No. 793,053. PATENTED JUNE 27, 1905.

E. G. CLARK.

DELIVERY ROLL OR SPOOL FOR MUSICAL INSTRUMENT CONTROLLERS.

APPLICATION FILED APR. 18, 1904.

Fig. 1.

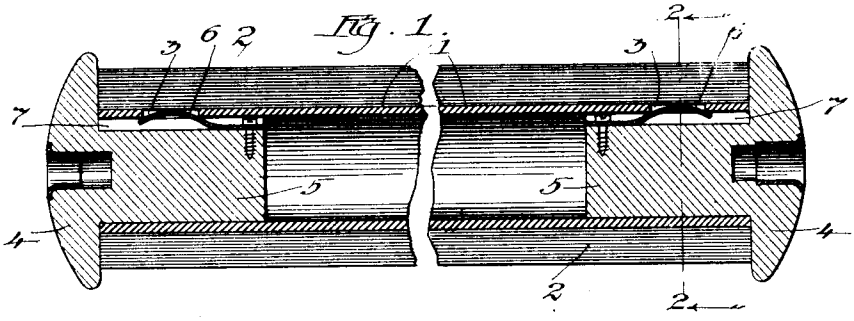


Fig. 2.

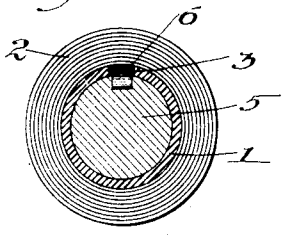


Fig. 3

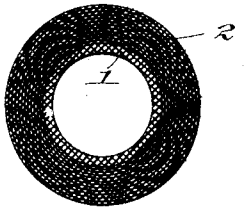


Fig. 4.

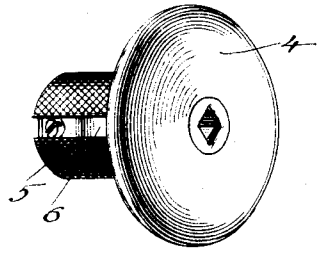


Fig. 5.

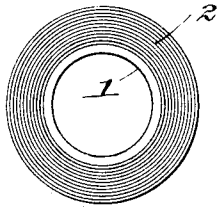


Fig. 6.

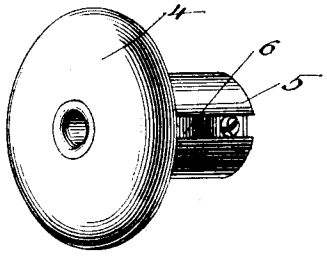
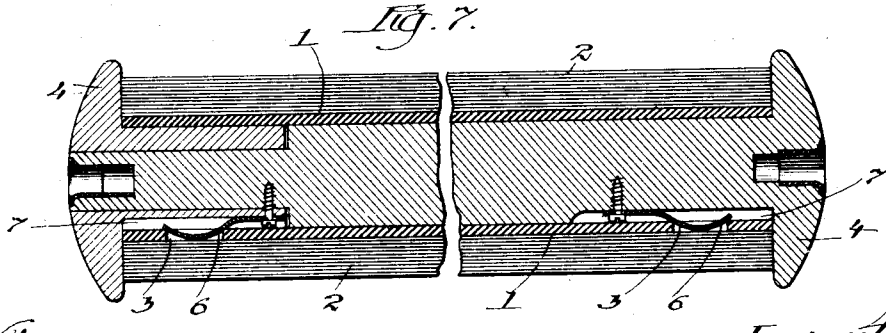


Fig. 7.



Witnesses:
Frank L. Blanchard
Fred'k G. Fischer

Inventor:
Ernest G. Clark
By Burton Burton
His Attorneys.

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No. 793,053. Patented June 27, 1905.

UNITED STATES PATENT OFFICE.

ERNEST G. CLARK, OF CHICAGO, ILLINOIS.

DELIVERY ROLL OR SPOOL FOR MUSICAL-INSTRUMENT CONTROLLERS.

SPECIFICATION forming part of Letters Patent No. 793,053, dated June 27, 1905.

Application filed April 18, 1904. Serial No. 203,571.

To all whom it may concern:

Be it known that I, ERNEST G. CLARK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Delivery Rolls or Spools for Musical-Instrument Controllers, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide a delivery roll or spool for carrying the perforated sheet which constitutes the customary form of controller for an automatic musical instrument, which shall not require for mounting and securing the perforated sheet as it is put up for market the more expensive parts which necessarily pertain to it when it is connected with the mechanism for operation, these more expensive parts consisting of the heads and devices thereon for affording means by which the spool may be carried accurately and rotated.

The invention consists of the features and combination which are set out in the claims.

In the drawings, Figure 1 is an axial section of a delivery-roll embodying this invention. Fig. 2 is a section at the line 2 2 on Fig. 1. Fig. 3 is a driving-end elevation of the spool-shaft with the controller-sheet wound thereon. Fig. 4 is a perspective view of the driving-end head. Figs. 5 and 6 are views, similar to Figs. 3 and 4, respectively, of the opposite end of the spool-shaft and opposite head of the spool. Fig. 7 is a longitudinal axial section of a spool embodying a modified form of my invention.

In all the forms of my invention I employ a tube 1, which is preferably made of pasteboard rolled up and lapped and pasted in the manner which is familiar in making pasteboard tubes, as the shaft or body on which the controller-sheet 2 is wound for market, and I make the heads of the spool which comprises such tubular shaft or body detachable from the shaft and provide coöperating means in the tubular shaft or body and the heads for engaging them for rotation. In the form of this invention shown in Figs. 1 and 2 the means in the tubular body for effecting such engagement consists of an aperture 3 near each end, and the head 4 for each end of the spool has a short stub-axle 5, which fits within the tube 1 and has secured to it a spring 6, said spring being lodged in a longitudinal groove 7 in the stub-axle 5, and, as shown, being a bow-spring fastened at one end in the bottom of the groove and having the other end also lodged in the groove and bowed between the ends to protrude above the surface of the stub-axle at such point that it will engage the aperture 3 when the head 4 is close against the end of the tubular body. It will be seen that the stub-axle 5, having this spring mounted in it as described, may be thrust into the tubular body at any position, the bowed spring being pressed back by encounter with the tubular body, and the head being then turned round the bow of the spring will engage the aperture 3 when the latter is reached, and that such engagement will connect the shaft and head for rotation—that is to say, that either will be rotated when the other is rotated—and it will be seen that the head may be detached from the body by a longitudinal pull, which will cause the bow-spring to be forced back in the groove 7.

Since the spool is rotated by the head only in rewinding and engagement for this purpose is made only at one end, it is only necessary that the head at that end termed the "driving" end should have the positive engagement with the body which is effected by the spring and aperture, as described. The aperture may therefore be omitted at the other end, if desired, and the spring, if present on the opposite head, will only serve to slightly increase the frictional engagement of the head in the body necessary to prevent it from dropping out when the spool is handled, and thereby causing slight inconvenience; but it is not necessary that the head at said opposite ends should be connected for rotation with the body. Preferably, however, the tubular shaft of the spool will be provided, as illustrated in the drawings, with the perforation 3 at both ends, and both the heads will be provided with the spring 6 for engagement with such perforation.

The economy of this construction consists in that the controlling-sheets may be prepared

for market mounted only on the tubular shaft or body, and each user will require only one pair of heads, which can be inserted into any one of the tubular shafts pertaining to the entire "library" of controllers with which he may be supplied. Since the driving-head of the spool is usually provided with a square socket for engagement with the driving-spindle of the machine, while the opposite head is provided with a round socket for centering it on the opposite centering-pin of the machine, it is necessary in applying the heads to the spool to observe the difference and apply the driving-head at the proper end of the spool to cause the paper to run from the upper side thereof when the driving-head is engaged with the driving-spindle. Users of these controlling-sheets as they have hitherto been customarily marketed—*i. e.*, mounted upon complete spools having the two heads permanently attached as a part of the spool—are accustomed to mount them in the player with the sheet running from the upper side, and they are thus compelled without observing it to bring the driving-head at the upper side of the machine for engagement with the driving-spindle. In using the spools above described the unfamiliar user might be liable to transpose the heads and never having observed the difference between the sockets at the two ends be at a loss to account for the fact that the spool would not be driven when placed in the machine with the paper running from the upper side. To prevent or diminish the liability to such mistake in applying the heads, the two heads may be distinguished from each other by color of the stub-axles attached to them, one of which may be stained or dyed, the other being left, as such spools usually are, the natural untinted color of the wood, and the end of the roll of paper constituting the controlling-sheet to which the dyed head should be applied may be similarly colored. Proper instructions being then printed upon the terminal portion of the roll, which will constitute the outer layer when it is rolled, will tend to insure proper application of the heads.

By making the tubular shaft, as described, of paper-stock, or what is commonly called "pasteboard" or "strawboard"—that is to say, paper in proper thickness to afford the necessary strength without regard to the manner in which it is produced—a specific advantage is obtained in that such tubular shaft expands and contracts substantially equally with the paper of the controlling-sheet wound thereon, thus avoiding the puckering which happens when the controlling-sheet is attached by glue or paste to a wooden shaft in the customary manner and affording the further special advantage in the construction described that the heads being telescoped within the tubular shaft and having capacity for longitudinal movement within a limited range without disengagement of the devices by which they are adapted to rotate said shaft the expansion of the tubular shaft and the paper-controlling sheet thereon spreads the heads a corresponding amount, thus avoiding the binding of the paper between the heads, which results in the common construction of a rigid spool with rigid heads. When the structure shown in Figs. 1 and 2 is employed—that is, having the spring 6 bowed up into engagement with the slot 3 in the paper tubular shaft—the slope of the bow of the spring operates against the end of the slot with a tendency to retract the head and hold it up snugly against the end of the shaft and paper-roll in case of contraction of the latter by drying, and in case of expansion of the paper by absorption of moisture the same construction permits the head to yield outward easily enough to prevent the paper from being pinched or jammed at the end.

When for any reason it is considered desirable to avoid the transmission onto the end of the paper-roll of the pressure of the spring by which the driving-head is held in engagement with the chuck, the shaft of the driving-head may be extended through the entire length of the spool having the center socket at the opposite end, and the head at the opposite end of the roll being axially apertured may be telescoped upon the correspondingly-reduced end of the shaft of the driving-head, as seen in Fig. 7.

I claim—

1. A delivery-roll for a controller-sheet comprising a tube having near the ends, formed in and of the substance of the tube itself, means engageable from the interior of the tube for rotating the latter, in combination with heads having each a shaft to fit within the tube, one of such shafts being provided with means for coöperating with said engaging means formed in the tube for connecting the head thereto for rotation.

2. A delivery-roll for a controlling-sheet consisting of a tubular shaft or body having near one end means formed in and of the substance of the tube itself engageable from within the tube for rotating the latter, in combination with detachable heads having each an axle for fitting within the tube, one of said axles having means coöperating with said engageable feature of the tube for connecting the tube and head for rotation.

3. A delivery-roll for a controller-sheet consisting of a tubular shaft or body having near one end an aperture engageable from within the tube, in combination with heads having each an axle adapted to enter and fit within the tube, one of said axles being provided with a spring-catch for engaging the aperture in the tube.

4. A delivery-roll for a controller-sheet consisting of a tubular shaft or body having near one end an aperture engageable from

within the tube, in combination with heads having axles adapted to fit in the opposite ends of the tube respectively, one of said axles having a longitudinal groove and a bow-spring lodged in the groove and protruding therefrom at a position adapted for engaging the aperture when the head is against the end of the tube.

5. A delivery-roller for a controlling-sheet comprising a tube having means engageable within it for rotating the same, in combination with a driving-head having a shaft telescoped through the tube, provided with means coöperating with the engaging means of the tube for connecting the head thereto for rotation, and reduced in diameter at the opposite end, and a head for the opposite end axially apertured and telescoped onto the reduced portion of the shaft of the driving-head.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 29th day of March, 1904.

ERNEST G. CLARK.

In presence of—

CHAS. S. BURTON,

FRED G. FISCHER.