

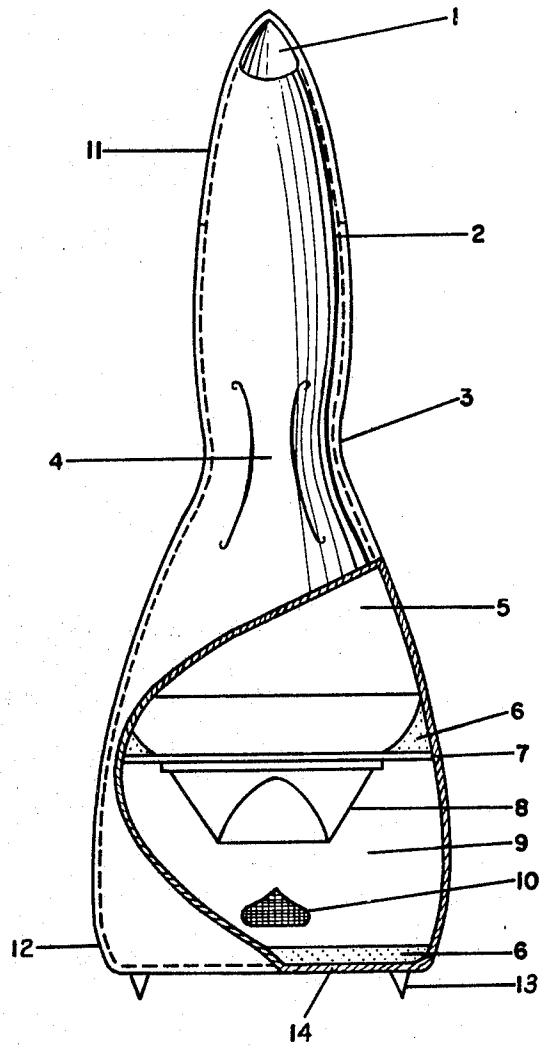
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ELECTRO-MECHANICAL REPRODUCTION OF SOUND

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1

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ELECTRO-MECHANICAL REPRODUCTION OF SOUND

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4 Claims

ABSTRACT OF THE DISCLOSURE

An invention related to the electromechanical reproduction of sound and claiming to be a novel and improved type of high fidelity speaker system is described. Fundamentally consisting of an upwards-facing high fidelity speaker within a specially designed and constructed enclosure, the invention combines the functioning of an enclosed, shaped column of air above the speaker face with the acoustically resonant and reflective properties of the enclosure to measurably enhance the tonal quality of reproduced sound as obtained from electronically amplified audio signals.

The occasion of this invention is to contribute significant improvement to the present system of reproduction of electronically amplified sound signals. It is a fact well known to those who are concerned with the art of high fidelity sound reproduction, be it monophonic or stereophonic, that there exists much room for the development and perfection of the speaker system. Therein lies the intent of the new instrument which is described in this specification.

The objective of concern is a sound-producing device which derives power from any electronically amplified source of audio signal, where this sound-producing device is composed of an electromagnetic-audio transducer (such as a high fidelity speaker) fully integrated with a specially designed enclosure in such a manner that the speaker (transducer) is positioned with its central axis of focus directed at an upward angle from the horizontal plane of gravity and where a significant portion of the interior volumetric space of the specially designed enclosure lies functionally above the upwards-directed speaker in such a fashion as to, in combination with the acoustically resonant and reflective properties of the enclosure, noticeably enhance the quality of reproduced sound especially where music is involved, and to do so with an attractive and efficient design.

In order to accomplish such an improvement in the tonal quality of electromechanically reproduced sound where effects as clarity, depth, brilliance, tonal balance, and efficiency of design are important aspects of the high fidelity speaker unit, a specially derived design for the enclosure is brought forth, and this, in exacting combination with the speaker, comprises the new instrument. The drawing illustrates a suitable practical design for the invention which embodies the fundamental principles involved. The enclosure is basically a thin-walled conical type shell, 11 in the drawing, with a rounded-off and closed bottom 12, and a truncated upper portion 1, which is referred to as the upper acoustic port of the instrument. This shell is pinched near its middle height, the constriction at 3, and the shell is best composed of a double layer of thin fine grain wood which is laminated with a hard-cure bonding agent. The grain of this wood should run

2

parallel with the vertical axis of the enclosure. In so constructing the shell a desirable acoustic resonance quality obtains. The shell is smooth in and out, and is coated with suitable sealers and finished as desired. It may of course be possible to construct this enclosure of other appropriate materials.

Towards the lower section of the enclosure, and dividing 5, the lower wave compression zone from 9, the bass reflex zone, is 7, the speaker mounting panel upon which the speaker 8 is directly bolt-mounted to face upwards, the panel being directly affixed to the inner enclosure surface. At the back of the instrument in the bass reflex zone 9, is the base reflex port 10, which allows for pressure differentials created by peak low-frequency sound wave compressions. The disposition of this port is somewhat variable within the bass reflex zone. Acoustic insulation 6, is located at the bottom of the bass reflex zone and around the top of the speaker support panel. Both the speaker mounting panel 7, and the bottom enclosure plate 14, are cut from thicker woods than the shell enclosure, and the bottom plate 14 is directly affixed to and made integral with the enclosure.

The front of the instrument contains in the area of the constriction two vertically curving slots which are referred to in the drawing as defining 4, the acoustic saddle. The flexibility thereby provided at this point of the enclosure has an important effect on the tonal quality provided by the instrument. The disposition and number of these slots is somewhat variable. The upper enclosure section above the constriction 3 consists in the higher wave compression zone 2, which terminates at 1, the slanted, curved upper acoustic port of the instrument. It is to be understood that this truncated upper chamber 2 above constriction 3 is adaptable to variation in design, depending upon specific application of the instrument. As an example of this inherent variability, the angle of truncation may be turned in order to effect acoustic directional control. Another example relates to the use of an acoustically reflective device within the upper chamber 2. Such a device would serve to effect acoustic directionality. The entire structure stands on four feet 13, which are fastened to the underside, and it requires but little floor space especially on the basis of speaker wattage capacity compared with other hi-fi enclosure designs handling similar capacities.

The instrument depicted by the drawing and described above is designed to stand near a wall or a corner in view of the acoustic directional control imparted by the design of the upper port, the acoustic saddle, and bass reflex port. However, the fundamental design contains inherent flexibilities, and a version of the instrument to stand in open spaces is also contemplated, as well as other pertinent acoustical adaptations. It is therefore to be realized that the limitations of this invention are not to be defined by the specific design disclosed in the above, but are to be defined by the claims which follow.

I hereby claim:

1. A speaker enclosure consisting of a vertically arranged opened top, closed bottom, substantially conical shaped thin walled structure, a constricted portion substantially at the middle height of the structure, a vertical slot at said portion, a speaker mounting panel spaced from and generally parallel to the bottom and forming a lower chamber, bass reflex porting in said lower chamber, a speaker or electromagnetic-audio transducer mounted to said panel in said lower chamber, said open top being an acoustic port comprised of a truncated opening, said

3,486,578

3

acoustic port slanted, and said slot opening, in a direction substantially opposite the bass reflex porting.

2. A speaker enclosure as cited in claim 1 in which the constricted portion contains multiple vertical slots and where such slots may be curved and articulated at their terminal points.

3. A speaker enclosure as described in claim 1 in which acoustic insulation is applied at the speaker mounting panel and at the bottom.

4. A structure such as in claim 1 which stands upon its own feet.

5

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