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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LOUIS J. BRUNO, MASSOUD VAZIRI, MICHAEL KRENZ,
ADAM M. FINNEY, CHARLES BEECROFT, THOMAS M. ZYWIAK,
DONALD E. ARMY JR., SCOTT F. KASLUSKY,
JEFFREY T. WAVERING, and BRANDON M. GRELL

Appeal 2018-001542
Application 13/305,941¹
Technology Center 3600

Before PHILIP J. HOFFMANN, BRADLEY B. BAYAT, and
ROBERT J. SILVERMAN, *Administrative Patent Judges*.

SILVERMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1, 2, 4–6, 12, 13, and 15. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ The Appellants identify United Technologies Corp. as the real party in interest. Appeal Br. 1. (Citations to the Appeal Brief refer to the Corrected Appeal Brief dated July 17, 2017).

ILLUSTRATIVE CLAIM

1. An aircraft power distribution architecture comprising:

an Auxiliary Power Unit (APU) coupled to an electric power distributor, and operable to provide power to said electric power distributor;

a pressure bleed system connected to said APU, said pressure bleed system being operable to bleed air from said APU and from an aircraft engine, and operable to provide bleed air to a plurality of pneumatic aircraft systems including at least one environmental control system, wherein air provided from said pressure bleed system to an environmental control system inlet is at most 10 pounds per square inch (psi) above an ambient cabin pressure of an aircraft cabin;

an electric generator system coupled to said electric power distributor and operable to provide electric power to said electric power distributor, wherein said electric power distributor is further coupled to a plurality of aircraft systems that use electric power; and

wherein a magnitude of the bleed air bled by said pressure bleed system is limited to a magnitude of air pressure required to operate the plurality of pneumatic aircraft systems.

CITED REFERENCES

The Examiner relies upon the following references:

Atkey et al. US 2007/0284480 A1 Dec. 13, 2007
(hereinafter "Atkey")

Derouineau et al. US 2009/0326737 A1 Dec. 31, 2009
(hereinafter "Derouineau")

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 2007 ASHRAE Handbook, Heating, Ventilating, and Air-Conditioning Applications, ch. 10, Aircraft (2007) (hereinafter "ASHRAE").

REJECTIONS

I. Claims 1, 2, 4–6, 12, 13, and 15 are rejected under 35 U.S.C. § 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement.²

II. Claims 1, 2, 4–6, 12, 13, and 15 are rejected under 35 U.S.C. § 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention.

III. Claims 1, 4–6, 13, and 15 are rejected under 35 U.S.C. § 103(a) (pre-AIA) as unpatentable over Atkey and ASHRAE.

IV. Claims 1, 4–6, 13, and 15 are rejected under 35 U.S.C. § 103(a) (pre-AIA) as unpatentable over Atkey, ASHRAE, and Derouineau.

V. Claim 2 is rejected under 35 U.S.C. § 103(a) (pre-AIA) as unpatentable over Atkey, ASHRAE, and Derouineau.

VI. Claim 12 is rejected under 35 U.S.C. § 103(a) (pre-AIA) as unpatentable over Atkey, ASHRAE, and Derouineau.

FINDINGS OF FACT

The findings of fact relied upon, which are supported by a preponderance of the evidence, appear in the following Analysis.

² The Final Office Action (pages 2, 8) bases the written-description and indefiniteness rejections upon either the pre-AIA or the AIA version of 35 U.S.C. § 112. In view of the filing date of the application at issue in this Appeal, the pre-AIA version of § 112 applies.

ANALYSIS

Written Description

Pursuant to the written-description requirement of 35 U.S.C. § 112 (pre-AIA), first paragraph, “the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharms., Inc. v. Eli Lilly & Co*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc) (citations omitted). However, “the level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology.” *Id.* (citation omitted).

The written-description rejection of independent claim 1 (the sole independent claim in this Appeal) concerns the following limitations of the claimed “aircraft power distribution architecture”:

a pressure bleed system connected to said APU, said pressure bleed system being operable to bleed air from said APU and from an aircraft engine, and operable to provide bleed air to a plurality of pneumatic aircraft systems including at least one environmental control system, wherein air provided from said pressure bleed system to an environmental control system inlet is at most 10 pounds per square inch (psi) above an ambient cabin pressure of an aircraft cabin; [and]

wherein a magnitude of the bleed air bled by said pressure bleed system is limited to a magnitude of air pressure required to operate the plurality of pneumatic aircraft systems.

See Final Action 2–7. According to the Examiner, claim 1 does not satisfy the written-description requirement, because the Specification provides “no recitation with respect to the structural limitations of the low pressure bleed, how the air pressure is limited, or the magnitudes of the pressures provided

by the bleed system to the other pneumatic systems is ever provided.” *Id.* at

3. Instead, in the Specification, “the pressure bleed system is essentially a ‘black box.’” *Id.* at 6. The Examiner further states:

No explanation of what the “black box” of the bleed system comprises is ever made in the disclosure or claims. Applicant also fails to describe whether the magnitude of air pressure supplied via the bleed system is variable in response to only some of the pneumatic systems being operated, whether the quantity is based upon all the systems operating simultaneously, and/or if the quantity of air is variable in response to changes in altitude and/or flight conditions (e.g. taxiing, high altitude cruise, descent, low speeds) which would appear to affect the ambient cabin pressure during the operation of the aircraft.

Id. In addition, the Examiner states: “[M]erely reciting a single pressure measurement for the bleed system in the present application does not demonstrate that the Applicant was in possession of the invention at the time of filing.” *Id.*

In response, the Appellants argue: “[T]he level of detail presented by Appellant with regards to the ‘black box’ pressure system is commensurate in scope with the level of detail provided by numerous existing references in the analogous art, including both references cited by the examiner.” Appeal Br. 4. According to the Appellants:

The reference to the amount of disclosure provided in other applications is an indication of the level of technical detail one of skill in the art would understand to be required to adequately describe the invention and to demonstrate possession. The existing art establishes, that one of skill in the art would have considered a black box description of the bleed structure, and the related physical structures, to be sufficient writing to demonstrate possession of the claimed structure.

Id. The Appellants regard these prior art references as “first hand evidence of what multiple distinct individuals of skill in the art, including both patent examiners and inventors, consider to be sufficient disclosure to demonstrate possession of a claimed invention similar in scope to the instantly claimed invention.” Reply Br. 2.

Yet, as the Examiner points out, “the prior art references are not currently being examined”; accordingly, the references “have no bearing on whether the present application meets the requirements of the statutes.”

Answer 3. Moreover, even if the prior art references might “arguably contain the same specificity as the present application relating to similar features, they do not claim the same subject matter in the functional manner as the present application and rely upon said matter for patentability.” *Id.* at 4. This is not to say that the cited prior art references, or other documents, could never play a role in demonstrating the adequacy of the Specification, with regard to the written-description requirement. But the Appellants have not established the factual basis — through the mechanism of 37 C.F.R. § 1.132 or otherwise — needed to support a determination that the Specification would have conveyed possession of the claimed subject matter, when viewed through the eyes of a person of ordinary skill in the relevant art. *See Ariad*, 598 F.3d at 1351. Although the Appellants purport to offer “first hand evidence” of such facts (Reply Br. 2), the Appellants actually rely upon attorney argument as support for the asserted position. *See In re Cole*, 326 F.2d 769, 773 (CCPA 1964) (“Statements by counsel in the brief cannot take the place of evidence.”)

The Appellants also argue that the claimed subject matter was present in the originally filed application; as such, it should be presumed to satisfy the written-description requirement. Appeal Br. 5 (citation omitted).

Yet, we agree with the Examiner’s position, to the effect that, “[w]hile some details may have been originally claimed, the manner of amendment and the newly added limitations have altered the scope of the claim such that it can no longer be argued as” being subject to such a presumption. Answer 5 (citing *In re Wertheim*, 541 F.2d 257 (CCPA 1976)). Specifically, the Examiner points out:

[O]nly the “10 psi” limitation was supported in original claims 7 and 8. The limitation regarding the total magnitude being only that required by the pneumatic systems was not original in combination with the 10 psi limitation. Furthermore, claims 7 and 8 were notably dependent upon claims 4, 5, and 6, whereas those limitations are no longer required.

Id.

In view of the foregoing, we are not persuaded of error in the rejection of independent claim 1, such that we sustain the rejection of claim 1 and dependent claims 2, 4–6, 12, 13, and 15 under 35 U.S.C. § 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement.

Indefiniteness

The indefiniteness rejection focuses on the limitation of independent claim 1 reciting: “air provided from said pressure bleed system to an environmental control system inlet is at most 10 pounds per square inch (psi) above an ambient cabin pressure of an aircraft cabin.” *See* Final Action 8–9. The Examiner states:

It is known in the art that the ambient cabin pressure inside a cabin (also referred to as the “equivalent effective cabin altitude” or more commonly “cabin altitude”) of an aircraft sized to comprise both aircraft engines and an APU (e.g. a commercial passenger jet) is generally programmed to rise gradually from the altitude of the airport of origin to a regulatory maximum of 8,000 feet. As the term “ambient cabin pressure” has not been defined in the originally filed disclosure contrary to the accepted definition, it is unclear whether the magnitude of air pressure supplied to the pneumatic systems is variable in response to changes in altitude and/or flight conditions (e.g. taxiing, high altitude cruise, descent, low speeds), which affect the cabin pressure during the operation of the aircraft, or if the air pressure remains constant. If the cabin air pressure is variable, it is unclear how the pressure bleed system is constructed/operated in order to adjust the pressures accordingly as only a “black box” is presented as outlined above. On the other hand, if the magnitude of air pressure required by the systems is constant, it is unclear at which point in the aircraft operation (e.g., cruising altitude with all systems turned on simultaneously) the magnitude of all pneumatic devices is determined. As it is unclear what the metes and bounds of the claim encompassed by the last limitation are, Applicant has failed to particularly point out and distinctly claim what they regard to be their invention.

Id.

The Appellants “agree[] with the examiner that one of skill in the art would understand that the ambient pressure inside a cabin is programmed to rise gradually, dependent upon altitude.” Appeal Br. 5. Yet, the Appellants contend, this circumstance does not inject any uncertainty into the identified claim limitation; rather, one of skill in the art reading the claim limitation at issue (concerning the parameter of “at most 10 pounds per square inch (psi) above an ambient cabin pressure of an aircraft cabin”) “would understand

that the air provided is at most 10 psi above the ambient pressure for a current operating condition of the aircraft.” *Id.* at 6.

With respect to the Examiner’s position that “[i]f the cabin air pressure is variable, it is unclear how the pressure bleed system is constructed/operated in order to adjust the pressures accordingly” (Final Action 8), the Appellants contend that “[o]ne of skill in the art would fully understand that any of the multiple known techniques for controlling air pressure within a pressure bleed system could be utilized and still fall within the claim scope” (Appeal Br. 6). Even so, the Appellants assert:

The specific valve structures, sensor configurations, and so on, within a pressure bleed system required to provide air from the pressure bleed system and to an environmental control system at a given pressure are conventional and need not be described by Appellant in order to define the metes and bounds of the claim.

Id.

We agree with the Appellants. “[A] claim is indefinite when it contains words or phrases whose meaning is unclear,” i.e., “ambiguous, vague, incoherent, opaque, or otherwise unclear in describing and defining the claimed invention.” *In re Packard*, 751 F.3d 1307, 1310–13 (Fed. Cir. 2014); *see also In re McAward*, No. 2015-006416, 2017 WL 3669566, at *3 (PTAB Aug. 25, 2017) (precedential). Even though the claimed “ambient cabin pressure” might vary (e.g., resulting from a change in altitude), this circumstance — although indicative of the breadth of the claim language (*see* Appeal Br. 6) — would not render the claim language unclear. Nor would the clarity of the claim language be impaired by any of the Examiner’s concerns about how such a claimed device might be constructed. *See* Final Action 8–9.

Accordingly, we do not sustain the rejection of independent claim 1, and dependent claims 2, 4–6, 12, 13, and 15 under 35 U.S.C. § 112 (pre-AIA), second paragraph.

Obviousness

The Examiner advances two distinct obviousness rejections for claims 1, 4–6, 13, and 15. First, the Examiner determines these claims to be obvious over the combination of Atkey and ASHRAE (Rejection III). Final Action 10–13. Second, the Examiner determines these claims also to be obvious over the combination of Atkey, ASHRAE, and Derouineau (Rejection IV). *Id.* at 13–17. With respect to these rejections, the Appellants’ arguments concern claim 1’s limitation of “wherein air provided from said pressure bleed system to an environmental control system inlet is at most 10 pounds per square inch (psi) above an ambient cabin pressure of an aircraft cabin.” *See* Appeal Br. 7–9.

For the reasons provided below, we do not sustain Rejection III, but we do sustain Rejection IV.

The Examiner also rejects claims 2 and 12 as obvious over the combination of Atkey, ASHRAE, and Derouineau (Rejections V and VI). Final Action 17–19. The Appellants do not provide any separate arguments for these claims, relying instead upon the arguments presented in response to Rejection IV. *See* Appeal Br. 9. Accordingly, we also sustain Rejections V and VI.

Therefore, for the reasons provided in the separate sections below, we sustain the rejection of claims 1, 2, 4–6, 12, 13, and 15 under 35 U.S.C. § 103(a).

1. Rejection III Based Upon Atkey and Aircraft

In rejecting claims 1, 4–6, 13, and 15 as obvious over Atkey and ASHRAE, the Examiner takes the position that a person of ordinary skill in the art, at the time of the invention, would have implemented claim 1’s limitation “wherein air provided from said pressure bleed system to an environmental control system inlet is at most 10 pounds per square inch (psi) above an ambient cabin pressure of an aircraft cabin,” as “an obvious matter of design choice”:

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to limit the air pressure at an inlet to an ECS [“environmental control system”] to be at most ten psi above an ambient cabin pressure at the ECS outlet because Applicant has not disclosed that limiting the low air pressure to no more than 10 psi above an ambient air pressure provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art furthermore, would have expected Applicant’s invention to perform equally well with an air pressure of 11 to 20 psi above cabin air pressure because air pressure at the ECS inlet can further be modified by the ECS itself to supply a desired output pressure into the cabin at an ECS outlet and/or the total pressure of the bleed system can be supplemented by the APU without any change to the magnitude (i.e. total volume) of air bled from the APU and/or aircraft engine. Therefore, it would have been an obvious matter of design choice to modify Atkey et al. to obtain the invention as specified in claim 1.

Final Action 12.

In disputing the rejection, the Appellants (*see* Appeal Br. 8) argue that the cited prior art references do not support the Examiner’s premise that “[o]ne of ordinary skill in the art furthermore, would have expected Applicant’s invention to perform equally well with an air pressure of 11 to

20 psi above cabin air pressure” (Final Action 12). The Appellants emphasize that the Examiner’s finding includes the proviso that, if needed, “air pressure at the ECS inlet can be further modified by the ECS itself.” Appeal Br. 8 (quoting Final Action 12). Yet, the Appellants point out, if “additional features are required to be added to the ECS in order to further condition air provided at 11–20 psi, then 11–20 psi does not work equally as well, and the examiner's statement is incorrect.” *Id.* Further, the Appellants argue:

[E]ven if 11–20 Psi would work “equally well” there is no indication that the manifold of Atkey is 11–20 psi above ambient. Indeed, the 11–20 number is a number arbitrarily selected by the examiner, and has no basis in the disclosure or teaching of either Atkey or ASHARE.

Id. Consequently, according the Appellants, the Examiner’s obviousness rationale is based upon “pure speculation and is incorrect.” *Id.*

The Examiner agrees with the Appellants’ assertion, to the effect that the choice of the hypothetical environmental control system (ECS) inlet pressure of 11–20 psi above ambient cabin pressure is “arbitrary.” Answer 10. Yet, according to the Examiner, this arbitrary range in the hypothetical example was presented in response to claim 1’s recitation of an arbitrary limit (i.e., “at most 10 pounds per square inch (psi) above an ambient cabin pressure”): “While the value range selected by the Examiner may be arbitrarily selected, there is nothing on the record to establish that the Appellant’s value range was not also arbitrarily selected.” *Id.* at 11. Indeed, according to the Examiner, the Appellants have “continuously failed to provide any explanation as to why or how [the claimed] value range has

[any] criticality whatsoever so Examiner maintains that the value range is completely arbitrary and an obvious design choice.” *Id.* at 9.

A so-called “design choice” rationale, such as the Examiner relies upon (*see* Final Action 12), has been deemed appropriate where one prior art element or property is proposed to be substituted for another that achieves the same purpose. *See ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1367 (Fed. Cir. 2016) (“The prior art consistently locates the two sensors at issue in the shredder’s feed, and no party disputes that an ordinary artisan would have found this the obvious location for the combination of sensors. The ordinary artisan would then be left with two design choices.”) *Cf. In re Gal*, 980 F.2d 717, 719 (Fed. Cir. 1992) (“The Board held that Gal had simply made an obvious design choice. However, the different structures of Gal and Matsumura achieve different purposes.”) Our reviewing court has cautioned that “[m]erely stating that a particular [limitation] is a design choice does not make it obvious.” *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 n.4 (Fed. Cir. 2018) (quoting *Cutsforth, Inc. v. MotivePower, Inc.*, 636 F. App’x 575, 578 (Fed. Cir. 2016) (nonprecedential)).

Consistent with the foregoing principles, the Examiner acknowledges that an obviousness rationale based upon a design choice requires a showing “that the prior art would have performed equally as well as the claimed invention.” Answer 8. Yet, the Examiner does not identify, in the prior art of record, a disclosure of an element that operates sufficiently, in regard to the very claim limitation stated to be a matter of design choice (i.e., claim 1’s “wherein air provided from said pressure bleed system to an environmental control system inlet is at most 10 pounds per square inch (psi)

above an ambient cabin pressure of an aircraft cabin”). Instead, the Examiner’s hypothetical example, which the Examiner concedes to be an “arbitrary” choice (*id.* at 10), supplies the essential predicate for the rejection.

Therefore, we do not sustain the rejection of independent claim 1 and dependent claims 4–6, 13, and 15 as obvious over Atkey and ASHRAE, based upon the design-choice rationale.

2. Rejections IV–VI Based Upon Atkey, ASHRAE, and Derouineau

The Examiner also rejects the claims as obvious over Atkey, ASHRAE, and Derouineau, relying upon Derouineau for claim 1’s limitation of “air provided from said pressure bleed system to an environmental control system inlet is at most 10 pounds per square inch (psi) above an ambient cabin pressure of an aircraft cabin.” *See* Final Action 15–16 (citing Derouineau ¶¶ 2, 17–18, 38).

The Appellants argue that this rejection is erroneous, because it improperly combines two distinct and mutually exclusive examples of Derouineau. Appeal Br. 8–9. According to the Appellants, ¶¶ 17–18 of Derouineau describe an example in which the pressure at the bleed port is “at or below cabin pressure,” but the Appellants contend that this circumstance applies where the bleed is used “for only ECS (in other words, not for wing anti icing (WAI) or other bleed loads).” *Id.* at 9 (quoting Derouineau ¶ 18). The Appellants contend that such low bleed pressure does *not* exist in Derouineau’s disclosures in ¶ 38 and Figure 4, wherein the bleed supplies pressurized air to the ECS and at least one other application (such as the wing anti-icing mechanism). *Id.* According to the Appellants,

“[t]hese two examples are distinct, mutually exclusive embodiments, and the explicit teaching of Derouineau is that the low pressure bleed can only be used in a system that exclusively provides bleed pressure to the ECS.” *Id.*

However, the Appellants misunderstand Derouineau’s teachings and the Examiner’s application of the reference in this rejection.

Derouineau addresses the problem of the engine compressor delivering air at a “pressure above what is required for ECS,” such that using that source to supply the ECS mandated the “pressure to be throttled (wasted).” Derouineau ¶ 17. By contrast, Derouineau’s “invention is designed to use an engine bleed system capable of normally providing bleed air *above* (but not generally more than 5 psi above in cruise to avoid waste), *at or below cabin pressure*, and thus, it may be the most efficient solution for pressurization.” *Id.* (emphasis added).

In regard to the disclosure of Derouineau’s ¶ 18 — i.e., “using engine bleed for *only* ECS” — “[t]he present invention recognizes that a very simple bleed system may be realized, relying on a low pressure bleed port which may be sized to be *at or below* required cabin pressure for standard cruise altitude, speed and temperature.” *Id.* ¶ 18 (emphasis added).

In regard to ¶ 38 (and Figure 4, described therein) of Derouineau, the reference discloses supplying “low pressure bleed air” in order to pressurize an aircraft cabin and to supply other pneumatic systems. *Id.* ¶ 38, Fig. 4.

Yet, there is no indication that the disclosure of Derouineau’s ¶ 38 embodiment negates the general condition described in ¶ 17 — i.e., providing bleed air to the ECS that is “*above* (but not generally more than 5 psi above in cruise to avoid waste), *at or below* cabin pressure” — notwithstanding that ¶ 38 does not state the still more narrowly proscribed

condition of ¶ 18, in which the “low pressure bleed port” is “*at or below* required cabin pressure.” *Id.* ¶¶ 17, 18, 38 (emphasis added).

Therefore, the Examiner’s rejection does not rely upon “mutually exclusive” embodiments of Derouineau that “cannot have their features combined,” as the Appellants contend. Reply Br. 3. Nor do the Appellants sufficiently articulate any other reason why the cited prior art disclosures may not be combined, as set forth in the rejection, to meet the requirements of claim 1.

Accordingly, we sustain the rejections of independent claim 1 and dependent claims 2, 4–6, 12, 13, and 15 (none of which is argued separately) under 35 U.S.C. § 103(a), based upon the combination of Atkey, ASHRAE, and Derouineau.

DECISION

We AFFIRM the Examiner’s decision rejecting claims 1, 2, 4–6, 12, 13, and 15 under 35 U.S.C. § 112 (pre-AIA), first paragraph.

We REVERSE the Examiner’s decision rejecting claims 1, 2, 4–6, 12, 13, and 15 under 35 U.S.C. § 112 (pre-AIA), second paragraph.

We AFFIRM the Examiner’s decision rejecting claims 1, 2, 4–6, 12, 13, and 15 under 35 U.S.C. § 103(a) (pre-AIA).

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

AFFIRMED