

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT ADLER

Appeal No. 96-1225
Application 08/107,696¹

ON BRIEF

Before WILLIAM F. SMITH, JOHN D. SMITH, and OWENS,
Administrative Patent Judges.

OWENS, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of claim 12 and refusal to allow claims 1, 3, 5-11, 13, 15, 16 and 18-23 as amended after final rejection. These are all of

¹ Application for patent filed December 30, 1993. According to applicants, this application is a national stage application under 35 U.S.C. § 371 of PCT/EP92/00322 filed February 14, 1992.

the claims remaining in the application.

THE INVENTION

Appellant claims a process for cleaning workpieces by placing the workpieces in a pressure tank and contacting them with a liquefied or supercritical gas which is mechanically circulated at a velocity which is varied during the cleaning. Appellant also claims a cleaning apparatus which includes two cylindrical pressure tanks which each contain an axially-mounted impeller and which are connected by a conduit system having therein a pump and heat exchanger. Claims 1 and 12 are illustrative and read as follows:

1. In a process for cleaning workpieces exhibiting organic residues, comprising introducing compressed gas under pressure into a pressure tank loaded with the workpieces, the improvement wherein a liquefied or supercritical gas having a temperature is mechanically circulated within the pressure tank during cleaning of the workpieces whereby the mechanically circulated liquefied or supercritical gas exhibits a circulation velocity and said circulation velocity of said liquefied or supercritical gas is varied during said cleaning.

12. An apparatus for cleaning workpieces contaminated with organic residues said apparatus comprising:

a first cylindrical pressure tank containing an impeller mounted on an axle within said first cylindrical pressure tank; said first cylindrical pressure tank is connected via conduits provided with valves with a second cylindrical

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pressure tank containing an impellar mounted on an axle within said second pressure tank; one of said conduits is provided with a pump, and a heat exchanger is positioned in this or another connecting

conduit wherein said heat exchanger and said pump are connected with each pressure tank respectively by additional conduits; and that each pressure tank is connected by means of additional conduits with one or several storage tanks for compressed gases.

THE REFERENCES

Nishikawa et al. (Nishikawa) 1990	4,944,837	Jul. 31,
Jackson et al. (Jackson '619) 1993	5,213,619	May 25,
		(filed Nov. 30, 1989)
Hoy et al. (Hoy) 1994	5,306,350	Apr. 26,
		(parent filed Dec. 21, 1990)
Jackson (Jackson '189) 1990 (PCT application)	WO 90/06189	Jun. 14,

THE REJECTIONS

Claims 1, 3, 5-11, 13, 15, 16 and 18-23 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention.

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Claims 1, 3, 5-13, 15, 16 and 18-23 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combined teachings of Jackson '189, Hoy, Jackson '619 and Nishikawa.

OPINION

We have carefully considered all of the arguments advanced by appellant and the examiner and agree with appellant that the aforementioned rejections are not well founded. Accordingly, we

do not sustain these rejections. Under the provisions of 37 CFR § 1.196(b), we enter new grounds of rejection of claims 1, 3, 6, 18 and 22.

Rejection under 35 U.S.C. § 112, second paragraph

The examiner argues (answer, page 4):

In claim 1, the recitation of "mechanically circulated" is indefinite, because it does not show how to mechanically circulate the liquefied or super critical gas. Claim 2 [sic, 1?] is very broad and it can read on any mechanically circulated means.

In claim 1, line 9, "varied" is indefinite term, because appellant does not show how the velocity will be varied.

These rejections clearly are improper. Consequently, we reverse them without further comment.

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Rejection under 35 U.S.C. § 103

Because the examiner has not applied any of the references or combination thereof to the subject matter of any claim as a whole, we reverse the rejection under 35 U.S.C. § 103. *See Manual of Patent Examining Procedure* § 706.02(j) (7th ed., July 1998).

New grounds of rejection under 37 CFR § 1.196(b)

Under the provisions of 37 CFR § 1.196(b), we enter the following new grounds of rejection.

Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by JP '189.

During patent prosecution, claims are to be given their broadest reasonable interpretation consistent with the specification, and the claim language is to be read in light of the specification and prior art, as it would be interpreted by one of ordinary skill in the art. *See In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *In re Sneed*, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983); *In re Okuzawa*, 537 F.2d 545, 548, 190 USPQ 464, 466

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(CCPA 1976); *In re Kroekel*, 504 F.2d 1143, 1146, 183 USPQ 610, 612 (CCPA 1974); *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238-39 (CCPA 1971). However, limitations are not to be read from the specification into the claims. See *In re Prater*, 415 F.2d 1393, 1405, 162 USPQ 541, 551 (CCPA 1969).

A patent specification "acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1577 (Fed. Cir. 1996). Appellant's specification not only does not expressly define the term "mechanically circulated" recited in claim 1, but does not mention this term or any similar term.² The term "mechanically circulated" was added to claim 1 by amendment (filed September 23, 1994, paper no. 8). The specification states (page 3, lines 10-13) that the liquefied or supercritical gas "is circulated in the pressure tank, for example, by the rotation of a vane-equipped impeller" and that

² The examiner should consider requiring that the specification be amended so that it provides clear antecedent basis for the term "mechanically circulated". See 37 CFR § 1.75(d)(1)(1996); *Manual of Patent Examining Procedure* § 608.01(o) (7th ed., July 1998).

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an impeller is a suitable apparatus (page 6, line 35 - page 7, line 1). The specification, however, does not indicate that the term "mechanically circulated" in claim 1 is limited to circulation provided by an impeller. We find no implied definition of "mechanically circulated" in appellant's specification.

Jackson '619 states (col. 6, lines 13-17) that acoustic radiation for practicing his invention "is provided by a high-powered ultrasonic generator which converts electrical energy into mechanical energy, or acoustic radiation, via a piezoelectric transducer." This teaching indicates that at least some of the energy produced by an ultrasonic generator is in mechanical form.

The dictionary definition of "circulate" is as follows:

1. To move in or flow through a circle or circuit <electricity *circulating* through the building> 2. To move around, as from person to person or place to place <a candidate *circulating* through the crowd> 3. To move about or flow freely, as air. 4. To spread widely among persons or places: DISSEMINATE <Bad news tends to *circulate* quickly.> -vt. To cause to

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move about or be distributed.^[3]

This term is not limited in meaning to movement in a circle or circuit but, rather, broadly includes movement from place to place, which certainly is movement produced when an ultrasonic generator is used.

For the above reasons, when we give the term "mechanically circulated" in appellant's claim 1 its broadest reasonable interpretation in view of appellant's specification and the prior art, we find that this term includes the movement of fluid provided by an ultrasonic generator.

Appellant argues that ultrasonic energy is not mechanical (brief, page 7). We are not persuaded by this argument in view of the teaching in Jackson '619 discussed above. Appellant further argues that the application of ultrasonic energy produces ultrasonic waves which cause microscopic excursions of particles of the dense phase gas from their equilibrium which does not suggest mechanical circulation (see *id.*). This argument is not well taken because it is merely an

³ *Webster's II New Riverside University Dictionary* 264 (Riverside Publishing Co. 1984). A copy of the relevant page of this dictionary is provided to appellant with this decision.

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unsupported argument by appellant's counsel, and such an argument cannot take the place of evidence. See *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984); *In re Payne*, 606 F.2d 303, 315, 203 USPQ 245, 256 (CCPA 1979); *In re Greenfield*, 571 F.2d 1185, 1189, 197 USPQ 227, 230 (CCPA 1978); *In re Pearson*, 494 F.2d 1399, 1405, 181 USPQ 641, 646 (CCPA 1974). Appellant provides no evidence as to what movements of fluid those of ordinary skill in the art considered to be produced by mechanical circulation, and why no such movement is provided by an ultrasonic generator.

Appellant argues that Jackson '189 does not suggest that ultrasonic waves produce suction zones and pressurized zones (brief, page 7). Appellant apparently is arguing that the formation of such zones is a characteristic of mechanical circulation. Appellant's argument is not convincing because appellant has not established that the term "mechanically circulated" was considered in the art to require the formation of suction and pressure zones. Furthermore, Jackson '619 (col. 6, lines 47-52) teaches that ultrasonic energy produces low and high

pressure zones, which appear to be suction and pressure zones, and appellant has not distinguished these zones from the zones referred to by appellant.

For the above reasons, when we apply JP '189 to appellant's claim 1 below, we consider the term "mechanically circulated" in that claim to include the fluid movement produced by ultrasonic energy.

Jackson '189 discloses a process for cleaning workpieces wherein compressed gas is introduced into a pressure vessel loaded with workpieces, and the temperature and pressure in the pressure vessel are adjusted such that the gas becomes a dense fluid (page 10, line 26 - page 11, line 4; page 12, line 27 - page 13, line 11). The phase of the fluid then is shifted between liquid and supercritical states by varying the temperature (page 11, lines 4-9; page 15, lines 21-29). After completion of each phase shifting step, the temperature is maintained for a period of time to allow contaminant removal from the workpieces (page 4, lines 13-17). In one embodiment, the cleaning is enhanced by applying ultrasonic energy to the cleaning zone, which agitates the dense phase gas (page 21, lines 15-18; page 22, lines 10-13). The frequency of the

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sonic energy preferably is shifted back and forth over the range of 20-80 kilohertz (page 22, lines 4-6). That is, the fluid circulation velocity is varied. The use of ultrasonic energy is effective for enhancing the removal of organic contaminants from the workpieces (page 22, lines 6-9).

For the above reasons, the process recited in appellant's claim 1 is anticipated by JP '189.

Claim 3, 6, 18 and 22 are rejected under 35 U.S.C. § 103 as being unpatentable over JP '189.

JP '189 does not disclose a specific embodiment in which the fluid is carbon dioxide and the cleaning is enhanced by use of ultrasonic energy. However, the disclosures that carbon dioxide is a preferred dense phase gas (page 6, lines 32-34), that supercritical carbon dioxide is effective for removing organic contaminants from workpieces (page 20, lines 22-23), and that use of ultrasonic energy enhances the removal of organic contaminants (page 22, lines 6-9), would have fairly suggested, to one of ordinary skill in the art, use of supercritical carbon dioxide and ultrasonic energy in combination to obtain enhanced removal of organic contaminants. Consequently, the processes recited in

appellant's claim 3 and 22 would have been *prima facie* obvious to one of ordinary skill in the art over JP '189.

As for claims 6 and 18, JP '189 discloses a system in Fig. 4 which can be used for either batch or continuous cleaning (page 14, lines 18-34) and which includes a high pressure cleaning vessel (12) having an exhaust line (26) connected to a separator (28) (page 14, lines 20-21; page 15, lines 14-17). In the continuous mode, dense fluid is introduced into the cleaning vessel (12) at the same rate that exhaust dense phase gas is continuously removed through the exhaust line (26) in order to maintain the pressure in the cleaning vessel (12) at or above the critical pressure (page 15, lines 23-26). JP '189 does not discuss, with respect to the continuous mode, separating contaminants from the exhaust dense phase gas and recycling the dense phase gas. However, regarding the batch mode, JP '189 states (page 15, lines 14-17) that "[t]he exhaust line may be connected to a separator 28 which removes the entrained contaminants from the exhaust gas thereby allowing recycling of the dense phase gas." This teaching, combined with the teaching that contaminated dense

phase gas is exhausted in the continuous mode (page 15, line 23), would have fairly suggested, to one of ordinary skill in the art, separating the contaminants from the exhausted dense phase gas in the continuous mode and recycling the dense phase gas for the same reason that recycling apparently is used in the batch mode, i.e., to reduce the amount of fresh dense phase gas required by the process. JP '189 does not disclose that the recycle gas is conducted through a heat exchanger before it is returned to the pressure vessel. However, the teaching in JP '189 that the temperature in the pressure vessel is controlled at the desired temperature above or below the critical temperature of the cleaning fluid (page 16, lines 16-21) would have fairly suggested, to one of ordinary skill in the art, adjusting the temperature of the recycled dense phase gas prior to introducing it into the pressure vessel so that it would be at the temperature desired in the pressure vessel.

For the above reasons, the processes recited in appellant's claims 6 and 18 would have been *prima facie* obvious to one of ordinary skill in the art over JP '189.

We do not find in JP '189 a disclosure or suggestion of

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the subject matter of appellant's claims 5, 7-13, 15, 16, 19-21 and 23. The examiner points out (answer, page 5) that JP '189 discloses that the temperature between temperature changes is maintained for a predetermined time (page 8, lines 19-23), but does not explain why this disclosure would have fairly suggested, to one of ordinary skill in the art, maintaining the temperature constant during the cleaning as required by appellant's claims 5, 13, 15, 16 and 19-21. The examiner states that the limitations of claims 1, 3, 5-13, 15, 16 and 18-21 are disclosed in JP '189 and either cites column numbers and line numbers in the reference or refers us to the document in general (answer, page 6), but does not specifically discuss the content of the relied-upon disclosures.

The examiner should address each limitation of every rejected claim and specifically explain why the portions of the references which the examiner relies upon disclose or suggest each limitation.

DECISION

The rejections of claims 1, 3, 5-11, 13, 15, 16 and 18-23 under 35 U.S.C. § 112, second paragraph, as being indefinite

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for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention, and of claims 1, 3, 5-13, 15, 16 and 18-23 under 35 U.S.C. § 103 as being unpatentable over the combined teachings of Jackson '189, Hoy, Jackson '619 and Nishikawa, are reversed. Under the provisions of 37 CFR § 1.196(b), new grounds of rejection of claims 1, 3, 6, 18 and 22 have been entered.

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b) (amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides that, "A new ground of rejection shall not be considered final for purposes of judicial review."

37 CFR § 1.196(b) also provides that the appellant, 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 proceedings

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(§ 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

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

REVERSED, 37 CFR § 1.196(b)

WILLIAM F. SMITH)

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