

The opinion is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte Samuel R. Alexander

Appeal 2007-2097
Application 10/746,644¹
Technology Center 3600

Decided: August 27, 2007

Before RICHARD E. SCHAFER, SALLY G. LANE, AND
MICHAEL P. TIERNEY, *Administrative Patent Judges*.

TIERNEY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a 35 U.S.C. § 134 appeal in the above-referenced case.² Specifically, the Examiner has rejected all pending claims, claims 1-7, under 35 U.S.C. § 103(a) as having been obvious. The Applicant (“Alexander”) seeks review. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b). We affirm.

¹ The application published as 20050147472 on July 7, 2005.

² The real party in interest is Tronox LLC (“Tronox”). (Appeal Br. at 1).

STATEMENT OF THE CASE

Alexander's claims on appeal relate to a process of treating waste solids from the processing of titanium bearing ores. (Spec., p. 1, Appeal Br., Claims Appendix, Claim 1). Alexander's specification states that the processing of titanium-bearing ores produces significant quantities of impurity metal chlorides. (Spec., p. 1). The specification also states that the impurities, predominantly iron chloride salts, must be isolated and removed prior to processing into a salable product. (*Id.*). Typical disposal methods are said to include neutralization and storage of the resulting neutralized sludge in a pond or the injection of non-neutralized waste metal chloride solutions into porous subsurface formations via deep well injection. (*Id.* at 2). The use of storage ponds are said to be environmentally problematic. Furthermore, filtering the accumulated waste solids from the pond is said to be costly. (*Id.*).

There are two independent claims on appeal, claims 1 and 4, each of which is directed to a process where titanium-bearing ore waste is contacted with an acid to dissolve some of the waste, residual undissolved wastes are separated and the remainder is injected into a deep well. Claim 1 is representative of the claims on appeal and reads as follows:

A process for treating waste solids from the processing of titanium-bearing ores including waste metal hydroxide solids, whereby the waste solids are contacted with an acid under conditions effective to dissolve at least some of the waste metal hydroxide solids, residual undissolved solids are separated out and the remainder is injected into a subterranean waste disposal well.

(Br., Claims Appendix, emphasis added).

The Examiner has set forth three prior art rejections:

- i. Claim 1-3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Alexander's own specification ("admitted prior art") taken in view of Tate, U.S. Pat. 3,817,859 ("Tate") and further in view of Oddo, U.S. Pat. 5,613,242 ("Oddo")
- ii. Claims 4-6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art taken in view of Tate, Oddo and Lipford 5,146,600 ("Lipford")
- iii. Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art, Tate, Oddo, Lipford, and Carter, U.S. Pat. 6,800,260 ("Carter")

There are two issues in dispute. The prior art Tate reference describes contacting a waste solution with acid to inhibit the formation of solid precipitates and then injecting the waste into a subterranean formation. The Examiner and Alexander however, dispute whether one of ordinary skill in the art would understand that Tate's method is applicable to treating existing waste metal solids at a surface location. (Appeal Br. at 4-5). Additionally, the Examiner and Alexander dispute whether one of ordinary skill in the art would have understood that such a method could be used to treat solids removed from a pond. (*Id.* at 5-6).

We affirm.

ISSUE

The issue is whether Patentee has shown that the Examiner erred in rejecting the claims. Specifically, the issue(s) is/are:

Has Applicant demonstrated that the Examiner was incorrect in finding that one of ordinary skill in the art would have recognized that Tate's acid neutralization waste treatment process could be employed on waste having suspended solids?

Has Applicant demonstrated that the Examiner was incorrect in finding that one of ordinary skill in the art would have recognized that Tate's acid neutralization waste treatment process could be employed on ponds containing solid wastes?

FINDINGS OF FACT

A. Alexander's '644 Specification

1) Alexander's specification is directed to a method for protecting subterranean drinking water sources against the migration of hazardous metal waste solids. (Spec., p. 1).

2) Alexander's specification teaches that:

Typically disposal of the waste metal chlorides from a chloride route titanium dioxide process, for example, has been accomplished by one or more of four techniques: 1) neutralization and storage of the resulting neutralized sludge in a pond; 2) neutralization, followed by filtration and then landfilling of the filter cake; 3) open ocean disposal of the non-neutralized waste metal chloride solutions; or 4) injection of the non-neutralized waste metal chloride solutions into porous subsurface formations (safely isolated from subterranean drinking water sources) via deep well injection.

(*Id.* at p. 2).

3) Alexander's specification states that the processing of titanium-bearing ores produces significant quantities of impurity metal chlorides. (Spec., p. 1).

4) Alexander's specification states that the impurities, predominantly iron chloride salts, must be isolated and removed prior to processing into a salable product. (*Id.*).

5) Alexander's specification also states that conventional methods of dealing with accumulated waste solids from a chloride route titanium dioxide process, such as filtering to permit landfilling, are costly. (*Id.*).

B. Prior Art

1. Tate, U.S. Patent 3,817,859

6) Tate describes a method for disposing of effluent waste streams by injecting them into subterranean formations. (Tate, col. 1, ll. 11-17).

7) Tate's method inhibits the formation of solid precipitates, which plug subterranean formations, by lowering the pH of the waste stream. (*Id.*).

- 8) Tate states that waste streams must be disposed of but surface disposal might cause considerable pollution problems. (*Id.* at col. 1, ll. 26-29).

- 9) Tate teaches that subterranean wells for injection have small pores in the formation rock that are easily plugged by undissolved particles present in fluids being injected. (*Id.* at col. 1, ll. 45-47).

- 10) Tate teaches that solids that plug subterranean wells come from four sources including: 1) suspended solids and emulsions, such as clay from river water, 2) solids formed by the mixing of two or more solids-free streams, 3) solids formed by mixing of the stream(s) with connate water in the subterranean well, and 4) solids formed by precipitation when certain streams react with the rock in the well. (*Id.* at col. 1, ll. 53-68).

- 11) Tate states that suspended solids and emulsions, such as clay from river water, may be removed “by more effective surface treatment using techniques well known in the art” and that his invention is directed to plugging problems posed by other sources (*Id.* at col. 1, ll. 68-70).

- 12) Tate describes lowering the pH of a waste stream by adding an acid, such as hydrochloric acid. (*Id.* at col. 3, ll. 5-23).

13) Tate teaches that its method can be used to dissolve existing precipitates in a waste stream. (*Id.* at col. 3, ll. 24-28, “dissolve the precipitates already formed.”)

C. Final Office Action dated August 19, 2005

14) The Examiner found that Alexander’s specification admits that it was known in the art to inject waste solids having solid metal hydroxides into subterranean wells. (Final Office Action, p. 2).

15) The Examiner found that Tate teaches that injecting waste solutions into a subterranean well avoids above ground pollution problems. (*Id.*).

16) The Examiner found that Tate teaches the desirability of contacting waste solids with an acid prior to injection into the well in order to dissolve existing precipitates and inhibit the formation of further precipitates. (*Id.*).

17) The Examiner found that Lipford teaches that it is advantageous to remove industrial wastes from surface ponds in order to prepare the land for subsequent use or mitigate existing hazards. (*Id.* at 3).

18) The Examiner found that Oddo teaches that it is desirable to filter liquids prior to injection into a well to minimize plugging of the well and Alexander did not dispute this finding. (*Id.* at 2 and Appeal Br. at 5).

19) The Examiner found that Carter teaches that it was known in the art to recycle unreacted ore and/or coke to a titanium dioxide process and Alexander did not dispute this finding. (Final Office Action, p. 4, Appeal Br., pages 6-7).

D. Appeal Brief

20) Alexander's Appeal Brief states that no evidence appendix was included with the brief as no evidence was submitted or relied upon. (Appeal Br. at 7).

PRINCIPLES OF LAW

An invention is not patentable under 35 U.S.C. § 103 if it is obvious. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1745-46 (2007). The facts underlying an obviousness inquiry include:

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966). In addressing the findings of fact, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR* at 1739. As explained in *KSR*:

If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same

reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* and *Anderson's-Black Rock* are illustrative — a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

KSR at 1740.

A prior art reference is analyzed from the vantage point of all that it teaches one of ordinary skill in the art. *In re Lemelson*, 397 F.2d 1006, 1009, (1968) (“The use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain.”). Furthermore, “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR* at 1742.

On appeal, Applicants bear the burden of showing that the Examiner has not established a legally sufficient basis for combining the teachings of the prior art. Applicants may sustain its burden by showing that where the Examiner relies on a combination of disclosures, the Examiner failed to provide sufficient evidence to show that one having ordinary skill in the art would have done what Applicants did. *United States v. Adams*, 383 U.S. 39 (1966).

ANALYSIS

The Examiner rejected all of the claims on appeal setting forth three prior art rejections. The three prior art rejections are discussed below.

- i. The Rejection of Claim 1-3 Under 35 U.S.C. § 103(a) as Unpatentable over Admitted Prior Art taken in view of Tate and further in view of Oddo

Alexander did not argue the separate patentability of any subgroups of the claims as provided by rule so we select claim 1 as representative.³ Alexander claim 1 is directed to a process for treating waste solids from the processing of titanium-bearing ores including waste metal hydroxide solids. The process involves contacting waste solids with an acid under conditions effective to dissolve at least some of the waste metal hydroxide solids. The residual undissolved solids are then separated out and the remainder is injected into a subterranean waste disposal well.

The Examiner held that it would have been obvious to one of ordinary skill in the art to conduct Alexander's process where neutralized wastes solids from the processing of titanium-bearing ore are contacted with an acid to dissolve waste solids prior to injecting the solids into a subterranean well. Alexander disagrees.

Alexander contends that Tate is not concerned with treating suspended solids already existing at the surface, such as those recovered from a pond. (Appeal Br. at 4). Alexander states that the solids Tate contemplates dissolving are those formed by precipitation

³ 37 C.F.R. § 41.37(c)(1)(vii).

of certain otherwise solids-free waste streams. (Reply Br. at 2). In particular, Alexander identifies Tate as teaching that surface solids should be treated via more effective surface treatments. (*Id.*).

Alexander concludes that dealing with surface solids is distinct from treating solids formed from otherwise solids-free wastes. (*Id.*).

Disclosures in the prior art must be evaluated for all that they fairly teach one of ordinary skill in the art. Tate teaches the benefits of injecting wastes into subterranean formations but states that undissolved particles can plug the formation. Tate teaches one of ordinary skill in the art that its method dissolves precipitates that have already formed in a waste stream and that the process inhibits the formation of further precipitates thereby reducing the likelihood of plugging the formation. While Tate recognizes that other conventional methods may be employed for suspended solids, such as clay from river water, Tate does not teach that its method is ineffective as applied to suspended solids.

Alexander contends that Oddo does not disclose or suggest the aspect of acidifying existing waste solids including waste metal hydroxides, such as those formed by neutralizing waste metal chlorides. (Appeal Br., p. 5). Obviousness however, is not limited to the express teachings of a single prior art reference but is based upon what the *combined* teachings of the prior art suggest to the person of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the

test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”). In the present case, Tate teaches that iron oxides may precipitate out of a waste stream and plug the formation. (Tate, col. 2, ll. 60-65). Tate teaches that its method is applicable to precipitates, such as waste metal iron hydroxides, and Oddo does not teach or suggest otherwise.

Based upon the record presented, we find that Applicants’ claimed subject matter combines familiar elements of the prior art according to known methods to yield predictable results, i.e., a process that injects waste materials into a subterranean well where the process has a reduced tendency to plug the well. We conclude that Alexander has failed to demonstrate that the Examiner erred in rejecting claims 1-3 as obvious over the admitted prior art taken in view of Tate and further in view of Oddo.

- ii. The Rejection of Claims 4-6 Under 35 U.S.C. § 103(a) as Unpatentable over Admitted Prior Art taken in view of Tate, Oddo and Lipford

Alexander did not argue the separate patentability of any subgroups of the claims as provided by rule so we select claim 4 as representative. Alexander claim 4 is directed to a process for disposing of waste metal hydroxide solids from a process of making titanium dioxide from titanium-bearing ore. Claim 4 involves removing waste solids from a pond, contacting the waste solids with an acid to dissolve at least some of the solids, separating out the undissolved solids and injecting the remainder into a well.

The Examiner relies upon Tate and Oddo as discussed above,

and further relies upon Lipford as teaching that it was known in the art to remove wastes from ponds and treat them. (Answer, pages 4-5).

Alexander does not dispute that waste ponds were known. Alexander however, contends that the removed solid pond wastes of Lipford remain in solid form and presumably are disposed by conventional means, such as landfilling. (Appeal Br. at 5). Alexander further contends that the teachings of Lipford cannot be combined with Tate as the only solids specifically discussed by Lipford do not substantially dissolve in acid. (Appeal Br. at 6).

The Examiner has relied upon Lipford as teaching that it is advantageous to remove industrial waste from ponds and Alexander does not dispute this finding. Further, Alexander has not demonstrated that one of ordinary skill in the art would understand pond wastes to be outside the scope of Tate's process of treating effluent wastes with acid. Accordingly, Alexander has not shown error in the Examiner's finding that one of ordinary skill in the art would have understood that Tate's process of treating wastes for injection into a well is suited for treating pond wastes such that the wastes are removed from the pond and the surface land reclaimed.

We affirm the Examiner's rejection of claims 4-6 under 35 U.S.C. § 103(a) as unpatentable over admitted prior art taken in view of Tate, Oddo and Lipford.

- iii. The Rejection of Claim 7 Under 35 U.S.C. § 103(a) as Unpatentable over Admitted Prior Art, Tate, Oddo, Lipford, and Carter

Alexander states that, if the subject matter of claim 4 is obvious over the prior art, then the subject matter of claim 7 is likewise obvious. As we affirmed the Examiner's rejection of claim 4 as obvious over the prior art, we likewise affirm the Examiner's rejection of claim 7.

CONCLUSION

Upon consideration of the record and for the reasons given, it is:

Ordered that the Examiner's rejection of claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art taken in view of Tate and further in view of Oddo is affirmed.

Further Ordered that the Examiner's rejection of claims 4-6 under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art taken in view of Tate, Oddo and Lipford is affirmed.

Further Ordered that the Examiner's rejection of claim 7 under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art taken in view of Tate, Oddo, Lipford and Carter is affirmed.

Further Ordered that 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

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