Feb. 15, 1966 W. H. QUINION 3,235,028

HIGH FIDELITY SPEAKER ENCLOSURE

Filed Feb. 25, 1965

Fig. 1

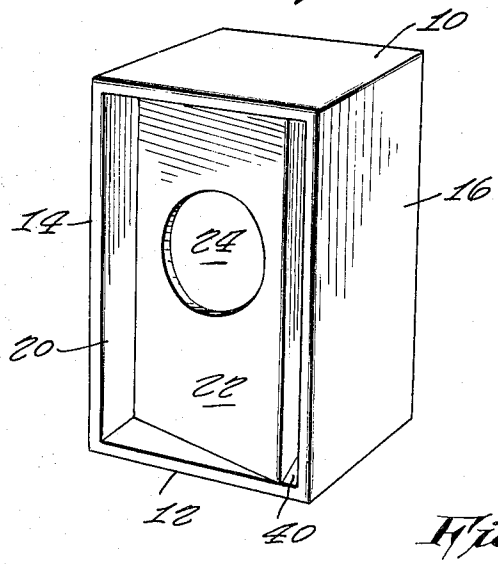


Fig. 2

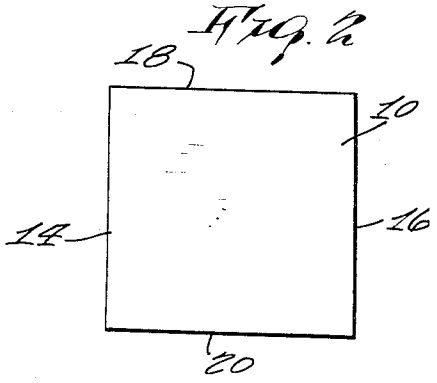


Fig. 3

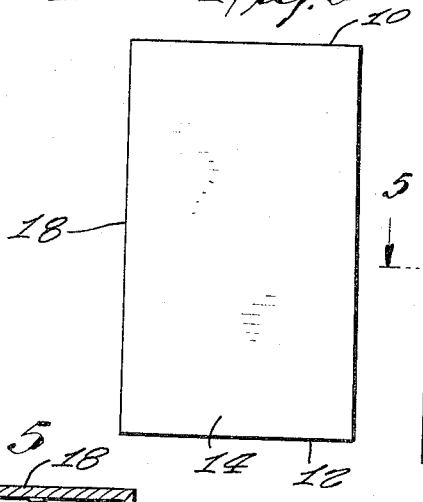


Fig. 4

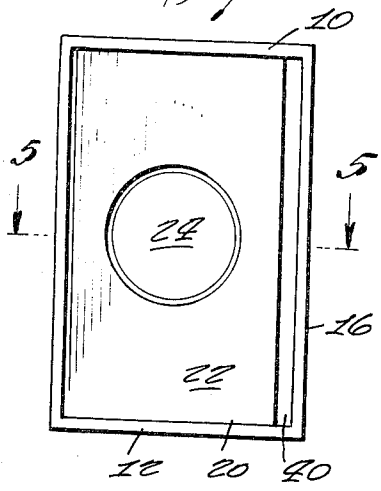
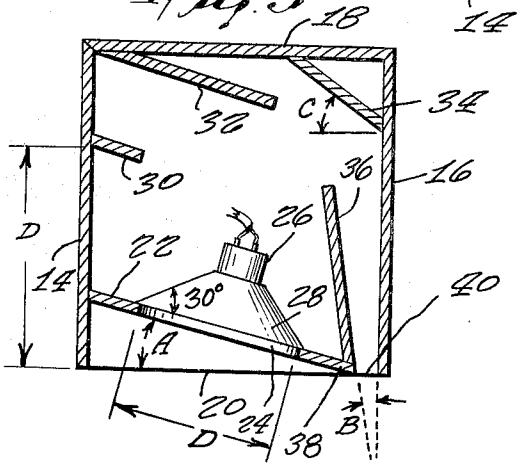


Fig. 5



INVENTOR.

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United States Patent Office

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HIGH FIDELITY SPEAKER ENCLOSURE

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Substituted for abandoned application Ser. No. 212,190, July 25, 1962. This application Feb. 25, 1965, Ser. No. 440,660

2 Claims. (Cl. 181—31)

My invention is directed toward high fidelity loudspeaker enclosures. My application is a substitute application filed July 25, 1962, Serial No. 212,190, now abandoned.

It is an object of my invention to provide a new and improved loudspeaker enclosure suitable for high fidelity reproduction.

Another object is to provide a new and improved loudspeaker enclosure for reinforcing the bass notes produced at the front of the loudspeaker.

Still another object is to provide a new and improved loudspeaker enclosure of the character indicated, which can be easily manufactured at low cost.

All of the foregoing and still further objects and advantages of my invention will be explained with reference both to this specification and to the drawings, wherein:

FIGURE 1 is a perspective view of my invention;

FIGURE 2 is a top plan view;

FIGURE 3 is a side view;

FIGURE 4 is a front view; and

FIGURE 5 is a cross-section through 5—5 of FIGURE 4.

Referring now to the drawings, my enclosure has a top exterior panel **10**, a bottom exterior panel **12**, side exterior panels **14** and **16**, a rear exterior panel **18**, and an open front periphery **20**.

An exposed interior panel **22** makes an angle A with respect to periphery **20**. Panel **22** has a central opening **24** arranged to support a loudspeaker **26**, the front of the speaker cone **28** communicating with opening **24**. Speaker **26** is, for example, a two-terminal permanent magnet speaker.

A second interior panel **30** extends from panel **14** and is parallel to panel **22**.

A third interior panel **32** extends from the intersection of panels **14** and **18**, and is also parallel to panel **22**.

A fourth interior panel **34** extends between panels **18** and **16**, and makes an angle C with respect to a plane parallel to periphery **20**.

A fifth interior panel **36** extends from the edge **38** of panel **22** remote from panel **14**, at an angle B with respect to the extension of panels **36** and **16**, thus defining a port **40**.

Panels **36** and **32** serve as primary and secondary sound directors to guide the sound waves emitted from the rear of speaker **26**, and at the same time, filter out the high frequencies. The guided waves are mixed together at panel **30** and then are directed by panel **34** into port **40** with such phase as to reinforce the sound waves emitted from the front of the speaker cone **28**. This enclosure thus produces a "depth of sound" which provides truer sound reproduction at any listening level.

If M is the thickness in inches of each panel, and X is the width of panel **22** in inches, then panel **36** is $2X/3$ inches wide, panel **32** is $5X/8$ inches wide, panel **30** is $X/8$ inches wide, and panel **34** is $5X/12$ inches wide.

The height of the interior panels is $3X/2-2M$. X depends upon the size of the speaker cone. If the speaker diameter is D, then $X=3D/2$. Thus when $D=10$ inches, $X=15$ inches.

Angle A is equal to one-half the angle the speaker cone makes with the face of the speaker. The cone angle is normally 30°, so angle A is normally 15°. Angle B can be, for example, 15°. Angle C can be for example 35°.

The separation between panel **30** and the front edge of the cabinet is equal to D, the speaker diameter.

The width of port **40** also depends upon the speaker size. More particularly, this width is equal to D/X where D and X have been previously defined.

While I have described my invention with particular reference to the drawings, my protection is to be limited only by the terms of the claims which follow.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A loudspeaker enclosure comprising, top, back, side and bottom panels forming a rectangular enclosure having an open vertical front, and a first interior vertical panel mounted adjacent said front, and inclined at a predetermined angle with respect to the vertical front side, said first interior panel having a central opening of predetermined dimension, with a loudspeaker mounted in said opening, and having a speaker cone with a predetermined cone angle having a width bearing a specific predetermined ratio to the first interior panel, second and third interior panels having widths of specific predetermined ratios to the first interior panel, and wherein the second and third interior panels are both parallel to the first interior panel, further including a fourth interior panel joining a back and side panel at a predetermined angle, and having a width bearing a specific predetermined ratio to the first interior panel, and a fifth interior panel extending inwardly from the point of intersection from the first interior panel and the front plane at a predetermined angle to said side panel, and spaced from said side panel, providing a port of predetermined dimension, and wherein the height of all the said panels is a predetermined dimension expressed in a linear algebraic relationship involving the width of the first interior panel and the thickness of each panel.

2. A loudspeaker enclosure, as in claim **1**, wherein the width of the said port is equal to the diameter of the speaker, divided by the width of the first interior panel, and wherein the second interior panel is ⅛ the width of the first interior panel, and the third interior panel is ⅝ the width of the first interior panel, and the fourth interior panel is 5/12 the width of the first interior panel, and the fifth interior panel is ⅔ the width of the first interior panel, and wherein the angle formed between the first interior panel and the front plane is ½ the angle of the speaker cone.

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