No. 686,664. Patented Nov. 12, 1901.

H. H. MANSFIELD.

SPOOL FOR PERFORATED MUSIC.

(Application filed June 6, 1901.)

(No Model.)

Fig. 1.

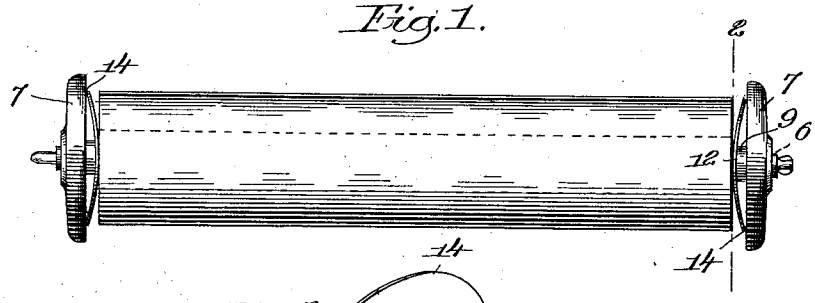


Fig. 5.

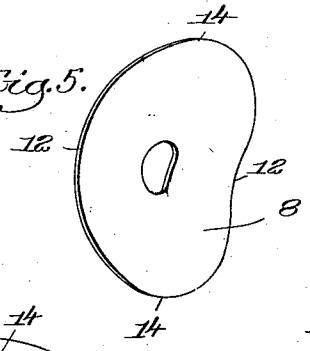


Fig. 2.

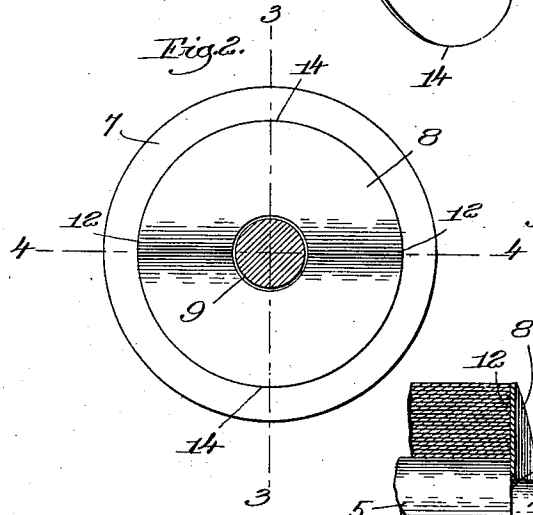
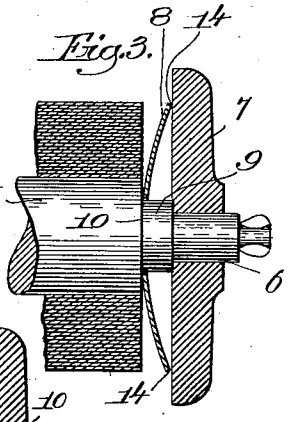


Fig. 3.



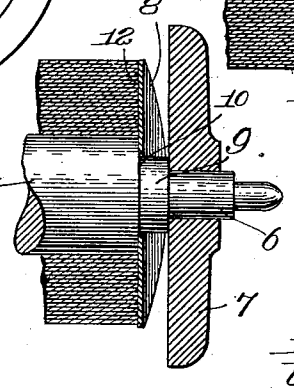


Fig. 4

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UNITED STATES PATENT OFFICE.

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SPOOL FOR PERFORATED MUSIC.

SPECIFICATION forming part of Letters Patent No. 686,664, dated November 12, 1901.

Application filed June 6, 1901. Serial No. 63,436. (No model.)

To all whom it may concern:

Be it known that I, HORACE H. MANSFIELD, a citizen of the United States, residing at Sharon, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Spools for Perforated Music, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

In pneumatic piano-playing devices, automatic organs, and similar instruments wherein the music is produced by a perforated sheet of paper which passes over apertures or air-ducts in the mouthpiece or "tracker" of the instrument it is essential that the perforated paper in passing over the tracker shall "track," as it is termed—*i. e.*, that the perforations in the paper shall register exactly with the apertures or air-ducts in the tracker, for otherwise the correct notes will not be properly sounded. The perforated paper is usually wound upon spools which are mounted for rotation in the instrument, the paper in passing over the tracker being taken from one spool and rewound upon another spool. After the paper has passed from one spool to the other spool the motor or other device is reversed and the paper is wound back upon the first-named spool, ready for use over again. It has been found that the paper is appreciably affected by changes in atmospheric conditions, the said paper swelling and becoming wider in damp, humid weather and shrinking and becoming narrower in dry weather. If, therefore, the spool is made having a certain definite length between the flanges thereof it will be obvious that in damp weather the paper will expand or swell to such an extent as to be slightly wider than the distance between the flanges of the spool, with the result that when the paper is wound back upon the spool the edges thereof will curl. On the other hand, in dry weather, when the paper has shrunk to its minimum width, the sheet of paper will be narrower than the distance between the flanges of the spool, and consequently when under these conditions the paper is wound back upon the spool it will have a slight traverse longitudinally of the spool and will not be wound centrally between the flanges. Under either of these extreme conditions when the paper is being used and withdrawn from the spool the paper will not track perfectly—*i. e.*, the perforations in the paper will not register exactly with the air-ducts in the tracker—and as a consequence the notes are imperfectly or only partially sounded.

It is the object of my invention to provide a novel spool for holding the lengths of perforated paper, which spool has means for properly centering the web of paper as it is wound thereon, so that when unwound in using the instrument the apertures in the web will correctly register with the air-ducts or apertures in the mouthpiece or tracker.

With this end in view my invention comprises a spool having a core provided at its ends with heads comprising in their construction an outer portion or face which is fixed rigidly to the core and an inner portion or face or that portion which is adapted to engage the edge of the material wound on the spool, said inner portion or face being yieldable longitudinally or in the direction of the length of the spool, whereby the distance between the inner faces of the two heads may vary according to the varying widths of the paper, while the distance between the outer faces or the total length of the spool remains constant. The inside faces of the heads are constructed so as to have straight portions extending radially from the axis of the spool and at right angles thereto, the said straight portions of the heads being yieldable in lines perpendicular to the axis of the spool. With this construction whenever a web of perforated paper is wound upon the spool the straight portions of the inner faces of the heads abut against the edges of the roll of paper and properly center the same; but since the said straight portions are yieldable longitudinally of the spool while the outer portion of the head is fixed to the core the spool is adapted to accommodate the web of paper even though it varies slightly in width, owing to atmospheric changes, without making any increase in the total length of the spool.

In the drawings, Figure 1 is a view of my improved spool with a web of perforated paper wound thereon. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a section on the line 3 3, Fig. 2. Fig. 4 is a section on the

line 4 4, Fig. 2; and Fig. 5 is a perspective view of a detail hereinafter referred to.

My improvement consists in making each head at the end of the core of the spool with an outer portion, which is fixed to the core, and an inner or operative face or that face which engages the edge of the paper wound on the spool capable of a movement longitudinally of the spool, whereby the distance between the inner faces of the head may vary to compensate for variations in the width of the paper wound on the spool without in any way affecting the total length of the spool, the said inner or yielding faces constituting, in effect, compensating devices. In the preferred embodiment of my invention the spool is shown as having the usual core 5, at the ends of which are the heads comprising the usual flanges 7, which are shown as rigidly fixed to the core, and a separate elastic or flexible disk 8, which constitutes the operative face of the head and which has a central aperture therein, through which projects the reduced portion 9 on the end of the core 5, the said disk being confined between the shoulder 10 on the core and the flange 7. It will thus be seen that the head of my spool comprises the outer fixed portion 7, which has no movement relative to the core, and the inner face 8, which can yield longitudinally of the spool.

The disk 8 is curved on lines at right angles to the axis of the spool, so that the disk forms, in effect, a portion of the surface of the cylinder whose axis is perpendicular to the axis of the spool. By constructing the disk 8 in this manner its inner face has extending at right angles to the axis of the spool the straight portion 12, which is parallel to the inner face of the flange 7 and against which the edge of the roll of perforated paper abuts, as seen in Fig. 4. A section of the disk at right angles to the straight portion 12 in Fig. 4 shows the disk of the shape shown in Fig. 3, wherein the outer edges 14 of the disk engage the inner face of the flange 7.

Since the disk is made of elastic material it will be obvious that should the width of the sheet of music vary slightly, as would be the case on days having different degrees of humidity, or should the width of the web vary from any other cause, the yielding disk 8 will compensate for these changes of width and will operate to hold the web of music centrally between the flanges 7, said disk therefore having the function of a compensating device. Moreover, since the disk is constructed as described the straight portion 12 thereof, which engages the ends of the roll of paper, will yield always on lines perpendicular to the axis of the roll, so that with any width of paper the straight portion 12 will always engage the ends of the roll of paper.

While I have herein illustrated one form of centering device or one manner of making the inner face of the head at the end of the spool yielding, I do not wish to be limited in all respects to the precise construction herein set forth, as various changes may be made in the device within the scope of my invention as expressed in the appended claims.

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

1. A spool for perforated music comprising a core having flanges at the ends thereof, and an elastic compensating device on the inside of the flanges and adapted to engage the edge of the material wound upon the spool.

2. In a spool for perforated music, a core having heads at the ends thereof, said heads each comprising an outer face or portion fixed to the core, and an inner face which is adapted to engage the material wound on the core and which is capable of yielding longitudinally of the said core.

3. In a spool for perforated music, a core having a head fixed thereto at each end thereof, the said heads each having the inner face, or that face which engages the material wound on the spool, yielding longitudinally of the core.

4. In a spool for perforated music, a core having a head at each end thereof, said heads being rigidly fixed to the core, and having on their inside faces a straight portion extending at right angles to the axis of the spool and against which the edges of the material on the spool abut, said straight portions of the heads being yieldable in lines parallel to the axis of the spool.

5. A holder for perforated music comprising a core, an elastic disk at each end thereof, and adapted to engage the edge of the roll of perforated music, said disk being curved to present a portion of a cylindrical surface.

6. A holder for perforated music comprising a core, a flange at each end thereof and rigid therewith, and a disk of elastic material concentric with the core and on the inside of each flange, said disks each having one diameter on a straight line perpendicular to the axis of the core, and the other diameter at right angles thereto on a curve having its concave face toward the adjacent flange.

7. A holder for perforated music comprising a core, a flange at each end thereof, said core having a reduced portion adjacent each flange, and a concavo-convex disk of elastic material supported on said reduced portion, the outer edge of the disk engaging the inside of the flange.

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

HORACE H. MANSFIELD.

Witnesses:
LOUIS C. SMITH,
GEO. W. GREGORY.