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3501 Quadrangle Blvd Ste 230  
Orlando, FL 32817

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AMICK, JACOB M

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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* CHING-PANG LEE, DANNING YOU,  
REINHARD SCHILP, and CHANDER PRAKASH

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Appeal 2014-009585  
Application 12/832,116  
Technology Center 3700

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Before JENNIFER D. BAHR, LINDA E. HORNER, and  
BRANDON J. WARNER, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Ching-Pang Lee et al. (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

### THE CLAIMED SUBJECT MATTER

Claim 1, reproduced below, is illustrative of the claimed subject matter.

1. A damping resonator comprising:

a resonance chamber formed by an outer wall with coolant inlet holes, an inner wall with acoustic holes, and side walls spanning between the inner and outer walls;

a depression in the outer wall comprising a bottom portion that is closer to the inner wall than is a first peak portion of the outer wall;

the coolant inlet holes distributed along the bottom portion of the depression;

wherein the coolant inlet holes are close enough to the inner wall for effective impingement cooling thereof, and are located to direct coolant flows toward impingement locations on the inner wall apart from the acoustic holes;

wherein the first peak portion of the outer wall is disposed at a first distance from the inner wall, and the bottom portion of the depression is disposed at a second distance from the inner wall that is less than 60% of the first distance.

### REJECTION

Claims 1–20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Mandai (US 2004/0060295 A1, pub. Apr. 1, 2004), with further reference to Ikeda (US 7,089,741 B2, iss. Aug. 15, 2006), Auxier (US 4,773,593, iss. Sept. 27, 1988), Johnson (US 2011/0138812 A1, pub. June 16, 2011) (hereinafter “Johnson ’812”), Jablonka (US 4,555,433, iss. Nov. 26, 1985), and Johnson (US 2011/0179795 A1, pub. July 28, 2011) (hereinafter “Johnson ’795”).<sup>1</sup>

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<sup>1</sup> The Examiner’s rejection states that it is based on Mandai “alone.” Final Act. 5. However, in the detailed explanation of the rejection, the Examiner

## DISCUSSION

The Examiner finds that Mandai discloses a damping resonator including, in relevant part, “a depression in the outer wall comprising a bottom portion that is closer to the inner wall than is a first peak portion of the outer wall.” Final Act. 6 (citing Mandai, Fig. 6B, para. 30). The Examiner acknowledges that “Mandai does not positively disclose coolant inlet holes distributed along the bottom portion of the depression.” *Id.* Nevertheless, the Examiner determines:

[A]s the purpose of the cooling holes of Mandai is to provide cooling to the inner wall surface (Paragraph 0027), it would have been obvious to one of ordinary skill in the art at the time the invention was made to configure the resonator of Mandai such that the inner wall surface received sufficient cooling at all locations (including those portions located beneath said depression or near the walls) by arranging cooling holes as appropriate (by distributing said holes in said depression . . . ).

*Id.* at 7. The Examiner also finds that Ikeda and Auxier provide evidence that “it is known in the art to configure . . . damping resonators with various cooling hole arrangements,” and that Ikeda discloses “cooling holes 22 . . . provided in depressed surface 18.” *Id.* (citing Ikeda, Figs. 3, 6A–6C).

Appellants argue that the Examiner’s articulated reason for the proposed modification of Mandai lacks rational underpinnings because “the folds of the bellows of Mandai are not suitable for . . . cooling holes,” and “[b]ecause it would be irrational to modify a device to achieve an objective when that objective is already achieved in the device.” Appeal Br. 4. For

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refers to Ikeda, Auxier, Johnson ’812, Jablonka, and Johnson ’795. *Id.* at 7, 8, 9.

the reasons that follow, we agree with Appellants that the Examiner's proposed modification lacks rational underpinnings.

Mandai discloses a damping resonator having a depression in the outer wall in the form of “a bellows portion[] for reducing thermal stress.” Mandai, para. 29. With reference to Figure 6B, Mandai discloses that “liner segment **346** has a lateral bellows portion **346c**[] provided in the peripheral wall portion **346b**” that “allows the liner segment **346** to deform in the direction of arrow ‘a’ and parallel to the side wall of the combustor tail tube **12**.” *Id.*, para. 30. In this regard, Appellants correctly observe that Mandai's “folds (246c, 346c) are for thermal expansion and contraction . . . , so they flex during thermal cycles.” Appeal Br. 4. As a result, placing “[i]mpingement holes along the bottom of such folds would form a perforation line coincident with the flex line” of bellows portion 346c and would present an increased potential for “structural fatigue weakness along the line.” *Id.* at 4–5. Thus, a person of ordinary skill in the art would not have been prompted to modify Mandai's damping resonator to include cooling holes along the bottom of the bellows portion as proposed by the Examiner.

Mandai does not specifically disclose air cooling orifices in liner segment 346 of the embodiment of Figure 6B. *See* Mandai, paras. 29–30; Fig. 6B. However, in the embodiment of Figure 4, Mandai does disclose air cooling orifices 24a in the peripheral wall portion of acoustic liner 24, which is like liner segment 346, except that it is not provided with a lateral bellows portion. *See id.*, Fig. 4; para. 27. In discussing the embodiment of Figure 4, Mandai discloses that “[t]he . . . disposition of air cooling orifices **24a** allows the air to flow into the acoustic buffer **25** . . . as impingement[] jet[s]

relative to the wall of the combustor tail tube **12** and *to effectively cool* the wall portions between the adjoining orifices **12b** of the combustor tail tube **12.**” *Id.*, para. 27 (emphasis added). We agree with Appellants that Mandai’s disclosure regarding cooling orifices evidences that “Mandai is clearly aware of the need for sufficient cooling.” Appeal Br. 4. Thus, a person having ordinary skill in the art would have understood from this disclosure that cooling orifices in the peripheral wall portion of Mandai’s liner segments are effective in sufficiently cooling the wall portions of the combustor tail tube. The Examiner does not explain, nor do we discern, a reason why modifying Mandai’s bellows portion 346c to include cooling holes would be necessary in order for the inner wall surface to “receive[] sufficient cooling,” as the Examiner states. *See* Final Act. 7.

For the above reasons, the Examiner fails to articulate adequate reasoning supported by rational underpinnings as to why a person of ordinary in the art would have been prompted to modify the damping resonator of Mandai to include cooling holes at the bottom of the bellows portion. The Examiner does not rely on Ikeda, Auxier, Johnson ’812, Jablonka, or Johnson ’795 for any teaching, nor articulate any additional findings or reasoning, that would remedy the aforementioned deficiency in the proposed modification to Mandai.<sup>2</sup> Accordingly, we do not sustain the Examiner’s rejection of claims 1–20 under 35 U.S.C. § 103(a).

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<sup>2</sup> To the extent that Ikeda and Auxier provide evidence that “it is known in the art to configure . . . damping resonators with various cooling hole arrangements,” or that Ikeda discloses “cooling holes 22 . . . provided in depressed surface 18” (Final Act. 7), such evidence alone is not sufficient to establish a reason why a person of ordinary skill in the art would have been prompted to arrange cooling holes along the bottom of Mandai’s bellows portion as proposed by the Examiner.

Appeal 2014-009585  
Application 12/832,116

DECISION

The Examiner's decision rejecting claims 1–20 is reversed.

REVERSED