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TONE HOLE COVERING ASSEMBLY FOR WOODWIND MUSICAL INSTRUMENTS

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FIG. 1

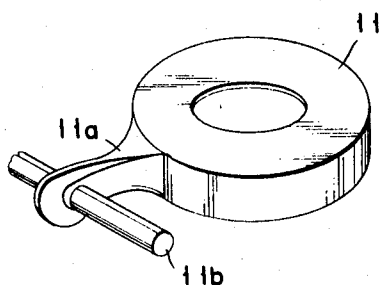
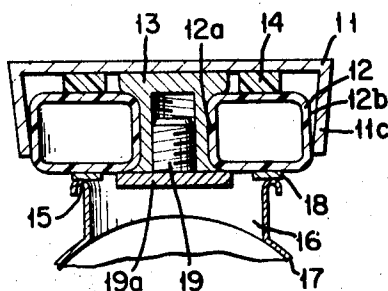


FIG. 2



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## TONE HOLE COVERING ASSEMBLY FOR WOODWIND MUSICAL INSTRUMENTS

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3 Claims

### ABSTRACT OF THE DISCLOSURE

A tone hole covering assembly for a woodwind musical instrument comprising a pad cup and an enclosed, hollow pad received therein, the pad being filled with air compressed to a sufficient extent to cause the outer surface of the pad to contact the annular edge of a tone hole of the instrument in an airtight manner when the cup is operated to cover the tone hole.

The present invention relates to a tone hole covering assembly for a woodwind musical instrument wherein the pad is so improved in construction that it can contact a tone hole of the instrument with sufficient airtight seal.

With woodwind musical instruments, for example, a flute, the tone hole covering assembly comprising a pad cup and a pad received therein, is generally set in place by fixing an arm projecting from the pad cup to a key hinge-bar and pivotally fitting the key hinge-bar to the body of the wind instrument in such a manner that rotation of said key hinge-bar allows the tone hole covering assembly to open or close the tone hole bored in the body of the wind instrument. In this case, the degree of airtight seal with which the pad contacts the edge of the tone hole largely affects the stability of musical tones. During assembly, it often occurs that the pad does not satisfactorily contact the edge of the tone hole due to effects resulting from the positions of the pad cup, the key hinge-bar and the tone hole as well as from the precision with which the parts thereof are manufactured. In such case, there was required a troublesome and yet unreliable adjusting step of removing the pad cup together with the key hinge-bar and interposing a suitable number of spacer sheets between the pad and the bottom of the pad cup so as to control the inclination of the contact surface of the pad. This operation demanded advanced skill and consumed a great deal of time.

The present invention has been accomplished to make improvements in the aforementioned drawbacks and is intended to provide tone hole covering assembly for woodwind musical instruments wherein the pad is formed into an enclosed hollow member inflated with air that it is elastically deformed by the pressure with which it contacts the annular edge of the tone hole, with sufficient flexibility being furnished to effect airtight seal by said contact.

Further features and advantages of the invention will be apparent from the following description taken by reference to the appended drawing, in which:

FIG. 1 is a perspective view of a tone hole covering assembly embodying the present invention; and

FIG. 2 represents a side view of the assembly partly in longitudinal section.

Referring to the drawing, there is shown a tone hole covering assembly for a woodwind musical instrument such as a flute. The assembly comprises a pad cup 11 and a pad 12 received therein.

The pad cup 11 has an arm 11a integrally formed at one end. To the arm 11a is fixed a key hinge-bar 11b

which is rotatably supported by the body of the wind instrument. At the center of the inner bottom of the pad cup 11 is disposed a threaded seat 13. Concentrically with the threaded seat 13 is received the doughnut-shaped pad 12 in the pad cup 11. The pad 12 is formed into an enclosed, tubular member made of rubber or very flexible plastics such as polyethylene, which member is filled with compressed air in airtight seal so as to be rendered self-sustaining. Between the pad 12 and the inner bottom surface of the pad cup 11 is interposed a doughnut-shaped base plate 14.

That part of the pad 12 which contacts the annular edge 15 of a tone hole 16 bored in the body 17 of the instrument is bonded with a ring-shaped protective sheeting 18 made of leather or other cushion material. The pad 12 is clamped with a screw 19 between the screw head 19a and the base plate 14 by inserting the seat 13 and the screw 19 into a center hole 12a formed in the pad 12.

The perimeter 12b of the circular pad 12 is firmly clamped by the circular side wall 11c of the pad cup 11 which is inclined toward the pad 12. The pad 12 may be fixed to the cup 11 by using any suitable means such as an adhesive instead of employing the above-mentioned threaded seat and screw.

With the tone hole covering assembly constructed as described above, the pad 12 is rendered self-sustaining by air pressure prevailing therein. When, therefore, the pad 12 is forcibly pressed to the annular edge 15 of the tone hole 16, it is elastically deformed to a sufficient extent to render its contact with the tone hole edge 15 fully airtight, obtaining stable musical tones during performance, namely, realizing good performance without the necessity of taking any extra mechanical step.

Further, the tone hole covering assembly of the present invention does not require the position and inclination of the pad with respect to tone hole to be manually adjusted in assembly as has been practised in the prior art woodwind instrument, resulting in its increased productivity. Absence of such adjusting operation naturally leads to elimination of any advanced skill in assembly.

What is claimed is:

1. A tone hole covering assembly for a woodwind musical instrument having a tone hole therein comprising a pad cup, a pad received therein, said pad being formed into an enclosed, hollow member of flexible material filled with air so as to make an elastic deformation when pressed to the edge of the tone hole, and means for fixing the pad to the pad cup, whereby realizing airtight contact of the pad with the edge of the tone hole.

2. A tone hole covering assembly as claimed in claim 1 wherein the pad is further formed into a doughnut shape with a hole at its center, and the fixing means consists of a threaded seat and a screw with a head, said screw being inserted into said hole and engaged with the seat so that the pad is clamped between the head and the seat.

3. A tone hole covering assembly as claimed in claim 1 wherein the pad cup is provided with a side wall inclined toward the pad so as to firmly clamp the pad in the pad cup.

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