

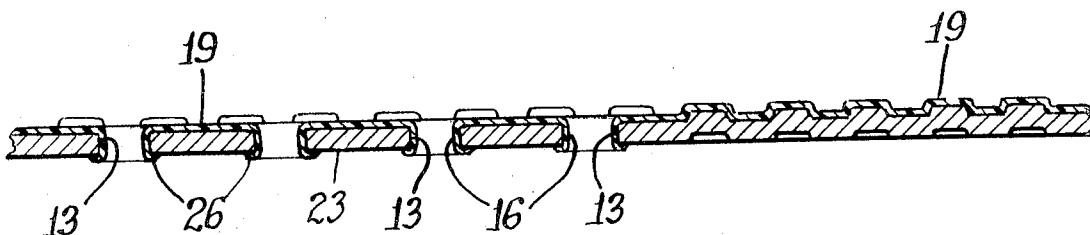
- [54] **BACKPLATE CONSTRUCTION FOR ELECTRET TRANSDUCER**
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- [52] U.S. Cl..... **161/112, 156/253, 161/119, 307/88**
- [51] Int. Cl..... **B32b 3/10**
- [58] Field of Search..... **161/112, 119; 156/252, 255, 513, 514; 264/154-156; 307/88; 340/8**

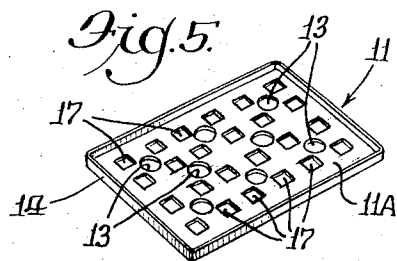
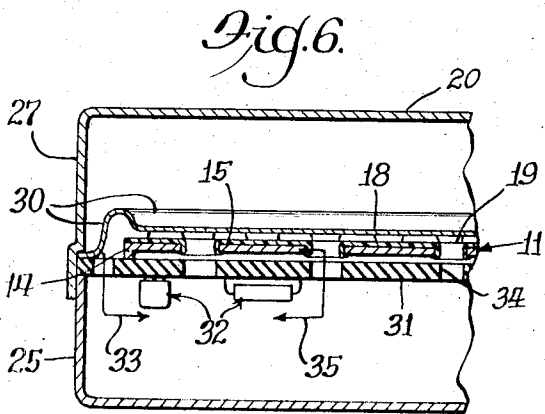
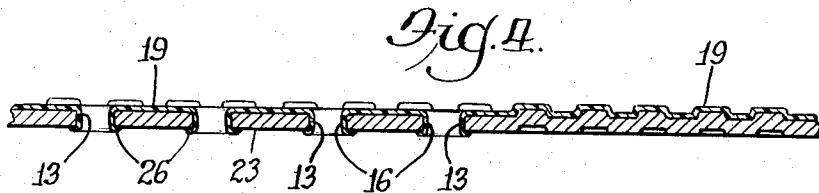
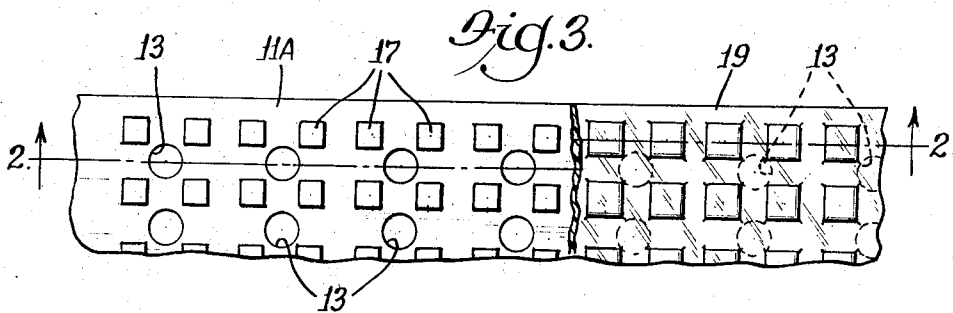
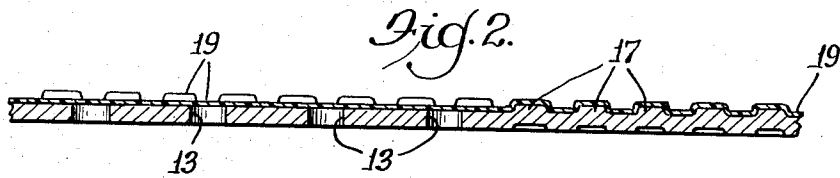
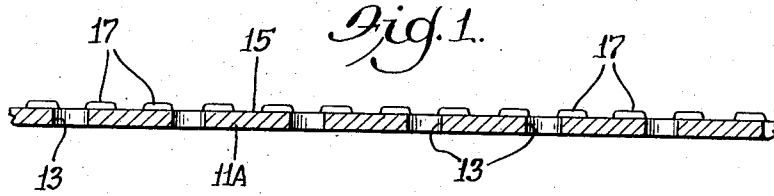
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- [57] **ABSTRACT**
- An electret transducer having a perforate backplate wherein the side of the perforations or holes are coated with a dielectric material.

**3 Claims, 6 Drawing Figures**





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## BACKPLATE CONSTRUCTION FOR ELECTRET TRANSDUCER

### BACKGROUND OF THE INVENTION

The present electret transducer relates to that type of transducer including a diaphragm, mounted adjacent a backplate. The backplate is perforated to permit air pulsations created by the vibrations of the diaphragm to pass therethrough to the associated acoustic chambers.

A principal object of the present invention is to provide an electret transducer having an improved backplate assembly construction wherein a dielectric film is formed such as to mechanically anchor to the backplate and to cover any irregularities on the surface of the backplate.

It is another object of the invention to provide an electret transducer wherein protrusions are formed on the backplate for supporting the diaphragm, thereby providing a discrete spacing between the diaphragm and the backplate to enhance the response characteristics of the transducer.

It is another object of the invention to provide a new method of coating a dielectric film on a perforated backplate to cover the upper surface of the backplate, and the surfaces of the holes, formed in the backplate.

The foregoing and other objects, features and advantages of the invention will be apparent from the following more particular description of a preferred embodiment of the invention, as illustrated in the accompanying drawings wherein:

FIG. 1 is a view in cross-section of a length of sheet material from which the backplate of the invention is constructed showing the holes formed in the material and the protrusions formed on the upper surface of the material;

FIG. 2 is a view of the material of FIG. 1 with a film dielectric deposited on its surface;

FIG. 3 is a top view of the material of FIG. 1 showing the film dielectric covering part of the backplate material;

FIG. 4 is a view in cross-section of the material particularly showing the film material covering the sides of the holes;

FIG. 5 is a backplate formed in accordance with the invention, (note that in FIG. 5 the backplate is shown in a position relatively inverted with respect to FIG. 1-4 to more clearly show the peripheral flange construction); and,

FIG. 6 is a partial view in cross-section of a transducer assembly utilizing the structure of the invention.

### DESCRIPTION OF THE INVENTION

Referring first to FIG. 6, a partial cross-sectional view of an electret transducer 20 including a casing 25 and 27 is depicted. A bulkhead 31 of a suitable insulating material is mounted in casing 25 and supports the associated electronic components indicated generally as 32, and also an electret assembly and diaphragm assembly. A backplate 11, to be described more fully hereinbelow, is mounted on the bulkhead 31 and a diaphragm 18 is positioned over the backplate.

The backplate 11 of the electret transducer of FIG. 6 is shown in FIG. 5. The backplate 11 is perforated with holes indicated generally as 13, which, as is known, permit pulsations of air generated by the vibrations of diaphragm 18 to pass therethrough. Note, that

bulkhead 31, also includes holes 34 for the same purpose. Backplate 11 includes a rim 14 formed along its periphery, and rim 14 rests on bulkhead 31 to form a space between the lower surface of backplate 11 and the upper surface of the bulkhead 31. One surface 15 of the backplate 11 includes discrete protrusions 17 formed to provide a precise selected spacing between the surface 15 of the backplate 11 and the lower surface of the diaphragm.

A sheet, strip or plate of metal 11A can first be cut and formed into the shape of backplate 11 as shown in FIG. 5, and then a film material can be positioned and attached to on the backplate 11 as will be described. Alternatively, the film can first be positioned on and attached to the sheet of metal plate 11A and the assembly can be cut and formed into backplate 11 of FIG. 5.

In either case the following description of the construction is applicable. Referring to FIG. 1-4, the metal sheet 11A having a pattern of holes 13 formed therein is used to make backplate 11 of FIG. 5 and 6. The pattern of protrusions 17 is formed, as by stamping, on sheet 11A with the protrusions being intermediate the holes 13.

The thin film 19 of a suitable dielectric material such as, for example, a fluorocarbon material, is positioned on surface 15 of sheet 11A by applying to the film air pressure in order of a fraction of a pound per square inch. Film 19 will settle onto the surface and conform to the protrusions 17 and the general contours of the surface 15.

FIG. 3 shows, on the left side of the drawing, the surface 15 of sheet 11A, and on the right side of the drawing, the dielectric film 19 positioned on surface 15.

As the next step, the heated film 19 is subjected to a blast of air under pressure, say 100 lbs per square inch pressure which ruptures the film in the area of the holes 13. The forming action is enhanced by preheating the air. The ruptured film material is forced to flow as at 16 through the holes 13 and thereby coats the sides of the holes as shown in FIG. 4. A portion of the flowing material tends to flow over the lower surface 23 of backplate 11 as shown as at 26 in FIG. 4.

The foregoing construction provides a means of securely anchoring the film 19 to the backplate 11. Such anchoring tabs or fingers 26 of particular importance for certain types of films such as, for example, certain fluorocarbon films which do not readily adhere to the metallic surface of backplate 11.

Also, the film 19 covers any irregularities on the surface of backplate 11 such as burrs which may be caused in the forming or manufacturing process. Due to the small sizes of the components in the transducer 20, any such irregularities on the backplate 11 might cause undesirable effects.

The inventive structure is positioned in the transducer 20 of FIG. 6 where, as mentioned, the backplate 11 is mounted on bulkhead 31. The diaphragm is positioned over the backplate 11 in contact with the protrusions 17. A portion 30 of diaphragm 18 extends over backplate 11 and is supported on bulkhead 31. Suitable electrical conductors 33 and 35 provide electrical connection between the diaphragm 18 and the electret film material 19 through known electronic units, not shown.

While the invention has been particularly shown and described with reference to a preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made

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therein without departing from the spirit and scope of the invention.

I claim:

1. A backplate assembly for an electret transducer comprising a backplate having perforations passing from a first to a second surface, a dielectric material film formed on the first surface of the backplate, on the interior surfaces of said perforations, and extending over the edge of said perforations on the second sur-

face.

2. A backplate assembly as in claim 1 wherein the film extending over the edge of said perforations on the second surface provides stable anchoring tabs to securely anchor the film on the backplate.

3. A backplate assembly as in claim 1 wherein the film tends to cover any irregularities on the surfaces of said plate and on the surfaces of said perforations.

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