Key pad for covering tone opening of a musical instrument, such as a saxophone, supported on pad cup pivotally mounted on the body of the instrument. The pad is secured in the cup by a plastic material interposed therebetween. A portion connected to the pad, or to the cup, or separate therefrom, permits the pad to rock within the cup when the plastic material is pliable for accurate alignment of the pad with respect to the edge of the tone opening. The plastic material hardens at room temperature to hold the pad fixed in the aligned position.

Background of the invention

Key pads are used to cover tone openings in the body of musical instruments, such as saxophones, to control the effective length of the instrument to thereby determine the frequency of the musical tone produced thereby. Such pads are supported in cup members attached to arms pivotally mounted on the body of the instrument. A lever mechanism may be used for operating the arm, or the back of the cup member may be directly engaged by the musician playing the instrument.

It is desired that the sealing surface of the pad be accurately aligned with the edge of the tone opening to completely close the opening. Various pivotal mounting structures have been provided for the pads to provide such alignment, but in these structures the pad can be easily moved out of the aligned position. The key pads have been secured in the cup supporting member by plastic material such as wax, and although this material when soft permits movements of the pad for alignment, it is difficult to accurately align the pad at the proper position in the cup so that it can be held in such position by the wax.

Summary of the invention

It is an object of the present invention to provide a key pad structure which facilitates the alignment of a pad in its supporting cup and wherein the pad is held in the desired aligned position.

A further object is to provide a key pad for a musical instrument with a pivotal arrangement permitting the pad to rock in the supporting cup and with plastic material holding the pad in aligned position during repeated use.

In practicing the invention a key pad is provided for a musical instrument, such as a saxophone, for closing a tone opening in the body of the instrument. The pad is supported in a cup-shaped member attached to an arm pivotally mounted on the body of the instrument. Engagement between the pad and the cup is provided by a portion which permits the pad to rock in the cup so that the sealing surface thereof can be accurately aligned with the edge of the tone opening. Plastic material is positioned between the pad and the cup to hold the pad in the aligned position so that it will remain in fixed position after repeated use.

Brief Description of the drawings

The invention is illustrated in the drawings wherein:

FIG. 1 illustrates the pad and support of the invention on the body of a musical instrument having at one opening:

FIG. 2 is the cross sectional view of the pad of FIG. 1; and

FIGS. 3, 4, 5 and 6 show alternate embodiments of the pad construction of the invention.

Detailed description of the preferred embodiment

In FIG. 1 there is illustrated a portion of the body 10 of a musical instrument, which may be a woodwind instrument such as a saxophone. The body 10 is made of metal, plastic or wood and has an opening 11 therein with an edge 12 extending in a single plane. A pad 15 is provided for engaging the edge 12 to close the opening 11. The pad has a surface 16 for engaging the edge 12 formed of fish skin, leather, or synthetic material which may be of known construction. The pad has a support plate 17 on the opposite side having a generally conical extension 18 at the center thereof. The support plate 17 and extension 18 may be integrally formed of metal or molded plastic. The tone openings and pads therefor are commonly round, but can be of any desired configuration.

The cup shaped member 20 for receiving the pad 15 is attached to a pivot arm 21. The arm is pivoted on pin 22 secured to a post 23 mounted to the body 10 of the instrument. A lever system may be provided for moving the arm 21, or the cup 20 may be engaged by the fingers of the musician to actuate the arm. A spring may be used to hold the arm outward of the body so that the pad 15 is spaced from the edge 12 and the opening is not covered.

As shown in FIGS. 1 and 2, the conical projecting portion 18 extending from the pad supporting plate 17 rests in a socket 25 in the cup shaped member 20 in the rock therein, so that the sealing surface 16 of the pad can be tilted to be accurately aligned with the edge 12 of the tone opening when the pad is in engagement therewith. By providing such tilting movement, inaccuracies in the construction of the various parts can be compensated for.

The material of the surface of the pad has some resilience to compensate for minor irregularities in the edge 12 of the opening.

Plastic bonding material 30 is positioned in the cup 20 and fills the space between the back plate 17 of the pad and the cup shaped member 20. This plastic material may be any known material such as shellac, wax or a hotmelt adhesive which can be applied in a pliable plastic form and which hardens to hold the pad in fixed position within the cup 20. The plastic material must harden at normal temperatures encountered to hold the pad in fixed position in the cup. Preferably the plastic material should soften at a temperature somewhat above that encountered in normal use so that the pad can be re-aligned if necessary by heating the plastic material.

FIG. 3 shows a construction wherein a post or stud 32 having a rounded end is used in place of the conical portion 18. The post 32 is secured to the back plate 17 of the pad, and plastic bonding material 30 in the space between the plate 17 and the cup 20 hardens at normal temperatures encountered to hold the pad in fixed position within the cup.

FIG. 4 shows a different embodiment wherein a ball 34 is used to provide the rocking engagement, which is not secured to either the supporting plate 17 of the pad or to the cup shaped member 20. Alternately the ball can be mounted to either the plate 17 or to the cup 20 and still provide the self-aligning action.

FIG. 5 shows a construction wherein a post 36 is secured to the cup member 20 at the center of the bottom thereof. The plate 17 engages the rounded edge of the post 36 to permit tilting of the pad 15 for aligning the same with the edge of the tone openings.
In FIG. 6 a threaded stud or screw 40 is secured into a tapped boss 41 secured to the bottom of the cup 20 at the center thereof. The screw 40 extends through an opening in the pad 15 and has a head with a rounded back surface 42 which co-operates with a complementary rounded surface on the pad. This permits the pad 15 to rock about the head of the screw so that the surface 16 can be aligned with the edge of the tone opening. Plastic material 30 is positioned between the back plate 17 of the pad and the cup 20 which will initially be soft so it can flow for alignment of the pad, and which hardens at normal operating temperatures to hold the pad in fixed position.

The construction of the invention includes a pivotal connection between the pad and the supporting cup which facilitates alignment of the pad, while holding the pad at the desired position within the cup. The plastic material between the pad and the cup allows the pad to be lifted and then holds the pad in fixed position. This construction makes it much easier to accurately position the pad than a construction wherein there is no pivotal engagement between the pad and the cup, and the plastic material is compressed by the aligning engagement and tends to work out about the edges of the pad. In the construction of the invention the plastic material is pliable and flows slightly to permit adjustment of the pad. The material then hardens to prevent unintended movement of the pad which can take place when a pivotal mounting is used alone.

We claim:

1. A musical instrument having a body with a tone opening therein, a key pad for covering said opening including in combination, a cup member, means for pivotally mounting said cup member on the body of the instrument, a pad having a surface on one side thereof for engaging the edge of the tone opening for closing the same, means on the other side of said pad in engagement with said cup member to facilitate positioning said pad at various angular positions with respect to said cup member, and plastic material positioned between said pad and said cup member for holding said pad so that said surface thereof is in a predetermined aligned position.

2. A key pad in accordance with claim 1 wherein said plastic material is substantially rigid at room temperature and is pliable at a temperature above room temperature to facilitate alignment of said surface of said pad.

3. A key pad in accordance with claim 1 including a projection extending from said other side of said pad into engagement with said cup member.

4. A key pad in accordance with claim 3 in which said projection is of a generally conical configuration.

5. A key pad in accordance with claim 1 including a ball positioned between said other side of said pad and said cup member.

6. A key pad in accordance with claim 1 including a post secured to said cup member and having a rounded surface engaging said other side of said pad.

7. A key pad in accordance with claim 1 wherein said pad has an opening therein, and including a screw extending through said opening and a stud for receiving said screw secured to said cup member, said screw having a head with a rounded back surface and said pad having a complementary rounded surface cooperating therewith to permit rocking movement of said pad with respect to said cup.

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