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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/426,689	03/06/2015	David L. Perkins	7523.598US01	5588

27683 7590 11/25/2019

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ART UNIT	PAPER NUMBER
2861	

NOTIFICATION DATE	DELIVERY MODE
11/25/2019	ELECTRONIC

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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 DAVID L. PERKINS and CHRISTOPHER MICHAEL JONES

_____

Appeal 2019-001919
Application 14/426,689
Technology Center 2800

_____

BEFORE LILAN REN, SHELDON M. MCGEE, and JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] requests our review under 35 U.S.C. § 134(a) of the Examiner's decision to reject claims 1–20.[2] We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

We REVERSE.

[1] We use the word "Appellant" to refer to the "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies Halliburton Energy Services, Inc. as the real party in interest. Appeal Brief filed June 28, 2018 ("Appeal Br.") at 2.

[2] Non-Final Office Action entered February 8, 2018 ("Office Act.") at 1.

CLAIMED SUBJECT MATTER

Appellant claims a microfluidic optical computing device (independent claim 1), and an optical computing device (independent claim 19). Claims 1 and 19 illustrate the subject matter on appeal and are reproduced below with contested subject matter italicized:

> 1. A microfluidic optical computing device, comprising:
> a device substrate having a channel therein to receive a fluid sample; and
> a multivariate optical calculation device positioned to perform a regression calculation on light emanating from the fluid sample within the channel to thereby produce a signal which corresponds to at least one property of the fluid sample, wherein *the multivariate optical calculation device is integrated into the device substrate*.
>
> 19. An optical computing device, comprising:
> a device substrate having a matrix of channels therein to receive a fluid samples; and
> a multivariate optical calculation device positioned to perform a regression calculation on light emanating from the fluid samples within the channels to thereby produce signals which correspond to at least one property of the fluid samples, wherein *the multivariate optical calculation device is integrated into the device substrate*.

Appeal Br. 11, 14–15 (Claims Appendix) (emphasis added).

REJECTION

The Examiner maintains the rejection of claims 1–20 under 35 U.S.C. § 103 as unpatentable over Tunheim et al. (US 2013/0031964 Al, published February 7, 2013) in the Examiner's Answer entered November 5, 2018

("Ans.").[3]

FACTUAL FINDINGS AND ANALYSIS

Upon consideration of the evidence relied upon in this appeal and each of Appellant's contentions, we reverse the Examiner's rejection of claims 1–20 under 35 U.S.C. § 103 for the reasons set forth in the Appeal Brief and below.

As set forth above, independent claims 1 and 19 each require the claimed optical computing device to include a multivariate optical calculation device integrated into a device substrate.

The Examiner finds that Tunheim discloses an optical computing device comprising an integrated computational element (ICE) (multivariate optical calculation device) that is integrated into the optical computing device. Office Act. 4–5 (citing Tunheim Abstr., ¶ 54). The Examiner finds that Tunheim discloses integrated computational element (ICE) 100 (multivariate optical calculation device) including layer 108, which "is generally exposed to the environment of the device or installation." Office Act. 4–5 (citing Tunheim ¶¶ 33[4], 54; Fig. 1). Based on these disclosures, the Examiner determines that the integrated computational element (ICE)

[3] Although the Examiner lists Tunheim as the only applied prior art reference in the heading for the rejection of claims 1–20 under 35 U.S.C. § 103, the Examiner appears to rely on Palmer et al. (US 2012/0241643 A1, published September 27, 2012) in the body of the rejection when addressing claim 19. Office Act. 17–18. We need not discuss Palmer for disposition of this appeal, however, for reasons discussed below.

[4] Although the Examiner cites paragraph 33 of Tunheim, the relied-upon disclosure is actually in paragraph 35.

(multivariate optical calculation device) disclosed in Tunheim "is integrated into the device substrate." Office Act. 4–5.[5]

As Appellant argues (Appeal Br. 7), however, the relied-upon disclosures in Tunheim do not teach, and would not have suggested, a multivariate optical calculation device integrated into a device substrate. Rather, Tunheim discloses an optical computing device comprising integrated computational element 100 (ICE) (multivariate optical calculation device) that includes alternating layers 102, 104 consisting of materials whose index of refraction is high and low, respectively, and layer 108 "that is generally exposed to the environment of the device or installation." Tunheim ¶¶ 34, 35; Fig. 1. The Examiner does not identify any disclosure in Tunheim indicating that the optical computing device described in the reference includes a device substrate. Thus, although Tunheim discloses that layer 108 of integrated computational element 100 (ICE) (multivariate optical calculation device) is exposed to the environment of the optical computing device or installation, this disclosure does not indicate, nor would it have suggested, that integrated computational element 100 (ICE) (multivariate optical calculation device) is integrated into a device substrate, due to the lack of any disclosure in Tunheim of such a substrate in Tunheim's optical computing device.

Although the Examiner also finds that paragraph 54 of Tunheim discloses an integrated computational element (ICE) (multivariate optical calculation device) that is integrated into an optical computing device, the

[5] This determination appears at odds with the Examiner's acknowledgement that Tunheim does not disclose a substrate, but that "attaching or manufacturing the [ICE] into a/the substrate would be deemed to be obvious to one of ordinary skill." Office Act. 5.

Examiner does not identify any disclosure in this paragraph indicating that the optical computing device includes a device substrate. In fact, the Examiner expressly acknowledges that Tunheim does not explicitly disclose such a substrate. Office Act. 5. Consequently, any disclosure in paragraph 54 describing integrating an integrated computational element (ICE) (multivariate optical calculation device) into an optical computing device does not support the Examiner's determination that the integrated computational element (ICE) (multivariate optical calculation device) is integrated into a device substrate.

In response to Appellant's arguments, the Examiner finds in the Answer that "Tunheim discloses, as seen in figure 3, a channel in a substrate (flow path 304) and a multivariate optical calculation device positioned to perform regression calculation on light emanating from the fluid sample within the channel (processor 334). That is what claim 1 requires and Tunheim meets the claimed limitation." Ans. 6. These disclosures in Tunheim, however, do not teach, and would not have suggested, a multivariate optical calculation device integrated into a device substrate.

Tunheim discloses that Figure 3 illustrates system 300 for monitoring fluid 302 contained, or otherwise flowing within, flow path 304, which Tunheim discloses "may be a flow line or a pipeline . . . or any other type of flow path." Tunheim ¶ 52; *see also* Tunheim ¶ 23 (defining "flow path" as "a route through which a fluid is capable of being transported between two points."). Tunheim discloses that system 300 comprises optical computing device 306 within which is arrange integrated computational element (ICE) 320 (multivariate optical calculation device), and Tunheim explains that electromagnetic radiation 310 impinges upon and optically interacts with

fluid 302 to generate optically interacted radiation 318, which is directed to integrated computational element (ICE) 320 (multivariate optical calculation device). Tunheim ¶¶ 57, 58; Fig. 3.

We find no disclosure in Tunheim indicating that system 306 includes a device substrate. And contrary to the Examiner's assertions, Tunheim explicitly indicates that flow path 304 may be a flow line or a pipeline, rather than a channel in a substrate. Tunheim ¶ 52. Consequently, Figure 3 of Tunheim does not show that integrated computational element (ICE) 320 (multivariate optical calculation device) is integrated into a device substrate as the Examiner asserts. Ans. 6.

The Examiner also asserts in the Answer that the "device in figure 3 has components, which cannot be just floating in the air, thus they are somehow mounted or constructed. This ***could*** be accomplished on a single substrate or attached to a substrate." Ans. 7 (emphasis added). This unsupported assertion, however, constitutes mere speculation as to the existence of a substrate in the device of Tunheim's Figure 3. *In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967) ("The Patent Office . . . may not . . . resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis."); *In re Sporck*, 301 F.2d 686, 690 (CCPA 1962).

Consequently, on the record before us, the Examiner does not provide a sufficient factual basis to establish that Tunheim discloses, or would have suggested, an optical computing device including a multivariate optical calculation device integrated into a device substrate, as required by

independent claims 1 and 19.[6] We, accordingly, do not sustain the Examiner's rejection of claims 1 and 19, and claims 2–18 and 20, which each depend from either claim 1 or 19, under 35 U.S.C. § 103.

CONCLUSION

Claims	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–20	103	Tunheim		1–20

REVERSED

[6] In the rejection of claim 19, the Examiner does not rely on Palmer for any disclosure that remedies this deficiency of Tunheim. Office Act. 17–18.