PATENT N°: US 8990073 B2

Jurisdiction: US

Names of the Evaluators		
Lead Evaluator	**Assistant Evaluator #1**	**Assistant Evaluator #2**
Allen RUBENSTEIN	Jochen EHLERS	Kan ZU

The above mentioned Evaluators hereby declare that the following claim(s):
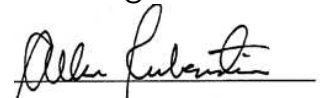
- Claim 1
- Claim 30

in the above referenced patent, is(are) essential to making, using in, selling within, or importing into, the countries of registration, any 3GPP product (the applicable Product Categories are given below) that is or purports to be in compliance with the following parts of the Third Generation Partnership Program (3GPP) technical standards:

- Document 3GPP TS 26.445 V12.1.0 (2014-12): Section 5.1.11.2.5

Claim 1 is relevant for 3GPP Terminal Products and 3GPP Base Station Products.
Claim 30 is relevant for 3GPP Terminal Products and 3GPP Base Station Products.

Authorized signature and date
August 21, 2017

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(12) **United States Patent**
Malenovsky et al.

(10) **Patent No.:** **US 8,990,073 B2**
(45) **Date of Patent:** **Mar. 24, 2015**

(54) **METHOD AND DEVICE FOR SOUND ACTIVITY DETECTION AND SOUND SIGNAL CLASSIFICATION**

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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 1063 days.

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§ 371 (c)(1),
(2), (4) Date: **Jun. 11, 2010**

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PCT Pub. Date: **Dec. 31, 2008**

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Related U.S. Application Data

(60) Provisional application No. 60/929,336, filed on Jun. 22, 2007.

(51) **Int. Cl.**
G10L 21/00 (2013.01)
G10L 25/78 (2013.01)
(Continued)

(52) **U.S. Cl.**
CPC *G10L 25/78* (2013.01); *G10L 19/22* (2013.01)
USPC **704/208**; 704/203; 704/200; 704/219; 704/500; 704/226; 381/94.3

(58) **Field of Classification Search**
USPC 704/208, 219, 226, 229, 223, 207, 220, 704/500, 233, 239, 200, 203; 381/94.3
See application file for complete search history.

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(57) **ABSTRACT**

A device and method for estimating a tonal stability of a sound signal include: calculating a current residual spectrum of the sound signal; detecting peaks in the current residual spectrum; calculating a correlation map between the current residual spectrum and a previous residual spectrum for each detected peak; and calculating a long-term correlation map based on the calculated correlation map, the long-term correlation map being indicative of a tonal stability in the sound signal.

41 Claims, 6 Drawing Sheets