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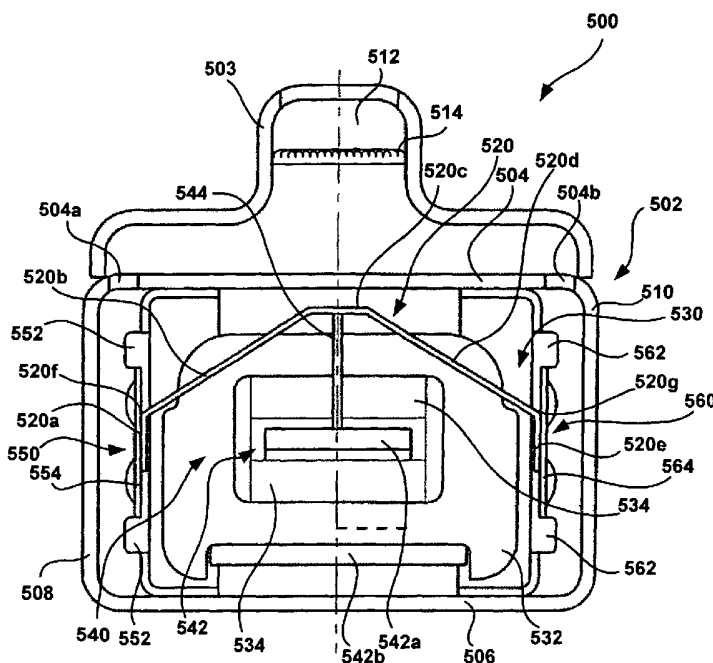
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(54) Title: APPARATUS AND METHOD FOR GENERATING ACOUSTIC ENERGY IN A RECEIVER ASSEMBLY



(57) Abstract: A receiver assembly includes a first diaphragm assembly having a diaphragm, and a second diaphragm assembly having a diaphragm. A linkage assembly is coupled to an armature of the receiver. The linkage assembly is also coupled to the first diaphragm assembly and to the second diaphragm assembly.

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B. FIELDS SEARCHED

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, COMPENDEX, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 102 517 A (SIEMENS AUDIOLOGISCHE TECHNIK) 23 May 2001 (2001-05-23) paragraph '0001! - paragraph '0009! paragraph '0012! - paragraph '0019!	1, 21
Y	-----	2-4, 14-16
X	US 3 013 189 A (BERNIER VAUGHAN A) 12 December 1961 (1961-12-12) column 1, line 8 - column 2, line 20	1, 21
Y	-----	2-4, 14-16
	US 3 454 912 A (MORRISON LOUIS A) 8 July 1969 (1969-07-08) column 1, line 26 - column 4, line 25 column 4, line 48 - column 6, line 37	

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 109 116 A (VICTOREEN JOHN A) 22 August 1978 (1978-08-22) column 2, line 26 - column 3, line 7 column 7, line 11 - column 9, line 7 figure 11 -----	1-21
A	US 6 044 159 A (MCKEE JOHN MICHAEL ET AL) 28 March 2000 (2000-03-28) column 2, line 13 - column 3, line 39; figures 2-4 -----	1-21

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1102517	A	23-05-2001	DE 19954880 C1	25-01-2001
			CN 1296373 A	23-05-2001
			EP 1102517 A2	23-05-2001
			JP 2001186597 A	06-07-2001
			US 6563933 B1	13-05-2003
<hr style="border-top: 1px dashed black;"/>				
US 3013189	A	12-12-1961	NONE	
<hr style="border-top: 1px dashed black;"/>				
US 3454912	A	08-07-1969	NONE	
<hr style="border-top: 1px dashed black;"/>				
US 4109116	A	22-08-1978	NONE	
<hr style="border-top: 1px dashed black;"/>				
US 6044159	A	28-03-2000	NONE	
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