P. J. DREHER.

BELT SLACKENING AND TIGHTENING DEVICE.

APPLICATION FILED APR. 14, 1911.

1,035,327.

Patented Aug. 13, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

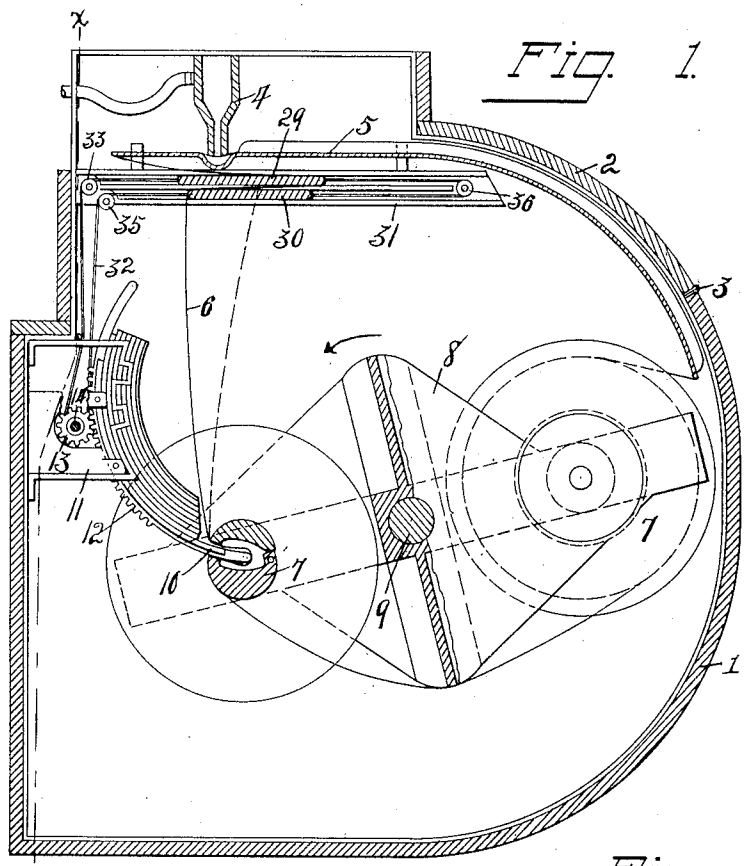
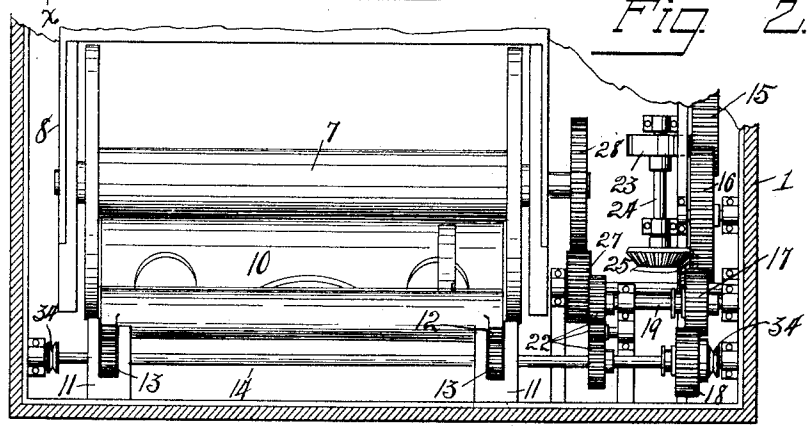


Fig. 2.



WITNESSES:

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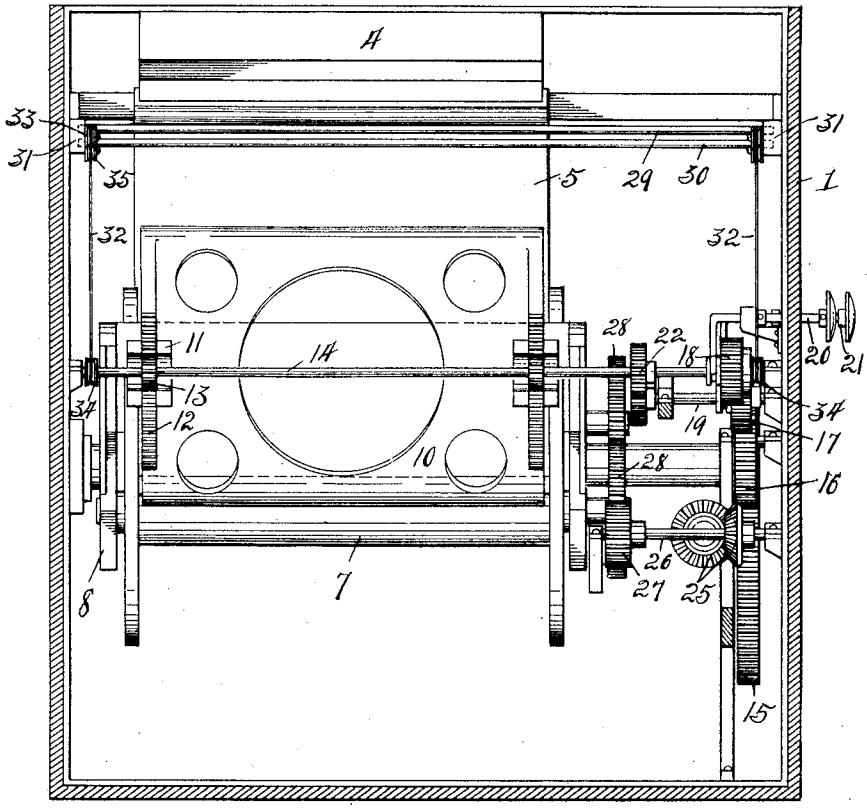
Fig. 3.



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UNITED STATES PATENT OFFICE.

PHILLIP JACOB DREHER, OF TOLEDO, OHIO.

BELT SLACKENING AND TIGHTENING DEVICE.

1,035,327. Specification of Letters Patent. **Patented Aug. 13, 1912.**

Original application filed February 10, 1911, Serial No. 607,877. Divided and this application filed April 14, 1911. Serial No. 621,177.

To all whom it may concern:

Be it known that I, PHILLIP JACOB DREHER, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Belt Slackening and Tightening Device; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates particularly to a belt slackening and tightening device adapted for use in automatic musical instruments of the character shown and described in my former application for United States Letters Patent Serial No. 607,877, filed Feb. 10, 1911, of which this application is a division, but is not restricted to such use as it may be employed in any connection for which it may be adapted and appropriate.

The object of my invention is the provision of a simple and efficient device of this character which is operable to slacken or tighten a belt as the purpose of its use may require.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a vertical section of a portion of an automatic player with my invention associated therewith. Fig. 2 is a horizontal section of the left hand portion of said apparatus, and Fig. 3 is a vertical cross section of the same on the line x x in Fig. 1.

Referring to the drawings, 1 designates a case or box which may comprise a part of the casing of a musical instrument with which my invention is adapted, in the present instance, to be associated, and is shown as having its top portion 2 hinged as at 3 to permit an opening thereof to render access to its interior. The top portion 2 carries the pneumatic mouth piece 4, which is usually associated with instruments of this class.

5 designates a track which is disposed immediately beneath the top portion 2 and is adapted to guide the movement of the upper portion of a note sheet or belt 6. The track 5 is depressed beneath the mouth-piece 4 to permit such mouth-piece to project slightly therein so that the note sheet 5 in passing under the mouth-piece is held closely thereto, as is apparent.

The music belt 6 in the present instance, is of the endless type and adapted to wind, as hereinafter more fully described, from one to the other of a pair of rolls 7, 7, which are carried on opposite sides of the axis of a frame 8. This frame, in the present instance, is mounted upon a shaft 9 for rotation therewith, said shaft being suitably journaled within the case 1 for such purpose. Each of the rolls 7 comprises a pair of pivoted sections forming jaws which are adapted to open and close and when closed to grip an interposed portion of the belt therebetween. When a belt of the endless type, such as shown, is used, it passes under the frame 8 and over the track 5 and has portions thereof looped between or engaged by the jaws of the rolls 7, whereby the belt is divided into two sections of substantially equal length. As the halves or sections of the belt are of considerably greater length than necessary to enable them to merely extend from one roll to the other over their respective courses, the surplus portions thereof are wound upon one roll and during an operation of the instrument unwind therefrom and wind upon the other roll. The gripping of the belt in the manner described causes the two sections thereof, upon a winding action of either roll, to wind thereon one upon the other, as is apparent by reference to Fig. 1 and as is more fully explained in my said former application Serial No. 607,877. Supposing the note sheet to be winding from the right hand or front roll to the left or rear roll, the upper section of the sheet passes from the right hand roll 7 over the track 5 and thence downward to and winds upon the left roll, while the lower section of the note sheet or belt passes from the right roll under the frame 8 and winds upon the left roll 7.

When the note sheet has been unwound from the front roll and wound upon the rear roll, the portion thereof which is engaged by the jaws of the front roll is drawn from engagement therewith so that the note sheet then extends around the frame 8 and track

5 and is attached only to the rear roll. As it is important, especially when the belt 6 is used in connection with a musical instrument, to have the note sheet always move in the same direction over the track 5, the frame 8 is turned by hand or automatically by any suitable mechanism, as for instance that described in my said former application, in the direction indicated by the arrow in Fig. 1, for the purpose of reversing the positions of the filled and empty rolls, the free portion of the note sheet sliding over the track 5 during such transfer. When the position of the rolls have been thus reversed, a belt looping blade 10 which is disposed within the case at the left side thereof is operated to engage a registering portion of the belt and draw it between the jaws of the associated roll 7, which jaws operate to grip and frictionally hold such looped portion of the belt therein when the looping blade has returned to its normal position.

The looping blade 10 is of segmental form and is guided for reciprocal rotary movements by guide brackets 11. This blade is shown as having segmental racks 12 on its rear sides which mesh with pinions 13 carried by a horizontal shaft 14, which is journaled in the case transversely thereof. The shaft 14 is intended to be driven first in one direction and then in the other, and the mechanism shown in the present instance for accomplishing such operation comprises a drive-gear 15, which is adapted to communicate rotation in one direction to the shaft 14 through the train of gears 16, 17 and 18, the latter of which is shiftably mounted on the shaft 14, while the gear 17 is shiftably mounted on a shaft 19. The gears 17 and 18 are manually shiftable to release or engage coöperating clutch members on their respective shafts by working the shift-bars 20 and 21, or this may be accomplished automatically by the mechanism shown and described in my said former application. To drive the shaft 14 in one direction, the gear 17 is released from its clutch and the gear 18 engaged with its clutch, and to drive the shaft 14 in the opposite direction, the gear 17 is engaged with its clutch and the gear 18 released from its clutch, and rotation is communicated from the shaft 19 to the shaft 14 through the train of gears 22. A winding movement may be communicated to the rear roll 7 from the drive gear 15 through the medium of a wheel 23 in frictional contact with a side of the gear 15, a shaft 24, beveled gears 25, shaft 26, and meshing gears 27 and 28, one of which is mounted on the shaft 26 while the other is mounted on the associated trunnion of the roll.

When the belt or note sheet 6 is engaged with a roll 7, it is important that sufficient slack be provided in the belt to enable it to have at least one turn upon the engaged roll before such slack is taken up and strain is applied to the belt for unwinding it from the filled roll, as one or more convolutions are thus placed upon the winding roll to coact with the gripping jaw thereof to prevent a disengagement of the portion of the belt engaged by the roll jaws. This is accomplished by passing the belt 6 between two tension blades 29 and 30, which are located in the upper portion of the apparatus beneath the rear or left hand end portion of the track 5. These blades preferably extend from one side to the other of the machine and have their ends mounted for horizontal movements. The blades 29 and 30 have shifting movements in opposite directions imparted thereto by endless cables 32, one of which extends from each end portion of the blade 29 rearwardly therefrom over a guide sheave 33, thence downward under a grooved drive pulley 34 carried by the shaft 14 and upward therefrom over a sheave 35 and attaches to the rear end of the blade 30. The opposite or front side edges of the blades 29 and 30 are connected by portions of the cables which pass around sheaves 36 at the forward ends of the guides 31.

When the shaft 14 is turned to impart a downward movement to the looping blade 10, the pulleys 34 act to move the cables 32 in a direction to move the upper blade 29 toward the front of the machine and the lower blade 30 toward the rear of the machine to the positions shown in Fig. 1, thus acting on the engaged portion of the belt to unwind a quantity thereof from the front roll 7. Upon the upstroke of the blade 15, the tension blades 29 and 30 are moved to assume their normal positions, thus leaving a sufficient slack in the belt or note sheet 6 to permit it to pass at least once around the winding roll 7 before such slack is taken up and strain is applied to the belt to unwind it from the other roll.

It is apparent that while I have shown my improved belt slackening and tightening mechanism in association with a belt of the endless type and with an automatic player, the same may be used in connection with a belt of any other style, and in any connection for which it may be adapted or appropriate.

I wish it understood that my invention is not limited to any specific construction or arrangement of the parts except in so far as such limitations are specified in the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is,—

1. In combination, a set of rolls, a belt-like part, secured to said rolls and adapted to unwind from one and wind upon another thereof, and a plurality of blade-like guiding members in contact with which the belt passes before engaging said means, said

members being operable to effect a slackening of the part.

2. In combination, a set of rolls, a belt secured to and adapted to unwind from one and to wind upon the other of said rolls, and means having a plurality of parts both engaging the same portion of the belt intermediate its points of attachment to said rolls and operable to tighten or slacken such portion of the belt.

3. In combination, a belt, a set of rolls to which the belt is secured at spaced points and from one to the other of which the belt winds, and means guiding the course of movement of said belt in its passage to the roll on which it winds and having parts movable in opposite directions in engagement with the belt to effect a tightening or slackening of the belt.

4. In combination, a pair of rolls, a belt for winding from one to the other of said rolls, means guiding the movements of said belt intermediate the rolls, and mechanism coöperating with said guiding means to guide the course of the belt and operable to tighten or slacken the belt.

5. In combination, a set of rolls, a belt adapted to wind from one to the other of said rolls, a guide for the portion of the belt intermediate the rolls, two members mounted for relative reciprocal movements with opposite edges of which the belt engages, and means for moving said members to effect a tightening or slackening of the belt.

6. In combination, a set of rolls, a belt secured to said rolls and unwinding from one and winding upon the other of said rolls, a plurality of belt guiding members mounted for relative reciprocatory movements and engaging the portion of the belt which moves toward and winds upon the winding roll, and means for imparting opposite movements in unison to said members to a ffect a tightening or slackening of the belt.

7. In combination, a set of rolls, a belt for winding from one to the other of said rolls, a guide for the belt as it passes from one to the other of the rolls, a pair of tension blades disposed beneath a portion of said guide and mounted for relative transverse reciprocal movements, the belt passing over the upper blade around the far edge thereof thence between the blades and around the opposite edge of the other blade, and means operative to impart opposed movements in unison to said blades.

8. In combination, a pair of rolls, a belt unwinding from one and winding upon the other of said rolls, and means having a plurality of reciprocal parts engaging the same portion of the belt intermediate its points of connection to the rolls and being oppositely movable to slacken or tighten the belt.

9. In combination, a pair of rolls, a belt winding upon one and unwinding from the other of said rolls, a guide part for the belt in its passage from one to the other of the rolls, and a pair of oppositely movable reciprocal members for coöperating with said guide part to guide the course of the belt and being movable to cause the belt to have a greater or less zig-zag course of movement to tighten or slacken the same.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

PHILLIP JACOB DREHER.

Witnesses:

C. W. Owen,

E. E. Thomas.