

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SUMITOMO ELECTRIC INDUSTRIES, LTD.,
Petitioner,

v.

UNITED TECHNOLOGIES CORPORATION,
Patent Owner.

Case IPR2017-00966
Patent 9,166,243 B2

Before CHRISTOPHER L. CRUMBLEY, JON B. TORNQUIST, and
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

CRUMBLEY, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318 and 37 C.F.R. § 42.73

I. INTRODUCTION

In this *inter partes* review trial, instituted pursuant to 35 U.S.C. § 314, Petitioner Sumitomo Electric Industries, Ltd. (“SEI”) challenges the patentability of claims 1–4, 8–13, 16, and 17 of U.S. Patent No. 9,166,243 B2 (Ex. 1001, “the ’243 patent”), owned by United Technologies Corporation (“UTC”).

We have jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision, issued pursuant to 35 U.S.C. § 318(a), addresses issues and arguments raised during trial. For the reasons discussed below, we determine that SEI has not proven, by a preponderance of the evidence, that claims 1–4, 8–13, 16, and 17 of the ’243 patent are unpatentable.

A. Procedural History

On February 23, 2017, SEI requested an *inter partes* review of claims 1–4, 8–13, 16, and 17 of the ’243 patent. Paper 2, “Pet.” UTC filed a Patent Owner Preliminary Response. Paper 6. In a Decision on Institution of *Inter Partes* Review (Paper 7, “Dec. on Inst.”), we instituted trial as to all challenged claims on the following grounds of unpatentability:

1. Whether claims 1–4, 8–13, 16, and 17 are unpatentable under 35 U.S.C. § 103(a),¹ as having been obvious over the combined disclosures of JP228,² JP659,³ and JP029;⁴ and
2. Whether claims 1–4, 8–13, 16, and 17 are unpatentable under 35 U.S.C. § 103(a), as having been obvious over the combined disclosures of JP228, JP659, JP029, and Perry.⁵

Dec. on Inst. 27.

Following institution, UTC filed a Patent Owner Response (Paper 13, “PO Resp.”), and SEI filed a Reply (Paper 16, “Pet. Reply”).

SEI supported its Petition with the Declaration of Toru Kato.

Ex. 1025. UTC took cross-examination of Dr. Kato via deposition, and filed the transcript in the record. Ex. 2022. With its Reply, SEI submitted a

¹ The relevant sections of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, took effect on March 16, 2013. Because the application to which the ’243 patent claims priority was filed before that date, our citations to Title 35 are to its pre-AIA version.

² Japan Examined Patent Application Publication S54-19228, published July 13, 1979 (Ex. 1003). An English translation of Exhibit 1003 was submitted as Exhibit 1004; citations to “JP228” herein are to the translation.

³ Japan Unexamined Patent Application Publication H02-148659, published June 7, 1990 (Ex. 1005). An English translation of Exhibit 1005 was submitted as Exhibit 1006; citations to “JP659” herein are to the translation.

⁴ Japan Unexamined Patent Application Publication 2006-156029, published June 15, 2006 (Ex. 1008). An English translation of Exhibit 1008 was submitted as Exhibit 1009; citations to “JP029” herein are to the translation.

⁵ U.S. Patent Application Pub. No. 2008/0292938 A1 to Perry et al., published Nov. 27, 2008 (Ex. 1007).

Supplemental Declaration of Dr. Kato (Ex. 1058), and also provided a Supplemental Declaration of James Yagaeshi (Ex. 1066).

With its Patent Owner Response, UTC submitted the Declaration of Dr. Fikile Brushett. Ex. 2048. SEI took cross-examination testimony of Dr. Brushett via deposition, and submitted the transcript. Ex. 1069.

During trial, a dispute arose regarding the English translation of JP228 (Ex. 1004), which we address at further length below. In response to a request from UTC, we authorized UTC to file the declaration of David Baldwin (Ex. 2050), which included as Exhibit A a prior declaration by Mr. Baldwin regarding the translation of JP228. In our Order authorizing the filing, we noted that Exhibit A would be accepted solely for the limited purpose of establishing Mr. Baldwin's credibility, not as independent evidence of the proper translation of JP228. Paper 19.

UTC filed a Motion to Exclude certain evidence submitted by SEI with its Reply (Paper 21, "Mot."), to which SEI filed an Opposition (Paper 23, "Mot. Opp.") and UTC filed a Reply (Paper 25, "Mot. Reply").

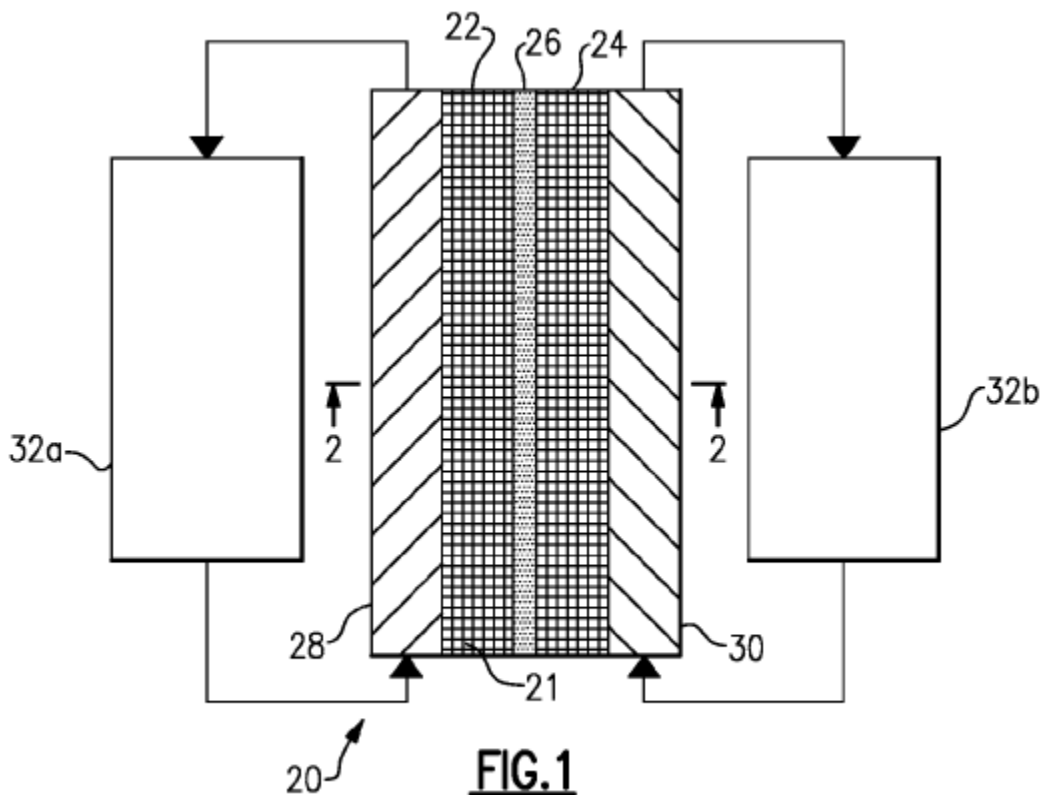
An oral hearing was held on May 10, 2018, and a transcript of the oral hearing is available in the record. Paper 28 ("Tr.").

B. The '243 Patent

The '243 patent, titled "Flow Battery With Interdigitated Flow Field," issued October 20, 2015, from U.S. Patent Application No. 13/513,651 ("the '651 application"), filed on June 4, 2012. Ex. 1001, (54), (45), (21), (86). The '651 application was a national stage filing of PCT application PCT/US2009/068681, filed December 18, 2009. *Id.* at (86), (22).

As UTC acknowledges, flow batteries, and specifically redox flow batteries (“RFBs”), have been known for over 40 years. Paper 6, 3. Typical flow batteries use the flow of an electrolyte over an electrode to convert chemical energy stored in the electrolyte into electrical energy. Ex. 1001, 1:13–20. Conversely, the electrolyte may be pumped in reverse to convert excess electrical energy into stored chemical energy. *Id.* As such, the ’243 patent states that flow batteries have great potential in renewable resource generation such as wind power, to store energy production that exceeds customer demand. *Id.* at 1:17–20.

The ’243 patent discloses an RFB having the general structure shown in Figure 1 of the ’243 patent:



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