

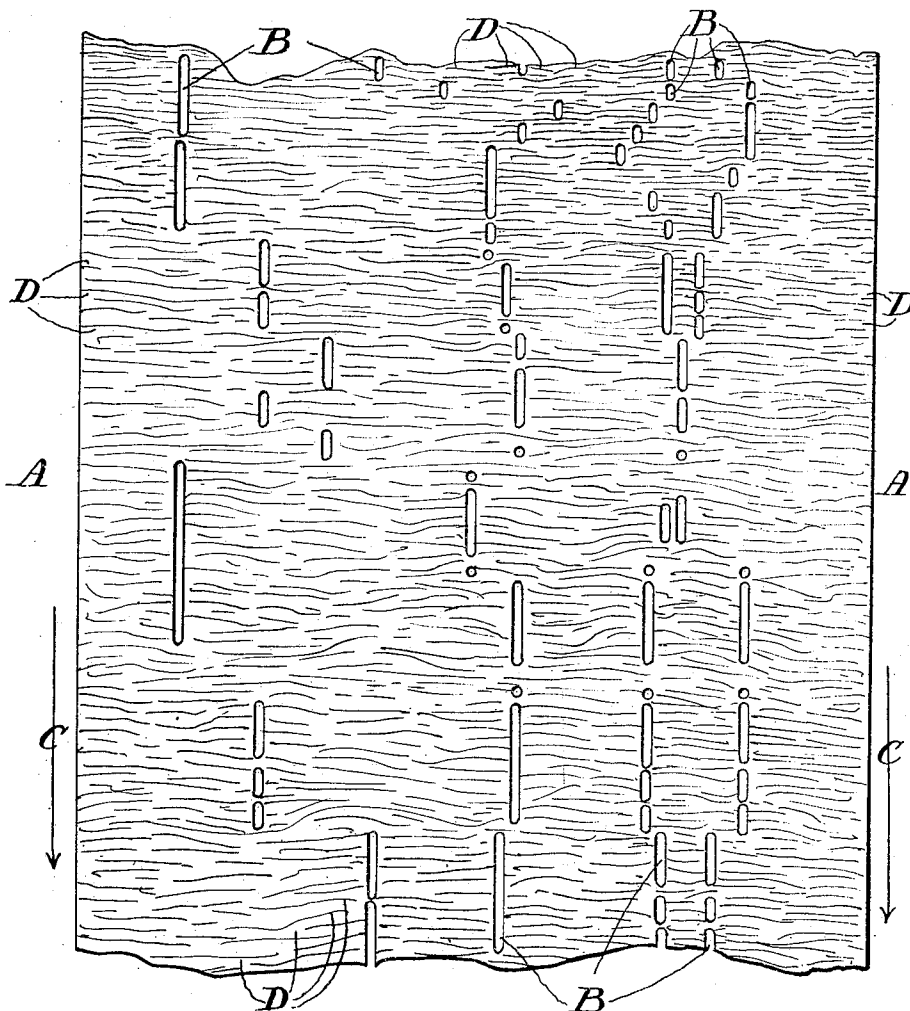
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J. B. WALKER & A. R. BOND.

MUSIC SHEET.

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WITNESSES

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JOHN B. WALKER, OF NEW YORK, N. Y., AND ALEXANDER RUSSELL BOND,
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MUSIC-SHEET.

No. 846,267.

Specification of Letters Patent.

Patented March 5, 1907.

Application filed August 18, 1906. Serial No. 331,200.

To all whom it may concern:

Be it known that we, JOHN B. WALKER, a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, and ALEXANDER RUSSELL BOND, a resident of Plainfield, in the county of Union and State of New Jersey, both citizens of the United States, have invented a new and Improved Music-Sheet, of which the following is a full, clear, and exact description.

Our invention relates to music-sheets of the type used in piano-playing mechanism.

As ordinarily made a music-sheet consists of a length of paper provided with perforations variously arranged according to the notes to be sounded. In use the music-sheet is adapted to be moved over a series of pneumatic ducts in a so-called "tracker-board," and said sheet serves as a valve to progressively uncover, by means of the perforations, certain of said ducts or combinations of said ducts, thereby pneumatically selecting the notes or chords which are to be struck by the mechanism.

One of the greatest difficulties attending the use of music-sheets made of paper as heretofore formed is their liability to contract or expand laterally under varying atmospheric conditions to such an extent that the perforations will not properly track with their respective ducts in the tracker-board; and it is an object of our invention to provide a music-sheet made of paper or similar material which will properly track with a tracker-board regardless of hygroscopic changes of the atmosphere.

A practical embodiment of our invention is represented in the accompanying drawing, forming part of this specification, and which shows a fragment of our improved music-sheet.

We have discovered that paper expands or contracts under hygroscopic changes of the atmosphere in a direction transverse to the length of the fibers of which it is composed. If the fibers are uniformly distributed in all directions, contraction and expansion of the paper will be equal in all directions; but if the mass of fibers have a general trend in any one direction contraction and expansion of the paper will be least in said direction and greatest at right angles thereto.

Music-sheets have heretofore been made of a paper having a decided grain or trend of fibers in one direction; but owing to convenience of manufacture said music-sheets have been formed with the grain of the paper coinciding in direction with the direction in which the music-sheets are adapted to travel over a tracker-board. As a consequence the greatest variations in the dimensions of said music-sheets take place at right angles to the direction in which they are adapted to travel, and in use under certain hygroscopic conditions the perforations do not properly track with the ducts in the tracker-board.

It will be evident that the direction in which a music-sheet is adapted to travel over a tracker-board is determined entirely by the arrangement of the perforations therein, for in rendering or otherwise interpreting the music denoted by said perforations the interpretation or reading must progress in a certain definite direction of the sheet, for in no other direction can it be interpreted to represent intelligible music such as will conform to the laws of harmony. While a sheet of paper *per se* cannot be said to have any definite direction, yet it is apparent that the perforations in this sheet of paper representing consecutive notes or chords of a musical composition must have a progressive arrangement in a certain definite direction, and this direction in the present specification and the appended claims we have termed the "interpretive direction" of the perforations.

Our improved music-sheet is made of a paper with the fibers having a general trend at right angles to the interpretive direction of the perforations, thus reducing to a minimum the contraction and expansion laterally of the music-sheet or along the axis of the tracker-board.

Referring to the drawing, A designates a sheet of paper which is provided with a series of perforations B B.

The arrow C indicates the interpretive direction of the perforations—that is, the direction in which the music-sheet is adapted to travel over a tracker-board.

D D represent the fibers of the paper A. It will be noted that said fibers have a trend at right angles to the interpretive direction of the perforations. Consequently under hygroscopic changes of the atmosphere the

maximum contraction and expansion of the paper A will be in the direction of the arrow C and the minimum contraction and expansion of the paper A in the width of the music-sheet, or at right angles to the direction of said arrow.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

10 1. A music-sheet consisting of a web containing fibers and provided with perforations disposed in a definite order relative to the general length of said web, the trend of said fibers extending crosswise of said general length of said web.

20 2. A music-sheet consisting of a web of material containing fibers and provided with perforations of different lengths for controlling the duration of different notes, the majority of said fibers being disposed in a general direction crossing the direction represented by the lengths of said perforations.

25 3. A music-sheet consisting mainly of fibers, the majority of which lie in a common direction, said music-sheet being provided with perforations representing successive notes and chords of a musical composition, the direction in which the perforations follow one another in interpretation crossing said common direction in which said fibers are disposed.

30 4. A music-sheet formed mainly of fibers

and provided with perforations representing consecutive notes and chords of a musical composition, the majority of said fibers having a common direction transverse to the direction in which the perforations follow one another in interpretation. 35

5. A music-sheet formed mainly of fibers and provided with music-controlling elements arranged in a definite succession, the majority of said fibers having a common direction transverse to the direction in which the music-controlling elements follow one another in interpretation. 40

6. A music-sheet formed mainly of fibers and provided with music-controlling elements arranged in definite succession, the majority of said fibers being so disposed relatively to said music-controlling elements as to reduce to a minimum the tendency to expansion and contraction of said sheet transversely to the direction in which the music-controlling elements follow one another in interpretation. 45

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses. 55

JOHN B. WALKER.

ALEXANDER RUSSELL BOND.

Witnesses:

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