

United States Court of Appeals for the Federal Circuit

99-1463
(Reexamination Nos. 90/003,346 and 90/003,873)

IN RE BAKER HUGHES INCORPORATED

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Appealed from: Patent & Trademark Office
Board of Patent Appeals & Interferences

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IN RE BAKER HUGHES INCORPORATED

DECIDED: June 14, 2000

Before MAYER, Chief Circuit Judge, PLAGER, and LOURIE, Circuit Judges.

LOURIE, Circuit Judge.

Baker Hughes Inc. appeals from the decision of the United States Patent and Trademark Office Board of Patent Appeals and Interferences holding, in a merged reexamination proceeding involving U.S. Patent 5,074,991, that claims 1-9, 17-25, 35, and 42-45 are unpatentable under 35 U.S.C. § 103 (1994). See Ex parte Petrolite Corp., Paper Nos. 31 and 41 (BPAI Aug. 5, 1997). Because the Board erred in concluding that the appealed claims would have been obvious to one of ordinary skill in the art, we reverse.

BACKGROUND

The patent at issue in this appeal was initially assigned to Petrolite Corporation. Baker Hughes filed a third-party request for reexamination of the patent in 1994, arguing that U.S. Patent 4,368,059 (Doerges et al.) raised a substantial new question concerning the patentability of claims 1-9. The Patent and Trademark Office ("PTO") agreed and granted the Baker Hughes request. That reexamination was subsequently merged with another reexamination proceeding brought by a different party. Baker Hughes later became the owner of the '991 patent when it acquired Petrolite and thus became the defender of the patent in the reexamination proceeding rather than an attacker.

The invention claimed by the patent involves hydrogen sulfide contamination. Hydrogen sulfide is a toxic gas found naturally in crude oil, derivative products such as petroleum residua and fuel oils, and waste water associated with crude oil production. See '991 patent, col. 1, l. 19 to col. 2, l. 2. Hydrogen sulfide vapors are slowly emitted from these liquids at all stages of production, transport, and storage. If uncontrolled, they pose a serious health problem. See id. The claims at issue are directed to processes and compositions for controlling these emissions. Claims 1-9 are process claims. Independent claim 1, from which claims 2-9 depend, reads in pertinent part as follows:

1. A process of inhibiting the liberation of hydrogen sulfide gas from a material comprising water or a hydrocarbon containing dissolved hydrogen sulfide comprising adding to said material a sufficient amount of the following diaminomethane compound to inhibit hydrogen sulfide gas evolution. . . .

Id. at col. 7, ll. 7-12.

Claims 17-25 and 35 are related composition claims. Independent claim 17, from which claims 18-25 and 35 depend, reads in pertinent part as follows:

17. A composition comprising
 - a. a material comprising water or a hydrocarbon, and
 - b. a sufficient amount of the following diaminomethane compound to inhibit hydrogen sulfide gas liberation. . . .

Id. at col. 8, ll. 34-38.

Claims 42-45, which were added during the reexamination proceeding, are also composition claims. Claim 42, from which claims 43-45 depend, reads in pertinent part as follows:

42. A composition comprising:
 - a. a liquid hydrocarbon material, and
 - b. a sufficient amount of the following diaminomethane compound to inhibit hydrogen sulfide gas liberation. . . .

Feb. 8, 1995 Response to Office Action at 2-3 (adding claims 42-45).

The two references upon which the Board relied in rejecting the claims at issue were the Doerges reference and U.S. Patent 4,244,703 (Kaspaul). The parties do not dispute what these references teach one of ordinary skill in the art.

The Doerges reference teaches a process for removing hydrogen sulfide and other acid gases from natural gas (a gaseous hydrocarbon) by “scrubbing” the natural gas with an absorbent liquid containing an organic solvent and an organic base such as a diaminomethane. See Doerges, col. 1, ll. 49 to col. 2, l. 28. Specifically, the absorbent liquid is circulated through a vertical column from the top to the bottom. See id. at col. 4, ll. 35-41. The natural gas is then pumped into the bottom of the column. See id. As the natural gas vapors rise to the top of the column, the hydrogen sulfide is absorbed by the absorbent liquid. See id. The natural gas then exits the top of the column with less hydrogen sulfide in it. See id.

The second reference, Kaspaul, teaches adding a diaminomethane compound to hydrocarbon fuels to improve fuel economy. See Kaspaul, col. 2, ll. 50-60. It does not teach inhibiting the liberation of hydrogen sulfide from a hydrocarbon. It does not refer to hydrogen sulfide at all.

The Board held that process claims 1-9 and composition claims 17-25 would have been obvious over the Doerges reference. The Board held that the broadest reasonable interpretation of the term “hydrocarbon” included both gases and liquids in light of references in the written description to both gaseous and liquid hydrocarbons. See Petrolite, slip op. at 15, 21-27. The Board also held that the process of claim 1 would have been obvious over the Doerges reference because the amount of diaminomethane in the absorbent liquid in the column was sufficient to inhibit the evolution of hydrogen sulfide.

See id. at 19. With regard to composition claim 17, the Board found that the process disclosed in the Doerges reference resulted in “a mixture containing a hydrocarbon gas, methanol, and a particular amount of the claimed diaminomethane compound . . . [T]he Doerges reference describes the composition recited in claim 17.” Id. at 32. The Board held that “the complete description of the claimed composition is the ultimate of obviousness.” Id. The Board concluded that dependent claims 2-8 and 18-25 would have been obvious for the same reason.

The Board also concluded that composition claims 17-25, 35, and 42-45 would have been obvious over the Kaspaul reference. The Board construed independent claims 17 and 42 as not requiring the presence of hydrogen sulfide in the compositions. See id. at 37. The Board concluded that the compositions of claims 17 and 42 would have been obvious over the Kaspaul reference because the amount of diaminomethane described in that reference would effectively inhibit the evolution of hydrogen sulfide. See id. at 36-37. The Board concluded that dependent claims 18-25, 35, and 43-45 would have been obvious for the same reason.

Baker Hughes timely appealed to this court. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4)(A) (1994).

DISCUSSION

We review the Board’s legal conclusion of obviousness without formal deference, see 5 U.S.C. § 706 (1994), and the Board’s findings of fact for substantial evidence because they are “on the record of an agency hearing provided by statute,” In re Gartside, 203 F.3d 1305, 1315, 53 USPQ2d 1769, 1775 (Fed. Cir. 2000); see also 5 U.S.C. § 706(2)(E) (1994); 35 U.S.C. §§ 7(b), 144 (1994).

Baker Hughes argues that the Board erred in construing the term “hydrocarbon” (found in all of the claims at issue) to include gases, and attempts to distinguish the Doerges reference by arguing that (1) Doerges addresses gaseous hydrocarbons, not liquid hydrocarbons; (2) Doerges teaches how to separate hydrogen sulfide from a hydrocarbon rather than how to inhibit their separation; and (3) in Doerges the diaminomethane and hydrocarbon are not “added” together, they only “contact” each other. Baker Hughes argues that the Board also erred in construing claims 17 and 42 not to require the presence of hydrogen sulfide in the composition, and distinguishes the Kaspaul reference by arguing that it does not involve hydrogen sulfide.

The Director¹ responds that construing the term “hydrocarbon” to include gases provides the broadest reasonable construction of the term and that Doerges therefore essentially describes the subject matter of claims 1-9 and 17-25. The Director also argues that claims 17 and 42 do not require the presence of hydrogen sulfide and that the Kaspaul reference therefore essentially describes the subject matter of claims 17-25, 35, and 42-45. While this analysis suggests anticipation rather than obviousness, the rejections are under section 103. The Director also argues that Baker Hughes is

¹ Pursuant to the Patent and Trademark Efficiency Act, Pub. L. No. 106-113, § 4713, 113 Stat. 1501, 1501A-575 (1999) (amending 35 U.S.C. § 3) (effective March 28, 2000), the powers and duties of the United States Patent and Trademark Office were vested in an Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office (referred to as the “Director”).

“quasi-estopped” from arguing the validity of claims 1-9 over the Doerges reference because, when it requested reexamination of the ‘991 patent, it argued that those claims were unpatentable over the Doerges reference.

Section 103(a) of the patent statute provides as follows:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103(a) (1994). Whether an invention satisfies the section 103 nonobviousness requirement is a question of law with subsidiary factual inquiries. See Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). These inquiries include the scope and content of the prior art, the differences between the prior art and the claims at issue, the level of ordinary skill in the pertinent art, and any objective indicia of nonobviousness. See id. Although the PTO gives claims the broadest reasonable interpretation consistent with the written description, see In re Cortright, 165 F.3d 1353, 1358, 49 USPQ2d 1464, 1467 (Fed. Cir. 1999), claim construction by the PTO is a question of law that we review de novo, see In re Freeman, 30 F.3d, 1459, 1464, 31 USPQ2d 1444, 1447 (Fed. Cir. 1994); In re Donaldson, 16 F.3d, 1189, 1192, 29 USPQ2d 1845, 1848 (Fed. Cir. 1994) (en banc), just as we review claim construction by a district court.

As an initial matter, we disagree with the Director that Baker Hughes is “quasi-estopped” from arguing the patentability of claims 1-9 over the Doerges reference. This court has never had occasion to address quasi-estoppel; it is a seldom-utilized doctrine that appears predominately in tax cases. Our predecessor court, the United States Court of

Claims, explained the doctrine as follows:

The purpose of the doctrine of quasi estoppel is to prevent a taxpayer, after taking a position in one year to his advantage and after correction for that year is barred, from shifting to a contrary position touching on the same facts or transaction. J. Mertens, *The Law of Federal Income Taxation* [§] 60.04 (1976 rev.). A key element is the fact that the earlier position was then to the advantage of the taxpayer but that it is now to the taxpayer's advantage to shift his position.

Union Carbide Corp. v. United States, 612 F.2d 558, 566 (Ct. Cl. 1979). Quasi-estoppel is also known as the "duty of consistency," see Lewis v. Commissioner, 18 F.3d 20, 26 (1st Cir. 1994); it only applies when the earlier position amounts to a misstatement of fact, not of law, see id.; Herrington v. Commissioner, 854 F.2d 755, 758 (5th Cir. 1988); Crosley Corp. v. United States, 229 F.2d 376, 380 (6th Cir. 1956). "Moreover, the misstatement must be one on which the government reasonably relied, in the sense that it neither knew, nor ought to have known, the true nature of the transaction mischaracterized by the taxpayer." Lewis, 18 F.3d at 26; see also Herrington, 854 F.2d at 758; Black's Law Dictionary 572 (7th ed. 1999) (hereinafter "Black's") ("quasi-estoppel. An equitable doctrine preventing one from repudiating an act or assertion if it would harm another who reasonably relied on the act or assertion.").²

² Quasi-estoppel is in apparent contradistinction to judicial estoppel. See Black's 571 ("judicial estoppel. Estoppel that prevents a party from contradicting previous declarations made during the same or a later proceeding if the change in position would adversely affect the proceeding or constitute a fraud on the court."); Data Gen. Corp. v. Johnson, 78 F.3d 1556, 1564 (Fed. Cir. 1996) ("The doctrine of judicial estoppel is that where a party successfully urges a particular position in a legal proceeding, it is estopped from taking a contrary position in a subsequent proceeding where its interests have changed."); Wang Lab., Inc. v. Applied Computer Sciences, Inc., 958 F.2d 355, 358, 22 USPQ2d 1055, 1058 (Fed. Cir. 1992) ("The doctrine of judicial estoppel is the general proposition that where a party assumes a certain position in a legal proceeding, and succeeds in maintaining that position, he may not thereafter, simply because his interests have changed, assume a contrary position.") The Director has not argued judicial estoppel in this case.

In this case, it is true that Baker Hughes' change of position with regard to the patentability of claims 1-9 puts it in an unusual, and perhaps suspect, position. However, the Director has not shown that Baker Hughes made any specific factual misstatements in either its Request for Reexamination of the '991 patent or otherwise, and it has not shown that the PTO relied on any such misstatements. Moreover, the PTO is charged with making an independent determination concerning the patentability of inventions. The fact that Baker Hughes once opposed the maintenance of the patent and now defends it does not change the PTO's duty to conduct the reexamination. Lastly, the Director has not shown that the PTO or the public has suffered any harm from the change of Baker Hughes' position. Baker Hughes informed the PTO of a reference that had not been considered by the examiner in the patent's original examination, argued that that reference raised a substantial new question of patentability as to claims 1-9, and requested a reexamination. The PTO agreed that a substantial new question of patentability was raised by the Doerges reference and granted the request. The Office had the same obligation and ability to reexamine the patent in light of the reference whether Baker Hughes was an opposer or a defender. The public interest lies in having valid patents upheld and invalid patents rendered invalid, and hence patents should be reexamined when a substantial question of patentability is raised. The proper result occurs irrespective of Baker Hughes' role in the process.

Turning to the merits of the Board's decision, we agree with Baker Hughes that the Board erred in construing the term "hydrocarbon" as used in the claims to include gases. As the plain language of claims 1, 17, and 42 indicates, the claims are directed to inhibiting the "evolution" or "liberation" of hydrogen sulfide from either an aqueous or hydrocarbon

material. The written description uses the terms “evolve” and “liberate” several times and, in each instance, the terms are used to describe the emission of hydrogen sulfide from a liquid hydrocarbon, particularly petroleum residua. See, e.g., ‘991 patent, col. 1, ll. 57-58.

For example, in the Background of the Invention, the written description states:

The presence of the sulfur compounds in the residua gives rise to the generation of a gas having substantial portions of hydrogen sulfide gas. . . . [D]uring storage or [] transport [of residua], hydrogen sulfide gases become liberated. . . . Providing an effective chemical method for suppressing or inhibiting the liberation of hydrogen sulfide gases from residua are of considerable importance. Methods heretofore known for suppressing the liberation of hydrogen sulfide gases from residua suffer from the standpoint of effectiveness.

Id. at col. 1, l. 66 to col. 2, l. 17 (emphasis added). Similarly, in the Detailed Description of the Invention, the written description states that “[t]he incorporation of the additive to suppress the evolution of hydrogen sulfide gases should be made before the residua are stored or transported.” Id. at col. 3, ll. 62-65 (emphasis added). Although the Director points to various parts of the written description that describe hydrocarbons as gases and liquids, nowhere does the written description use the terms “evolution” or “liberation” to describe the separation of hydrogen sulfide from a gaseous hydrocarbon material. Moreover, the written description’s use of the terms “evolution” and “liberation” to describe the emission of a hydrogen sulfide from a liquid hydrocarbon is consistent with the terms’ common chemical definitions. See Webster’s II New Riverside University Dictionary 690 (1988) (“liberate: to release from combination, as a gas”); id. at 449 (“evolve: to give off: emit”). Lastly, nowhere in the written description is there an example of the claimed process being used with a gaseous hydrocarbon. None of the embodiments of the invention described in the written description relate to gaseous hydrocarbons. We therefore conclude that the Board adopted a construction of the claim beyond that which was

reasonable in light of the totality of the written description, and therefore erred in construing the claims to include gaseous hydrocarbons.

While in many cases a reversal on claim construction would necessitate a remand, we need not remand for the PTO to determine whether the change of construction renders claim 1 nonobvious over the Doerges reference. We agree with Baker Hughes that the process of claim 1 would not have been obvious over the Doerges reference. The differences between the processes are readily apparent. The Doerges reference teaches how to extract hydrogen sulfide from a gaseous hydrocarbon with a diaminomethane solution, whereas claim 1 teaches how to inhibit the liberation of hydrogen sulfide from a liquid hydrocarbon by adding diaminomethane directly. Thus, the results are opposite. In the Doerges reference the hydrogen sulfide is removed; in claim 1, it is retained. Moreover, in claim 1, the diaminomethane is added to a liquid hydrocarbon, whereas in the Doerges reference a gaseous hydrocarbon bubbles through the diaminomethane solution.

In its reexamination decision, the examiner allowed another claim, claim 37 (added during reexamination), that is identical to claim 1 except that it explicitly recites a “liquid hydrocarbon.” See Petrolite, slip op. at 2 (allowing claim 37); Feb. 8, 1995 Response to Office Action at 1-2 (adding claim 37). Since the examiner concluded that claim 37 would not have been obvious over the Doerges reference, we can safely assume that he would have concluded that claim 1 would not have been obvious over the Doerges reference had he construed the claim as we have. In addition, since we have concluded that the process of claim 1 would not have been obvious over the Doerges reference, the processes of claims 2-9, containing additional limitations, similarly would not have been obvious. The Board’s rejection of claims 1-9 over the Doerges reference is therefore reversed.

We also agree with Baker Hughes that the compositions of claim 17 would not have been obvious over the Doerges reference. The differences between the compositions of claim 17 and the mixture described in the Doerges reference are readily apparent. The Doerges reference describes a gaseous hydrocarbon, whereas claim 17 describes a liquid hydrocarbon. As with claim 1, we can also assume that the examiner would not have found claim 17 obvious over the Doerges reference had he construed the claim to cover only liquid hydrocarbons because he did not reject claim 42 (also added during reexamination) over the Doerges reference. Claim 42 is similar to claim 17 except that it also explicitly recites a “liquid hydrocarbon.” In addition, since we have concluded that the compositions of claim 17 would not have been obvious over the Doerges reference, the compositions of claims 18-25 and 35, containing additional limitations, similarly would not have been obvious. The Board’s rejection of claims 17-25 and 35 over the Doerges reference is therefore also reversed.

Finally, we agree with Baker Hughes that the Board erroneously construed composition claims 17 and 42 as not requiring the presence of hydrogen sulfide. Both claims require “a sufficient amount of [] diaminomethane compound to inhibit hydrogen sulfide gas liberation.” This language implicitly requires the presence of hydrogen sulfide in the compositions for two reasons. First, the liberation of hydrogen sulfide from a composition cannot be inhibited if it is not present. Second, it would be futile to determine how much diaminomethane would be “sufficient” to inhibit hydrogen sulfide liberation if hydrogen sulfide were not present.

Having construed claims 17 and 42 to require the presence of hydrogen sulfide in the claimed compositions, we reverse the Board’s rejection of these claims over the

Kaspaul reference. In addition, since there is no dispute that Kaspaul does not teach or suggest compositions containing hydrogen sulfide in a liquid hydrocarbon, one of ordinary skill in the art would not have found the claims obvious over that reference. We therefore need not remand. In addition, since we have concluded that the compositions of claims 17 and 42 would not have been obvious over the Kaspaul reference, the compositions of claims 18-25, 35, and 43-45, containing additional limitations, similarly would not have been obvious. The Board's rejection of claims 17-25, 35, and 42-45 is therefore also reversed.

CONCLUSION

The Board erred in construing claims 1-9, 17-25, 35, and 42-45 to include gaseous hydrocarbons and erred in construing claims 17-25, 35, and 42-45 to not require the presence of hydrogen sulfide. Consequently, the Board erred in concluding that the appealed claims would have been obvious to one of ordinary skill in the art. Its decision is therefore

REVERSED.