



Europäisches Patentamt
European Patent Office
Office européen des brevets



⑪ Publication number:

0 610 769 A3

12

EUROPEAN PATENT APPLICATION

②¹ Application number: 94101385.6

⑤ Int. Cl.⁵: **H04R 9/02**, H04R 9/04

②② Date of filing: 31.01.94

③ Priority: 02.02.93 JP 37490/93

④³ Date of publication of application:
17.08.94 Bulletin 94/33

⑧ Designated Contracting States:
DE FR GB

Ⓢ Date of deferred publication of the search report:
12.10.94 Bulletin 94/41

Applicant: **KABUSHIKI KAISHA KENWOOD**
14-6 Dougenzaka 1-chome
Shibuya-ku Tokyo (JP)

⑦ Inventor: **Sakamoto, Yoshio**
108-6-503 Yokokawa-cho
Hachioji-shi, Tokyo (JP)

74 Representative: **Patentanwälte Leinweber & Zimmermann**
Rosental 7/II Aufg.
D-80331 München (DE)

⑤4 **Loudspeaker.**

57 A magnetic gap-less loudspeaker of a high performance which has a good quality of a voice coil and provides easy wiring between tinsel wires and the voice coil. In the magnetic gap-less loudspeaker, two magnets (M1, M2) magnetized in the thickness direction are disposed with the same poles being faced each other and a voice coil (1) is disposed in a magnetic field generated by repulsion magnetic fluxes near at the outer circumferential areas of the magnets, wherein a reinforced paper 1B or bobbin material 1A1 is attached to at least a partial area of the outer surface of the voice coil. Conductive areas 1C are provided to the reinforced paper or bobbin material to which areas coil lead wires or tinsel wires are connected.

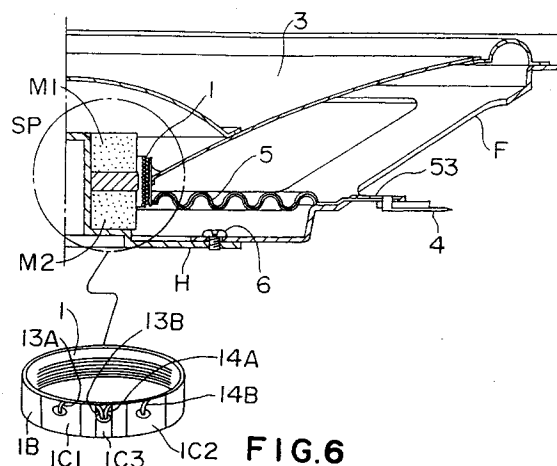


FIG. 6

EP 0 610 769 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 10 1385

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
P,X	EP-A-0 531 691 (NOKIA GMBH) * page 3, column 3, line 46 - page 3, column 4, line 20; figure 2 * ---	1	H04R9/02 H04R9/04
Y	DE-C-37 30 305 (DAIMLER-BENZ AG) * column 3, line 15 - column 4, line 35; figure 1A * ---	1	
Y	WO-A-90 04317 (HARMAN INTERNATIONAL INDUSTRIES, INC.) * page 4, line 18 - page 5, line 4; figure 1 * ---	1	
A	EP-A-0 503 860 (HARMAN INTERNATIONAL INDUSTRIES, INC.) * page 2, column 2, line 30 - page 3, column 4, line 26; figures * ---	1	
A	US-A-3 792 394 (BERTAGNI) * column 1, line 35 - column 2, line 20; figures * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			H04R
The present search report has been drawn up for all claims.			
Place of search THE HAGUE		Date of completion of the search 25 May 1994	Examiner GASTALDI G.L.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet -B-

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims,

namely claims: 1-3



LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

The different inventions contain the following subject-matter:

1. Claims 1-3: A gap-less loudspeaker wherein a reinforced paper or bobbin material is attached to at least a partial area of the outer surface of the voice coil.
2. Claims 4-5: A gap-less loudspeaker wherein coil lead wires of a coil wire of the voice coil are crawled on the outer surface of said voice coil and covered with a reinforced paper.
3. Claims 6-7: A gap-less loudspeaker wherein at least a pair of conductive areas made of rectangular copper foil are attached to the outer surface of the voice coil and coil lead wires are connected to the conductive areas.
4. Claim 8 : A gap-less loudspeaker wherein coil lead wires are connected to tinsel wires and the connection areas are fixed by adhesive agent to the outer surface of the voice coil.
5. Claim 9 : A gap-less loudspeaker wherein conductive areas made of copper foil are attached to a skirt of the voice coil and input tinsel wires are connected to said conductive areas.