

EXHIBIT 8



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(12) **United States Patent**
Burnett

(10) **Patent No.:** **US 10,779,080 B2**

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(54) **DUAL OMNIDIRECTIONAL MICROPHONE ARRAY (DOMA)**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

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(60) Provisional application No. 60/934,551, filed on Jun. 13, 2007, provisional application No. 60/953,444, filed on Aug. 1, 2007, provisional application No. 60/954,712, filed on Aug. 8, 2007, provisional application No. 61/045,377, filed on Apr. 16, 2008.

(51) **Int. Cl.**
H04R 3/00 (2006.01)
G10L 21/0208 (2013.01)
H04R 1/40 (2006.01)
H04R 3/04 (2006.01)
G10L 21/0216 (2013.01)

(52) **U.S. Cl.**

CPC **H04R 3/002** (2013.01); **G10L 21/0208** (2013.01); **H04R 1/406** (2013.01); **H04R 3/005** (2013.01); **H04R 3/04** (2013.01); **G10L 2021/02165** (2013.01)

(58) **Field of Classification Search**

CPC G10L 2021/02165; G10L 21/0208; H04R 3/005
USPC 381/92, 94.7; 704/233, E21.004
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,473,701 A 12/1995 Cezanne et al.
6,473,733 B1 10/2002 McArthur et al.
(Continued)

OTHER PUBLICATIONS

Weiss, Howard; Office Action mailed by U.S. Patent and Trademark Office dated Mar. 15, 2012 for U.S. Appl. No. 12/139,355.

(Continued)

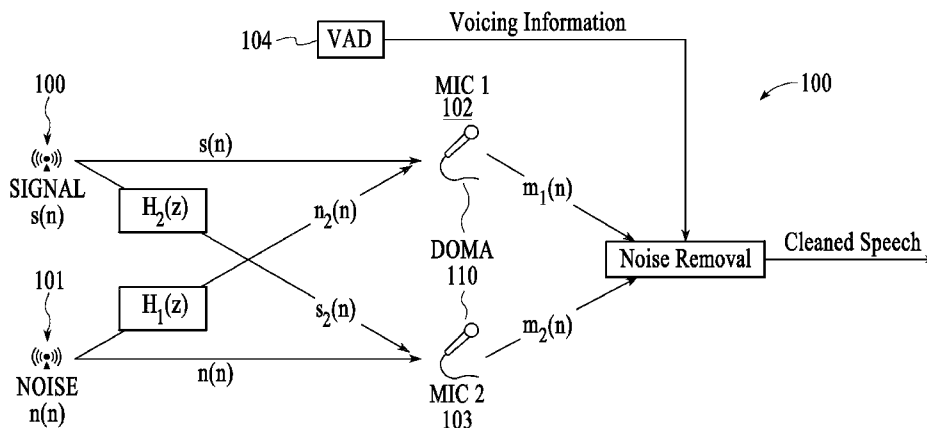
Primary Examiner — Howard Weiss

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(57) **ABSTRACT**

A dual omnidirectional microphone array noise suppression is described. Compared to conventional arrays and algorithms, which seek to reduce noise by nulling out noise sources, the array of an embodiment is used to form two distinct virtual directional microphones which are configured to have very similar noise responses and very dissimilar speech responses. The only null formed is one used to remove the speech of the user from V_2 . The two virtual microphones may be paired with an adaptive filter algorithm and VAD algorithm to significantly reduce the noise without distorting the speech, significantly improving the SNR of the desired speech over conventional noise suppression systems.

20 Claims, 17 Drawing Sheets



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(56)

References Cited

U.S. PATENT DOCUMENTS

7,706,549	B2	4/2010	Zhang et al.	
8,068,619	B2 *	11/2011	Zhang et al.	381/92
8,494,177	B2 *	7/2013	Burnett	381/92
8,503,691	B2 *	8/2013	Burnett	381/92

OTHER PUBLICATIONS

Weiss, Howard; Office Action mailed by U.S. Patent and Trademark
Office dated Jun. 13, 2008 for U.S. Appl. No. 12/139,355.

* cited by examiner

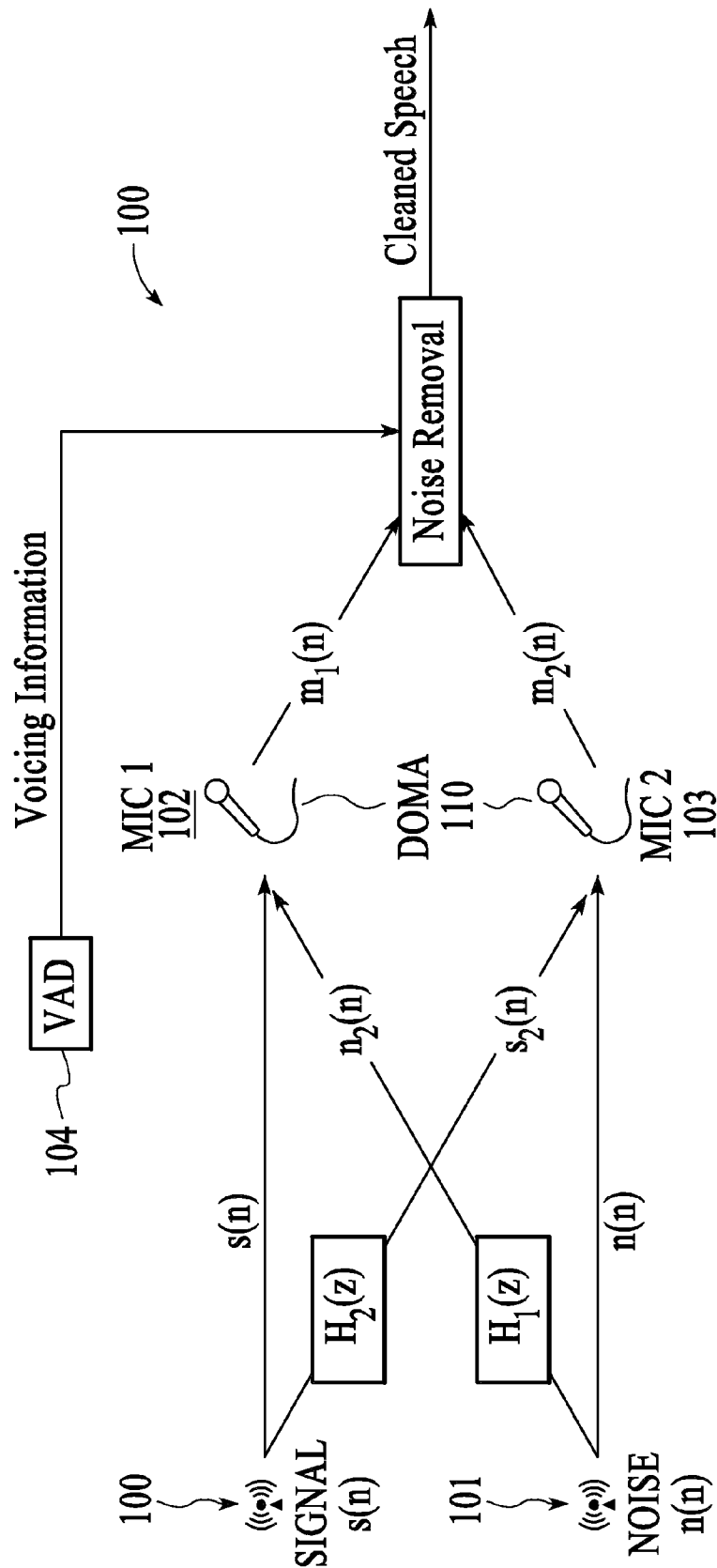


FIG. 1

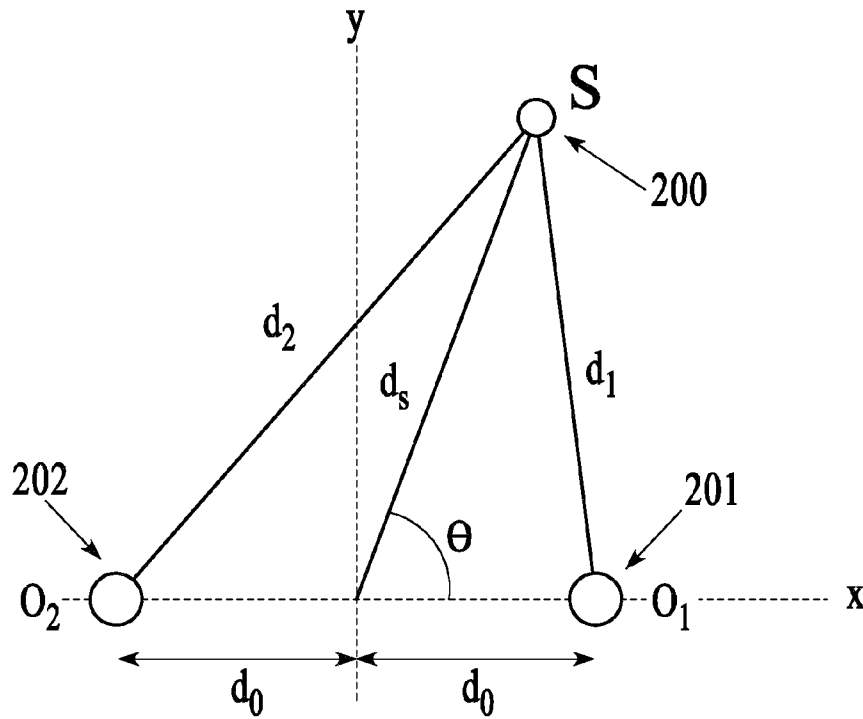


FIG. 2

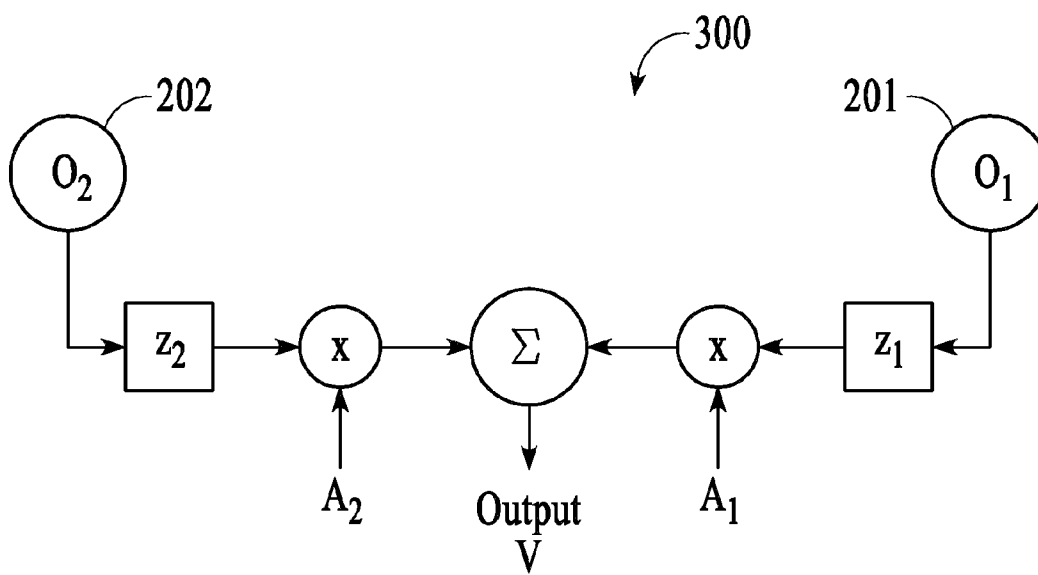


FIG. 3

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