UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte JOSE RICARDO BADDINI MANTOVANI

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Appeal No. 2006-1777
Application No. 10/206,704

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ON BRIEF

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Before KRASS, JERRY SMITH, and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-19, 21, and 22.

We affirm-in-part.

BACKGROUND

The invention relates to electrical impedance based audio compensation in electrical devices that are subject to variable acoustic impedance (e.g., wireless communication devices). Representative claim 1 is reproduced below.

> 1. A method in an electronics device having an ear-mounted sound transducer, comprising:
>
> determining a change in an electrical parameter that changes with changes in an acoustic impedance of the sound transducer;
>
> determining audio signal compensation based upon the change in the electrical parameter;
>
> dynamically compensating an audio signal sent to the sound transducer based upon the audio signal compensation.

The examiner relies on the following references:

Johnson	4,973,917	Nov. 27, 1990
Walker	5,068,903	Nov. 26, 1991
Richardson	5,771,297	Jun. 23, 1998
Klippel	5,815,585	Sep. 29, 1998
Nakano	6,154,538	Nov. 28, 2000

Claims 1, 6-9, 11, 21, and 22 stand rejected under 35 U.S.C. § 102 as being anticipated by Nakano.

Claims 14 and 15 stand rejected under 35 U.S.C. § 102 as being anticipated by Walker.

Claims 1, 2, 8-11, 21, and 22 stand rejected under 35 U.S.C. § 102 as being anticipated by Johnson.

Claims 18 and 19 stand rejected under 35 U.S.C. § 103 as being unpatentable over Walker.

Claim 16 stands rejected under 35 U.S.C. § 103 as being unpatentable over Walker and Klippel.

Claims 14 and 17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Richardson and Walker.

Claims 3-7, 12, and 13 stand rejected under 35 U.S.C. § 103 as being unpatentable over Johnson and Walker.

Claim 20 has been allowed.

We refer to the Final Rejection (mailed Mar. 24, 2005) and the Examiner's Answer (mailed Oct. 7, 2005) for a statement of the examiner's position and to the Brief (filed Jun. 29, 2005) and the Reply Brief (filed Nov. 30, 2005) for appellant's position with respect to the claims which stand rejected.

OPINION

Nakano

Claims 1, 6-9, 11, 21, and 22 are rejected under 35 U.S.C. § 102 as being anticipated by Nakano. The rejection deems the "dynamically compensating" step of claim 1 to read on continuous adjustment of the audio signal to be sent to the speaker,

"such as in the state of off-hook or on-hook," referring to column 4, lines 33 through 63 of the reference. According to the examiner, when the user removes the telephone from the ear, the telephone should be in the off-hook state ("gain is zero"), and in the on-hook state when the phone is moved to the ear ("gain is non-zero"). (Answer at 3-4.)

Nakano teaches that the apparatus detects, from varying impedance, when the user has held the earpiece 21 (Fig. 2) to the user's ear. Col. 3, ll. 46-53. When the controlling portion 13 (Fig. 1) receives the impedance variation detection signal, the controlling portion performs the same process as operation of the response button or start button. Col. 4, ll. 25-29.

We agree with appellant, for the reasons expressed in the briefs, that Nakano does not meet the requirements of instant claim 1. The rejection fails because when the telephone of Nakano is in the on-hook state, there is no audio signal to compensate. Nakano does not describe any form of compensation of the audio signal when the audio signal is present (i.e., when the telephone is in the off-hook state) that is responsive to measurements relating to changes in acoustic impedance.

The rejection of the other independent claims (claims 9 and 21) suffers from a similar deficiency. We thus do not sustain the rejection of claims 1, 6-9, 11, 21, and 22 under 35 U.S.C. § 102 as being anticipated by Nakano.

Walker

Claims 14 and 15 are rejected under 35 U.S.C. § 102 as being anticipated by Walker. (Answer at 5-6.) Appellant contends that Walker lacks an impedance "mismatch detection circuit." According to appellant, the current measured in Walker does not correspond to the mismatch between a reference electrical impedance and an actual electrical impedance of the sound transducer. (Brief at 12.)

Walker describes an operational amplifier 40 (Fig. 2) that amplifies a difference signal derived from the output of operational amplifier 30 and the voltage applied to the loudspeaker system 20. Col. 2, ll. 49-62.

> The circuit uses negative current feedback and works as follows. The current driving the loudspeaker system 20 causes a voltage drop across the current-sensing resistor 21, which is amplified by the operational amplifier 30. The gain of the amplifier 30 is chosen so that in operating conditions in which no mechanical resonances occur in the loudspeaker system 20, the output voltage of the amplifier 30 is equal in magnitude and phase to the voltage applied to the loudspeaker system.

Walker col. 3, ll. 5-14.

In our view, Walker's disclosure provides adequate support for the examiner's findings. Operational amplifier 40 has an output corresponding to the mismatch between a reference electrical impedance (from operational amplifier 30) and an actual electrical impedance (from loudspeaker system 20) with respect to loudspeaker system 20. We are not persuaded by appellant's bare assertion that the relevant portions of the Walker circuit of Figure 2 do not disclose a "mismatch detection circuit" as claimed.

Appellant also alleges, without convincing elaboration, that Walker's adder 16 (Fig. 2) cannot be considered a "compensation estimator" and that power amplifier 10 cannot be considered an "audio compensator" within the meaning of claim 14. We find that the corresponding elements of Walker do all that is required by the language of claim 14. Moreover, we know from appellant's specification (e.g., claims 6 and 11) that audio signal compensation does not require affecting the frequency response of the system, but may only require a change in gain (e.g., amplification) of the audio signal.

We thus find the examiner has established a prima facie case for anticipation for instant claim 14. However, we do not sustain the rejection of depending claim 15 because, as appellant argues, the rejection does not assert what elements of Walker are deemed to correspond to the limitations of claim 15. The 35 U.S.C. § 102 rejection over Walker is thus sustained with respect to claim 14 and not sustained with respect to claim 15.

Turning to the rejection of claims 18 and 19 under 35 U.S.C. § 103 as being unpatentable over Walker, we agree with appellant to the extent the examiner has not provided sufficient evidence in support of the proposed modification. Claim 18 requires that the audio compensator (power amplifier 10; Fig. 2 of Walker) is "a digital filter having an adjustable frequency response and gain." While digital filters were known, the rejection does not provide a teaching or suggestion from the prior art for modifying a circuit as shown in Walker's Figure 2 such that the component in place of power amplifier 10 is, or includes, a digital filter as claimed. We do not sustain the rejection of

claim 18 over Walker. However, we sustain the rejection of claim 19 because the examiner finds that any loudspeaker is inherently disposed within a housing, a finding that seems reasonable on its face. Appellant has not traversed the finding, but appears to rely (Brief at 14) on the unpersuasive arguments regarding the limitations of claim 14 to distinguish over Walker.

Walker and Klippel

We do not sustain the rejection of claim 16 under 35 U.S.C. § 103 as being unpatentable over Walker and Klippel. Claim 16 incorporates the limitations of claim 15. Klippel does not remedy the deficiencies in the rejection applied against base claim 15.

Richardson and Walker

Claims 14 and 17 are, at least nominally, rejected under 35 U.S.C. § 103 as being unpatentable over Richardson and Walker. The statement of the rejection (Answer at 8) relates to the requirements of claim 17. Claim 14, however, seems to be included in the rejection. Perhaps the naming of claim 14 relates to the fact that the rejection is reasoned in terms of Richardson in view of Walker, which was applied against base claim 14, rather than in terms of Walker in view of Richardson. In any event, we summarily sustain the § 103 rejection of claim 14 because, on this record, Walker taken alone has been demonstrated to meet all the requirements of (i.e., anticipate) claim 14.

With respect to the rejection of claim 17, appellant argues (Brief at 23) that the examiner "has not specifically indicated how the prior art applies to Claim 17." The argument is incorrect; see the examiner's findings in the Final Rejection and the Answer. In the Reply Brief (at 10), appellant relies on the untenable position that Walker fails to disclose a "mismatch detection circuit." Being not persuaded of error in the rejection of claim 17, we sustain the § 103 rejection over Richardson and Walker.

Johnson

Johnson describes a current feedback arrangement in an output amplifier suitable for use in driving loudspeakers for hearing aids (e.g., col. 1, ll. 29-42). According to Johnson, the loudspeakers have electrical characteristics that depend on the electrical materials, the mechanical construction of the load device, and the acoustic surroundings in which the device is placed. The electrical impedance characteristic of the loudspeaker may reflect resonances arising as a result of the acoustic impedance faced by the loudspeaker. Col. 3, ll. 7-23.

Appellant notes these and other sections of Johnson upon which the examiner bases the § 102 rejection of claim 1, and alleges that Johnson fails to disclose or suggest any of the entirety of claim 1. Appellant does not explain, however, why the examiner's findings should be considered erroneous. Appellant's arguments are correct to the extent that Johnson does not contain all the words of instant claim 1. For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed

invention must be identically shown in a single reference. However, this is not an "ipsissimis verbis" test. In re Bond, 910 F.2d 831, 832, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990).

Johnson summarizes the current feedback circuitry (Fig. 1C) at column 15, lines 26 through 41. The current feedback compensates for low impedance values of the loudspeaker that may occur due to the electromechanical and acoustic resonances associated with the speaker.

We are not persuaded of error in the examiner's position that Johnson teaches determining a change in an electrical parameter (i.e., current) that changes with changes in an acoustic impedance of the sound transducer (i.e, loudspeaker). The circuitry described by Johnson may fairly be considered to determine audio signal compensation based upon the change in the electrical parameter via the selected circuit elements and the selected values of those elements. The real time feedback described by the reference is a form of dynamic compensation of an audio signal sent to the sound transducer based upon the audio signal compensation. Johnson falls within the broad scope of instant claim 1. We sustain the rejection.

We also sustain the rejection of depending claim 2, as a hearing aid receives an audio voice signal. We sustain the rejection of depending claim 8 because, as noted by the examiner and supra, Johnson teaches that the electrical parameter of the sound transducer changes with the acoustical impedance of the sound transducer.

Appellant in the Brief repeats language from claims 9-11, 21, and 22, and repeats arguments we have considered in the rejection of claims 1 and 2. We sustain the rejection of claims 9, 21, and 22 for substantially the same reasons that we have sustained the rejection of claims 1 and 8. We sustain the rejection of dependent claim 10 for substantially the same reasons that we have sustained the rejection of claims 1, 2, and 8. We sustain the rejection of dependent claim 11 since Johnson meets at least the "gain" alternative for changing the electrical characteristic of the audio signal sent to the sound transducer because the negative feedback changes the gain of the audio signal (e.g., col. 17, ll. 29-37).

Johnson and Walker

We next consider the § 103 rejection of claims 3-7, 12, and 13 as being unpatentable over Johnson and Walker. Appellant submits that the rejection of claims 3 and 12 is improper because Walker does not measure impedance mismatch. We are not persuaded that Walker does not measure impedance mismatch, as noted in our discussion of the § 102 rejection over Walker. We sustain the rejection of claims 3 and 12. Further, we sustain the rejection of claim 7 because Walker teaches measuring changes in the electrical parameter (e.g., Fig. 2) in accordance with the claim.

With respect to claim 4, the examiner finds that frequency 3 as depicted in Figure 1B of Walker represents where the mismatch between the actual and reference electrical impedance is the greatest. Since the circuit of Figure 2 would operate over a

range of frequencies inclusive of that at the resonance represented by frequency 3, Walker teaches determining the change in the electrical parameter at least at a frequency where the mismatch between the actual and reference electrical impedance is greatest. (Answer at 10.) Appellant is correct that Figure 1B of Walker shows the sound pressure of a real speaker as a function of frequency. (Brief at 24.) Appellant's remarks do not, however, demonstrate error in the rejection of claim 4. We sustain the rejection.

Because Johnson teaches compensating the audio signal by changing at least the gain of the audio signal sent to the sound transducer as required by claim 6, we sustain the § 103 rejection of the claim.[1]

We do not, however, sustain the § 103 rejection of claim 5 or 13. We agree with appellant that the rejection over Johnson and Walker fails to show disclosure or suggestion of empirical audio signal compensation data as required by the claims.

CONCLUSION

The rejection of claims 1, 6-9, 11, 21, and 22 under 35 U.S.C. § 102 as being anticipated by Nakano is reversed.

[1] In comparing the requirements of claim 11 and claim 6, it is apparent that claim 6 should have been rejected under 35 U.S.C. § 102 over Johnson In any event, claim 6 is unpatentable under both statutory sections. Anticipation is "the epitome of obviousness." See, e.g., Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983); In re Fracalossi, 681 F.2d 792, 794, 215 USPQ 569, 571 (CCPA 1982); In re Pearson, 494 F.2d 1399, 1402, 181 USPQ 641, 644 (CCPA 1974).

The rejection of claims 14 and 15 under 35 U.S.C. § 102 as being anticipated by Walker is affirmed with respect to claim 14 but reversed with respect to claim 15.

The rejection of claims 1, 2, 8-11, 21, and 22 under 35 U.S.C. § 102 as being anticipated by Johnson is affirmed.

The rejection of claims 18 and 19 under 35 U.S.C. § 103 as being unpatentable over Walker is reversed with respect to claim 18 but affirmed with respect to claim 19.

The rejection of claim 16 under 35 U.S.C. § 103 as being unpatentable over Walker and Klippel is reversed.

The rejection of claims 14 and 17 under 35 U.S.C. § 103 as being unpatentable over Richardson and Walker is affirmed.

The rejection of claims 3-7, 12, and 13 under 35 U.S.C. § 103 as being unpatentable over Johnson and Walker is affirmed with respect to claims 3, 4, 6, 7, and 12 but reversed with respect to claims 5 and 13.

The examiner’s decision is thus affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a). See 37 CFR § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

ERROL A. KRASS Administrative Patent Judge	)
JERRY SMITH Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
HOWARD B. BLANKENSHIP Administrative Patent Judge	)

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