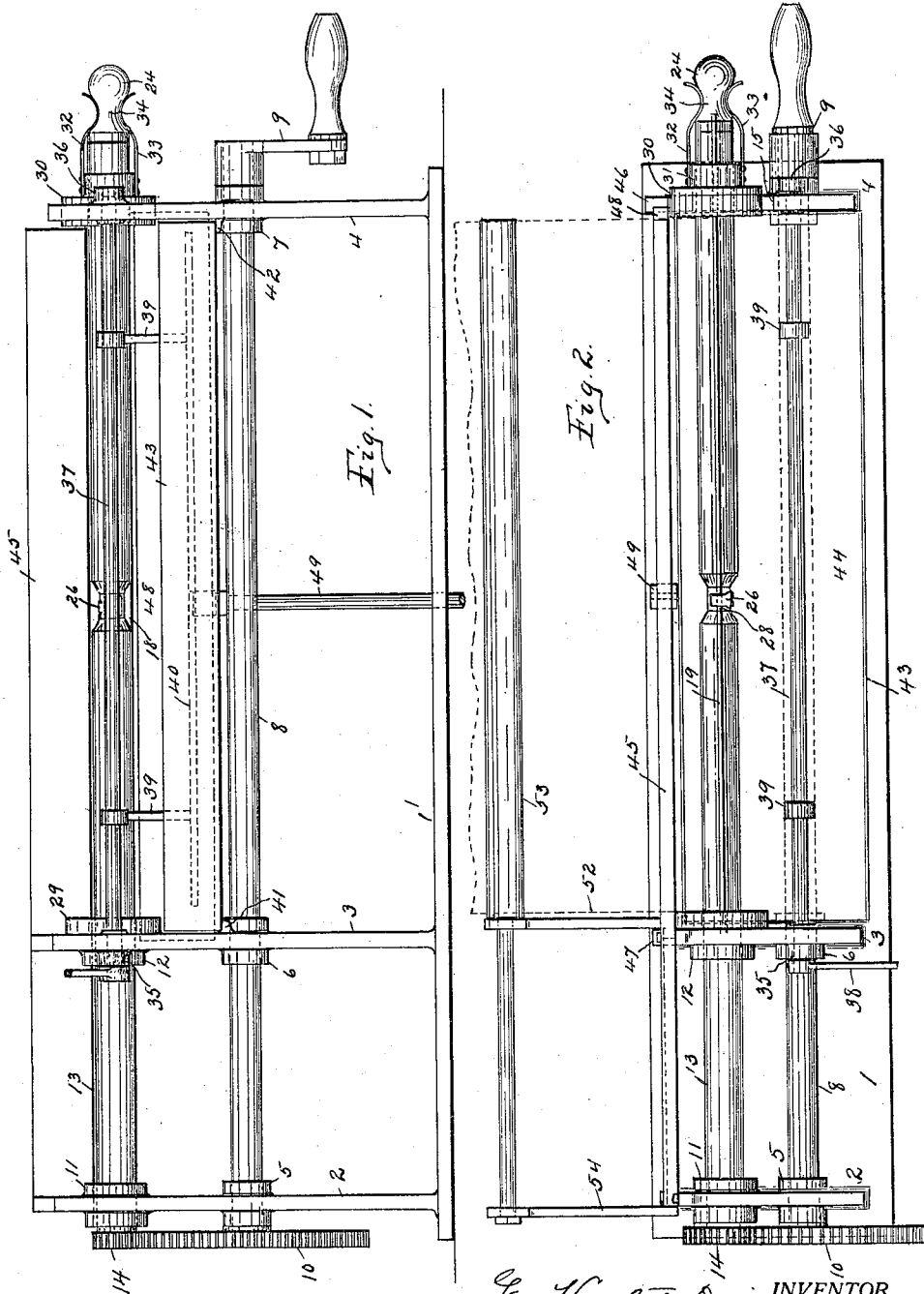


G. H. DAVIS.
SPOOLING MACHINE FOR MUSIC ROLLS.
APPLICATION FILED MAR. 29, 1915.

1,230,130.

Patented June 19, 1917.
2 SHEETS—SHEET 1.



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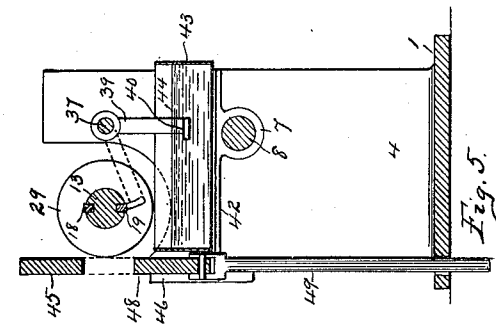


Fig. 5.

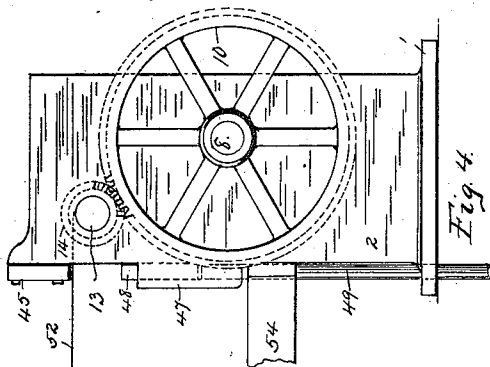


Fig. 4.

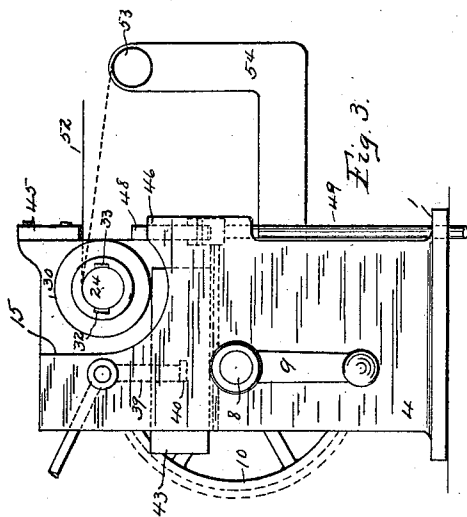


Fig. 3.

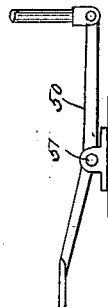


Fig. 7.

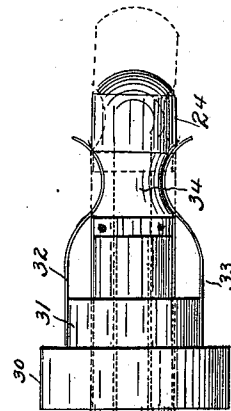


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE HOWLETT DAVIS, OF WEST ORANGE, NEW JERSEY.

SPOOLING-MACHINE FOR MUSIC-ROLLS.

1,230,130.

Specification of Letters Patent. Patented June 19, 1917.

Application filed March 29, 1915. Serial No. 17,757.

To all whom it may concern:

Be it known that I, GEORGE HOWLETT DAVIS, a citizen of the United States, residing in the town of West Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in a Spooling-Machine for Music-Rolls, of which the following is a specification.

In my prior application filed February 24th, 1915, Serial No. 10,350, I described an improved form of music roll wherein provision was made for a substitute for the usual spool of the music roll and also improved attaching devices, whereby all of the results of present day practice in the construction of perforated music rolls are obtained by a structure at once simple, cheap and effective.

My present application relates to a new and useful machine for spooling or winding up perforated music sheets into the form shown in my above named prior application. The manual labor required in such an operation must be reduced to a minimum and speed of operation is an essential to economy in the manufacture of music rolls of the type above referred to. In the modern manufacture of music rolls it is the practice to perforate simultaneously from ten to sixteen blanks or strips of paper at the same time. As these sixteen sheets come from the perforator they must for a time, retain their relative super-posed positions in order that they may pass simultaneously through certain subsequent steps in the process of manufacture. It is necessary, therefore, to leave the ten to sixteen perforated sheets in the form of a loosely folded over, or plicated pile, which in practice are placed in trays as they come from the perforator ready for subsequent steps in the process of manufacture as may be necessary.

In the use of the machine described in the following specification, these trays, containing the perforated sheets, are placed in suitable positions at the rear of the machine and the back end of each roll is taken separately and spooled upon the machine, after which it is removed from the mandrel of the machine, the end plugs, such as described in my above named prior application, are inserted and the end fasteners attached, when the roll is ready for boxing and shipping. An enormous reduction, both in time and labor accomplished by my improvement has resulted in labor saving amounting to from four to

seven operators upon the process of a single perforating machine. Not only are the above results accomplished, but the cost of production is correspondingly reduced by this cheap substitute for the old forms of wooden and paper spools.

In carrying out my invention I make use of the structure substantially as illustrated in the accompanying drawings wherein—

Figure 1, is a front elevation of my improved spooling machine.

Fig. 2, is a plan view of the same.

Fig. 3, is a right-hand end elevation.

Fig. 4, is a left-hand end elevation.

Fig. 5, is a cross-sectional view.

Fig. 6, is a fragmentary full size view of the expanding mandrel upon which the music rolls are wound.

Fig. 7, is a cross section of Fig. 6.

Similar letters of reference refer to like parts throughout the specification and drawings.

In Fig. 1, I have shown a base 1 which may be mounted upon a table or any other suitable support. Upon this base are three upright standards 2, 3 and 4, which are provided with journal bearings 5, 6 and 7 respectively to receive the driving shaft 8. Upon the right-hand end of the driving shaft, where it projects outside of the bearing 7, is rigidly secured the crank 9; the opposite end of the shaft 8 carries a spur gear 10. In the upper parts of the two standards 2 and 3, I provide the bearings 11 and 12, in which is mounted the mandrel 13, which carries upon its left-hand end a pinion 14 for engagement with the gear 10. Reference to Fig. 3 will disclose that the standard 4 is cut away as at 15, so that the mandrel 13, with the parts attached at the free end thereof, overhangs a distance greater than the ordinary width of a perforated music sheet. From the above description, it will be readily seen that the rotation of the crank 9 will be communicated to the mandrel 13.

Referring now to Figs. 6, and 7, it will be noted that the mandrel 13 is provided with a pair of diametrically opposite grooves 16 and 17, running substantially the full length of the overhanging part of the mandrel; that is, that part of the mandrel which extends outside of the bearing 12. In each of these grooves 16 and 17, is mounted a reciprocating strip of metal as 18 and 19. At intervals along the bottom of the grooves 16 and 17 are located inclined cams as 20 and

21 to engage correspondingly inclined notches 22 and 23 in the strips 18 and 19. It will be seen, therefore, that when the strips 18 and 19 are given longitudinal movement in the grooves 16 and 17, they will either come within the contour of the mandrel 13, or project outside thereof in accordance with the direction of their reciprocation.

Looking at Fig. 6, it will be noted that movement to the right will cause the strips to be withdrawn into the contour of the mandrel while reciprocation to the left will cause said strips to extend beyond the circumference of the mandrel. Each of the strips 18 and 19 is connected to an end handle 24, by which said strips may reciprocate within the grooves.

About midway of the free overhanging portion of the mandrel 13, I provide a circumferential groove 25, which is in effect, a reduction of the diameter of the mandrel. One of the reciprocating strips 19, is cut away to correspond to this reduced diameter. Rigidly secured to the bottom of this groove 25 is a spring 26 held in place by means of the screws 27, so that the tendency of the spring is to hug the cylindrical portion of the mandrel. Upon the strip 19, I provide a cam 28 in position to elevate the free end of the spring 26, when the strips 18 and 19 are moved to the right, but when the strips are moved in the opposite direction, the spring 26 will again grip very closely the cylindrical portion of the groove 25. In this manner, when it is desired to start a music sheet upon the mandrel the handle 24 is pulled out to the right to elevate the free end of the spring 26, so that the end of the music sheet may be inserted thereunder; the handle 24 is then pushed back into the full line position, looking at Fig. 6, when, of course, the spring 26 will grip the end of the music sheet and simultaneously the strips 18 and 19 will be extended beyond the circumference of the mandrel 13. If, now, the crank 9 is rotated, the music sheet will be rapidly wound upon the mandrel 13.

In order to properly guide the music sheet upon the mandrel, I provide the fixed collar 29, close up to the standard 3, upon the outside or free part of the mandrel 13, and at the opposite end I place the detachable collar 30, so that when in position the music sheet will be properly guided upon the mandrel 13. The collar 30 is provided with a cylindrical hub 31 upon opposite sides of which are rigidly secured the two springs 32 and 33, said springs being so bent as to hug closely the reduced portion 34 of the handle 24, when said handle is pushed completely to the left as shown in Fig. 6. This method of securing the collar 30 to the free end of the mandrel, permits free attachment and detachment, and yet it

is firm enough when in position to secure an accurate winding of the music sheet upon the mandrel 13.

In my former application above referred to, I have described the completed roll as comprising a number of convolutions of the back end of the music sheet formed into a tube with a strip of glue running completely across the sheet so as to form a comparatively rigid hollow spool body. In my present machine I provide means for gluing the last one of a number of convolutions so as to form this spool body upon the mandrel. In order that this gluing step may be quickly and conveniently formed, I provide in the two standards 3 and 4, the bearings 35 and 36, in which is mounted a rock shaft 37; upon the left-hand end of this projecting rock-shaft is rigidly secured the crank 38. Upon the shaft 37 are rigidly secured a plurality of arms 39 which hang vertically downward and carry at their lower ends a bar 40 of a length nearly equal to the width of a music sheet. The length of the arms 39 is such that when the rock-shaft 37 is oscillated, the edge of the bar 40 will strike throughout its length upon the circumference of the mandrel 13, or in case of several convolutions of a music sheet it will strike upon the outer convolution.

Upon facing sides of the two standards 3 and 4 are the two ledges 41 and 42. These ledges support a long trough or tank 43, containing a liquid adhesive 44. This tank 43, as shown in Fig. 5, is in position to permit the bar 40 to normally rest within the liquid adhesive 44, so that when the shaft 37 is oscillated the bar 40 will carry upon its free edge sufficient of the liquid adhesive to lay a strip of the same upon the outer convolution of a music sheet so that as such music sheet is further wound up, said strip of adhesive will firmly unite the adjacent convolutions and form a tubular spool out of a portion of the music sheet itself.

In order that the inner convolutions of the music roll may be firmly bound together, and these substitute spool bodies be of uniform size, I provide a tension device to firmly grip the body of the sheet as the same is being wound upon the mandrel, so that when the crank 9 is turned the mandrel 13 will also be turned to wind the inner end of the music sheet firmly and tightly upon the expanded mandrel. This tension device consists of the following structure. Upon the upper end of the two standards 2 and 3, I secure the bar 45, the free overhanging end of the same extending horizontally to the right, as shown in Figs. 1 and 2, and terminating adjacent to the standard 4. At the rear side of the two standards 3 and 4, I provide a pair of facing guides 46 and 47; in these guides are located the ends of the moving tension bar 48; to the lower

edge of the center of the bar 48 the pitman 49 is pivoted and the lower end of this pitman is connected to the foot lever 50, fulcrumed at 51 upon the floor beneath the machine. It will now be seen that a depression of the free end of the foot lever 50 will cause the moving tension bar 48 to rise to firmly grip the music sheet as 52, against the lower edge of the upper rigid tension bar 45, so that as the crank 9 is turned the inner convolutions of the music sheet are firmly wound upon the mandrel 13.

The music sheet 52 may be one of the super-posed ten to sixteen sheets as they come from the perforator. But in case the music sheets have been previously coiled up into rolls by means of the machine illustrated in my prior patent No. 968,136 such rolls may be mounted upon the loose mandrel 53 and wound directly from said mandrel upon the mandrel 13; the mandrel 53 is supported by a U-shaped bracket 54 projecting rearwardly from the standards 2 and 3, lying parallel to the mandrel 13.

The steps in the operation of spooling a music sheet are as follows: The back end of the music sheet is drawn forward underneath the tension bar 45, and the free edge thereof inserted underneath the spring 26, it being understood that said spring is elevated by means of the cam 28 when the handle 24 is pulled into the dotted line position shown in Fig. 6. When the free end of the music sheet is properly inserted under the spring 26, the handle 24 is pushed into the full line position permitting the cam 28 to release the spring 26 which firmly grips the inner end of the paper against the mandrel 13. At the same time the two strips 18 and 19 are projected from their radial slots 16 and 17 so as to increase the effective diameter of the mandrel 13. The operator then turns the crank 9 a few turns so as to lay a few convolutions of the music sheet upon the mandrel; he then oscillates the shaft 37 by means of the crank 38 to lay a strip of adhesive upon the outer convolution. He now depresses the foot lever 50 so as to firmly grip the body of the music sheet between the tension bars 45 and 48, and then turns the crank 9 slightly so as to draw the music sheet firmly upon the mandrel so as to permit the glue, or other adhesive material, to firmly unite the last convolution with the next oncoming one. The foot lever 50 may then be released and the winding continue until the sheet is completely wound upon the mandrel 13. The operator then removes the collar 30 by giving it a quick jerk to the right, disconnecting the springs 32 and 33 from, and at the same time pulling out the handle 24; this movement of the handle 24 carries with it the two strips 18 and 19, thus withdrawing them into their respective grooves 16 and 17,

thereby releasing the sheet from the gripping spring and reducing the effective diameter of the mandrel; otherwise it would be practically impossible to remove the tightly coiled music sheet from the mandrel. The coiled sheet upon removal from the mandrel is usually strapped with a rubber band so as to prevent the same from uncoiling, after which the end plugs are inserted and the end fastener secured, when, of course, the roll is completed. The spooling machine operator, however, has only to remove the coiled music sheet from the mandrel and start another.

The work is very quickly and effectively done so that with a little practice the operator is enabled to spool many thousands of rolls per day.

It will thus be seen that I have at once accomplished the manufacture of a cheap, effective, and economical spooling machine for the spooling of music sheets for the structure illustrated in my prior application Ser. No. 10,350.

I claim:

1. In a machine for spooling music sheets, the combination of a mandrel, means for rotating said mandrel, means upon said mandrel for gripping the end of a music sheet thereto to wind the same thereon, and means for applying a continuous strip of liquid adhesive to a convolution of said music sheet after a few turns of the same have been wound upon said mandrel.
2. In a machine for spooling music sheets, the combination of a mandrel, means upon said mandrel for gripping the end of a music sheet thereto, means for rotating said mandrel to wind the sheet thereon, and manually operated means for applying a strip of adhesive material to a convolution of said music sheet as the same is wound upon said mandrel.
3. In a music sheet spooling machine, the combination of a plurality of upright standards, a mandrel mounted in said standards, means for rotating said mandrel, a circumferential groove in said mandrel and a gripping device located in said groove for gripping the end of a music sheet to said mandrel, means associated with said mandrel for releasing said gripping device to permit the removal of a coiled music sheet therefrom, and means for applying a strip of adhesive material to a convolution of said music sheet as the same is wound upon said mandrel.
4. In a music sheet spooling machine, the combination of a plurality of upright standards, a horizontal mandrel mounted in said standards, manually operated means for rotating said mandrel, a gripping device mounted upon said mandrel for clamping the end of a music sheet thereto, a tank containing a liquid adhesive material located

beneath said mandrel, and manually operated means for applying a band or strip of said liquid adhesive to the outer convolution of a music sheet as the same is being wound upon said mandrel.

5. In a machine for spooling music sheets, the combination of an expanding mandrel, means for rotating said mandrel, means upon said mandrel for gripping the end of the music sheet, and means for applying a band of liquid adhesive material to the surface of the music sheet as the same is wound upon said mandrel.

6. In a machine for forming music roll spools from music sheets, the combination of a rotatably mounted mandrel, means upon said mandrel for gripping the end of a music sheet to wind the same thereon, means for applying a band of liquid adhesive material to the surface of the music sheet as the same is wound upon said mandrel, and means for reducing the effective diameter of said mandrel in order to remove a coiled music sheet therefrom.

7. In a machine for spooling music sheets, the combination of a mandrel having diametrically located longitudinal grooves therein, reciprocating strips in said grooves, means for extending the edge of said strips beyond the contour of said mandrel upon the reciprocation of said strips in one direction and for withdrawing said strips into said grooves within the contour of said mandrel upon the reciprocation of said strips in the opposite direction, means upon said mandrel for gripping the end of a music sheet thereto to wind the same thereon, and means for applying a band of liquid adhesive material to the surface of the music sheet as the same is wound upon said mandrel.

8. In a machine for spooling music sheets, the combination of a mandrel having diametrically opposite grooves therein, sliding strips in said grooves, a gripping device upon said mandrel for gripping the end of a music sheet thereto, means upon one of said strips for releasing said gripping means upon sliding said strip in one direction, means for rotating said mandrel to wind a music sheet thereon, and means for applying a band of liquid adhesive material to the surface of the music sheet as the same is wound upon said mandrel.

9. In a machine for spooling music sheets, the combination of a mandrel, means for rotating said mandrel, means upon said mandrel for gripping the end of a music sheet thereto to wind the same thereon, a tension device for gripping the body of the music sheet as the same is wound upon said mandrel in order to wind the same firmly thereon, and means for applying a continuous strip of liquid adhesive to a convolution

of said music sheet while the same is being wound upon said mandrel.

10. In a machine for spooling music sheets, the combination of a mandrel, means upon said mandrel for gripping the end of a music sheet thereto, means for rotating said mandrel to wind the sheet thereon, a tension device for gripping the body of the music sheet as the same is wound upon said mandrel in order to wind the same firmly thereon, and manually operated means for applying a strip of adhesive material to a convolution of said music sheet as the same is wound upon said mandrel.

11. In a machine for spooling music sheets, the combination of a mandrel, means thereon for gripping the end of a music sheet thereto, means for rotating said mandrel to wind the music sheet thereon, a rock shaft, a bar connected to said rock shaft for applying a band or strip of adhesive material to a convolution of the music sheet, and a tension device for gripping the body of said music sheet as the same is wound upon said mandrel in order to firmly wind the same thereon.

12. In a music sheet spooling machine, the combination of a plurality of upright standards, a mandrel mounted in said standards, means for rotating said mandrel, a circumferential groove in said mandrel and a gripping device located in said groove for gripping the end of a music sheet to said mandrel, means associated with said mandrel for releasing said gripping device to permit the removal of a coiled music sheet therefrom, a tension device for gripping the body of the music sheet as the same is wound upon said mandrel in order to wind the same firmly thereon, and means for applying a strip of adhesive material to a convolution of said music sheet as the same is wound upon said mandrel.

13. In a music sheet spooling machine, the combination of a plurality of upright standards, a mandrel in said standards and means for rotating said mandrel, a pair of diametrically located strips mounted to reciprocate in grooves in said mandrel, means associated with said strips and said mandrel for causing said strips to extend beyond the surface of said mandrel or be withdrawn within the contour of said mandrel, means upon said mandrel for gripping the end of a music sheet thereto, means for applying a band of liquid adhesive material to the surface of the music sheet as the same is wound upon said mandrel, and means associated with one of said strips for releasing said gripping means to permit the removal of the coiled music sheet from said mandrel.

14. In a music sheet spooling machine, the combination of a plurality of upright stand-

ards, a horizontal mandrel mounted in said
standards, manually operated means for ro-
tating said mandrel, a gripping device
mounted upon said mandrel for clamping
5 the end of a music sheet thereto, a tension
device for gripping the body of the music
sheet as the same is wound upon said man-
drel in order to wind the same firmly there-
on, a tank containing a liquid adhesive ma-
10 terial located beneath said mandrel, and

manually operated means for applying a
band or strip of said liquid adhesive to the
outer convolution of a music sheet as the
same is being wound upon said mandrel.

In testimony whereof, I have hereunto 11
set my hand this 27th day of March, 1915.

G. HOWLETT DAVIS.

In presence of—

L. M. SANDERS,

L. GREEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."