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METHOD OF CONSTRUCTING ACOUSTIC DIAPHRAGMS

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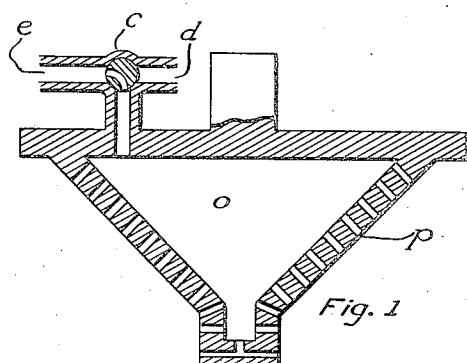


Fig. 1

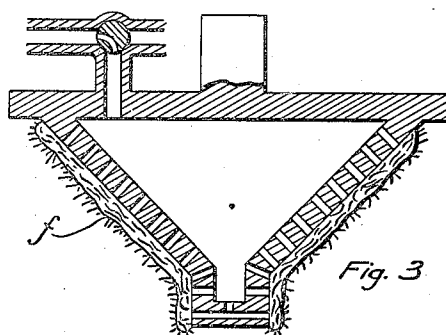


Fig. 3

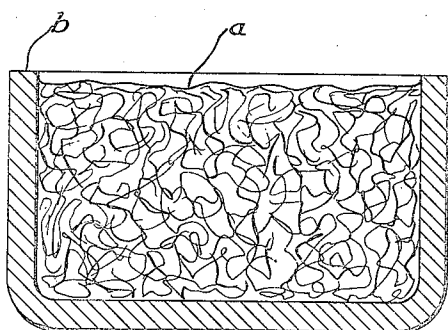


Fig. 2

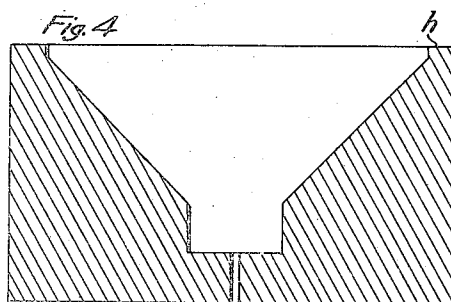


Fig. 4

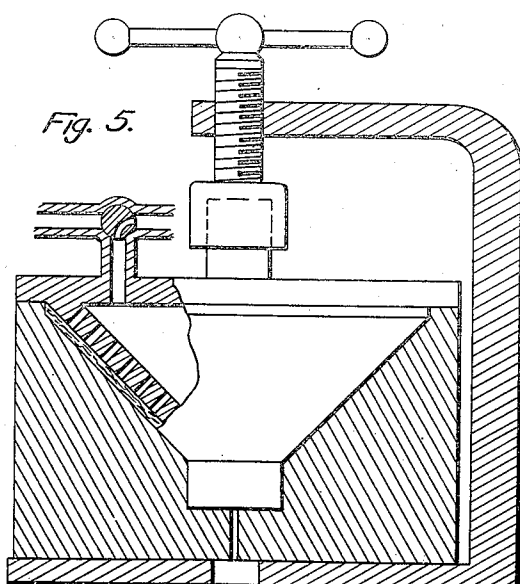


Fig. 5

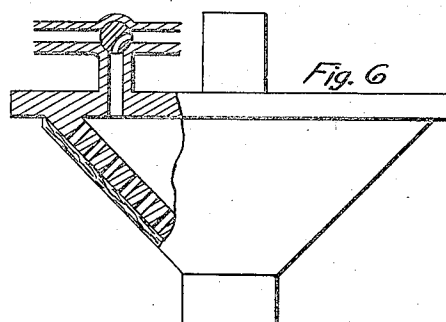


Fig. 6

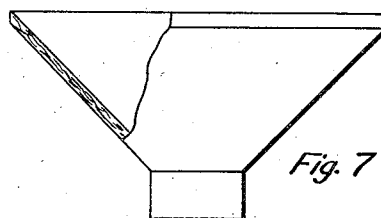


Fig. 7

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METHOD OF CONSTRUCTING ACOUSTIC
DIAPHRAGMS

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Serial No. 480,204

10 Claims. (Cl. 92—56)

The object of my invention is to produce a more perfect cone diaphragm for loud speakers such as are used in conjunction with sound reproduction and transcription. It is my intention to produce these cones of a fibrous material similar to the stock now used for the construction of the sheet stock from which such diaphragms are now fabricated. I do not limit myself as to material except that I have found it preferable so far to use a fibrous material. This material may be in the form of a dried fibre or it may be in solution in water or mixed with a binder in such a manner as to make it liquid enough to be used in the manner hereinafter described. In case the fibrous material is in a plastic stage a slightly different means of attaining the desired uniform thickness would be necessary.

Referring to the drawing which forms a part of this specification Figure 1 represents a conical form which is perforated on its conical surface and which perforations (p) lead to a hollow portion (o) of this conical form. An air pressure line (d) and a vacuum line (e) are connected by a two way cock (c) and a flexible pipe to the hollowed chamber (o). Thus it will be possible to produce vacuum or pressure in the chamber (o), by means of a vacuum pump, not shown, connected to line (e) and a pressure pump not shown connected to line (d) alternately as desired by operating the cock (c).

Figure 2 represents a vat (b) filled with a fibrous substance (a).

The first step in my method of producing a seamless acoustic diaphragm is to produce a vacuum in the chamber (o) Figure 1 of the desired intensity and then to dip the conical form shown in Figure 1 by means of the holder Figure 1 into the fibrous material (a) Figure 2 and to hold said form at the proper depth and for the proper length of time and at the same time moving the form Figure 1 by rotating it about the axis running parallel with the holder or by swinging it in an arc or by any other movement desired to better secure a uniform film of the material (a) Figure 2 onto the perforated surface (p) Figure 1.

Figure 3 shows a film (f) of the material (a) Figure 2 adhering to the surface (p) of this conical form. Figure 3 shows said form after removal from the vat with the film adhering in a uniform manner to it.

Figure 4 represents a form (h) which is the other half of a mould and a mate to the form shown in Figure 1.

Fig. 5 represents the form with the film of material thereon held in pressed relationship with the mating mold in a screw press.

Fig. 6 represents the form with the pressed fibrous diaphragm thereon.

In my process the form Figure 3 with the film thereon is pressed into the form (h) Figure 4 and the film (f) Figure 3 is made to cohere in such a manner under pressure and (or) suction that after a time the mould may be separated and the fibrous diaphragm (f) Figure 7 may be dropped or blown or sucked off the form.

In this manner a complete diaphragm of any desired shape suitable for use in acoustic instruments may be formed.

The diaphragm so formed Figure 7 may be dried and impregnated and a finished moulding process may be carried on with it as a base if desired. Another desirable proceeding is to first dry the diaphragm after it comes from the mould and then it may be sprayed or coated with a binder and remoulded to give it smoother finish. Another suitable method is to dry the diaphragm in the mould in which it is first formed without removal therefrom and after drying it may be impregnated with a binder in the same mould if desired.

What I claim is:

1. The method of making a one piece seamless diaphragm for acoustic instruments by causing a loose fibrous material to adhere to one surface of a mould and then compressing this material between two surfaces of the mould to make it of uniform thickness.

2. The method of making a one piece seamless diaphragm for acoustic instruments by causing a cavity in a mould to be filled with loose fibrous material and then subjecting this material to pressure within the mould to form the desired shape and cause permanent coherence of the fibers of said material.

3. The method of making a one piece seamless diaphragm for acoustic instruments by causing a cavity in a mould to be filled with loose fibrous material, subjecting this material to pressure within the mould, drying said material and then impregnating said dried fibrous material with a binder and then again drying the binder and material so formed.

4. The method of making a one piece seamless diaphragm for acoustic instruments by causing loose fibrous material to be spread over one surface of a two piece mould and then fitting the two halves of the mould together and subjecting

the content of the mould to pressure and vacuum and heat if necessary.

- 5 5. The method of making a seamless hollow conical diaphragm for acoustic instruments by causing a loose fibrous material to adhere to a conical surface and then subjecting the entire body of such material so adhering to pressure and thereby causing such material to assume a definitely permanent hollow shape.
- 10 6. The method of making a seamless diaphragm of hollow shape for acoustic instruments by causing a loose fibrous material to adhere in a layer of substantially uniform thickness to one or more internal surfaces of a mould having separable parts and then causing the parts of the mould to be pressed together in such a manner as to cause the fibers of said material to cohere and produce a diaphragm of the desired shape.
- 15 7. The method of moulding an acoustic diaphragm from loose fibrous substances which will cohere under pressure consisting of causing said substances to adhere by suction in a layer to the inner surface or surfaces of part of a mould and then pressing the parts of the mould together in
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such a manner as to cause said substances to cohere and form such diaphragm.

8. The method of constructing an acoustic diaphragm of hollow shape by causing liquid fibrous material to adhere to a moulding surface by suction, moulding against a complementary moulding surface, and extracting moisture therefrom by suction and pressure and then separating the diaphragm from the mould surfaces by air pressure.

9. The method of forming a seamless diaphragm for acoustic instruments by first forming a loose fibrous mass into the desired shape of a diaphragm then drying the material so formed and finally subjecting the shape so formed to compression in a mould.

10. The method of forming a smooth one piece diaphragm for acoustic instruments by first forming of loose fibrous material a shape in a mould and then drying the shape so formed then impregnating said shape with a binder, then again drying the impregnated shape and finally subjecting the impregnated shape bodily to pressure to cause it to set in its final form.

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