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Ranta

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(54) **ADJUSTING ACOUSTIC SPEAKER OUTPUT BASED ON AN ESTIMATED DEGREE OF SEAL OF AN EAR ABOUT A SPEAKER PORT**

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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 402 days.

This patent is subject to a terminal disclaimer.

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CPC ***H04R 3/04*** (2013.01); *H04R 2499/11* (2013.01)
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See application file for complete search history.

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(57) **ABSTRACT**

A degree of seal of an ear about a speaker port may be estimated by detecting touch contact between the ear and at least one touch sensor in fixed relation to the speaker port. The degree of seal is estimated based on the detected touch contact. Based upon the estimated degree of seal, the acoustic output of the speaker may be adjusted. The adjustment may compensate for perceived changes to the quality of the acoustic output resulting from the degree of seal. The at least one touch sensor may be a plurality of touch sensors spaced around the speaker port. Each sensor may have a truncated wedge shape, with a narrow end closest to the speaker port. Upon receipt of user input indicative of a high degree of ear seal, a sample of the sensor(s) may be taken and stored for using during future estimation of the degree of seal.

18 Claims, 13 Drawing Sheets