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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DANIEL MILLER, EVAN MASCIANICA, JOSEF DOLLISON,
JEREMY SAMBORSKY, and JASON SIELAFF

Appeal 2019-003933
Application 14/931,221
Technology Center 1700

Before MONTÉ T. SQUIRE, AVELYN M. ROSS, and
JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant¹ requests our review under 35 U.S.C. § 134(a) of the Examiner's decision to finally reject claims 1–4, 6, 8, 9, 11–18, and 21–23.² We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies Ford Global Technologies, LLC as the real party in interest. Appeal Brief filed January 28, 2019 (“Appeal Br.”) at 1.

² Claims 5 and 7 were withdrawn from consideration. Final Office Action entered September 4, 2018 (“Final Act.”) at 1.

CLAIMED SUBJECT MATTER

Independent claims 1, 12, and 21 illustrate the subject matter on appeal, and are reproduced below with contested subject matter italicized:

1. A traction battery for a vehicle comprising:
cells stacked in a linear array with the cells spaced apart to directly define pockets between adjacent pairs of the cells;
and
a manifold defining a recessed open channel and connected to the array with the array covering the channel and with the channel in fluid communication with the pockets to form a fluid flow path that circulates liquid coolant directly across a surface of the cells.

12. A traction battery comprising:
an array including cells linearly stacked and spacers interleaved with the cells, *each spacer defining channeling extending completely through a thickness of the spacer*; and
a manifold defining a recessed open channel extending a length of the array and configured to circulate liquid coolant to the channeling to directly contact the cells, wherein the manifold is connected to the array with the array covering the channel to define a coolant chamber.

21. A traction battery comprising:
a linear array including *prismatic cells*, and spacers each disposed between an adjacent pair of the cells and defining channeling extending completely through a thickness of the spacer so that surfaces of the pair cooperate with the channeling to define a coolant path in direct contact with the surfaces; and
a manifold extending along and connected to an outer side of the array and in fluid communication with the coolant paths.

Appeal Br. Claims Appendix 1–4.

REJECTIONS

The Examiner maintains the following rejections in the Examiner's Answer entered March 15, 2019 ("Ans."):

I. Claims 1–4 under 35 U.S.C. §§ 102(a)(1) and 102(a)(2) as anticipated by Jaura et al. (US 2004/0137313 A1, published July 15, 2004) ("Jaura");

II. Claims 21–23 under 35 U.S.C. §§ 102(a)(1) and 102(a)(2) as anticipated by Robert et al. (US 2015/0221995 A1, published August 6, 2015) ("Robert"); and

III. Claims 6, 8, 9, and 11–18³ under 35 U.S.C. § 103 as unpatentable over Jaura in view of Hermann et al. (US 2010/0136396 A1, published June 3, 2010) ("Hermann").

FACTUAL FINDINGS AND ANALYSIS

Upon consideration of the evidence relied upon in this appeal and each of Appellant's contentions, we affirm the Examiner's rejection of claims 1–4 under 35 U.S.C. §§ 102(a)(1) and 102(a)(2), and rejection of claims 6, 8, 9, and 11 under 35 U.S.C. § 103, for the reasons set forth in the Final Action, the Answer, and below, and we reverse the Examiner's rejections of claims 21–23 under 35 U.S.C. §§ 102(a)(1) and 102(a)(2), and rejection of claims 12–18 under 35 U.S.C. § 103, for the reasons set forth in the Appeal Brief and below.

We review appealed rejections for reversible error based on the

³ Although the Examiner does not list claim 11 in the heading for this rejection, the Examiner addresses claim 11 in the body of the rejection. Final Act. 5. And although the Examiner lists claim 7 in the heading for this rejection, the Examiner does not address claim 7 in the body of the rejection because claim 7 was withdrawn from consideration. Final Act. 1, 5–7.

arguments and evidence the appellant provides for each issue the appellant identifies. 37 C.F.R. § 41.37(c)(1)(iv); *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (explaining that even if the Examiner had failed to make a prima facie case, “it has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections”)).

Rejection I: claims 1–4 as anticipated by Jaura

Claim 1

Claim 1 requires the recited traction battery for a vehicle to comprise (1) cells stacked in a linear array and spaced apart to define pockets between adjacent pairs of cells, and (2) a manifold defining a recessed open channel.

Jaura discloses battery system 10 for an automotive vehicle including battery case 14 containing a plurality of cells 18 separated by a plurality of heat transfer passages 22 (pockets). Jaura ¶¶ 8, 20; Fig. 1. Jaura discloses that driver 28 (pump) pushes coolant through heat transfer passages 22 (pockets) in a reversible direction controlled in part by movable flow valves 32, 36, whose position is determined by controller 24. Jaura ¶¶ 20, 21; Figs. 1 and 2.

The Examiner determines that Appellant’s Specification requires a “recessed open channel” to be “nothing more than a coolant passage through a tray.” Ans. 8. The Examiner provides an annotated version of Jaura’s Figure 2 (reproduced below), which the Examiner finds illustrates a manifold defining a recessed “open channel” that brings a coolant into and out of a chamber holding a linear array of battery cells. Final Act. 3; Ans. 8.

The Examiner’s annotated version of Figure 2 of Jaura is a schematic

representation of Jaura's battery system 10:

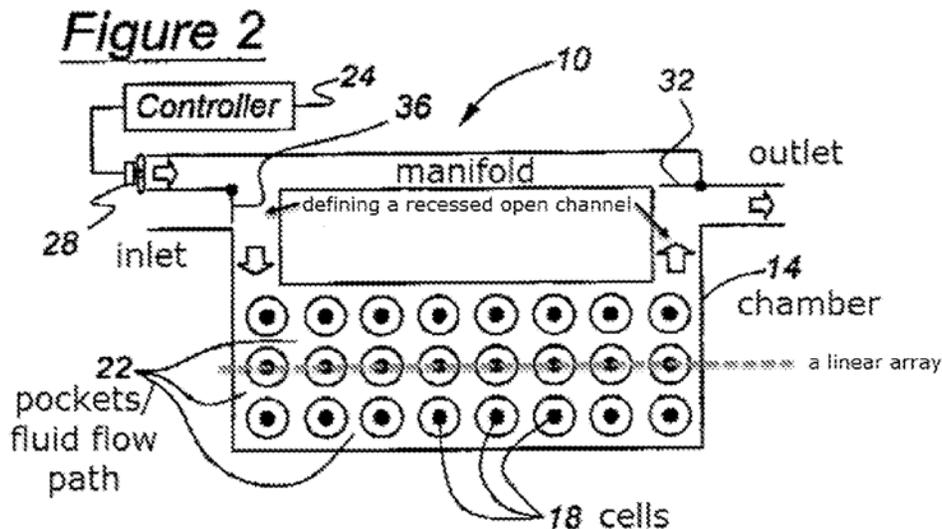


Figure 2 of Jaura illustrates battery system 10.

Appellant argues that “[i]n the Example of Appellant’s Figure 3, the manifold has a channel with an open top that is later sealed by the bottom of the array 66 when attached.” Appeal Br. 6. Appellant argues that “*Jaura* does not teach an array that seals an open channel defined in a manifold.” Appeal Br. 5. Appellant argues that “[a]n open channel is a channel that is not fully bounded,” and “[t]he passageways of [*Jaura*’s] case 14 are fully bounded by walls of the case.” Appeal Br. 6. Appellant argues that “[w]hile these passageways open into the larger open area that holds the cells, that does not make the passageways ‘recessed open channels.’” *Id.*

Appellant’s arguments do not identify reversible error in the Examiner’s rejection, for reasons that follow.

Claim 1 does not recite a manifold having “a channel with an open top that is later sealed by the bottom of the array 66 when attached” as Appellant appears to assert. Rather, claim 1 recites merely an “open channel.” We find no definition of an “open channel” in Appellant’s Specification, and

Appellant does not direct us to any such definition. Appeal Br. 2–10. Nor do we find any description in Appellant’s Specification that limits an “open channel” to a channel with an open top, which is sealed by the bottom of a linear cell array. Rather, the Specification describes “an *example* traction battery assembly 64” illustrated in Figures 3, 4, and 5 that includes tray 84 (manifold) “that defines an open channel 98 recessed into the top 86” of tray 84. Spec. ¶¶ 29, 31 (emphasis added); Figs. 3–5. The Specification indicates that “[t]he size of the channel 98 *may* approximate the size of the bottom 72 (or other side depending on the embodiment) of the array 66, albeit slightly smaller,” and “open channel 98 includes a bottom 100 and sidewalls 102, which define the boundaries of the channel 98.” Spec. ¶ 31 (emphasis added). The Specification further explains that “[t]he array 66 *may* be connected to the tray 84 such that the array 66 covers over the open channel 98.” Spec. ¶ 32 (emphasis added).

We find no further description of an “open channel” in Appellant’s Specification. Although battery assembly 64 shown in Figures 3–5 appears to illustrate manifold 84 having channel 98 with an open top that is sealed by the bottom of array 66 as Appellant argues, the Specification makes clear that the traction battery assembly illustrated in the figures is an *exemplary* embodiment of Appellant’s invention. It is well-established that exemplary limitations from the Specification may not be read into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) (“[L]imitations are not to be read into the claims from the specification.”); *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed. Cir. 2003) (explaining that claims must be interpreted “in view of the specification” without importing limitations from the specification into the claims unnecessarily).

Accordingly, under a broadest reasonable interpretation consistent with Appellant’s Specification and drawings, an “open channel” as recited in claim 1 is a passageway along which fluid flows having at least one opening.⁴ *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007) (During prosecution of patent applications, “the PTO must give claims their broadest reasonable construction consistent with the specification . . . Therefore, we look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation.”). As illustrated in Jaura’s Figure 2 (and the Examiner’s annotated version of Figure 2), Jaura’s battery case 14 includes an inlet formed partially by valve 36 and an outlet formed partially by valve 32, and case 14 defines channels (passages) through which coolant flows from the inlet to the outlet. The channels are “open”—and are not fully bounded by the walls of case 14 as Appellant argues—due to the presence of the inlet and the outlet, and thus, fall within the scope of the claim.

Appellant argues that Jaura discloses cells stacked in a “3 x 8 array, not a linear array.” Appeal Br. 3. Appellant argues that “[t]he claimed ‘cells stacked in a linear array’ requires the cells to be placed in a single, straight row.” Appeal Br. 4.

Appellant’s arguments, again, do not identify reversible error in the Examiner’s rejection. Claim 1 recites a “comprising” transitional phrase between the preamble and the body of the claim, which opens the claim to inclusion of unrecited components. *Gillette Co. v. Energizer Holdings, Inc.*

⁴ Channel: “[A] passage for water or other liquids to flow along.” Cambridge English Dictionary (accessed January 7, 2020), <https://dictionary.cambridge.org/us/dictionary/english/channel>.

405 F.3d 1367, 1371–1372 (Fed. Cir. 2005) (“The word ‘comprising’ transitioning from the preamble to the body signals that the entire claim is presumptively open-ended.”); *In re Baxter*, 656 F.2d 679, 686–87 (CCPA 1981) (“As long as one of the monomers in the reaction is [the claimed] propylene, any other monomer may be present, because the term ‘comprises’ permits the *inclusion* of other steps, elements, or materials.”). Thus, although claim 1 requires the recited traction battery to include “cells stacked in a linear array,” the claim does not exclude additional cells beyond cells stacked in a first linear array. Claim 1, therefore, does not exclude a plurality of linear cell stack arrays, such as three linear arrays of eight cells as disclosed in Jaura.

We, accordingly, sustain the Examiner’s rejection of claim 1 under 35 U.S.C. §§ 102(a)(1) and 102(a)(2) as anticipated by Jaura.

Claims 2–4

Appellant presents arguments for the patentability of claim 2, and does not separately address the patentability of claims 3 and 4. Appeal Br. 7. We, accordingly, select claim 2 as representative, and decide the appeal as to claims 2–4 based on claim 2 alone. 37 C.F.R. § 41.37(c)(1)(iv).

Claim 2 depends from claim 1 and recites that “the manifold is a tray having a body that defines the recessed open channel configured to circulate the liquid coolant, wherein the array is disposed against the body such that a side of the array covers the channel to define a coolant chamber that is in fluid communication with each of the pockets, wherein the side of the array defines a boundary of the chamber.”

The Examiner finds that Jaura’s “manifold (inlet and outlets, openings described above) is a tray having a body (coolant channels) that defines the

recessed open channel configured to circulate the liquid coolant, wherein the array is disposed against the body.” Final Act. 4. The Examiner provides a second annotated version of Jaura’s Figure 2 (reproduced below) to illustrate that the coolant passages shown in the figure “are reasonably considered [a] manifold defining a recessed open channel which is connected to the pockets where the array covers the channel when the orientation of the figure is flipped 180°.” Ans. 8.

The Examiner’s second annotated version of Figure 2 of Jaura is a schematic representation of Jaura’s battery system 10:

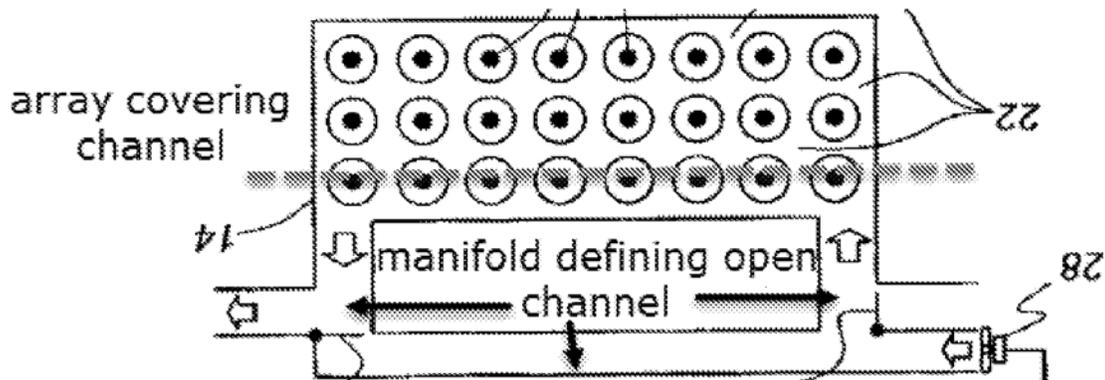


Figure 2 of Jaura illustrates battery system 10.

Appellant argues that claim 2 “requires that the tray and the array are separate subassemblies that are attached to each other.” Appeal Br. 7. Appellant argues that [w]hile the passages of the case 14 may meet the definition of a ‘manifold,’ these portions of the case are not a tray.” *Id.*

Contrary to Appellant’s arguments, the plain language of claim 2 does not require the tray and the array to be separate subassemblies that are attached to each other. Rather, as set forth above, claim 2 recites that (1) the manifold is a tray having a body that defines the recessed open channel configured to circulate the liquid coolant, and (2) the array is disposed

against the body such that a side of the array covers the channel to define a coolant chamber. As shown in the Examiner's second annotated version of Jaura's Figure 2 (above), case 14 and valves 32, 36 define open channels through which coolant circulates. We find no definition or limiting description of a "tray having a body that defines the recessed open channel" in Appellant's Specification that would exclude the open channels disclosed in Jaura defined by case 14 and valves 32, 36, and Appellant does not direct us to any such definition or description in the Specification. Appeal Br. 7. Accordingly, the open channel defined by Jaura's case 14 and valves 32, 36 through which coolant circulates corresponds to a tray having a body that defines a recessed open channel configured to circulate a liquid coolant, as recited in claim 2.

Appellant argues that the "array of cells 18" disclosed in Jaura "is a loose arrangement disposed in an area of the case 14 next to the open ends of the passageways," and the "cells are not disposed against the passageways and do not cover the open ends of the passageways." Appeal Br. 7. Appellant argues that a "coolant chamber is a sealed area, [and] the loose arrangement of cell[s] are incapable [of] sealing and are therefore incapable of cooperating with a tray to define a coolant chamber or to define a boundary of the chamber." *Id.*

Contrary to Appellant's arguments, the plain language of claim 2 does not require the recited coolant chamber to be a *sealed* area, and we find no definition or limiting description of a "coolant chamber" in Appellant's Specification that requires a "coolant chamber" to be interpreted in this way. As shown above in the Examiner's second annotated version of Jaura's Figure 2, cells 18 in the linear array nearest to the inlet and outlet cover, and

are disposed against, open channels defined by case 14 and valves 32, 36 through which coolant flows from the inlet to heat transfer passages 22 (pockets), and through which coolant flows from heat transfer passages 22 (pockets) to the outlet. Thus, cells 18 in the linear array nearest to the inlet and outlet cooperate with case 14 and valves 32, 36 to define a “coolant chamber,” or a coolant passageway, in fluid communication with heat transfer passages 22 (pockets), such that a side of the linear array closest to the inlet and outlet defines a boundary of the chamber, as recited in claim 2.

We, accordingly, sustain the Examiner’s rejection of claims 2–4 under 35 U.S.C. §§ 102(a)(1) and 102(a)(2) as anticipated by Jaura.

Rejection II: claims 21–23 as anticipated by Robert

Independent claim 21 requires the recited traction battery to comprise a linear array including prismatic cells.

The Examiner finds that Robert discloses a traction battery comprising electrode structures 12, which the Examiner contends constitute the claimed prismatic cells. Final Act. 4 (citing Robert ¶ 19; Fig. 8⁵).

In contrast to the Examiner findings, Appellant argues that Robert discloses a pouch-type battery cell, rather than a prismatic cell. Appeal Br. 9. The Examiner responds to Appellant’s argument by stating that “[t]he cells shown in the Robert prior art reference clearly have a prismatic shape (a square or rectangular electrode cell 30).” Ans. 9.

On the record before us, however, the Examiner does not provide a

⁵ The Examiner’s citation to Figure 8 of Robert appears to be a typographical error because Figure 8 of Robert does not illustrate electrode structures 12. Rather, Figure 1 of Robert illustrates electrode structure 12. Robert ¶ 19.

sufficient factual basis to establish that Robert discloses a linear array including prismatic cells, for reasons that follow.

Robert discloses that electrode structure 12 and electrode 30—relied on by the Examiner in the Final Action and Answer, respectively, as constituting prismatic cells—are actually *electrode components* of pouch-type battery cells, rather than prismatic cells. Robert ¶ 19. Specifically, Robert discloses pouch-type battery cell 10 that includes electrode structure 12. Robert ¶¶ 1, 3, 4, 18, 19; Fig. 1. Robert discloses that electrode structure 12 is covered by inner polymer layer 14, which is overlaid with pouch structural material 16 and outer polymer layer 18. *Id.* Similarly, Robert discloses that “cell electrode 30” is a component of a “sealed pouch cell” comprised of, among other components, pouch 32. Robert ¶ 24; Fig. 3.

Robert thus disclose that electrode structure 12 and electrode 30 constitute electrode components of pouch-type battery cells. Because the Examiner does not identify any disclosure in Robert of a linear array including *prismatic* cells, we do not sustain the Examiner’s rejection of claim 21, and claims 22 and 23, which each depend from claim 21, under 35 U.S.C. §§ 102(a)(1) and 102(a)(2) as anticipated by Robert.

Rejection III: claims 6, 8, 9, and 11–18 as obvious over Jaura in view of Hermann

Claims 6, 8, 9, and 11

We summarily sustain the Examiner’s rejection of claims 6, 8, 9, and 11, which depend from claim 1, under 35 U.S.C. § 103 as unpatentable over Jaura in view of Hermann, because Appellant does not contest the rejection of these claims. Appeal Br. 2–10; 37 C.F.R. § 41.37(c)(1)(iv).

Claims 12–18

Appellant presents arguments for claim 12 only. Appeal Br. 7–8. We, accordingly, select claim 12 as representative, and decide the appeal as to claims 12–18 based on claim 12 alone. 37 C.F.R. § 41.37(c)(1)(iv).

Independent claim 12 requires the recited traction battery to include linearly stacked cells and spacers interleaved with the cells, and requires each spacer to define channeling that extends completely through a thickness of the spacer.

Consistent with the plain meaning of a “channel” as a passage for water or other liquids to flow along,⁶ Appellant’s Specification describes exemplary spacers 67 that define channeling 122 that extends between major faces 69 of spacers 67 so as to create *a void completely through a thickness* of spacers 67, through which coolant circulates. Spec. ¶ 33.

The Examiner finds that Jaura “does not disclose spacers.” Final Act. 5. The Examiner finds, however, that Hermann discloses a traction battery for a vehicle including cells 301 and spacers 305, 505A, 505B, 705 disposed in pockets between cells 301 that include channeling extending completely through a thickness of the spacer. *Id.* at 5–6 (citing Hermann ¶ 4; Figs. 5 and 9).

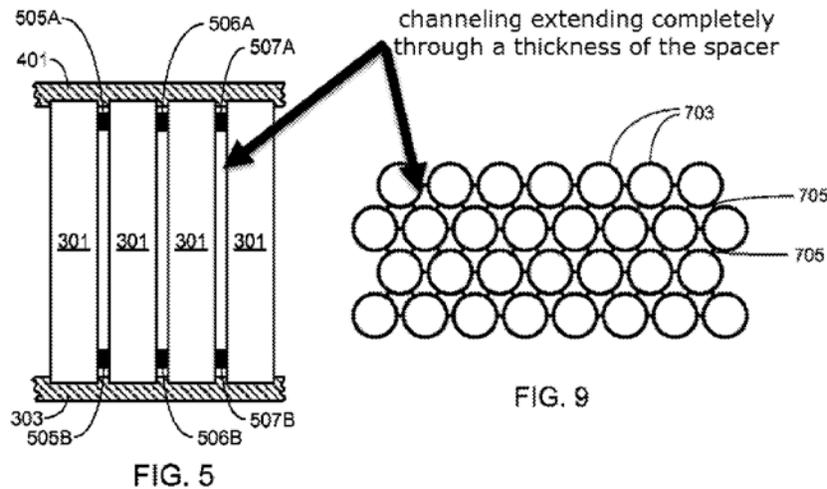
As Appellant correctly points out, however, the Examiner does not identify any disclosure in Hermann that teaches or would have suggested to one of ordinary skill that spacers 305, 505A, 505B, 705 define channeling that extends completely through a thickness of the spacers. Appeal Br. 7. Rather, Hermann discloses spacers fabricated from a compressible material that keep battery cells in place, and maintain the “minimum spacing between

⁶ See footnote 4.

cells.” Hermann ¶¶ 29, 32. Hermann discloses that the spacers “are not intended to act as a thermal shield between cells, but are instead intended to keep the cells in place during thermal runaway,” and, therefore “it is unnecessary for the spacers to run the full length of the cells.” Hermann ¶ 33. Herman discloses that, consequently, “in order to save mass, preferably each spacer is comprised of a pair of much smaller spacers, i.e., an upper spacer and a lower spacer,” such that single spacers 305, 306, 307 illustrated in Figure 4 are replaced by upper spacers 505A, 506A, 507A and lower spacers 505B, 506B, 507B illustrated in Figure 5. Hermann ¶ 33; Figs. 4 and 5.

Although the Examiner asserts that Hermann discloses “channeling extending completely through a thickness of the spacer” based on Hermann’s Figure 5 (Final Act. 6), the portion of Figure 5 identified by the Examiner as disclosing such “channeling” (reproduced below) is not part of the *spacers* shown in the drawing. Rather, Hermann’s Figure 5 illustrates spacers 505A, 506A, 507A, 505B, 506B, 507B with *solid shading*. Spacers 505A, 506A, 507A, 505B, 506B, 507B, consequently, do not appear to include a void or channel that extends completely through a thickness *of the spacers*.

The Examiner’s annotated version of Hermann’s Figure 5 shows a cross-sectional view of a spacer strip design, and Figure 9 shows a top view of a spacer assembly.



Hermann's Figure 5 is a cross-sectional view of a spacer strip design, and Figure 9 is a top view of a spacer assembly.

Although Figure 5 illustrates an area in white between each of the solid spacer pairs 505A, 505B, 506A, 506B, 507A, 507B, the Examiner does not identify any disclosure in Hermann that indicates or would have suggested that this area is a passage along which water or other liquids flow, corresponding to a "channel" as we have interpreted this term. Rather, as Appellant points out (Appeal Br. 7), the white area shown in Figure 5 between each of the darkly shaded spacer pairs appears to be merely an air gap, and the Examiner does not identify any disclosure in Hermann indicating otherwise.

Consequently, on the record before us, the Examiner does not provide a sufficient factual basis to establish that a combination of the relied-upon disclosures in Jaura and Hermann would have suggested traction battery including linearly stacked cells and spacers interleaved with the cells, with each spacer to define channeling that extends completely through a thickness of the spacer, as required by claim 12. We, accordingly, do not sustain the Examiner's rejection of claims 12–18 under 35 U.S.C. § 103.

CONCLUSION

Claims	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1	102(a)(1), 102(a)(2)	Jaura	1-4	
21-23	102(a)(1), 102(a)(2)	Robert		21-23
6, 8, 9	103	Jaura, Hermann	6, 8, 9	
11-18	103	Jaura, Hermann	11	12-18
Overall Outcome			1-4, 6, 8, 9, 11	12-18, 21-23

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED IN PART