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CARLSON, GASKEY & OLDS, P.C. 400 WEST MAPLE ROAD SUITE 350 BIRMINGHAM, MI 48009			SLIFKA, SARAH A	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANDREW SMELTZ, ROBERT MASON DARLING,
MICHAEL L. PERRY, and ZHONGFEN DING

Appeal 2019-006416
Application 14/768,622
Technology Center 1700

Before N. WHITNEY WILSON, JULIA HEANEY and
MERRELL C. CASHION, JR., *Administrative Patent Judges*.

WILSON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner's December 17, 2018 decision finally rejecting claims 1–7 and 19–23 (“Final Act.”). We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We reverse.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies United Technologies Corporation, as the real party in interest (Appeal Br. 1).

CLAIMED SUBJECT MATTER

Appellant's disclosure relates to a flow battery which includes a cell that has first and second flow fields spaced apart from each other and an electrolyte separator layer (Abstract). A supply/storage system is external to the cell and includes first and second vessels fluidly connected with the first and second flow fields, and first and second pumps configured to move first and second fluid electrolytes between the vessels and the first and second flow fields (*id.*). The flow fields each have an electrochemically active zone that has a total open volume that is a function of at least one of a power parameter of the flow battery, a time parameter of the pumps and a concentration parameter of the fluid electrolytes (*id.*).

Details of the claimed invention are set forth in representative claim 1, which is reproduced below from the Claims Appendix to the Appeal Brief:

1. A flow battery comprising:

at least one cell having first and second flow fields spaced apart from each other, and an electrolyte separator layer arranged there between; and

a supply/storage system external of the at least one cell, the supply/storage system including first and second vessels fluidly connected with the respective first and second flow fields, and first and second pumps configured to selectively move first and second fluid electrolytes between the first and second vessels and the first and second flow fields,

wherein the first and second flow fields each have an electrochemically active zone configured to receive flow of the respective first and second fluid electrolytes, the electrochemically active zone having a total open volume that is a function of at least one of a power parameter of the flow battery, a time parameter of the respective first and second pumps and a concentration parameter of the respective first and second fluid electrolytes,

wherein the power parameter is a maximum rated power of the flow battery, the time parameter is the time in seconds for the first and second pumps to achieve full flow of the first and second fluid electrolytes from a low-flow state, and the concentration parameter is a concentration of at least one electrochemically active species in the first and second fluid electrolytes.

REJECTION

1–7 and 19–23 are rejected under 35 U.S.C. § 102(a) as anticipated by Liu.²

DISCUSSION

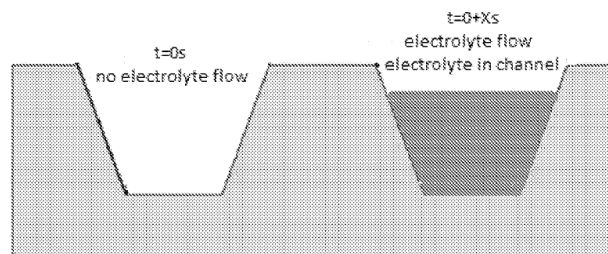
“A prior art reference anticipates a patent claim under 35 U.S.C. § 102(b) if it discloses every claim limitation.” *In re Montgomery*, 677 F.3d 1375, 1379 (Fed. Cir. 2012) (citing *Verizon Servs. Corp. v. Cox Fibernet Va., Inc.*, 602 F.3d 1325, 1336–37 (Fed. Cir. 2010)). In this instance, with regards to claim 1, Appellant argues that Liu does not disclose the claimed “electrochemically active zone having a total open volume that is a function of at least one of a power parameter of the flow battery” (Appeal Br. 3).

The Examiner finds that Liu explicitly discloses a flow battery with each of the structural features listed in the first two paragraphs of claim 1, as well as the “electrochemically active zone configured to receive flow of the respective first and second fluid electrolytes” (Final Act. 2–3, citing Liu, FIGS. 3, 4, ¶¶ 7, 20, 32, 34–36). The Examiner further finds that limitation relating to the “electrochemically active zone having an open volume that is a function of at least one of a power parameter of the flow battery” is met by

² Liu et al., US 2013/0022846 A1, published January 24, 2013.

Liu because “[g]iven the structural similarities of the instant claim and the battery of Liu, it is recognized that the battery of Liu can inherently operate as claimed” (Final Act. 3). The Examiner also finds that:

It is considered that the total open volume, meaning the unfilled volume of the grooved channels, prior to operation is necessarily a function of at least one of the parameters claimed. Although, the Examiner maintains that the other alternatives, power and concentration, are similarly a function of the total open volume during operation, for simplification's sake, the Board is reminded that only one claimed parameter (see listed above) is required thus let's consider the parameter of time of the flow pumps as an example.



As shown in the figure above, when time is 0 seconds, there is no flow into the channel. When time is $0+X$ seconds, electrolyte flows into the channel via the pump until full. As a result of time passing the total open volume decreases (function of time) as electrolyte occupies open volume and allows for ions to move and perform the battery functions. Therefore, the amount of open volume is a function of at least time and therefore reads on at least instant claim 1.

(Ans. 6–7).

The Examiner’s analysis is flawed, however, generally for the reasons set forth by Appellant (Reply Br. 2). In particular, the Examiner’s reasoning does not consider the language in the final paragraph of claim 1, which recites the specific parameters which may be used to determine the total open volume described in the third paragraph of the claim:

wherein the power parameter is a maximum rated power of the flow battery, *the time parameter is the time in seconds for the*

first and second pumps to achieve full flow of the first and second fluid electrolytes from a low-flow state, and the concentration parameter is a concentration of at least one electrochemically active species in the first and second fluid electrolytes.

(Claim 1, emphasis added).³

Thus, the claim requires that the total open volume of the flow battery be a function of at least one of three specific power parameters. The Examiner's finding that "the amount of open volume is a function of at least time" (Ans. 6) does not address claim 1's requirement that "the time parameter is the time in seconds for the first and second pumps to achieve full flow of the first and second fluid electrolytes from a low-flow state." The Examiner does not find that this structural feature of the battery⁴ is explicitly disclosed by Liu. Nor does the Examiner's example, illustrated above, demonstrate that the claimed time parameter is inherently met by Liu's battery. The Examiner's example demonstrates how Liu's total open volume could be a function of a different time parameter.

Accordingly, the Examiner has not demonstrated that the total open volume of Liu's battery is a function of a property which is "necessarily present" in Liu's battery. *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002) ("Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly

³ This claim language is consistent with and supported by the Specification (Spec. ¶¶ 5–7).

⁴ It is a structural feature because the total open volume is specifically tied to specific parameters of the battery (Spec. ¶¶ 5–7).

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present, in the prior art.” (quoting *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999)).

Appellant has demonstrated reversible error in the anticipation rejection over Liu.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1-7, 19-23	102(a)	Liu		1-7, 19-23

REVERSED