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HONEYWELL/S&S
Patent Services
115 Tabor Road
P.O.Box 377
MORRIS PLAINS, NJ 07950

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* JOHN STREHLOW and DOUG MACGUGAN

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Appeal 2015-005451
Application 13/019,913
Technology Center 2800

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Before ROMULO H. DELMENDO, JULIA HEANEY, and BRIAN D. RANGE, *Administrative Patent Judges*.

HEANEY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants[1] seek our review pursuant to 35 U.S.C. § 134(a) of a decision of the Examiner to reject claims 1–4, 6, and 13–15[2] of Application 13/019,913. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

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[1] Appellants identify the real party in interest as Honeywell International Inc. App. Br. 3.

[2] Claim 5 is also pending; the Examiner indicated in the Final Rejection that claim 5 would be allowable if rewritten in independent form. Final Act. 16. Claims 7–12 are withdrawn from consideration and not the subject of this appeal. App. Br. 3.

## BACKGROUND

The subject matter on appeal relates to drive and sense mechanisms for a double-ended tuning fork, such as may be utilized in a vibrating-beam accelerometer, a pressure sensor, or other devices where driven resonant tines are desired. Specification ("Spec.") ¶¶ 2–3. A drive component, comprising a piezoelectric trace and an electrical trace, is attached to at least one of the tines of the fork and offset laterally from a longitudinal bending neutral axis of the tine. Claims Appx., claim 1.

Claim 1 is illustrative of the subject matter:

> 1. A double-ended tuning fork (DETF) device comprising:
>
> a first base;
>
> a second base;
>
> first and second tines attached to the first base at a first end and to the second base at a second end; and
>
> a drive component attached to at least one surface of at least one of the tines and offset laterally from a longitudinal bending neutral axis of the at least one tine, wherein the drive component comprises:
>
> at least one piezoelectric trace; and
>
> at least one electrical trace.

App. Br. 16. Claim 6, which depends from claim 1, additionally recites "a sense component attached to at least one surface of the second tine and offset laterally from a longitudinal bending neutral axis of the second tine . . . ." *Id.* at 17.

## THE REJECTIONS

1. Claim 13 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for improper antecedent basis.

2. Claims 1, 3, 4, and 6 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Burns '273[3] and Burns '509.[4]
3. Claim 2 is rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Burns '273, Burns '509 and Honda.[5]
4. Claims 13–15 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Burns '273, Burns '509 and Featonby.[6]

## DISCUSSION

*Rejection 1*

Appellants do not argue Rejection 1. App. Br. 3. Accordingly, we summarily affirm the rejection of claim 13 on the ground of indefiniteness under 35 U.S.C. § 112, second paragraph. *See Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) ("If an appellant fails to present arguments on a particular issue—or more broadly, on a particular rejection—the Board will not, as a general matter, unilaterally review those uncontested aspects of the rejection.").

*Rejection 2*

Appellants argue claims 1, 3, and 4 as a group, and present separate argument for claim 6. Therefore we limit our discussion to claims 1 and 6. We sustain the rejection for the reasons given by the Examiner in the Final

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[3] Burns US 2006/0196273 A1; Sept 7, 2006 ("Burns '273")

[4] Burns US 7,443,509; Oct. 28, 2008 ("Burns '509")

[5] Honda et al. US 2010/0000322; Jan. 7, 2010 ("Honda")

[6] Featonby et al. US 2002/0152812 A1; Oct. 24, 2002 ("Featonby")

Action and Answer, with the following discussion added primarily for emphasis.

The Examiner finds Burns '273 discloses an optically coupled resonator including all limitations of claim 1 except for a drive component comprising at least one piezoelectric trace. Final Act. 6–7, citing Burns '273 Figure 13b, ¶ 75. The Examiner finds that Burns '509 discloses an optically coupled resonator similar to Burns '273's resonator, and which teaches that a piezoelectric driver may be used to drive the resonator mechanically into resonance so that optical methods can be used to determine the resonant frequencies. Final Act. 7, citing Burns '509 13:1–2. The Examiner determines it would have been obvious to a person of ordinary skill in the art to modify Burns '273's device so that it further includes at least one piezoelectric trace as taught by Burns '509 (citing Burns '509 12:47–13:7), in order to provide an improved excitation means for resonant frequencies in optically coupled tuning fork resonator devices, and further determines that a person of ordinary skill would have combined the known elements of Burns '273 and Burns '509 with no change in their respective functions, to yield the claimed invention with predictable results. Final Act. 7, (citing Burns '509 12:47–13:7)

Appellants argue that the piezoelectric drive disclosed by Burns '509 does not necessarily include "at least one piezoelectric trace" in the configuration of the drive component of claim 1. App. Br. 6. Appellants argue that a piezoelectric trace "is not a trivial feature" but offer no supporting evidence other than a sentence in the Specification referring to a need for "proper patterning of the piezoelectric material . . . ." *Id.* The Examiner responds that a person of ordinary skill would have understood that a piezoelectric driver would inherently require an electrical trace to

generate an electrical field within the piezoelectric driver, and would have placed the piezoelectric trace "in a manner similar to the electrical trace, i.e., attached to at least one surface of at least one of the tines and offset laterally from a longitudinal bending neutral axis of the at least one tine." Ans. 4. Having considered Appellants' argument, we conclude that in the absence of evidence that inclusion of a piezoelectric trace was uniquely challenging or difficult for a person of ordinary skill in the art, it was reasonable for the Examiner to determine it would have been obvious to include one in the drive component as recited in claim 1, particularly because both Burns references explicitly disclose that the drive component is laterally offset. *Id.*; *see also KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 416–19 (2007) (holding obvious the inclusion of a known device because there was no evidence presented that the inclusion of the known device in the combined device was "uniquely challenging or difficult for one of ordinary skill in the art" or "represented an unobvious step over the prior art").

Appellants further argue that Burns '509 describes a photodiode **24** attached to a semiconductor substrate **20**, rather than the resonator **10**, such that the photodiode could not reasonably be characterized as "a drive component attached to at least one surface of at least one of the tines," as recited in claim 1. App. Br. 7. This argument is not persuasive of reversible error. As the Examiner correctly finds, Burns '509 discloses that a piezoelectric driver may be used to mechanically drive one or more resonators into resonance. Ans. 4, citing Burns '509 13:1–2. A person of ordinary skill in the art would understand that a resonator mechanically driving a tine into resonance would necessarily be attached to a surface of the tine. *See KSR*, 550 U.S. at 418 ("the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the

challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ").

Appellants further argue that a person of ordinary skill in the art would have consciously avoided modifying the optically coupled resonator of Burns '273 to include the piezoelectric driver of Burns '509, because the modification would have changed a principle of operation of Burns '273, which relies on optics to drive the resonator. App. Br. 8. Appellants rely on the disclosure in Burns '273 of the advantage of an optically driven resonator in high-noise environments. *Id.*, citing Burns ¶ 12. Appellants' argument is not persuasive of reversible error. Undisputedly, Burns '509 itself contains the same statements about the advantage of optically driven resonators in its disclosure (the references have a common inventor and relate back to the same provisional applications), yet Burns '509 also suggests the use of a piezoelectric driver. Ans. 10, citing Burns '509 12:47–13:7. Further, tradeoffs regarding features, costs, manufacturability, or the like, do not necessarily prevent a proposed combination. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) ("a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine."). Accordingly, we affirm the rejection as to claims 1, 3, and 4.

As noted above, claim 6 specifies that the device of claim 1 further includes a sense component attached to at least one surface of the second tine and offset laterally from a longitudinal bending neutral axis of the second tine, wherein the sense component comprises at least one piezoelectric trace and at least one electrical trace. Appellants make several of the same arguments against the rejection of claim 6, concerning the sense component, as they do for claims 1 and 3, discussed above. We find those

arguments unpersuasive for the same reasons discussed above. In addition, Appellants argue that a person of ordinary skill in the art would have consciously avoided modifying Burns '273 to include a piezoelectric detection scheme because Burns '273 discloses that vibrations of resonator **10** are sensed with an optical sensor. App. Br. 11, citing Burns '273 ¶ 51. As the Examiner correctly finds, however, including a piezoelectric trace as part of the drive component and also as part of the sense component of Burns '273's device does not require both to be used simultaneously—either the resonator can be mechanically driven with a piezoelectric driver when the frequencies are detected optically, or the resonator can be optically driven when the resonator frequencies are detected using a piezoelectric sensor device. Ans. 12. Accordingly, we affirm Rejection 2.

*Rejections 3–4*

Appellants' arguments against the rejections of claims 2 and 13–15 essentially rely on their arguments as to the combination of the Burns references in response to Rejection 1, which are not persuasive for the reasons discussed above. Appellants further argue that the additional references, Honda and Featonby, fail to disclose or suggest the elements recited in the claims, but those arguments attack the references individually and are not persuasive arguments against an obviousness rejection. *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Accordingly, we affirm Rejections 3 and 4.

DECISION

We affirm the rejections of claims 1–4, 6, and 13–15.

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

AFFIRMED