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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GLEN RUTLEDGE, TRENT ROLF, and BRANDON GRAHAM

Appeal 2019-003588
Application 14/488,731
Technology Center 2600

Before JAMES B. ARPIN, MICHAEL M. BARRY, and
MICHAEL J. ENGLE, *Administrative Patent Judges*.

ENGLE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1–3, 5–7, and 18–20, which are all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies Harman International Industries, Inc. as the real party-in-interest. Appeal Br. 1.

TECHNOLOGY

The application relates to “a feedback suppression test filter correlation system.” Spec. ¶ 1.

ILLUSTRATIVE CLAIM

Claim 1 is illustrative and reproduced below:

1. A feedback suppression system for detecting a feedback peak, comprising:

a memory and a controller in communication therewith, the controller configured to:

identify at least one peak of an audio input signal that includes audio data and acoustic feedback;

apply at least one signature to the at least one peak;

determine a response of the at least one peak to the at least one signature, wherein the response of the at least one peak includes a change in slope of a magnitude of the peak;

identify the at least one peak as a feedback peak in response to the change in slope; and

set a notch filter at the identified peak to eliminate the acoustic feedback of the audio input signal at a loudspeaker.

REFERENCES

The Examiner relies on at least the following references:

| Name | Number | Date |
|-------------|--------------------|----------------|
| Salvetti | US 2009/0245552 A1 | Oct. 1, 2009 |
| Troxel | US 2006/021582 A1 | Sept. 28, 2006 |
| Williams | US 7,613,529 B1 | Nov. 3, 2009 |

REJECTIONS

The Examiner makes the following rejections:

| Claims | Statute | Reference(s)/Basis | Non-Final Act. |
|----------------|----------------|---------------------------|-----------------------|
| 1–3, 5, 18–20 | § 102 | Troxel | 5 |
| 1, 2, 5, 18–20 | § 102 | Williams | 7 |
| 6, 7 | § 103 | Williams | 10 |
| 6, 7 | § 103 | Troxel, Williams | 11 |
| 3 | § 103 | Williams, Salvetti | 12 |
| 18–20 | § 112(a) | Written description | 4 |

ISSUES

1. Did the Examiner err in finding Troxel anticipates claim 1?
2. Did the Examiner err in finding Williams anticipates claim 1?
3. Did the Examiner err in concluding the proposed combinations render obvious dependent claims 6 and 7?
4. Did the Examiner err in finding the combination of Williams and Salvetti teaches or suggests “the signature includes at least one of a pitch shift and frequency shift,” as recited in claim 3?
5. Did the Examiner err in finding the limitation “adjust a gain of the notch filter in response to the slope threshold exceeding the slope,” as recited in claim 18, lacks sufficient written description support?

ANALYSIS

§ 102 over Troxel

(Claims 1–3, 5, and 18–20)

Claim 1 recites a requirement to identify a peak “in response to” a “change in slope of a magnitude of the peak.”

Appellant argues that “the alleged decay in Troxel relates to iterations and not to a slope.” Appeal Br. 5. Further, Appellant argues that “the

‘permanent notch’ [in Troxel] is not set at a peak identified ‘as a feedback peak in response to the change in slope’ as a result of the signature, as recited in claim 1.” *Id.* at 6.

We are not persuaded by Appellant’s arguments. As the Examiner points out, Appellant “fails to follow the entire process as illustrated in Fig. 3” of Troxel. Ans. 15. In step 318 of Figure 3, Troxel asks whether a frequency is a potential feedback frequency (i.e., a claimed “feedback peak”). If the frequency is potentially a feedback frequency, then in step 330, Troxel places a “Test Notch.” The Examiner treats Troxel’s test notch as the claimed “signature.” Ans. 13. The flow in Figure 3 then loops back to the top and performs steps 304 through 314 before ultimately arriving at step 320, which asks, “Is Decay Criteria Satisfied?” Ans. 13, 15–16; Troxel ¶¶ 27, 30–34 (“The feedback control algorithm shown in FIG. 3 repeats continuously.”). As the Examiner correctly points out, “Fig. 7 provides . . . more detail” of step 320 and what happens “after placing the test notch at the potential peak frequency.” Ans. 14; Troxel ¶¶ 27 (“The method shown in FIG. 3 embodies various sub-methods that are described in greater detail with respect to FIGS. 4–7.”), 33 (discussing the “decay criteria” of “step 320” and how “[t]he decay criteria and determination is described in greater detail with respect to FIG. 7 below”).

Troxel’s Figure 7 explains that the decay criteria are satisfied by checking whether magnitude has dropped by a specific amount “if exactly two iterations have elapsed.” Troxel ¶¶ 56, 33. Thus, contrary to Appellant’s argument, Troxel is not concerned solely with “iterations and not . . . a slope.” Appeal Br. 5. Rather, Troxel tests for a change in magnitude over a specific number of iterations. Ans. 14–15. Appellant fails

to explain whether or why such a change in magnitude over time fails to teach the claimed change in slope.

Turning back to Troxel's Figure 3, if the decay criteria are satisfied in step 320, then step 332 places a "Permanent Notch" at that frequency because "the potential feedback frequency . . . is a 'feedback peak.'" Ans. 16. The Examiner treats Troxel's permanent notch as the claimed "notch filter." *Id.* at 14. Thus, contrary to Appellant's argument, Troxel sets a permanent notch at a peak identified as a feedback peak in response to the change in slope from the test notch.

Appellant, therefore, fails to persuade us of Examiner error.

Accordingly, we sustain the Examiner's § 102 rejection over Troxel of claim 1, as well as claims 2, 3, 5, and 18–20, which Appellant argues are patentable for similar reasons. *See* Appeal Br. 6; 37 C.F.R. § 41.37(c)(1)(iv).

§ 102 over Williams
(Claims 1, 2, 5, 18–20)

Similar to the argument against Troxel, Appellant argues that "Williams fails to make any recitation of 'slope'" and "Williams does not identify a feedback peak 'in response to the change in slope'" because Williams discloses only "an amplitude at a frequency," not slope. Appeal Br. 7.

However, we agree with the Examiner that in Williams, "amplitude is measured after a predetermined test time." Ans. 16. Specifically, Williams discloses, "[i]f, after a predetermined test time, the measured amplitude at the candidate frequency has been reduced by a predetermined minimum amount, then genuine feedback is said to have been detected, and the filter is

left in place at a predetermined depth.” Williams 8:16–20. We agree with the Examiner that “the amount of change (reduced amplitude) . . . in the short amount of time is measured,” which “represents a change in slope which is going downward after the notch filter was placed at the candidate frequency.” Ans. 17.

Accordingly, we sustain the Examiner’s § 102 rejection over Williams of claim 1, as well as claims 2, 5, and 18–20, which Appellant argues are patentable for similar reasons. *See* Appeal Br. 7–8; 37 C.F.R. § 41.37(c)(1)(iv).

*§ 103 over Troxel and Williams
(Claims 6 and 7)*

Claim 6 depends from claim 1 and further recites “the response of the at least one peak includes determining a correlation coefficient between gain changes in the notch filter and slope changes in audio input signal.” Claim 7 depends from claim 6 and further recites “the at least one peak is identified as a feedback peak in response to the correlation coefficient exceeding a correlation threshold.”

In the Office Action, the Examiner finds:

Williams teaches if there is “good correlation” between the gain changes and measured amplitude changes, then the frequency is determined to be the feedback frequency that should be suppressed. If there is “poor correlation”, then the frequency is not a feedback frequency (col. 3, lines 50-59). Thus, Williams suggests finding the correlation between the gain changes and the measured amplitude changes. Examiner takes Official Notice that determining a correlation value between two variables is notoriously well known in the art. “Good” or “bad”, as one skilled in the art would have recognized, is a relative term against a value to be compared with. Based on such teaching, one skilled in the art would have been motivated to determine or set a

correlation threshold in order to classify whether the determined correlation value (determined by the responses and gain changes) resulting a “good correlation” or “poor correlation”.

Non-Final Act. 11–12.

Appellant argues that “the Official Notice includes assertions of technical facts that are not capable of instant and unquestionable demonstration,” specifically “for a ‘correlation coefficient [to exceed] a correlation threshold.’” Appeal Br. 9 (brackets in original). Appellant further argues “the references do not even teach a correlation coefficient.” *Id.*

In the Answer, the Examiner provides a newly cited reference of StatSoft’s “Canonical Analysis” “in response to appellant’s request to show support for [the] Official Notice taken in the previous rejection.” Ans. 10 n.2; *see also* MPEP § 2144.03(C). This reference discusses various methods such as a “standard . . . correlation coefficient” to “measure[] the extent to which two variables are related.” StatSoft 1. Appellant does not challenge the Examiner’s determinations based on StatSoft. *See* Reply Br. 2. Nor does Appellant challenge the Examiner’s reliance on Williams’ distinction between a “good correlation” and a “poor correlation.” Williams 3:50–59.

Accordingly, we sustain the Examiner’s § 103 rejection over Troxel and Williams of claims 6 and 7.

*§ 103 over Williams
(Claims 6 and 7)*

Appellant does not argue this rejection separately. We sustain the Examiner’s § 103 rejection over Williams of claims 6 and 7 for the same reasons we sustain the rejection of claim 1 over Troxel and Williams above.

*§ 103 over Williams and Salvetti
(Claim 3)*

Dependent claim 3 recites “the signature includes at least one of a pitch shift and frequency shift.” The Examiner relies on the additional reference Salvetti for teaching this further limitation of claim 3. Non-Final Act. 12–13.

Appellant argues:

The claims apply the signatures prior to setting of the “notch filter . . . to eliminate the acoustic feedback.” Salvetti, on the other hand and according to the Examiner, discloses applying a notch filter for the feedback suppression. Thus, the Examiner is confusing the signature, as claimed, with the notch filter used for feedback suppression in Salvetti.

Appeal Br. 9–10.

We are not persuaded by Appellant’s argument. Appellant is arguing against Salvetti individually, not in the Examiner’s proposed combination with Williams. “Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.” *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Here, the Examiner relies on Williams for teaching both a “test notch” and a “notch filter.” Ans. 18. Salvetti discloses that “[i]n one embodiment, a notch filter is adjusted which is used to reduce acoustic feedback within the frequency region of the notch” but that “[o]ther attenuation methods include . . . *shifting* the phase and/or *frequency* of the output.” Salvetti ¶ 22 (emphasis added). Based on this disclosure, the Examiner determines “[t]his means that to test whether the candidate frequency is the genuine feedback, any one of [the disclosed] mechanisms, such as a notch filter, or shifting the

phase and/or frequency, taught in Salvetti could be used to determine whether the magnitude at the candidate frequency has reduced after the testing mechanism has been applied.” Ans. 18. Therefore, contrary to Appellant’s argument, the Examiner’s proposed combination uses Salvetti’s frequency shifting for Williams’ test notch (i.e., the claimed signature).

Accordingly, we sustain the Examiner’s § 103 rejection of claim 3.

§ 112(a): Claims 18–20

The § 112(a) issue is whether the Specification provides sufficient written description support for performing certain actions on “the slope” rather than on “a change in the slope.” In particular, independent claim 18 recites (with emphasis added):

recognize a change in a slope of the at least one peak in response to the notch filter;

compare *the slope* to a slope threshold; and

adjust a gain of the notch filter in response to the slope threshold exceeding *the slope*.

Unlike claim 18’s comparison to slope, however, the “Detailed Description” of the Specification discloses “the processor 106 may determine whether the change in slope exceeds a slope threshold.” Spec. ¶ 67 (emphasis added). According to the Examiner, “Appellant fails to explain the discrepancy between the disclosure and the claimed limitation.” Ans. 12.

Appellant argues that claim 18 was “part of the original disclosure and thus adequate support exists to the recitation in claim 18.” Reply Br. 2; Appeal Br. 3.

Appellant further argues the Specification’s discussion of later adjusting the gain to find “the optimal gain” (block 930 in Figure 9) rather

than an initial identification of the peak (block 920) provides written description support for claim 18. Appeal Br. 3 (citing Spec. ¶¶ 37, 67). The Examiner responds by determining that (A) block 930 must be triggered by block 920, yet (B) under Appellant’s interpretation of how block 930 provides written description support, the condition for block 920 would not be met. Ans. 12–13 (“when the slope is less than the slope threshold, it means that the notch filter does not reduce the peak” and “would not be treated as feedback peak”). “Therefore, element 930 identified by appellant also does not provide support for the claimed imitation.” *Id.* at 13. Appellant fails to adequately address this determination by the Examiner.

The Federal Circuit has held that “[o]riginal claims are part of the specification and in many cases will satisfy the written description requirement.” *Crown Packaging Tech., Inc. v. Ball Metal Beverage Container Corp.*, 635 F.3d 1373, 1380 (Fed. Cir. 2011). However, language appearing in an original claim does not guarantee sufficient written description support. “If a purported description of an invention does not meet the requirements of the statute, the fact that it appears as an original claim or in the specification does not save it. A claim does not become more descriptive by its repetition, or its longevity.” *Enzo Biochem, Inc. v. Gen-Probe Inc.*, 323 F.3d 956, 968–69 (Fed. Cir. 2002); *see also ScriptPro, LLC v. Innovation Assocs., Inc.*, 762 F.3d 1355, 1361 (Fed. Cir. 2014) (“When a specification is ambiguous about which of several features are stand-alone inventions, the original claims can help resolve the ambiguity, though even original claims may be insufficient as descriptions or be insufficiently supported by the rest of the specification.”).

The present case is an example of an original claim not providing sufficient written description support. This is not an instance of a specification disclosing an alternative embodiment. *Crown Packaging*, 635 F.3d at 1380–81. Rather, a person of ordinary skill in the art would have understood the omission of “the change in” in claim 18 to be a drafting error.

Here, independent claim 18 compares “*the slope* to a slope threshold” but the detailed description of the invention compares “the change in slope” to the same threshold. Spec. ¶ 67 (emphasis added). The other claims perform substantially similar actions on a “change in” slope rather than on the slope itself. *E.g.*, claim 5 (“the at least one peak is identified as a feedback peak in response to the change in slope exceeding a slope threshold”), claim 1 (“determine a response” that “includes a change in slope of a magnitude of the peak”; “identify the at least one peak as a feedback peak in response to the change in slope”). In claim 18 itself, the prior step recites to “recognize a change in a slope,” yet the rest of the claim does not refer to the “change” again.

For written description, “the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). Given how the language of claim 18 conflicts with the other claims, the rest of the Specification, and itself—and given the Examiner’s determination that Appellant’s interpretation would never be triggered—a person of ordinary skill in the art would have understood the omission of “the change in” in claim 18 to be a drafting error, not an alternative invention.

Accordingly, we sustain the Examiner's § 112(a) rejection of independent claim 18, and its dependent claims 19 and 20, which Appellant does not argue separately. *See* Appeal Br. 3; 37 C.F.R. § 41.37(c)(1)(iv).

OUTCOME

The following table summarizes the outcome of each rejection:

| Claims Rejected | 35 U.S.C. § | Reference(s) / Basis | Affirmed | Reversed |
|------------------------|--------------------|-----------------------------|-----------------|-----------------|
| 1-3, 5, 18-20 | 102 | Troxel | 1-3, 5, 18-20 | |
| 1, 2, 5, 18-20 | 102 | Williams | 1, 2, 5, 18-20 | |
| 6, 7 | 103 | Williams | 6, 7 | |
| 6, 7 | 103 | Troxel, Williams | 6, 7 | |
| 3 | 103 | Williams, Salvetti | 3 | |
| 18-20 | 112(a) | Written description | 18-20 | |
| OVERALL | | | 1-3, 5-7, 18-20 | |

TIME TO RESPOND

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.36(a)(1)(iv).

AFFIRMED