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[54] **SOUND PRESSURE BOX**

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[52] **U.S. Cl.** ..... **181/.5;** 181/33 R; 181/136; 73/432; 179/1 R; 179/175.1 A
[51] **Int. Cl.²** **G01V 1/00**
[58] **Field of Search** ..... 179/1 R, 1 E, 1 N, 175.1 A, 179/180; 73/10 V, 69, 553, 432 A, 432 B, 432 D, 67.7; 181/136, 33 R, .5 R

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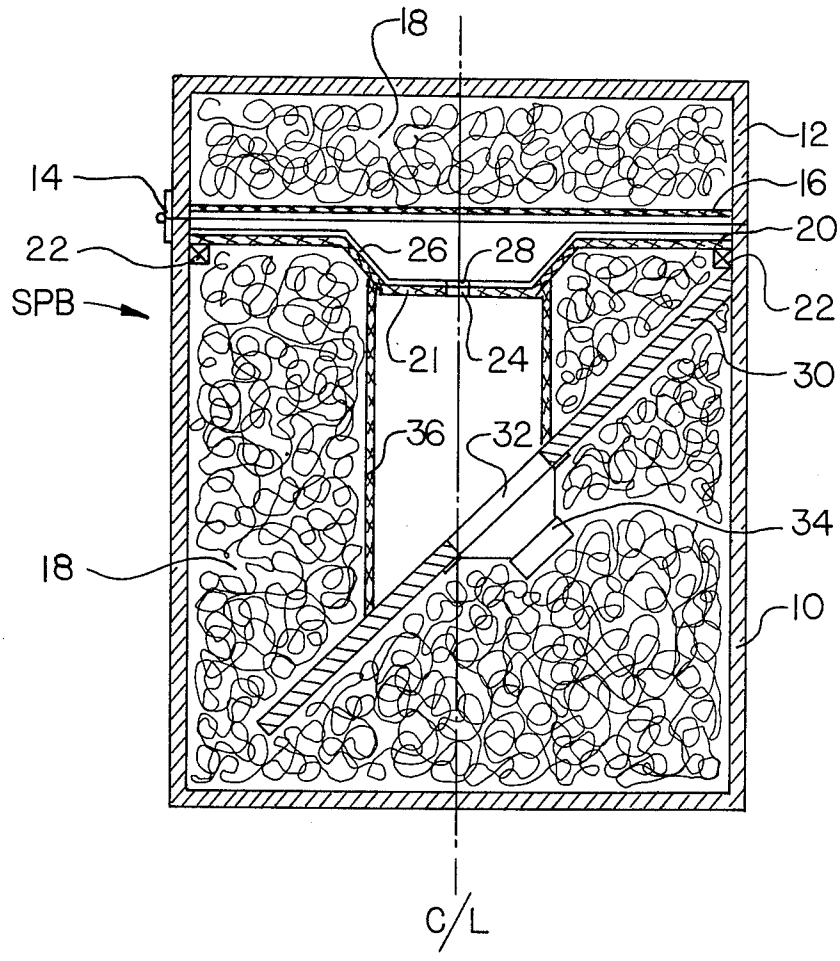
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Assistant Examiner—N. Moskowitz

[57] **ABSTRACT**

A sound pressure box for testing hearing aids and other devices is provided with a support member having a reference area onto which the hearing aid or device to be tested is disposed. A support frame for the sound-generating means is positioned within a bottom section of the box at about a forty five degree angle so that the axis of the sound-generating means is not coincident with the reference area.

6 Claims, 1 Drawing Figure



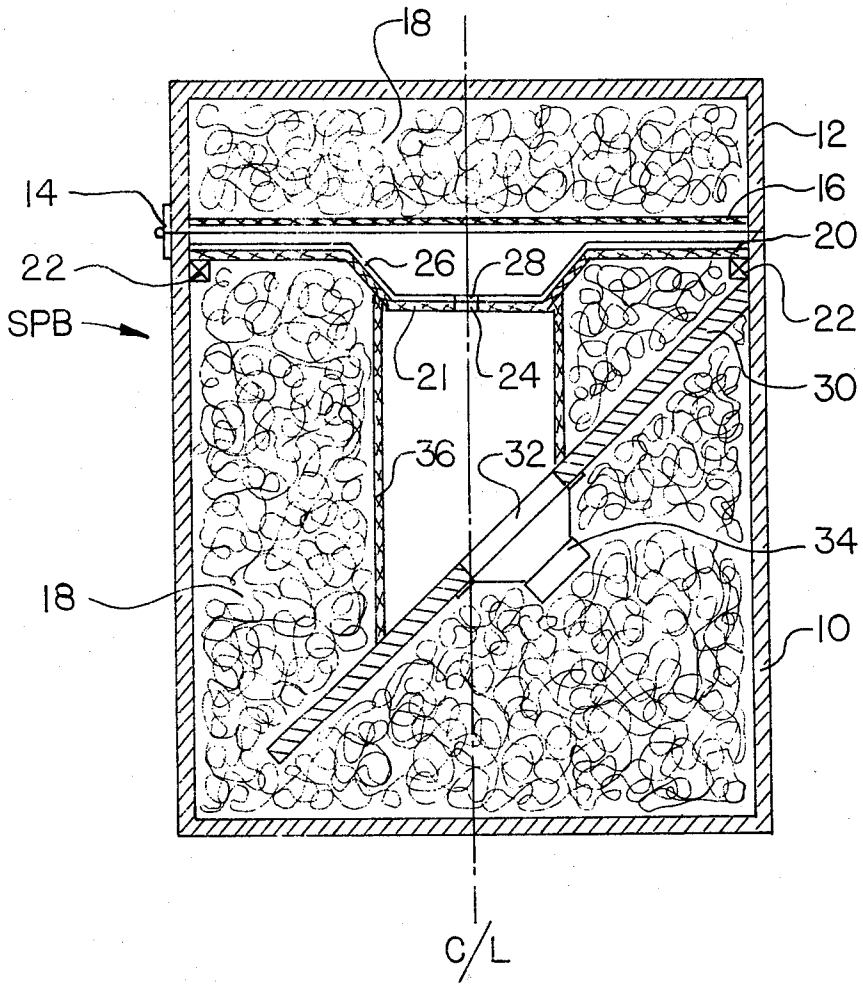


FIG. 1

SOUND PRESSURE BOX

BACKGROUND OF THE INVENTION

This invention is related to a sound pressure box and more particularly to a sound pressure box for testing hearing aids and other devices wherein the sound generating means is mounted such that its axis is offset with respect to the axis of the box or sound chamber therein.

Sound pressure boxes are known wherein the sound-generating means is mounted therein such that the axis of the soundgenerating means is coincident with the axis of the box or the sound chamber therein. In this configuration, the sound emanating from the sound-generating means impinges directly onto the device to be tested and a portion thereof reflects off to the device back onto the sound-generating means thereby adding to or substracting from the amplitude of the signal being generated by the sound-generating means. This constitutes interference with the true signal being generated and makes it difficult to test the device to be tested in the presence of the undesired signals that have been propagated.

An object of the present invention is to provide a sound chamber box wherein the undesired signals are minimized and a more accurate test can be conducted on the device to be tested.

Another object of the present invention is the provision of a sound chamber box having means mounting a sound-generating means at an angle with respect to the vertical axis of the box so that the sound generated by the sound-generating means does not impinge directly on the device to be tested.

A further object of the present invention is to provide a sound chamber box wherein the mounting means for the sound-generating means is mounted in said box at about a forty five degree angle so that the sound-generating means is disposed at about 45° relative to the vertical axis of the sound chamber box.

An additional object of the present invention is the provision of a mounting means for the sound-generating means of a sound chamber box extending between opposed sides of the box and affixed thereto in order to maintain the mounting means in position and to stiffen the sides of the box thereby attenuating unwanted sound external of the sound chamber box.

A still further object of the present invention is to provide a sound chamber box wherein an open space is provided at an inner end of the mounting means for the sound-generating means to extend the bass or low frequency response of the sound pressure chamber and to enable a more compact or smaller chamber to be used.

Still an additional object of the present invention is the provision of a reference area on the device mounting means which is offset with respect to the sound-generating means axis in order to make certain that the sound reflected off the device to be tested reflects at an angle and can be attenuated more readily.

A still another object of the present invention is to provide retaining means extending between the device mounting means and the mounting means for the sound-generating means to retain the accoustical-damping material in position and provide an open area between the sound generating means and the area of the device mounting means containing the reference area.

Other and further objects of the present invention will become apparent upon a reading of the detailed description of the invention when taken in conjunction with the drawing.

BRIEF DESCRIPTION OF THE DRAWING

In the accompanying drawing, FIG. **1** is a cross-sectional view of a sound-pressure box illustrating the features of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Turning now to FIG. **1**, a sound pressure box SPB is shown in cross section. It is divided into a bottom section **10** and a top section **12**, which are hingedly mounted together via hinges **14** to enable top section **12** to be opened and closed. The box can be made of metal, wood or other structurial material. A screen material **16** is secured onto the inner edges of top section **12** to maintain sound-absorbing material **18** in position therein. Such sound-absorbing material can be glass wool or other material having the desired soung-absorbing capability.

A support frame **20** is made from heavy guage screen material and it is positioned on mounting members **22** secured onto the inner walls of bottom section **10** adjacent the upper edges thereof. Support frame **20** has a centrally-disposed dished area **21** provided with a reference area **24.** Devices to be tested, such as hearing aids, are positioned at reference area **24.** An acoustically transparent material **26** is secured onto support frame **20** and it has a reference area **28** coincident with reference area **24.**

A mounting member **30** is secured between opposing sides of bottom section **10** and extends from the upper end to a position spaced from the inner end and it is disposed at a **45°** angle within the bottom section as shown. An opening **32** is centrally located in mounting member **30** and a sound-generating means **34** is secured to the inner surface of mounting member **30** surrounding opening **32.** Sound-generating means **34** is preferably a speaker connected to appropriate electronic circuitry (not shown) for operating same. The fact that mounting member **30** is secured to opposing sides of bottom section **10** stiffens the sides of bottom section **10** thereby attenuating of unwanted sounds external to the soundpressure box. The open space between the inner end of mounting member **30** and the inner wall of bottom section **10** forms a port which can be tuned in the same manner as a bass reflex enclosure for a speaker in order to extend the bass or low frequency response of the sound pressure chamber. This features enables a more compact and smaller box to be used with equivalent operation to that of a conventional large sound-pressure box.

If desired, mounting member **30** can extend the full diagonal length of bottom section **10** and be provided with an opening at its inner end to provide the port.

Sound-absorbing material **18** is positioned within the voids of bottom section **10** and annular screen **36** extends between dished area **21** and mounting member **30** surrounding opening **32** to provide open area between sound-generating means **34** and the dished area **21.**

By mounting sound-generating means **34** at or about a forty five degree angle within the sound-pressure box, the reflected sound waves generated thereby follow a relatively long multiple reflective path before becom-

ing coincident and reinforcing the incident sound waves which multiple reflective path results in the reflected sound waves being largely absorbed in the attenuating material.

Reference area **24, 28** is provided in dished area **21** so that a hearing aid or device to be tested is positioned thereat. Reference area **24, 28** is offset with respect to the sound-generating means axis and this will result in the reflections from the hearing aid case or case of the device to be tested or from parts of the support frame to impinge on the soundgenerating means and mounting member **30** at an angle such that re-reflection therefrom will pass into an area different from that at which the hearing aid or device to be tested is positioned. This will enable the hearing aid or device to be tested to provide a response substantially independent of unwanted reflectively caused amplitude peaks thereby resulting in a more true test of the hearing aid or device to be tested at the selected frequencies.

Although, the invention has been explained with reference to a particular embodiment, it is to be appreciated that various adaptations and modifications may be made without departing from the appended claims.

The invention is claimed in accordance with the following:

1. A sound pressure box comprising:

a top section;

a bottom section;

means connecting said top section and said bottom section together;

sound-absorbing material disposed in said top section and said bottom section;

device-holding means mounted in said bottom section;

mounting means disposed in said bottom section extending between an upper end of said bottom section and an opposed inner end thereof; and

sound-generating means mounted on said mounting means so that the axis thereof is at an angle with respect to the vertical axis of said box.

2. A sound-pressure box according to claim **1** wherein said mounting means is disposed at about a **45°** angle.

3. A sound pressure box according to claim **1** wherein said mounting means has its inner end spaced from said opposed inner end to provide a space therebetween.

4. A sound pressure box according to claim **1** wherein said mounting means is secured to opposite sides of said bottom section to stiffen said opposite sides.

5. A sound pressure box according to claim **1** wherein said device holding means has a dished area in which a device to be tested is disposed.

6. A sound pressure box according to claim **5** wherein said dished area is provided with a reference area at which the device to be tested is disposed.

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