

[54] **TRANSDUCER MOUNTING TO SOUNDING BOARD**

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[52] U.S. Cl. .... **179/181 W; 248/206 R; 310/8.3; 310/9.1**

[51] Int. Cl.<sup>2</sup> ..... **H04R 1/00**

[58] Field of Search ..... **310/8.3, 9.1; 340/8 S, 340/8 R; 248/206 R, 363; 179/101, 114 R, 115 R, 121 C, 121 T, 178, 181 W**

[56] **References Cited**

**UNITED STATES PATENTS**

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**FOREIGN PATENTS OR APPLICATIONS**

806,325 2/1969 Canada ..... 340/8 R

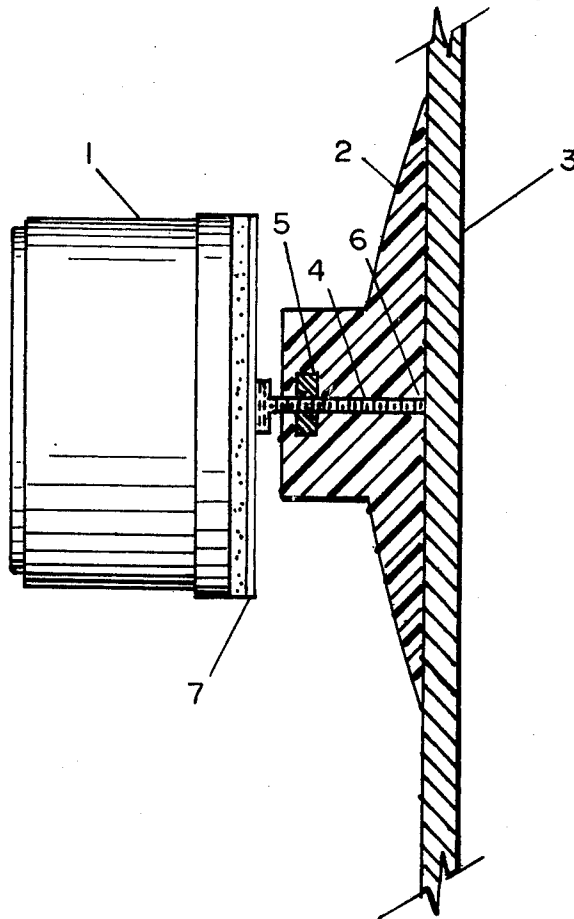
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[57] **ABSTRACT**

A transducer secured to a sounding board with a vacuum cup where a positive transfer of vibratory energy is accomplished between the transducer and the sounding board.

**4 Claims, 2 Drawing Figures**



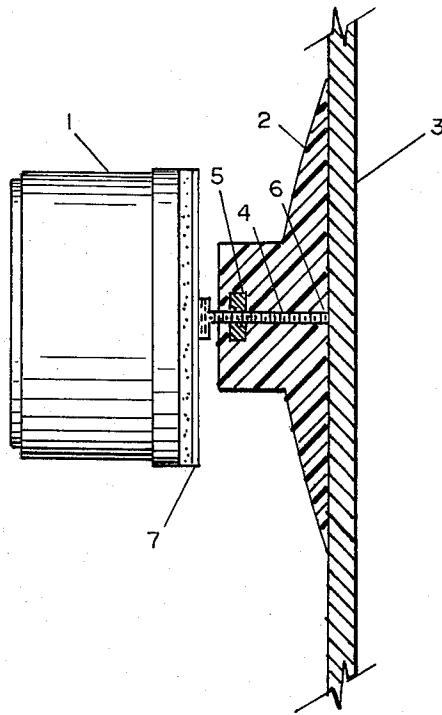


FIG. 1

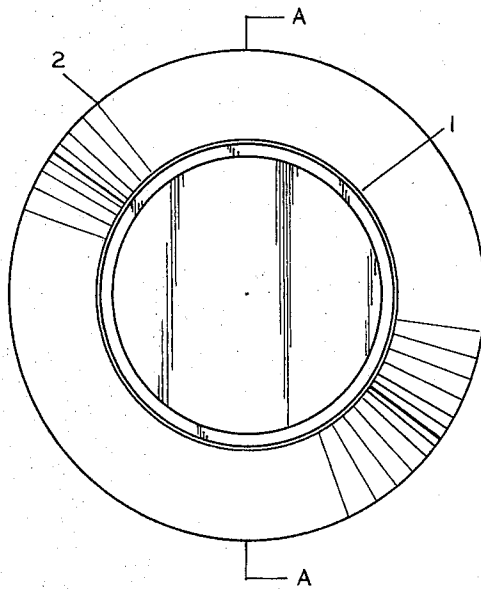


FIG. 2

## TRANSDUCER MOUNTING TO SOUNDING BOARD

### BACKGROUND OF INVENTION

The present invention relates to transducers and more particularly to a simple and efficient method of attaching a transducer to a sounding board. In the past, it has been necessary to either screw or cement inertia type transducers to a sounding board to secure the transducer in place.

### SUMMARY OF INVENTION

The present invention provides a method of attaching a transducer to a sounding board that has a smooth surface without either cementing or screwing the transducer to the sounding board. This is accomplished by having a transducer mounted on a vacuum cup and then pressing the vacuum cup against the sounding board. The vacuum cup will adhere to the sounding board holding the transducer in place. A vibratory transfer member is fastened to the transducer and it extends thru the vacuum cup and makes positive contact with the sounding board without penetrating into the sounding board. This fastening method is extremely useful when it is desired or necessary to attach a transducer to glass, helmets such as a motorcycle helmet, hard hats, hairdryers and any other surface with a smooth finish where a vacuum cup will adhere to it. The present invention is particularly useful when used on a motorcycle helmet. Because of the noise generated by the motorcycle engine, the rider cannot hear a conventional loudspeaker. It would be extremely dangerous if the cyclist wore earphones to listen to a radio or other sound equipment because this would block out other sounds. An audio transducer can be affixed to the outside of the helmet and a small pocket transistor radio connected to the transducer. This simple and inexpensive equipment will produce unbelievable sound that can easily be heard by the cyclist over the motor noise and he can also hear any other sounds around him. Applicant's transducers covered by U.S. and foreign patents have been used for mounting on helmets in the past but it has been necessary to mechanically connect the transducer to a helmet such as gluing a block of wood to the helmet and then by screwing the transducer into the block of wood. The same has been true for glass windows or metal surfaces. The present invention eliminates this necessity and provides an almost instant and extremely effective attaching means.

These and other advantages of the present invention are apparent in the following description, claims and drawings.

FIG. 1 is a vertical partial sectional view of the present invention along line A—A of FIG. 2.

FIG. 2 is a view of the transducer as detailed in FIG. 1.

### DESCRIPTION OF THE PREFERRED EMBODIMENT:

FIG. 1 is a partial sectional view of the present invention. Transducer 1 is not shown in section as audio transducers are well known to the art, but vacuum cup 2, sounding board 3, nut 5 and screw 4 are shown in

section to properly illustrate the present invention. Sounding board 3 may be constructed of glass, metal, plastic or any other surface a vacuum cup will adhere to. Nut 5 is moulded into the shank end of vacuum cup 2. A hole 6 which will be smaller than screw 4 is moulded or drilled entirely thru vacuum cup 2 in line with the hole in nut 5. Screw 4 is screwed into nut 5 forcing screw 4 thru hole 6 to within approximately 1/16 inch of the opposite end of vacuum cup 2. Vacuum cup 2 is then pressed against sounding board 3 to firmly secure it in place. Transducer 1 is then rotated which in turn rotates screw 4, pushing it all the way thru vacuum cup 2, bringing screw 4 into firm contact with sounding board 3. As transducer 1 diaphragm vibrates when a varying electrical signal is applied to transducer 1, screw 4 which is attached to diaphragm 7 transfers these vibrations to sounding board 3. Vacuum cup 2 will move with sounding board 3 and will not impede the vibratory action of sounding board 3. The vacuum seal of vacuum cup 2 is not punctured by hole 6 because the material that vacuum cup 2 is made of seals around screw 4 as it is screwed thru vacuum cup 2. It is necessary to have screw 4 partially in place in vacuum cup 2 before the vacuum cup is pressed in place or a vacuum will not occur because of hole 6. Of course, it would be possible to have a rigid plug in or over hole 6 to make the vacuum cup air tight and have screw 4 press against this plug. It would then be possible to set vacuum cup 2 in place before screw 4 is screwed in place. Although one form of the present invention has been shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of this disclosure as defined by the following claims.

I claim:

1. An inertia type electro-mechanical audio transducer in combination with a vacuum cup and a sounding board wherein said vacuum cup is secured to said sounding board by a vacuum seal formed therebetween, said inertia type electro-mechanical audio transducer comprises a vibratory transfer means which extends through said vacuum cup to make solid contact with said sounding board for the transfer of vibratory energy from said transducer to said sounding board for acoustic reproduction, wherein said vacuum cup is the sole support of said transducer by means of said vibratory transfer means.

2. A transducer secured to a sounding board by a vacuum cup according to claim 1 wherein said vibratory transfer means is a threaded element.

3. A transducer secured to a sounding board by a vacuum cup according to claim 1 wherein said vacuum cup has a threaded nut moulded therein for receiving said vibratory transfer means.

4. A transducer secured to a sounding board by a vacuum cup according to claim 1 wherein said vacuum cup has a hole in it smaller than said vibratory transfer means for receiving said vibratory transfer means wherein said vacuum cup seals around said vibratory transfer means when said vibratory transfer means passes thru said hole.

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