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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MICHAEL F. TARAS, BRUCE J. POPLAWSKI, ARINDOM JOARDAR, JACK LEON ESFORMES, TOBIAS H. SIENEL, and MEL WOLDESEMAYAT

Appeal 2019-006833
Application 14/890,236
Technology Center 3700

Before PHILLIP J. KAUFFMAN, TARA L. HUTCHINGS, and ALYSSA A. FINAMORE, *Administrative Patent Judges*.

KAUFFMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–11 and 16. Final Act. 2–16; Ans. 3. Although claims 12–15 and 18–20 remain pending in the application, the Examiner has withdrawn all pending rejections entered against those claims. Ans. 3. Claim 17 is cancelled. Appeal Br. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

The claims relate generally to multiple tube bank heat exchangers comprising first and second manifold assemblies connected by means of tube bank assemblies. Spec. ¶¶ 1–4, 17–18, Figs. 1–2. Claim 1 is the only independent claim subject to a pending rejection in this appeal. Ans. 3. We reproduce claim 1 below with emphasis on the limitation at issue.

> 1. A method for manufacturing a manifold assembly with internal fluid communication between a first manifold defining a first fluid chamber and a second manifold defining a second fluid chamber of said manifold assembly, the first manifold and the second manifold joined in parallel relationship along a longitudinally extending interface between a wall of the first manifold and a wall of the second manifold, said method comprising:
>
> forming a first access port in a wall of one of the first manifold and the second manifold diametrically opposite the interface;
>
> forming a first fluid communication port extending through a wall of the first manifold and a wall of the second manifold at the interface, said first fluid communication port defining a first fluid passage between the first and second fluid chambers; and
>
> sealingly plugging the access port;

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Carrier Corporation. Appeal Br. 1.

wherein each of the first and second manifolds has an internal diameter and the first fluid communication port has a diameter sized such that a ratio of the manifold internal diameter to the communication port diameter has a value in the range from 3 to 13 for each of the first and second manifolds.

REJECTIONS

I. Claims 1, 2, 10, 11, and 16 are rejected under 35 U.S.C. § 103 as unpatentable over Iino[2] and Locke.[3] Final Act. 2–8.

II. Claims 3–6 are rejected under 35 U.S.C. § 103 as unpatentable over Iino, Locke,[4] and Jenkins.[5] Final Act. 8–14.

IV. Claims 7–9 are rejected under 35 U.S.C. § 103 as unpatentable over Iino, Locke, and Beamer.[6] Final Act. 14–16.

[2] Iino (EP 1 657 513 B1, issued Jan. 2, 2008).
[3] Locke (US 2011/0288512 A1, published Nov. 24, 2011).
[4] In the Final Office Action, the Examiner concludes that claims 3–6 are unpatentable over "Iino as applied to claim 1, and further in view of Jenkins." Final Act. 8. This is inconsistent with the Examiner's rejection of claims 1, 2, 10, 11, and 16 over "Iino [as] evidenced by Locke" (Final Act. 2) on the basis that the Examiner uses Locke as evidence that the ratio of the diameter of fluid passageway 6 or 7 to the diameter of communication path 14 is a "result-effective variable" (Ans. 5). We caption the rejection of claims 3–6 as being over Iino, Locke, and Jenkins, rather than over Iino and Jenkins, so as to identify all reference whose teachings are relied on in rejecting those claims.
[5] Jenkins (US 2013/0220562 A1, published Aug. 20, 2013).
[6] Beamer (US 2008/0023184 A1, published Jan. 31, 2008).

ANALYSIS

Rejection I

The dispositive issue in this case relates to the ratio range between the internal diameter of the first and second manifold (the manifolds have the same diameter) and the communication port diameter. Specifically, claim 1 recites that the ratio "has a value in the range from 3 to 13." To help illustrate this ratio, we reproduce Figure 4C below.

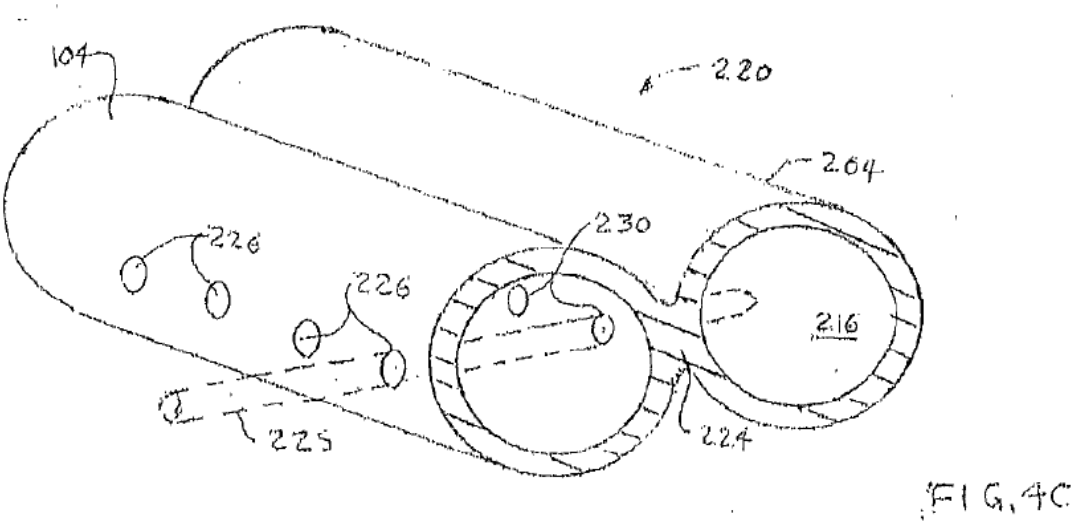

Figure 4C is a perspective view of a dual-barrel embodiment of an integral manifold assembly. Spec. ¶ 14. The embodiment includes first manifold 104, second manifold 204, and fluid communication port 230. *Id*. at ¶¶ 25 26.

The Examiner concludes that the subject matter of independent claim 1 would have been obvious from the combined teachings of Iino and Locke. Final Act. 2–5. Regarding the ratio range, the Examiner acknowledges that Iino does not disclose the ratio between the manifold internal diameter (fluid passages 6, 7 of header 2) and the communication

port (communication path 14).[7] Final Act. 3; Iino ¶¶ 17, 18, Fig. 3. We reproduce Figure 3 of Iino below.

FIG. 3

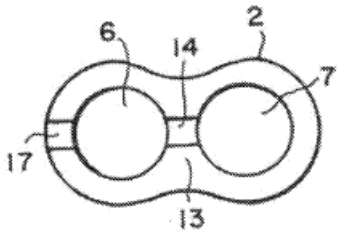

Figure 3 of Iino is a cross-sectional view of a header, showing an example method of forming a communication path in the header. Iino ¶¶ 17, 18, Fig. 3.

The Examiner determines that the claimed ratio would have been understood to be result-effective; and concludes that one of ordinary skill in the art would have discovered the optimum or workable range of the ratio by routine experimentation. Final Act. 3–4. Specifically, the Examiner contends that the ratio is a variable that achieves the recognized result of increasing or decreasing the velocity of flow as evidence by Locke. *Id*. (citing Locke ¶ 24). For the reasons that follow, we disagree with the Examiner's determination.

The Federal Circuit has held that discovery of an optimum value of a variable in a known process is normally obvious. *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). Here, the Examiner tells us that a person of ordinary skill would have varied the ratio of the diameter of the manifolds to the diameter of the communication port to discover the claimed range because changing the ratio increases or decreases the velocity of flow. Yet, as the

[7] Parenthetical nomenclature is Iino's.

Examiner acknowledges, Iino does not disclose any value for the ratio of diameters (Final Act. 3), and, more importantly, Iino fails to disclose using the ratio of diameters to effect velocity. *See* Appeal Br. 7; *In re Antonie*, 559 F.2d 618, 620 (CCPA 1977) (finding an exception to the rule of *In re Aller* that the discovery of an optimum value of a variable in a known process is normally obvious, in the case where a parameter optimized was not recognized to be a result-effective variable). Consequently, even if we agree with the Examiner that there is some relationship between velocity of flow and a ratio of diameters, the Examiner has not demonstrated sufficiently that it was known to use the ratio of diameters to manipulate velocity.

Because the Examiner has not articulated persuasive reasoning with sufficient factual underpinning to support the conclusion that the subject matter of claim 1 would have been obvious, we do not sustain the rejection of independent claim 1 or dependent claims 2, 10, 11, and 16 under 35 U.S.C. § 103.

Rejection II

Claims 3–6 depend from independent claim 1. The Examiner concludes that the subject matter of claims 3–6 would have been obvious from the combined teachings of Iino, Locke, and Jenkins. Final Act 8–14. The Examiner relies on Iino and Locke for the claimed ratio in the same manner as the first rejection, and consequently, we do not sustain this rejection.

Rejection III

Claims 7–9 depend from independent claim 1. The Examiner concludes that the subject matter of claims 7–9 would have been obvious from the combined teachings of Iino, Locke, and Beamer. Final Act. 14–16. The Examiner relies on Iino and Locke for the claimed ratio in the same manner as the first rejection, and consequently, we do not sustain this rejection.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference/Basis	Affirmed	Reversed
1, 2, 10, 11, 16	103	Iino, Locke		1, 2, 10, 11, 16
3–6	103	Iino, Locke, Jenkins		3–6
7–9	103	Iino, Locke, Beamer		7–9
Overall Outcome				1–11, 16

REVERSED