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**Plummer**

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(54) **CLOSED LOOP EMBEDDED AUDIO TRANSMISSION LINE TECHNOLOGY FOR LOUDSPEAKER ENCLOSURES AND SYSTEMS**

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(51) **Int. Cl.**

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(58) **Field of Classification Search** ..... 181/148, 181/151, 155, 145, 199, 146; 381/345, 351, 381/352, 160, 337, 338, 386, 395  
See application file for complete search history.

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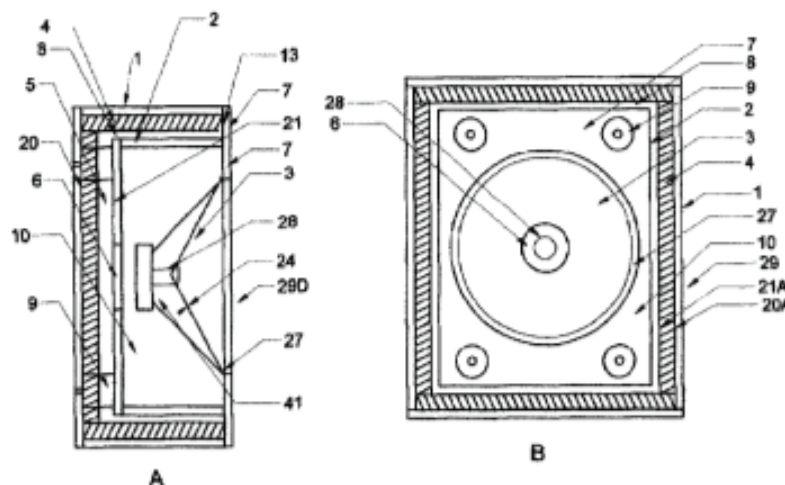
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(57) **ABSTRACT**

An acoustic impedance matching enclosure is provided having a driver loaded into a chamber buffering the throat/mouth of a closed loop transmission line. Transmission line consists of a termination member, outer and inner enclosure walls, high-density lining and throat/mouth area. Transmission line eliminates internal random standing waves while providing variable-frequency standing waves that through superposition of the waves compensates for mass-acceleration loss of the high-end of the driver output while damping the resonance of the driver. Alternative application of the acoustic impedance matching enclosure is that of compression loading the driver directly into the closed loop transmission line and using an acoustic low pass filter to translate the output into low frequencies only through a port. Both applications of the acoustic impedance matching enclosure are to insure that the drivers' diaphragm is clear of disruptive internal standing waves, properly loaded at all frequencies and not easily affected by room reflections.

**18 Claims, 18 Drawing Sheets**





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**Plummer**

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(54) **SOUND ENHANCEMENT MODULE**

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(21) **Appl. No.:** **11/760,788**

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(65) **Prior Publication Data**

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**Related U.S. Application Data**

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cation No. 10/709,538, filed on May 12, 2004, now  
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**G10K 15/04** (2006.01)

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(58) **Field of Classification Search** ..... 181/198,  
181/199, 207, 293, 196, 146, 151, 175, 176,  
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See application file for complete search history.

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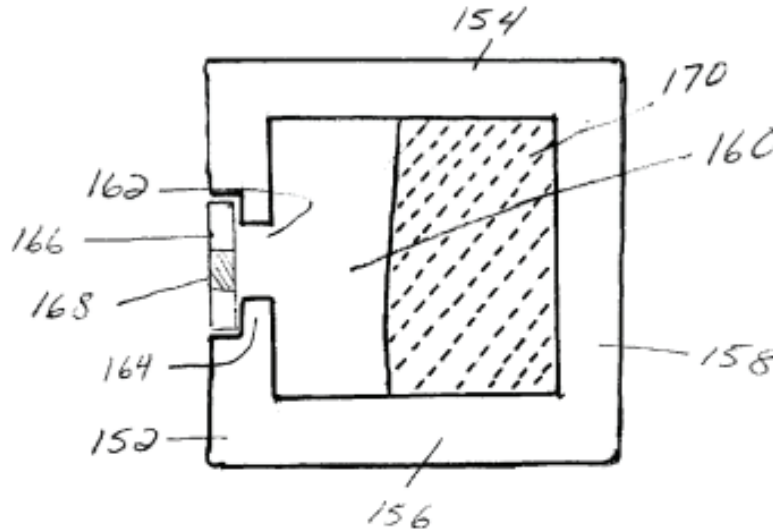
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(57) **ABSTRACT**

A sound enhancement module includes a set of walls that define an enclosed chamber, an aperture in one of the walls to provide a path for audio waves to travel between the enclosed chamber and an external space and an alternative density transmission medium positioned in the enclosed chamber.

**18 Claims, 19 Drawing Sheets**





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(54) **LOUDSPEAKER**

ation of application No. 10/709,538, filed on May 12, 2004, now Pat. No. 7,207,413.

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**Publication Classification**

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(57) **ABSTRACT**

(21) Appl. No.: **12/614,651**

A speaker with an embedded sound enhancement module includes a magnet, a pole piece positioned within the magnet, a sleeve surrounding the pole piece, a conductive wire coil wound around the sleeve between the magnet and the pole piece, a dust cap or diaphragm attached to a circumference of the sleeve, a speaker cone surrounding the dust cap, and an enclosed chamber having an aperture to access an internal volume of the chamber and an alternative density transmission medium (ADTM) positioned within a portion of the internal volume.

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