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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHRISTINE DELAFOY and BRUNO JULIEN

Appeal 2012-005049
Application 11/628,222
Technology Center 3600


BROWNE, Administrative Patent Judge.

DECISION ON APPEAL

STATEMENT OF THE CASE


We REVERSE and enter NEW GROUNDS OF REJECTION pursuant to our authority under 37 C.F.R § 41.50(b).
CLAIMED SUBJECT MATTER

The claims are directed to method for operating a nuclear reactor.

Independent claim 43, reproduced below, is representative of the claimed subject matter:

43. A method for operating a nuclear reactor in order to produce electricity, the reactor comprising a core that is loaded with assemblies that comprise nuclear fuel rods, at least one nuclear fuel rod being of a type comprising:
   a cladding of recrystallized zirconium-based alloy, comprising, by mass,
   from 0.8 to 1.3% of niobium,
   between 1000 ppm and 1700 ppm of oxygen,
   between 0 and 35 ppm of sulphur,
   between 0 and 7000 ppm in total of at least one of iron, chromium and vanadium,
   between 0 and 2% of tin,
   between 0 and 70 ppm of nickel,
   between 0 and 100 ppm of carbon, and
   between 0 and 50 ppm of silicon,
   a balance being constituted by zirconium, with an exception of inevitable impurities, and
   pellets of nuclear fuel based on uranium oxide, the pellets being stacked inside the cladding, the method comprising:
   controlling operation of the reactor, during a class 2 transient power occurrence, to reduce damage to the cladding caused by pellet/cladding interaction such that at least one of:
   (a) a linear power density of the nuclear fuel rod remains lower than a limit linear power density, the limit linear power density being greater than 430 W/cm, and
   (b) a variation of the linear power density of the nuclear fuel rod remains lower than a limit variation, the limit variation being greater than 180 W/cm.

REFERENCES

The prior art relied upon by the Examiner in rejecting the claims on appeal is:


REJECTIONS

5. Claim 64 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over NEA, Diz, Van Swam, Kurosaki, and Bratton.
6. Claims 49 and 50 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over NEA, Diz, Van Swam, and Aver’yanova.

8. Claim 65 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over NEA, Diz, Van Swam, and Mahe.

9. Claim 47 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over NEA, Diz, and Musick.

OPINION

Enablement

Claims 43, 47–65, and 67–69

The Examiner notes that “[t]he limitations, ‘greater than 430 W/cm’ and ‘greater than 180 W/cm’ include[] linear power densities greater than 444 W/cm and limit variations greater than 253 W/cm.” Ans. 5–6. The Examiner determines that:

the specification, while being enabling for a limit linear power density of 444 W/cm and a limit variation of the linear power density of 253 W/cm (specification; page 6, paragraph 5), does not reasonably provide enablement for a limit linear power density of greater than 430 W/cm and a limit variation of the linear power density of greater than 180 W/cm.

*Id.* at 5. The Examiner concludes that “[t]he specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.” *Id.* at 6. The Examiner further determines that

the specification, while being enabling for a limit linear power density of 590 W/cm, 600 W/cm, 610 W/cm, and 620 W/cm (and limit variation of 430 W/cm, 440 W/cm, 450 W/cm) when the pellets are doped with Cr$_2$O$_3$, it does not reasonably provide enablement for the above when the pellets are doped with any
at least one metal oxide, as recited in claim 54 (specification; page 6, paragraph 5 through page 7, paragraph 3).

Appellants argue that:

the Examiner has not provided a reasonable basis to question the enablement provided for claims 43, 47 to 65 and 67 to 69. The Examiner merely recites portions of the claims and summarily concludes that the disclosure does not provide enough information for one of ordinary skill in the art to perform the claimed methods without providing any bases whatsoever evidencing lack of enablement. The Examiner does not even suggest that any experimentation that might be required by one of ordinary skill in the art might be undue. Since the Examiner has not presented a rational basis as to why one of ordinary skill in the art could not practice the invention of claims 43, 47 to 65 and 67 to 69 without undue experimentation, the Examiner has not presented a prima facie case of non-enablement.

In response to these arguments, the Examiner determines that “an upper limit of ‘greater than 430 W/cm’, for example, can be an upper limit of infinity. The linear power density must have an upper limit; the instant application does not disclose one.” Ans. 17. The Examiner further determines that “[t]he same rationale applies to the limit variation (i.e., linear power density variation limit).” Id. Based on these determinations, the Examiner again concludes that “the specification does not enable any person skilled in the art to make or use the invention commensurate in scope with these claims.” Id.

The standard for determining whether the specification meets the enablement requirement was cast in the Supreme Court decision of Minerals Separation v. Hyde, 242 U.S. 261, 270 (1916) which postured the question: is the experimentation needed to practice the invention undue or
Determining enablement is a question of law based on underlying factual findings. In re Vaeck, 947 F.2d 488, 495 (Fed. Cir. 1991). The determination that “undue experimentation” would have been needed to make and use the claimed invention is not a single, simple factual determination. Rather, it is a conclusion that may be reached by weighing the following factual considerations: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. Wands at 737. As argued by Appellants supra, the Examiner’s determinations do not address undue experimentation. The Examiner does not make any findings pertaining to any of the factual considerations enumerated in Wands or any other factual considerations pertaining to undue experimentation. Thus, the Examiner errs by not applying the proper test for enablement.

For this reason, we do not sustain the Examiner’s decision rejecting claims 43, 47–65, and 67–69 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

**Indefiniteness**

The Examiner determines that “[a]s a result of the claims lacking enablement, they are considered vague and ill-defined in their metes and bounds; therefore, rendering them indefinite.” Ans. 6.

The lack of an enabling disclosure does not render a claim, per se, indefinite. Here, the Examiner does not explain why those skilled in the art
viewing the claims in light of the Specification would not be informed about the claimed scope of the invention with reasonable certainty. Thus, the Examiner errs by not applying the proper test for indefiniteness.

For this reason, we do not sustain the Examiner’s decision rejecting claims 43, 47–65, and 67–69 under 35 U.S.C. § 112, second paragraph, as indefinite.

**New Grounds of Rejection**

**Written Description:**

Claims 43, 47–65, and 67–69 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Appellants’ Specification describes specific limit linear power densities of 425 W/cm, 444 W/cm, 530 W/cm, and 620 W/cm. Spec. 17, 18. The Specification further describes a limit variation density ($\Delta P_L$) “[that] is greater than 180 W/cm, preferably greater than 200 W/cm, more preferably greater than 240 W/cm.” Id. at 23. As correctly noted by the Examiner, independent claim 43 recites the open ended limitations of “greater than 430 W/cm” and “greater than 180 W/cm.” See Ans. 17. These limitations “do not meet the written description requirement because the phrase ‘at least’ ha[s] no upper limit and cause[s] the claim to read literally on [an] embodiment outside of” the disclosed range of values. *In re Wertheim*, 541 F.2d 257, 263 (CCPA 1976). For example, Appellants’ Specification describes individual values of the limit linear power density of 425 W/cm, 444 W/cm, 530 W/cm, and 620 W/cm, whereas the claimed value of “greater than 430 W/cm” covers an entire range of values with no apparent upper limit that is outside of this range. Appellants have not provided any evidence to show that claim 43 is supported by the written description to convey with reasonable clarity to skilled artisans that Appellants had
possession of this claimed subject matter as of the filing date. Thus, claim 43 does not comply with the written description requirement of 35 U.S.C. § 112, first paragraph.

Claims 47–65 and 67–69 likewise fail to comply with the written description requirement as they depend from claim 43, and do not cure the deficiency in claim 43 discussed supra.

Indefiniteness:

Claims 43, 47–65, and 67–69 are rejected under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter that Appellants regard as the invention.

Independent claim 43 recites, inter alia, the step of “controlling operation of the reactor, during a class 2 transient power occurrence, to reduce damage to the cladding caused by pellet/cladding interaction.” Appeal Br., Clms. App. 26 (emphasis added). In claim 43, it is unclear as to what element or prior condition damage to the cladding is reduced (e.g., is the damage reduced with respect to situations where there is no pellet/cladding interaction, is the damage reduced with respect to the situation where operation of the reactor is not controlled, or some other situation?). “[If a claim is amenable to two or more plausible claim constructions, the USPTO is justified in requiring the applicant to more precisely define the metes and bounds of the claimed invention by holding the claim unpatentable under 35 U.S.C. § [112(b)], as indefinite.” Ex parte Miyazaki, 89 USPQ2d 1207, 1211 (BPAI 2008) (precedential).

Claims 47–65 and 67–69 depend from claim 43 and likewise are indefinite.
*Obviousness*

We do not reach the merits of the Examiner’s rejections under 35 U.S.C. § 103(a) at this time. Before a proper review of these rejections can be performed, the subject matter encompassed by the claims on appeal must be reasonably understood without resort to speculation. Because claims 43, 47–65, and 67–69 fail to satisfy the requirements of the second paragraph of 35 U.S.C. § 112, we are constrained to reverse, *pro forma*, the rejections under 35 U.S.C. § 103(a). *See In re Steele,* 305 F.2d 859, 862–63 (CCPA 1962) (A prior art rejection cannot be sustained if the hypothetical person of ordinary skill in the art would have to make speculative assumptions concerning the meaning of claim language.).

**DECISION**

The Examiner’s rejections of claims 43, 47–65, and 67–69 are REVERSED.

We enter a NEW GROUND OF REJECTION of claims 43, 47–65, and 67–69 under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement.

We enter a NEW GROUND OF REJECTION of claims 43, 47–65, and 67–69 under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter that Appellants regard as the invention.

37 C.F.R. § 41.50(b) provides “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

37 C.F.R. § 41.50(b) also provides that Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of
the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) **Reopen prosecution.** Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the Examiner, in which event the proceeding will be remanded to the Examiner. . . .

(2) **Request rehearing.** Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

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

**REVERSED; 37 C.F.R. § 41.50(b)**