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(54) **Loudspeaker**

(57) A loudspeaker containing an improved voice drive structure including a convex diaphragm adhered with a voice coil before being mounted to a modified

dampner integrated with a surround to increase directivity of output of sound effects and effective expand sound field of the loudspeaker.

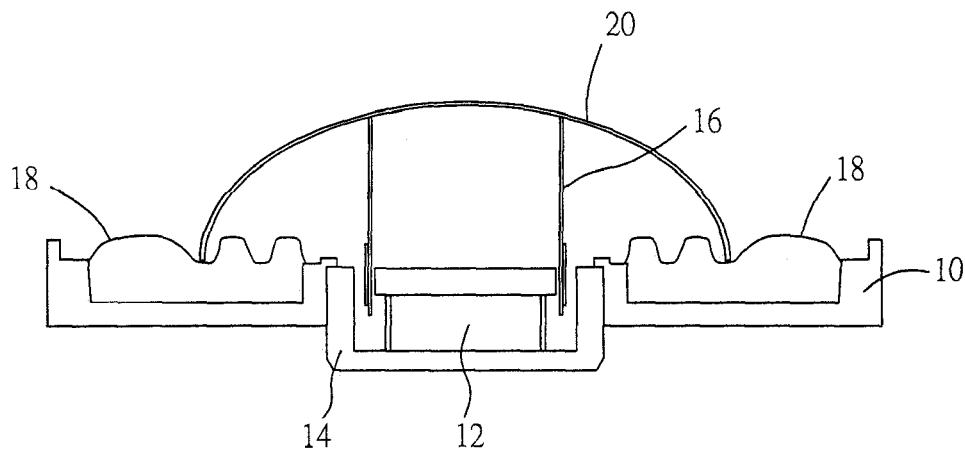


FIG. 2

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Description

FIELD OF THE INVENTION

[0001] The present invention is related to a loudspeaker, and more particularly, to an improved structure of voice drive materials of the loudspeaker.

BACKGROUND OF THE INVENTION

[0002] Whereas an electrodynamic loudspeaker of the prior art is essentially of magnetic circuit materials including magnet, U-shaped iron (yoke), washer, and frame; and moving system including damper, cone-paper (cone and surround), voice coil, and dust cap. According to an equation of force, $F = BIL$, wherein B relates to density of magnetic flux in a magnetic gap; L , length of voice coil conductor; and I , electric current flowing through voice coil, a working principle of the loudspeaker involves an electro-magnetic force F that varies when both of strength and direction of electric current flowing through the coil voice change for the voice coil to vibrate back and forth thus to drive the cone-paper to propel the air, and the air in turn serving as a medium to radiate sound waves.

[0003] Referring to Fig. 1 for a schematic view of a loudspeaker of the prior art, a magnetic circuit including a frame of basket 1, and a U-shaped iron (yoke) 2 containing a magnet 3 and a washer 4 disposed beneath the frame of basket 1 is assembled first, and then moving system including a damper 5, a voice coil 6, a cone-paper 7, and a dust cap 8 are glued to the frame of basket 1.

[0004] In the prior art, the output of sound is achieved by relying upon the cone-paper and the dust cap 8 to drive the air; however, the prior art is found with a major flaw in meeting requirements of certain sound field because that the conventional cone-paper has a poor directivity property.

SUMMARY OF THE INVENTION

[0005] The primary purpose of the present invention is to provide an improved structure of voice drive materials in a loudspeaker that is capable of increasing directivity of sound effects, expanding sound field, and allowing flatter and thinner construction of the entire loudspeaker through mounting a convex diaphragm glued with a voice coil to a modified damper (integrated damper and surround).

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

Fig. 1 is a schematic view showing a loudspeaker of the prior art.

Fig. 2 is a sectional view showing an improved struc-

ture of voice drive material of a loudspeaker of the present invention.

Fig. 3 is a schematic view showing a circular diaphragm and an oval diaphragm of the present invention.

Fig. 4 is a schematic view showing two modified dampers of the present invention respectively provided in a circular and an oval forms.

Fig. 5 is a schematic view showing a preferred embodiment of the present invention.

Fig. 6 is a schematic view showing another preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0007] Referring to Fig. 2 for a sectional view of an improved structure of a loudspeaker of the present invention, a frame of basket 10 containing at its center a magnet 12 and enclosed by a U-shape iron (yoke) 14. Wherein the frame of basket 10, the magnet 12, and the U-shape iron (yoke) 14 are referred to magnetic circuit materials. A modified damper 18 (an integrated part of the damper and a surround) is adhered to where inside the frame of basket 10, and a convex diaphragm 20 adhered to a voice coil 16 is mounted to where above the modified damper 18 (damper + surround). Wherein, the voice coil 16, the modified damper 18 (damper + surround) and the convex diaphragm 20 are referred to voice drive materials. Accordingly, with the improved structure, the loudspeaker of the present invention is generally reduced in thickness and provided with expanded directivity.

[0008] Now referring to Fig. 3 for an oval and a circular diaphragm of the present invention, the diaphragm 20 is made in an oval, circular, or rectangular (not illustrated) shape to cope with changed style of a speaker system.

[0009] As illustrated in Fig. 4, the modified damper 18 may be made in an oval, circular, or rectangular (not illustrated) shape to cope with changed style of a speaker system.

[0010] In a preferred embodiment of the loudspeaker of the present invention as illustrated in Fig. 5, the modified damper 18 has its both ends as two adhesion locations 22, 24 to be adhered to where inside the frame of basket 10 before mounting the diaphragm 20 already adhered with the voice coil 16 to the modified damper 18 for achieving the purpose of supporting those voice drive materials.

[0011] In another preferred embodiment as illustrated in Fig. 6, the modified damper 18 is adhered to the frame of basket 10 by means of three adhesion locations 22, 24, 26 before mounting the convex diaphragm 20 already adhered with the voice coil 16 to the modified damper 18

to achieve the same purpose of supporting those voice drive materials.

[0012] The modified damper 18 may be made of a single type of material (e.g., fabric, jute, plastic, etc.), or a combination of different materials to attain various properties, e.g., consistence, softness, and suitability.

[0013] A loudspeaker according to the invention comprises a rigid basket forming a frame, a damper integrally formed by a damper portion and a surround, a voice coil, and a convex diaphragm. The damper is mounted inside the frame. The convex diaphragm is adhered to the voice coil, extends over said damper and is mounted on said damper. This loudspeaker may be modified as described before or indicated in the claims. Preferably, it is made by adhering the damper to the inside of the frame of basket and separately adhering the convex diaphragm to the voice coil. Subsequently the convex diaphragm on which the voice coil is already fixed is mounted on the damper.

Claims

1. An improved structure of a loudspeaker comprising a loudspeaker provided with a voice drive assembly containing a modified damper (18); the modified damper (18) being made in an integral part with a surround; the modified damper (18) being mounted inside a frame of a basket (10); and a convex diaphragm (20) being adhered with a voice coil (16) being mounted over the modified damper (18).
2. The improved structure of a loudspeaker as claimed in Claim 1, wherein the convex diaphragm (20) contains the voice coil (16).
3. The improved structure of a loudspeaker as claimed in Claim 1 or 2, wherein both of the modified damper (18) and the convex diaphragm (20) are each made in a circular form.
4. The improved structure of a loudspeaker as claimed in Claim 1 or 2, wherein both of the modified damper (18) and the convex diaphragm (20) are each made in an oval form.
5. The improved structure of a loudspeaker as claimed in Claim 1 or 2, wherein both of the modified damper (18) and the convex diaphragm (20) are each made in a rectangular form.
6. The improved structure of a loudspeaker as claimed in any of Claims 1 to 5, wherein the modified damper (18) is made in an integral part of a same type of material.
7. The improved structure of a loudspeaker as claimed in any of Claims 1 to 5, wherein the modified damper (18) is made of two different types of materials.

8. The improved structure of a loudspeaker as claimed in any of Claims 1 to 7, wherein the modified damper (18) is incorporated to where inside the frame of basket (10) with both ends (22, 24) of the modified damper (18).
9. The improved structure of a loudspeaker as claimed in any of Claims 1 to 7, wherein the modified damper (18) is incorporated to the inside of the frame of basket (10) and to the voice coil (16) by means of multiple ends (22, 24, 26) of the modified damper (18).
10. Method of making a loudspeaker having a rigid basket (10) forming a frame; a damper (18) integrally formed by a damper portion and a surround; a voice coil (16); and a convex diaphragm (20) extending over said damper (18); said method comprising:

adhering the damper (18) to the inside of the frame of basket (10),
adhering the convex diaphragm (20) to the voice coil (16),
and subsequently mounting the convex diaphragm (20) already fitted with the voice coil (16) on the damper (18).

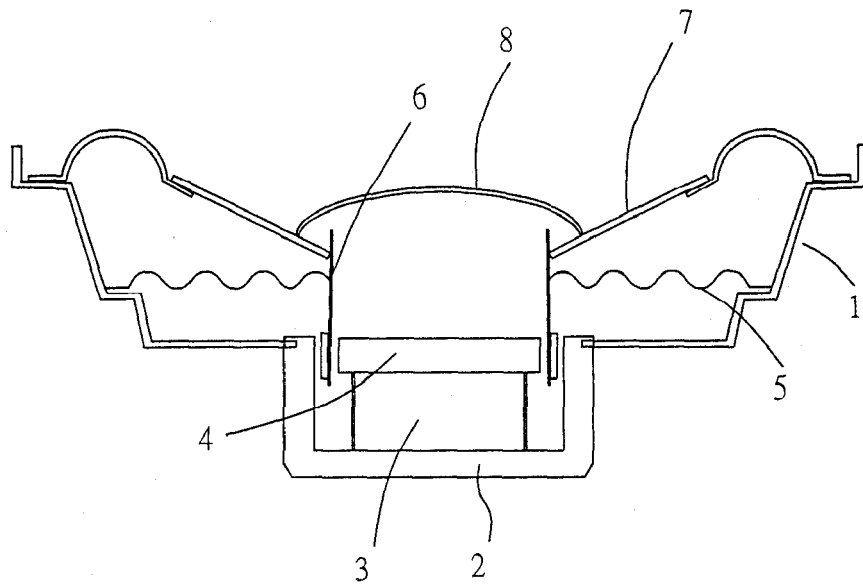


FIG. 1 (prior art)

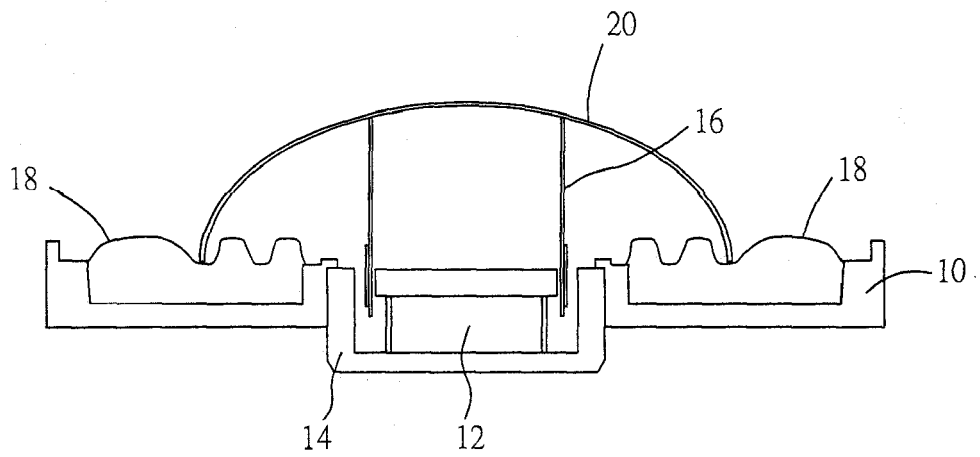


FIG. 2

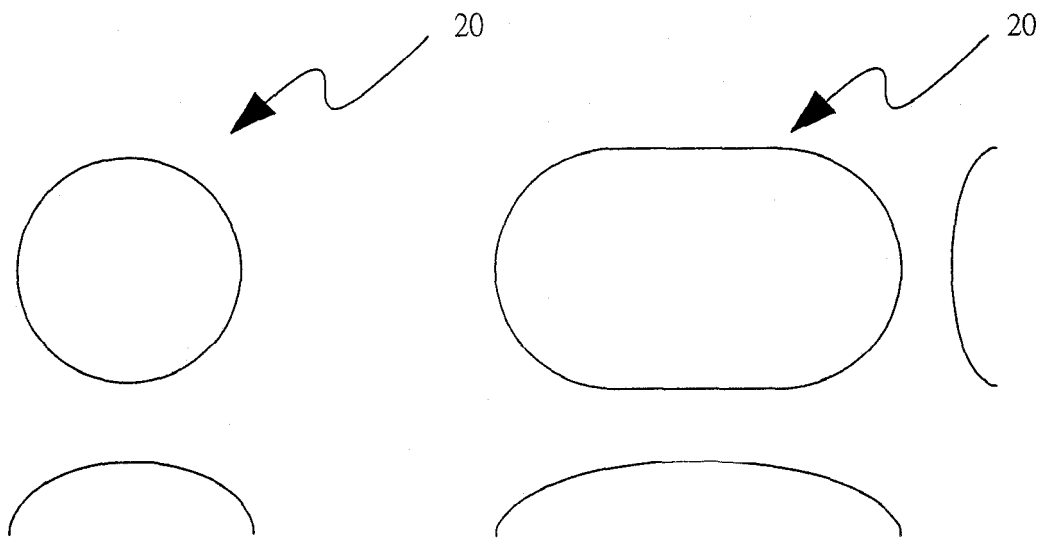


FIG. 3

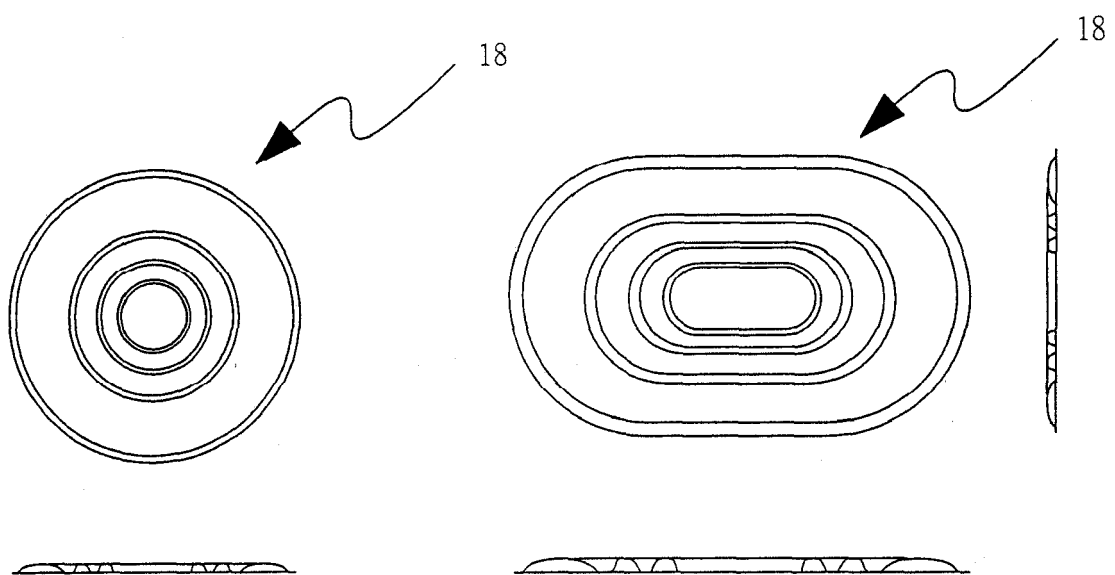


FIG. 4

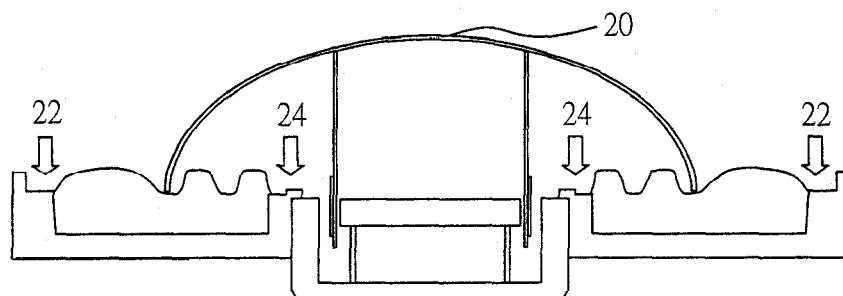


FIG. 5

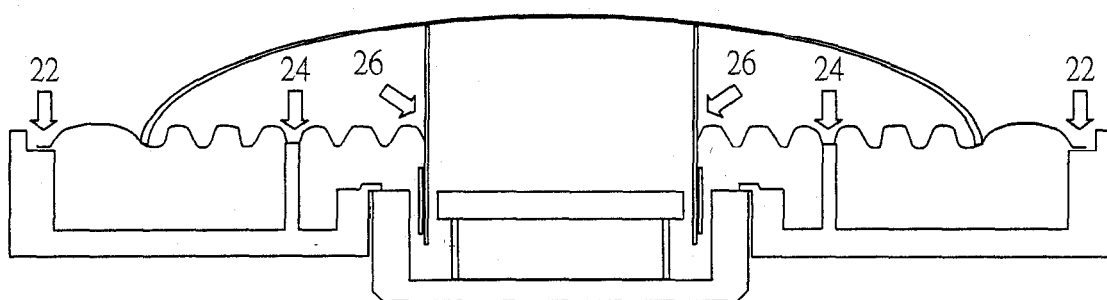


FIG. 6



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 11 3924

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A	US 2003/156731 A1 (SATO EIJI [JP]) 21 August 2003 (2003-08-21) * page 2, paragraph 33 - page 4, paragraph 48 * -----	1-10	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) H04R
Place of search Munich		Date of completion of the search 17 October 2007	Examiner Coda, Ruggero
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 07 11 3924

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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