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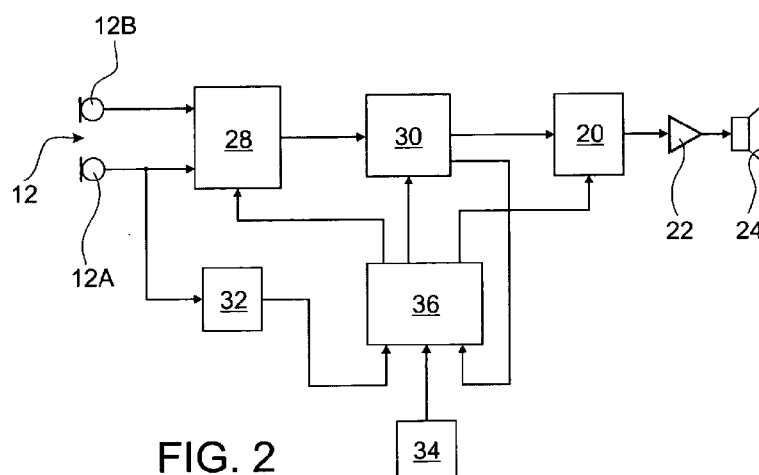


FIG. 2

(57) Abstract: The invention relates to a system for speech enhancement in a room (10), comprising: a microphone arrangement (12) comprising at least two spaced apart microphones (12 A, 12B) for capturing audio signals from a speaker's voice, an acoustic beamforming unit (28) for processing the captured audio signals in a manner so as to impart one of a plurality of different directional patterns to the microphone arrangement; a feedback cancellation unit (30) for applying a feedback cancellation algorithm to the processed audio signals and for providing a feedback status signal indicating how close an acoustic feedback loop (12, 17, 20, 22, 24, 28, 30, 40, 46) of the system is to feedback; means (20, 22) for amplifying the processed audio signals; a loudspeaker arrangement (24) to be located in the room for generating sound according to the amplified audio signals; and means (36) for selecting the directional pattern imparted to the microphone arrangement as a function of the feedback status signal.

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X	WO 2010/106469 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]; MANS MATHEUS J A [NL]; ROOVERS DA)	1-11, 17-23
Y	23 September 2010 (2010-09-23) page 2, line 10 - line 20 page 4, line 8 - line 10 page 7, line 5 - line 15 page 10, line 12 - line 28 page 11, line 13 - page 12, line 2 page 13, line 11 - page 15, line 24 figure 2 ----- -/--	12-16
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
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X	WO 03/010996 A2 (KONINKL PHILIPS ELECTRONICS NV [NL]; JANSE CORNELIS P [NL]; BELT HARM) 6 February 2003 (2003-02-06) cited in the application	1-11, 17-23
Y	abstract; figure 1 page 2, line 12 - line 16 page 4, line 18 - line 25 page 5, line 19 - page 6, line 4 -----	12-16
Y	WO 2010/000878 A2 (PHONAK AG [CH]; HARSCH SAMUEL [CH]) 7 January 2010 (2010-01-07) cited in the application abstract; figures 8-12 page 5, line 24 - page 8, line 2 page 10, line 8 - line 10 -----	1,12-16
Y	EP 1 501 332 A2 (MITEL NETWORKS CORP [CA]) 26 January 2005 (2005-01-26) the whole document -----	1,12-16
Y	EP 1 469 702 A2 (PHONAK AG [CH]) 20 October 2004 (2004-10-20) the whole document -----	1,12-16

INTERNATIONAL SEARCH REPORT

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2010106469	A1	23-09-2010	NONE
WO 03010996	A2	06-02-2003	EP 1413168 A2 28-04-2004 JP 2004537233 A 09-12-2004 US 2004170284 A1 02-09-2004
WO 2010000878	A2	07-01-2010	NONE
EP 1501332	A2	26-01-2005	CA 2475183 A1 23-01-2005 US 2005018836 A1 27-01-2005
EP 1469702	A2	20-10-2004	NONE