

[54] **SPEAKER ENCLOSURE** 3,283,848 11/1966 Patti..... 181/31 B
 [75] Inventor: Nils Lou, Saint Paul, Minn. 3,430,728 3/1969 Dunning..... 181/31 B

[73] Assignee: **Modular Sound Systems, Inc.,**
 Burnsville, Minn.

FOREIGN PATENTS OR APPLICATIONS

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Primary Examiner—Stephen J. Tomsky
Attorney, Agent, or Firm—Neil B. Schulte

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[52] **U.S. Cl.**..... 181/148, 181/145, 181/146,
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[51] **Int. Cl.**..... **G10k 13/00, H04r 1/28**

[58] **Field of Search** 181/31 B, 145-146,
 181/148, 175, 155

[57] **ABSTRACT**

A high fidelity speaker enclosure especially adapted for low frequencies comprising a highly damped housing completely surrounding the speaker with a sealed compartment adjacent the back of the speaker, a second sealed compartment adjacent the front of the speaker, a series of peripherally spaced slots in the front compartment, and a cotton batting filtering means placed across the front of the speaker.

[56] **References Cited**

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10 Claims, 2 Drawing Figures

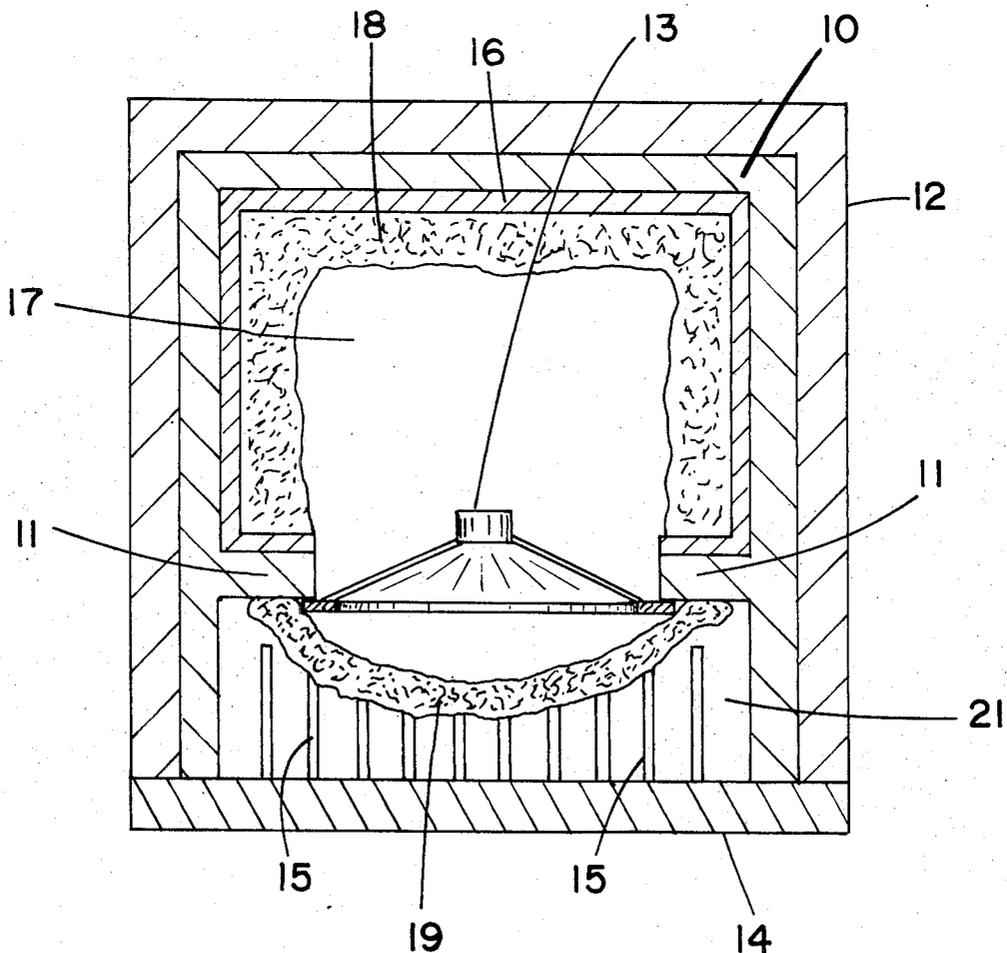


FIG. 1

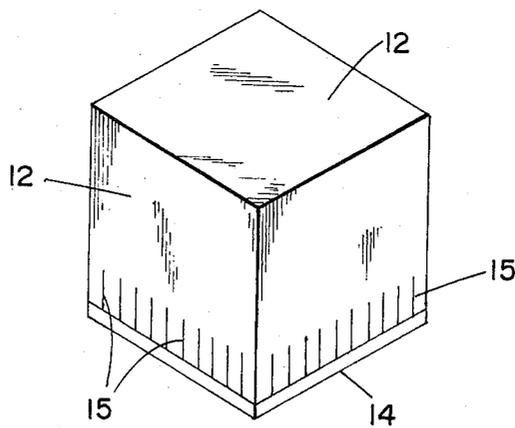
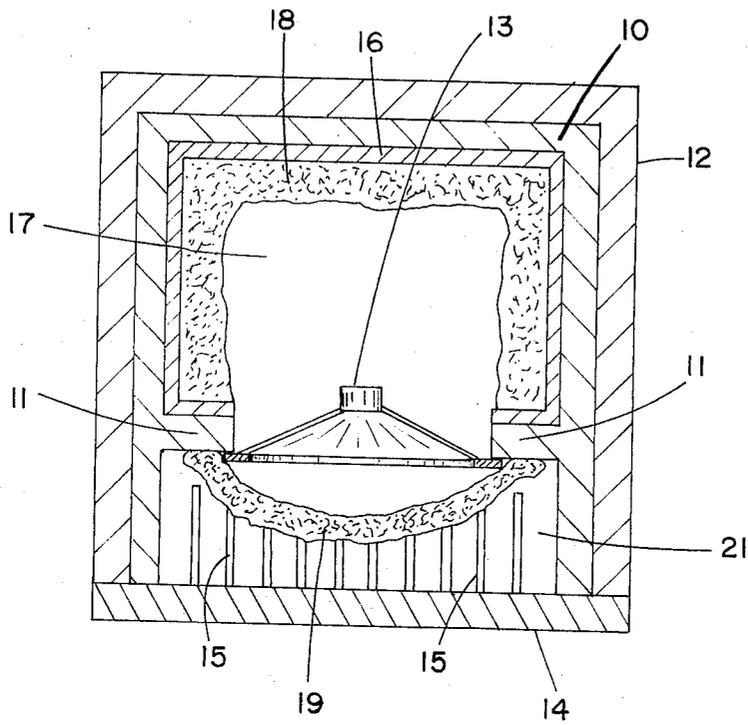


FIG. 2

SPEAKER ENCLOSURE

BACKGROUND OF THE INVENTION

In the prior art, high fidelity speakers are typically manufactured with electronic crossover networks in order to deliver only the appropriate frequencies to the bass, midrange and high frequency speakers. These crossover networks absorb energy and decrease the effectiveness of the amplifier. My invention avoids this disadvantage by eliminating the electronic crossover network and instead accomplishing the desired frequency selection by acoustical methods as described hereinafter.

SUMMARY OF THE INVENTION

Briefly, my invention contemplates a speaker housing designed to favor low frequency response. The speaker is sealed into an enclosure having front and back compartments in communication respectively with the front and back of the speaker. The back compartment is completely sealed and insulated with suitable sound deadening materials. The front compartment is sealed as well except for a series of spaced peripheral slots. The slots have the dual function of filtering out the higher frequencies and, at the same time, permitting a limited amount of air expansion so that the apparent volume of the front compartment, as seen by the speaker, is balanced equally with the physically larger back compartment. The balanced air pressure on both sides of the speaker ensures a linear response from the speaker so that the fidelity of the system is improved considerably. It may therefore be seen that it is an object of my invention to provide an improved speaker enclosure design especially suitable for lower frequencies. Further objects and advantages will become apparent upon consideration of the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional view of the preferred embodiment of my invention which, due to the symmetry of the invention, may comprise either a side sectional view or a front sectional view.

FIG. 2 is a perspective view of my invention showing the slots about the periphery of the front compartment.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring the FIGS. 1 and 2 it may be seen that the speaker enclosure is formed from a basic housing 10 which has support members 11 extending inward therefrom. Housing 10 may comprise plywood or the like. A layer of cork 12 is bonded or otherwise fastened to the outside of the housing 10 so as to insure good sound deadening. The speaker 13 is mounted to support members 11 about its peripheral edge in a manner well known to those skilled in the art and completely sealed so as to form a back compartment 17. Compartment 17 is additionally lined with a resilient material 16 such as roofing cement or the like and a one inch thick cotton batting layer 18 which serves to break up standing waves. An end member 14 is fastened over the bottom of housing 10 and the cork layer 12 so as to form a front compartment 21 in communication with the front of speaker 13. Another one inch thick cotton batting layer 19 is fastened to support members 11 so as to completely enclose the front of speaker 13. Cotton bat-

ting layer 19 acts as a low pass filter. In addition, layer 19 has been found to produce a phase shift in the emitted sound which is particularly favorable to listening quality. Cotton batting layer 19 is fastened to members 11 in such a way as to hold it in a dome shape as shown in FIG. 1. The dome shape is structurally resistant to being moved by the low frequency sound vibrations from speaker 13 and eliminates standing waves in the front compartment.

Front compartment 21 is sealed except for a series of narrow elongated slots 15 formed in the periphery thereof. Slots 15 are shaped and sized so as to readily allow the escape of low frequency sound but form a relatively effective filter for midrange and higher frequency signals. In the preferred embodiment forty slots are utilized each having dimensions of approximately one eighth inch width and two and one quarter inch length. These dimensions are preferred only and other sizes could, of course, be used.

The volume of compartment 21 is approximately one third of the volume of compartment 17. However, as far as the speaker is concerned, slots 15 permits air to pass in and out of compartment 21 in an amount just sufficient so that it appears to speaker 13 that the volume of compartments 17 and 21 are about equal. Thus, the speaker is pressure loaded in a balanced fashion so that the voice coil excursion is practically linear. The following table demonstrates the relative volumes of compartments 17 and 21 used in the preferred embodiment for different size speakers:

Speaker size	Back compartment volume	Front compartment volume
8 inch	900 ± 200 cu. inches	300 cu. inches
10 inch	1200 ± 250 cu. inches	400 cu. inches
12 inch	1500 ± 300 cu. inches	500 cu. inches
15 inch	1900 ± 350 cu. inches	600 cu. inches

I claim:

1. A high fidelity speaker enclosure for the production of lower frequencies comprising a speaker and a closed housing having first and second compartments therein with support means between said two compartments to hold the speaker between the said two compartments, the first compartment adjoining the back side of the speaker and being sealed and acoustically damped, and the second compartment being in communication with the front of the speaker and having a plurality of narrow slots therein to allow passage of predominantly low frequency acoustical energy from the speaker, and including a dome shaped acoustical filtering pad positioned in front of the speaker in said second compartment.

2. The enclosure of claim 1 in which said first compartment is damped with a layer of cork on the outside and a layer of resilient material on the inside.

3. The apparatus of claim 2 including cotton batting on the inside of said resilient layer.

4. The enclosure of claim 1 in which said narrow slots are disposed about the periphery of the second compartment in planes generally orthogonal to the front of the speaker.

5. The enclosure of claim 1 in which said dome shaped acoustical filtering pad comprises a cotton batting material.

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6. The enclosure of claim 4 in which said dome shaped acoustical filtering pad comprises a cotton batting material.

7. The enclosure of claim 6 in which said first compartment is damped with a layer of cork on the outside and a layer of resilient material on the inside.

8. The apparatus of claim 7 including cotton batting on the inside of said resilient layer.

9. The apparatus of claim 1 in which said second compartment has a volume of about one third the first

compartment so that the apparent volume of the compartments as seen by the speaker is approximately equal.

10. The apparatus of claim 4 in which said second compartment has a volume of about one third the first compartment so that the apparent volume of the compartments as seen by the speaker is approximately equal.

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