Feb. 3, 1959 G. BUCHMANN ET AL 2,872,532

CONDENSER LOUDSPEAKER

Filed Aug. 8, 1955

FIG. 1.

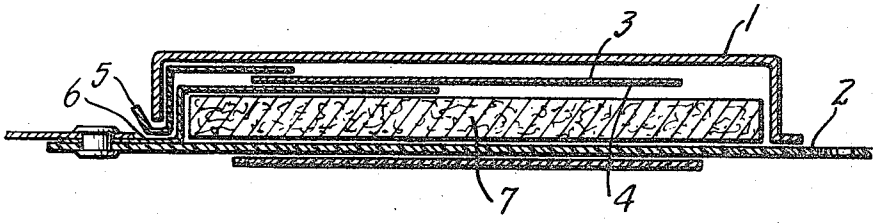


FIG. 2.

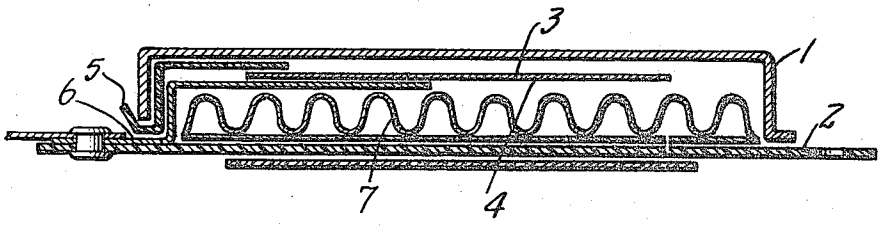
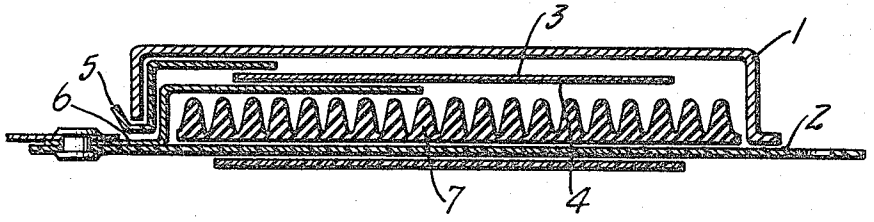


FIG. 3.



INVENTOR.
G. BUCHMAN
BY R. KAROLUS

ATTORNEY

John M. Collinsfelt

United States Patent Office

2,872,532

Patented Feb. 3, 1959

2,872,532
CONDENSER LOUDSPEAKER

Gerhard Buchmann, Eutingen, near Pforzheim, and Roland Karolus, Pforzheim, Germany, assignors to International Standard Electric Corporation, New York, N. Y., a corporation of Delaware

Application August 8, 1955, Serial No. 527,101

Claims priority, application Germany August 26, 1954

7 Claims. (Cl. 179—111)

The invention relates to a high-frequency condenser loudspeaker comprising a foil applied to a perforated sheet of metal.

For the transmission of a wide as possible voice frequency band there are often provided in radio receivers special speakers for the reproduction of the high frequencies. However, additional speakers are accompanied by an increase in price of the apparatus and, therefore, it is often desired to provide a high-frequency speaker which is relatively easy to manufacture and has good reproduction quality. This problem is solved in a particularly advantageous manner by the present invention.

It is a common practice to employ condenser loudspeakers as high frequency speakers. Such types of speakers actually require relatively few component parts, but they do require special fittings, suspensions, bracings or wirings which make the arrangement relatively complicated.

Thus, in the conventional types of high-frequency condenser loudspeakers there is provided a foil electrode clamped to the housing by means of a special ring. The other electrode is usually formed of a perforated sheet of metal over which the diaphragm is tensioned.

With other conventional arrangements, similarly employing perforated sheet and foil electrodes, the foil is pressed and clamped, against the perforated sheet over a piece of suitably dimensioned gauze.

An object of the invention is to eliminate the large number of clamps and rings described above. In accordance with the invention, the foil electrode is not clamped but rather is held by means of a resilient body close to the perforated sheet. The foil electrode is held generally in position by the electrostatic forces between the electrodes. The resilient body may consist of e. g. felt, corrugated paper, ribbed or corrugated rubber. In accordance with a further aspect of the invention, the opposite electrode serves as a protecting cover.

In the arrangement according to the invention, accordingly, the foil merely needs to be inserted loosely without having to employ any kind of clamping device, and the pressure is effected by utilizing the electrostatic forces produced between the two electrodes. The elastic body merely serves as a counter support in order to prevent the diaphragm from being loosened by external forces directed away from the perforated sheet. This body is merely applied to the metallized side of the diaphragm without requiring any bracings on the sides. Since the amplitudes of the higher sounds are only small ones, the unevenness on the one side of the perforated sheet are sufficient for the free vibrations of the diaphragms. On the other side the little hairs of the upholstering, respectively of the elastic body permit the performance of vibrations in the other direction.

The invention will now be particularly described with reference to an exemplified embodiment shown in Figs. 1 to 3 of the accompanying drawings wherein:

Fig. 1 is a cross-sectional view of one embodiment of the invention; and

Figs. 2 and 3 show alternative embodiments.

A casing 1, in Fig. 1, is approximately U-shaped in design and forms the opposite electrode and serves also as the perforated sheet. An insulating sheet 2 covers

the open side of the casing. On the inside side of the perforated sheet there is arranged an insulating foil 3 which is metallized or plated on the side opposite the perforated sheet. This metallic layer is denoted by 4. A lead-in 6 is led e. g. from a rivet to the metallized layer 4. For reasons of preventing a short-circuit between the opposite electrode and the metallized layer, an insulating strip 5 is interposed between the opposite electrode 1 and the foil 3. For reasons of clarity the component parts 1 to 7 are shown in the drawings with an exaggerated space between the components. With the aid of resilient material 7, which may consist of e. g. felt, the lead-in is pressed against the metal layer 4 and the foil is thus secured in its position. The electrostatic forces which exist between 1 and 4 are sufficient for maintainnig the insulating foil 3 against the perforated sheet and also to permit it to vibrate freely. As will be seen from the drawings, the construction of the arrangement is an extremely simple one because all of the components merely need to be placed one on top of another without requiring any bracings etc.

In Fig. 2 of the drawings the upholstering or padding 7 consists of corrugated paper, while consisting of ribbed rubber in the embodiment according to Fig. 3.

What is claimed is:

1. An electroacoustical transducer comprising a substantially flat perforated plate electrode, a resilient insulating membrane freely mounted adjacent said plate electrode, a thin metal layer electrode mounted adjacent said insulating membrane, a layer of elastic insulating material freely mounted adjacent said thin metal layer, a base insulating member, and means attaching said base member to said plate electrode, against a surface of said layer of elastic insulating material, the force produced by said base member against said elastic insulating material being sufficient to support said resilient insulating membrane and the metal electrode in mounted position.

2. An electroacoustical transducer comprising a dish-shaped plate electrode having a perforated flat part and a peripheral flange, a resilient insulating membrane freely mounted within said dish-shaped electrode adjacent said flat part thereof, a thin metal layer electrode mounted adjacent said insulating membrane, a layer of elastic insulating material freely mounted adjacent said thin metal layer, a base insulating member, and means attaching said base member to said plate electrode against said layer of elastic insulating material whereby the open portion of said dish-shaped electrode is closed, and the force produced by said base member against said elastic insulating material is sufficient to support said resilient insulating membrane and metal electrode in position.

3. The transducer according to claim 1, wherein said layer of elastic insulating material comprises corrugated rubber.

4. A transducer according to claim 1, wherein said layer of elastic insulating material comprises felt-like material.

5. The transducer according to claim 1, and further comprising a lead-in terminal passing between said base insulating member and said plate electrode but spaced from said electrode, and contacting said thin metal layer electrode.

6. The transducer according to claim 1, wherein said thin metal layer comprises a metal foil electrode.

7. A transducer according to claim 1, wherein said thin metal layer comprises a metallized surface on said insulating membrane.

References Cited in the file of this patent

UNITED STATES PATENTS

2,686,847 Aamodt ---------- Aug. 17, 1954