Aug. 30, 1927. 1,640,623

S. F. STEIN

BELT TIGHTENER

Filed Jan. 5. 1918

FIG. 1.

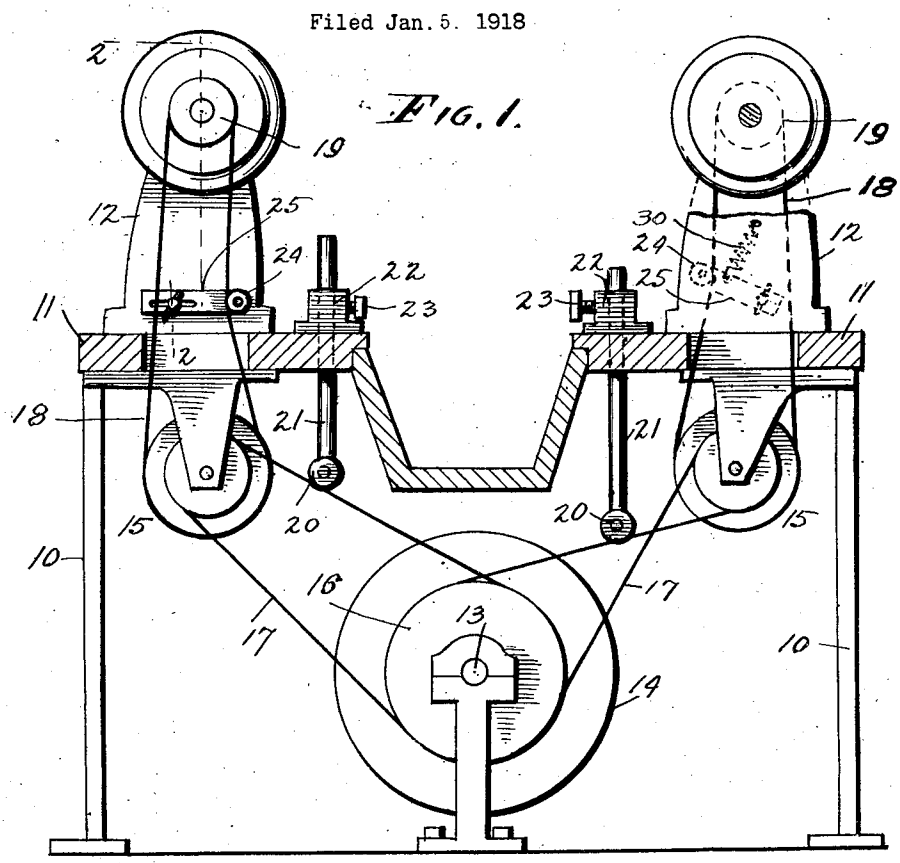


FIG. 2.

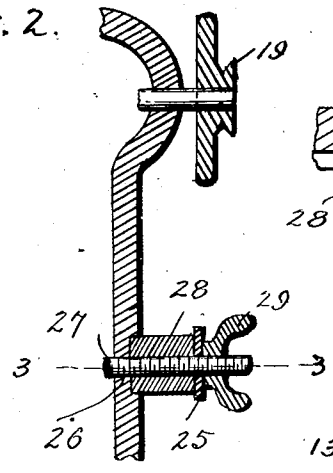
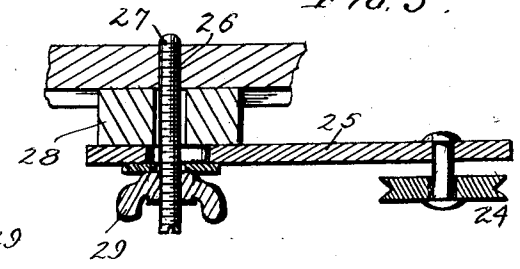


FIG. 3.



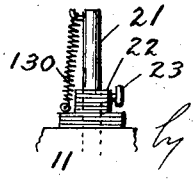


FIG. 4.

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Patented Aug. 30, 1927. 1,640,623

UNITED STATES PATENT OFFICE.

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BELT TIGHTENER.

Application filed January 5, 1918. Serial No. 210,453.

The driving mechanism of power driven sewing machines includes belts. These belts become loose or slack in use. When as in the case of garment factories, a series of machines are driven from one driving shaft and the belt in any one of the series become loose or slack, it is necessary to stop the running of all the machines of the series, with consequent loss of valuable time and likelihood of injury or damage to the goods being worked on, as will be further explained in detail, or as an alternative to stopping all the machines, the workman must run the risk from rotating shafts or other parts, if he undertakes to remedy the slack condition of the belt without stopping the machines.

The object of my invention is to render unnecessary the stoppage of the machines and thereby avoid the loss of time that comes from stoppage and at the same time enable the slack condition of any particular sewing machine belt to be remedied even by the operative running the machine and without danger of harm or injury from the rotating members. Under the usual conditions the work of adjusting loose or slack belts is performed by some special mechanic, it being beyond the ability of the sewing machine operative to do this.

For the attainment of my object and to secure other advantages which will be apparent to those skilled in the art when the embodiment of my invention shown in the drawings is understood, my invention consists in the construction substantially as hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a cross section showing a sewing machine power table construction embodying my invention;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2;

Fig. 4 is a detail view illustrating a form of automatic belt tightener.

Referring to the drawings I show a double power table of ordinary construction, it comprising cast iron supporting legs 10 and two alining parallel series of table tops 11, each adapted to support a sewing machine 12 and having a main driving shaft 13 running longitudinally of the series of tables and situated between the two series of tables and being driven continuously by power applied to a band wheel 14 at one end thereof. For each sewing machine there is a treadle-controlled transmitter 15 through which power from the continuously running driving shaft 13 may be transmitted at the will of the operator to the sewing machine, and in the usual practice there is a pulley 16 for each sewing machine on the driving shaft 13 belted to a pulley on the transmitter by a belt 17 and there is a second pulley on the transmitter, belted by a belt 18 to a pulley 19 on the sewing machine shaft adjacent the hand wheel thereof. With such ordinary construction when a belt becomes slack, work on that machine must be stopped and the slack condition remedied by cutting out the surplus portion of the belt and replacing it. Usually there is a mechanic whose duty it is to look after such matters, and he, of course, may be busy elsewhere, thus prolonging the disuse of the machine, and he must do the work of replacing while the main driving shaft and its pulleys are revolving, and thus is exposed to danger of injury. If, as the safety laws require, all rotating or moving parts which might expose the workman to injury must be stopped running, then not only the sewing machine immediately concerned on account of the loose belt, but all of the machines that are driven from the same driving shaft are stopped and thus the loss will be multiplied by the number of machines put out of use. The importance and valve of my invention will therefore be seen when it is understood that no stoppage is necessary, but the work of taking care of a slack belt in a particular machine can be performed while the driving shaft and the other machines are running and without any danger to the workman concerned in doing the work and no special mechanic is required to do the work, but the operative on the sewing machine can do all that is necessary to take care of the loose or slack condition. Again the matter of stoppage of the sewing machine is of importance in that if it is prolonged there is likelihood of injury to or damage of the goods being sewn. If by reason of the slack condition of the belt the machine stops with the work say on a line of stitching partially through the machine it would be exposed to the drip of oil from the needle bar and if it should be stationary long enough, enough oil would drip upon it so as to soil or disfigure the goods. By the provision of a belt tightener and especially one capable of adjustment or manipulation by

the girl, the belt can always be kept in a proper tight condition and if by inadvertence or oversight it should become slack and result in stoppage of the machine, the stop need be but momentary because with a belt tightener such as I provide, the slack can at once be taken up and the running of the machine quickly resumed. If the machine stops with the work in it, it would be undesirable to remove the work to prevent injury from the dropping of oil because of the difficulty and practical impossibility of replacing the work in the machine so that the line of stitching would be unbroken.

I provide a belt tightener for the belt 17 which connects the driving shaft 13 with the transmitter and said tightener may consist of a roller 20 on the lower end of a shank or stem 21, which passes through a hole in the table top and through a box 22 secured to the upper side of the table top and having above the latter a set screw 23 for securing the shank or stem at the desired vertical position. It will be seen that although the belt to be tightened is below the table top, yet access to the tightener from the top is provided so that conveniently and quickly the necessary adjustment to the tightener may be had without any risk or danger from the running parts of the machinery.

The tightener for the belt which runs to the sewing machine pulley 19 also consists of a belt engaging roller 24 and a shank or bar 25 which carries the same and I also locate said tightener above the table top and mount it upon the side of the upright portion of the sewing machine head so that it is thereby situated for convenient, easy and safe access for manipulation; it is out of the way; and is in effect a part of the sewing machine so that if occasion arises for moving the sewing machine from the table and returning it, the tightener is always carried by the machine and always in proper position for operation. I find in many sewing machines the provision of a threaded hole 26 in the head below the hand wheel and I utilize that hole for the attachment of the tightener to the head. This makes unnecessary the provision of any special hole and permits of the tightener being applied to machines already in use with no alteration of the machine head or frame. I screw in said hole a threaded bolt or stud 27, and place over the projecting portion of the stud a spacing block 28 of a thickness which will bring the roller-carrying bar in the right position to secure contact of the roller with the belt, said bar being pivoted on a portion of said stud which projects beyond the spacing block. Outside of the block I apply a wing nut 29 which serves the purpose of clamping the roller-carrying bar at the desired position. Thus one bolt or stud serves as the pivot or support for the roller-carrying bar and the means for mounting and securing the spacing block. The roller-carrying bar instead of being pivoted to the stud may have a longitudinal slot so that adjustment for tightening the belt is effected by a sliding rather than a swinging movement.

It will be seen that a very important feature of my invention is the application of a belt tightener to each of a number of sewing machines driven from a common shaft because thereby the driving belt in one of the machines which needs adjustment to take up slack may be attended to without interfering in any way with the operation of the other machines.

As shown in Fig. 1 a coil spring 30 may be connected at one end to the roller-carrying bar 25 and at the other end to a relatively stationary point on the machine head which tends to pull the roller against the belt and thereby take up the slack. With this arrangement the operative can take up the slack by the use of one hand which is used merely to loosen the wing nut so as to allow the spring to act and then to tighten the wing nut again; or in order to render the device automatic in its action at all times to take up slack or to keep the belt tight, the wing nut may be left loose or not employed; that is to say a construction may be employed for pivotally attaching the roller-carrying bar not involving the use of a wing nut, in which case the stud or bolt 27 may be provided with a slotted head, which may act either as a pivot or as a clamp, by use of a screw driver, if desired.

The belt tightener which I provide for the belt running from the driving shaft may also be made to work automatically by means of a coil spring 130 by having same connected at one end to the upper end of stem 21 and at the other end to some stationary point on the table or box 22, as shown in Fig. 4.

Having thus described my invention what I claim is:

1. The combination of the arm of a belt driven sewing machine having a threaded hole, a stud projecting horizontally from said hole and screwed therein, a constantly acting belt tightener comprising a bar mounted on said stud, and clamping means for said bar.

2. The combination of a sewing machine table, a sewing machine mounted thereon, a main driving shaft below the table, a transmitter belted to said driving shaft, and means for transmitting power from the transmitter to the sewing machine, a belt tightener extending from below the table and reaching above the table through the table top.

3. The combination of a sewing machine table, a sewing machine mounted thereon, a

driving shaft, a transmitter under the table drivingly connected to said driving shaft and belted to the sewing machine and a belt tightener above the table top for the belt running from the transmitter to the sewing machine and independent of the transmitter in its action.

4. The combination of a sewing machine table, a sewing machine mounted thereon, a main driving shaft, a transmitter under the table belted to said driving shaft and belted to the sewing machine, a belt tightener extending from the belt running from the driving shaft and reaching above the table top, and a belt tightener above the table top for the belt running from the transmitter to the sewing machine and independent of the transmitter in its action.

In testimony that I claim the foregoing I have hereunto set my hand.

SAMUEL F. STEIN.