J. J. WALKER.

APPARATUS FOR PRODUCING MUSIC RECORDS.

APPLICATION FILED JULY 12, 1909.

967,274.

Patented Aug. 16, 1910.

Fig. 1.

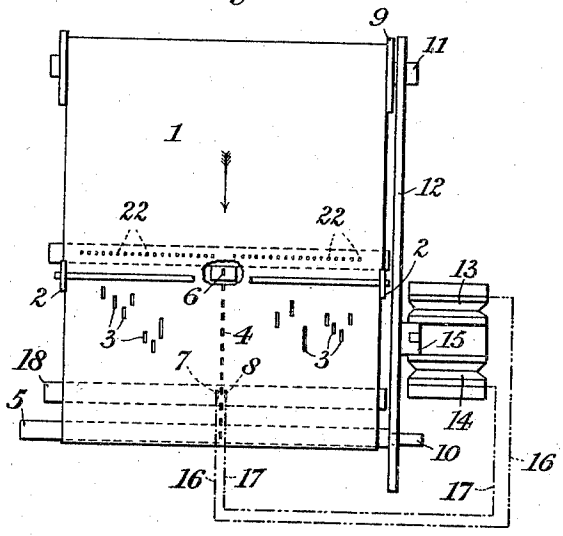
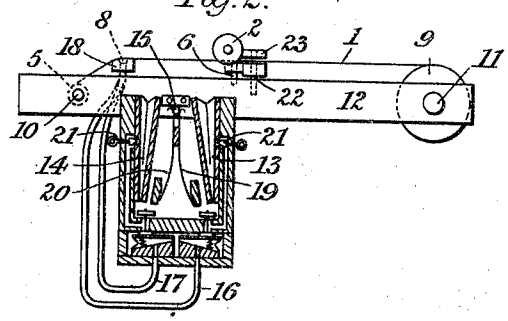


Fig. 2.



Witnesses.

W. P. Burke

John A. Percival

Inventor:

James John Walker

BY Wm. Wallace White

ATTY.

UNITED STATES PATENT OFFICE.

JAMES JOHN WALKER, OF LONDON, ENGLAND.

APPARATUS FOR PRODUCING MUSIC-RECORDS.

967,274. Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed July 12, 1909. Serial No. 507,159.

To all whom it may concern:

Be it known that I, JAMES JOHN WALKER, a subject of the King of the United Kingdom of Great Britain and Ireland, residing at No. 27 Francis street, Tottenham Court Road, London, England, have invented new and useful Improvements Connected with Apparatus for Producing Music-Records, of which the following is a specification.

This invention relates to improvements connected with the production of records of music played upon pianofortes, carillons and other instruments, and apparatus therefor.

In the production of perforated music records as hitherto effected, much difficulty has been experienced in securing the punching of the respective rows of perforations in proper parallelism with, or relationship to, the lateral edges of the tune sheets; this is due sometimes or partly to a want of uniformity in the width of the paper from which the records are made, and sometimes or partly to the said paper, when traveling through the punching machine, being caused to move edgewise by strains set up through the paper winding unevenly upon the receiving roller, these strains also frequently causing the paper to buckle or bulge. The result of these defects is that when the record sheet is afterward used in an automatic reproducer, the imperfections present in the said sheet render it exceedingly difficult and indeed sometimes impossible to maintain the several rows of perforations in proper alinement with their respective tracker-board ports, and the unperforated parts of the record sheet in the necessary air-tight contact with the tracker board, the said sheet bulging away from the tracker board, and opening ports therein and thereby causing notes to be sounded which should remain silent; moreover, owing to the existence of the said imperfections, the record sheet, when being rewound on to the supply roller, cannot be guided by the flanges of the latter with the regularity necessary to insure its note-controlling perforations afterward coming into the aforesaid proper alinement when the record sheet is next unwound from the supply roller for the playing of the recorded music.

The object of this invention is to provide means for overcoming the aforesaid difficulties and to that end it consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

In the accompanying drawings, which are to be taken as part of this specification and read therewith:—Figure 1 is a plan (shown partly in diagram), and Fig. 2 is a sectional side elevation of the improved apparatus constructed according to the present invention.

According to this invention, the paper 1, in which the record is to be punched, as shown in Fig. 1, (and as has sometimes heretofore been done) is supplied to the punching machine slightly wider than the ultimate width thereof, and the edges thereof are trimmed off by rotary cutters 2, at the same time as the paper is being punched with the note perforations 3 and with other perforations 4 by which, as hereinafter explained, the regular winding of the tune sheet on the receiving roll 5 is automatically effected or controlled, by which means perfect parallelism is insured between the thus-formed edges and the different rows of perforations. The control perforations 4 are formed preferably along the center of the tune sheet 1, as shown in Fig. 1, and they may be produced by a constantly reciprocating punch 6 (a portion of which is shown in Fig. 2) or by a rotating perforating wheel; these perforations can afterward be used for correspondingly controlling the alinement of the note perforations 3 with the respective tracker-board ports of the automatic reproducer through which the said sheet may subsequently be passed.

For securing the automatic control of the winding of the tune sheet 1 on to the receiving roll 5, the latter is capable of being moved either axially or angularly (somewhat as described for example in the specification of Letters Patent No. 911,789) by one or more pneumatic motors the operation of which is controlled through two ports 7, 8 adapted to be closed and opened by the tune sheet 1, and row of control perforations 4.

In the example illustrated, the reciving roll 5, and the supply roll 9 are both adapted to be moved angularly, relatively to the

direction of travel (indicated by the arrow in Fig. 1) of the tune sheet 1, and for that purpose their respective shafts 10, 11, are, at one end, loosely journaled in a frame 12 capable of moving forward and backward in a direction parallel with the direction of the travel of the tune sheet 1, this forward and backward motion being imparted to it by the two motors 13, 14 which act on the said frame through a block 15 fast thereto. The motors 13, 14 through tubes 16, 17 are in tubular connection with the two ports 7 and 8 respectively, these ports being provided in a tracker board 18, at a sufficient distance apart to allow the control perforations 4 to pass between them without registering with or opening either of them, this being the condition which obtains during the normal or correct working of the apparatus. When, however, the tune sheet 1 is out of its correct central position, the row of perforations 4, comes more or less into register with one of the ports 7, 8, with the result that the motor 13 or 14 controlled by that port, is operated so as to move the receiving roll 5 in the direction necessary for restoring the necessary centralization of the tune sheet, the said motor ceasing to be operative as soon as the tune sheet 1 again assumes its central position with the control perforations 4, passing centrally between the ports 7, 8, at which juncture the motors are brought to their respective zero positions by two blade springs 19, 20 which act on the block 15. It is preferred to provide each of the motors 13, 14 with an adjustable valve 21, see Fig. 2, by means of which the speed of operation or degree of sensitiveness of the said motors can be regulated; in other respects the motors may be of any suitable construction.

22 represents the punches for making the note perforations 3, and 23, Fig. 2, represents the die with which the punches 6 and 22 coöperate.

It is preferred that the control perforations 4 should be at the center of the tune sheets 1 as hereinbefore mentioned, for the reasons that the lateral expansion and contraction of these sheets, which is generally due to atmospheric influences, is symmetrically or approximately symmetrically outward and inward relatively to the said center of the tune sheets, and that, in consequence thereof, when the said control perforations are situated near the edges of the tune sheet, as they usually have been in the past, the said perforations are frequently, themselves, out of correct relationship to the respective control ports with which they are intended to coöperate in the reproducing apparatus, an dtherefore they cannot exercise the controlling influence for which they are provided. So far however as the present invention is concerned it matters not at what particular part of the width of the tune sheet the control perforations are situated, because the interval between the actual punching of them at 6, and the time at which they exercise their controlling influence at 7, 8, is too short for any material distortion of the tune sheet to take place.

I claim:—

1. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet and a roll for receiving the said sheet, of means adapted automatically to secure a regular winding of the tune sheet upon the roll.

2. In appartus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet and a roll for receiving the said sheet, of means adapted to automatically adjust the roll so as to cause the sheet to be wound regularly thereon.

3. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet, a supply roll from which the tune sheet is unwound, and a roll for receiving the perforated tune sheet, of means adapted to automatically adjust the two rolls so as to cause the sheet to be wound regularly on the receiving roll.

4. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet, and a roll for receiving the said sheet, of means adapted to automatically vary the angle of the axis of the said roll relatively to the direction of travel of the tune sheet so as to cause the sheet to be wound regularly on the roll.

5. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet, a supply roll from which the tune sheet is unwound, and a roll for receiving the perforated tune sheet, of means adapted to automatically vary the angle of the axes of the supply roll and receiving roll relatively to the direction of travel of the tune sheet so as to cause the sheet to be wound regularly upon the receiving roll.

6. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet and a roll for receiving the said sheet, of means adapted automatically to secure a regular winding of the tune sheet upon the roll, and means adapted to trim off the edges of the tune sheet.

7. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet and a roll for receiving

the said sheet, of means adapted to automatically adjust the roll so as to cause the sheet to be wound regularly thereon, and means adapted to trim off the edges of the tune sheet.

8. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet, a supply roll from which the tune sheet is unwound, and a roll for receiving the perforated tune sheet, of means adapted to automatically adjust the two rolls so as to cause the sheet to be wound regularly on the receiving roll, and means adapted to trim off the edges of the tune sheet.

9. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet, and a roll for receiving the said sheet, of means adapted to automatically vary the angle of the axis of the said roll relatively to the direction of travel of the tune sheet so as to cause the sheet to be wound regularly on the roll, and means adapted to trim off the edges of the tune sheet.

10. In apparatus for producing records of music, the combination with punches for forming note-controlling perforations in a traveling tune sheet, a supply roll from which the tune sheet is unwound, and a roll for receiving the perforated tune sheet, of means adapted to automatically vary the angle of the axes of the supply roll and receiving roll relatively to the direction of travel of the tune sheet so as to cause the sheet to be wound regularly upon the receiving roll, and means adapted to trim off the edges of the tune sheet.

11. In apparatus for producing records of music, the combination with a device adapted to form a continuous row of control perforations in the tune sheet, of a port with which the said perforations are out of alinement when the tune sheet is in correct working position, and a motor device in operative connection with the port, and adapted to be operated when the perforations register with the port and thereby to restore the tune sheet to its correct working position, with the control perforations out of alinement with the port.

12. In apparatus for producing records of music, the combination with a device adapted to form a continuous row of control perforations in the tune sheet, of two ports between which the said perforations normally pass without registering with either, and two motor devices each in operative connection with one of the ports and each adapted to be operated when the perforations register with the respective port and thereby to restore the tune sheet to its correct working position with the control perforations passing between the ports without registering with either of them.

13. In apparatus for producing records of music, the combination with a device adapted to form a continuous row of control perforations in the tune sheet, of two ports between which the said perforations pass without registering with either when the tune sheet is in correct working position, two motor devices each in operative connection with one of the ports and each adapted to be operated when the perforations register with the respective port and thereby to restore the tune sheet to its correct working position, and springs adapted to restore the motors to their respective normal positions.

14. In apparatus for producing records of music, the combination with a device adapted to form a continuous row of control perforations in the tune sheet, of a port with which the said perforations are out of alinement when the tune sheet is in correct working position, a motor device in operative connection with the port, and adapted to be operated when the perforations register with the port and thereby to restore the tune sheet to its correct working position, and means adapted, simultaneously with such punching, to trim off the edges of the tune sheet.

15. In apparatus for producing records of music, the combination with a device adapted to form a continuous row of control perforations in the tune sheet, of two ports between which the said perforations normally pass without registering with either, two motor devices each in operative connection with one of the ports and each adapted to be operated when the perforations register with the respective port and thereby to restore the tune sheet to its correct working position, and means adapted, simultaneously with such punching, to trim off the edges of the tune sheet.

16. In apparatus for producing records of music, the combination with a device adapted to form a continuous row of control perforations in the tune sheet, of two ports between which the said perforations pass without registering with either when the tune sheet is in correct working position, two motor devices each in operative connection with one of the ports and each adapted to be operated when the perforations register with the respective port and thereby to restore the tune sheet to its correct working position, springs adapted to restore the motors to their respective normal positions, and means adapted, simultaneously with such punching, to trim off the edges of the tune sheet.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JAMES JOHN WALKER.

Witnesses:
HENRY HART,
F. W. BELL.