinging bracket, means for swinging the bracket toward and away from the driving pulley to bring the belt into engagement with the driving pulley, and a tensioning pulley and engaging with the belt intermediate the machine pulley and the directional pulley for tensioning the belt to maintain driving relation between the belt and driving pulley when said belt is in engagement therewith.

11. A structure of the class described embodying a support, a sewing machine, provided with a driven pulley, mounted on said support, a driving pulley carried by said support and a swinging bracket pivotally mounted on the support for movement toward and away from the driving pulley, in

combination with a pair of spaced pulleys carried by the swinging bracket, means for driving the sewing machine pulley including a belt passed over the spaced pulleys of the bracket, and means for swinging the bracket to bring the portion of the belt between the spaced pulleys into frictional driving relation to the driving pulley and to permit of the swinging of said bracket into a position wherein the belt is free from engagement with the driving pulley.

12. A structure of the class described embodying a support, a sewing machine, provided with a driven pulley, mounted on said support, and a driving pulley, a swinging member pivoted to the support, a pair of spaced pulleys carried by the swinging member and a belt passed around the driven pulley of the sewing machine and past the spaced pulleys on the swinging member, in combination with means for pivotally moving the swinging member in the direction of the driving pulley to bring the portion of the belt between the spaced pulleys of the swinging member into driving engagement with the driving pulley and to also permit the movement of the swinging member into a position wherein the belt is free from engagement with the driving pulley.

13. A structure of the class described embodying a support, a sewing machine, mounted on said support, a driven pulley associated with the sewing machine, a driving pulley, a bracket pivoted to the support and adapted for swinging movement toward and away from the driving pulley, a directional pulley carried by said bracket, a belt passed around the directional pulley of the bracket and around the driven pulley of the sewing machine, and means for moving the bracket toward and away from the driven pulley to bring the belt into and out of engagement with the driving pulley, in combination with a tensioning pulley and cooperating with the belt intermediate the frictional pulley and the driven pulley of the sewing machine, for the purpose of forcing the belt to conform to a portion of the circumference of the driving pulley and effect driving relation between the driving pulley and the belt.

14. In a machine drive, the combination with a power pulley, a driving belt normally falling clear of the pulley, a pair of spaced apart belt engaging means for moving a portion of the belt having a length less than the diameter of the pulley into pressing engagement with the periphery of the pulley, and manually actuated means for moving said belt portion from a straight position tangent to the pulley into a plurality of positions having a variable angular degree of engagement with the pulley thereby to vary the speed of the driving belt.

15. In a machine drive, the combination with a power pulley, a driving belt normally falling clear of the pulley, a pair of spaced apart pressing pulleys for moving a portion of the belt having a length less than the diameter of the pulley into pressing engagement with the periphery of the pulley, and manually actuated means for moving said belt portion from a straight position tangent to the pulley into a plurality of positions having a variable angular degree of engagement with the pulley thereby to vary the speed of the driving belt, said pressing pulleys at all times being spaced from the power pulley a distance greater than the thickness of the belt.

In testimony whereof I have affixed my signature.

ALEXANDER B. COHN.