UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DERONG ZHOU,
JOHN P. BORZIO,
GREGORY M. JURSICH, and
EARLE R. KEBBEKUS

Appeal 2006-3270
Application 10/369,089
Technology Center 1700

Decided: July 3, 2007

Before, CHARLES F. WARREN, THOMAS A. WALTZ, and
JEFFREY T. SMITH, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Statement of the Case

This is an appeal under 35 U.S.C. § 134 from a final rejection of claims 1-8. We have jurisdiction under 35 U.S.C. § 6.

Appellants' invention relates to a method of treating an adsorbent. The adsorbent is capable of removing water vapor from a vapor stream (Specification 22: 27-28). Representative independent claim 1, as presented in the Brief, appears below:

1. A method of treating an adsorbent, comprising:

first heating the adsorbent at a first temperature under dry nitrogen; and

second heating the adsorbent at a second temperature, wherein the second temperature is less than the first temperature and greater than 100°C., under a gas comprising Cl_2, Br_2, F_2, HCl, HF, or HBr.

The Examiner relies on the following references in rejecting the appealed subject matter:

Alvarez, Jr	US 5,910,292	Jun. 08, 1999
Schulze	US 2,246,900	Jun. 24, 1941

Claims 1-8 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Alvarez in view of Schulze.

As evidence of obviousness of the claimed subject matter under § 103, the Examiner has relied on the disclosures of Alvarez and Schulze (Answer 3-4). The Examiner has found that Alvarez teaches a method of treating an adsorbent including first heating the absorbent and an anhydrous nitrogen atmosphere of 250°-425°C and subsequently passing a gas stream comprising a halide over the absorbent resin. The Examiner has recognized that Alvarez does not teach performing the second heating step at a temperature lower than the first but greater than 100°C as required by claim 1 (Answer 4). The Examiner asserts the second treatment step of an adsorbent at a temperature lower than the first but greater than 100°C would

have been obvious to a person of ordinary skill in the art. In support of this position the Examiner has referred to the disclosures of Schulze.[1]

Appellants contend that there is no combination of Alvarez and Schulze that renders obvious the claimed invention (Br. 11). Appellants contend that Alvarez does not disclose removing moisture from a corrosive gas at a temperature that exceeds 100°C (Br. 11-12). Appellants contend that Schulze describes the treatment of an absorbent-type catalyst with halogen containing gases for increasing the lifetime and activity of the catalysts (Br. 13). Appellants contend that Schulze is devoid of any teaching that would suggest using the operating temperature of Schulze during the dehydration of the acid gas stream of Alvarez (Br. 14). Appellants further contend that the Examiner has not employed the proper standard of obviousness for creating the stated rejection (Br. 14-15).

Accordingly, the issues presented on the record in this appeal are as follows: (1) does Alvarez disclose, teach, or suggest a method of treating an adsorbent including first heating the absorbent and an anhydrous nitrogen atmosphere of 250°-425°C and subsequently passing a gas stream comprising a halide over the absorbent resin?; (2) has the Examiner presented an explicit analysis of the reasons for combining the elements of Alvarez and Schulze?; and (3) do the applied prior art references disclose, teach, or suggest treating an absorbent with a first heating step under dry nitrogen and a second heating step wherein the second temperature is less than the first temperature and greater than 100° C?

[1] The Examiner asserts that Schulze teaches the use of and inert gas step at temperatures of 200°C and 350°C (Answer 4).

We determine that the Examiner has established a prima facie case of obviousness in view of the reference evidence, which prima facie case has not been adequately rebutted by Appellants' arguments. Therefore, we AFFIRM the rejection presented in this appeal essentially for the reasons stated in the Answer, as well as those reasons set forth below. [2]

OPINION

We determine the following factual findings from the record in this appeal:

Alvarez is directed to a process for removal of water (dehydration) from corrosive halogen gases (col. 3, ll. 40-50). The process includes the use of corrosion resistant high silica zeolite as an absorbent for removing water from corrosive gas streams (col. 6, ll. 7-13). Alvarez discloses that the zeolite absorbent should be activated prior to incorporation into the gas stream for dehydration. Specifically, Alvarez states:

> it is preferred to activate the material prior to incorporation into the gas system for dehydration. Activation can be accomplished by heating the high silica zeolite in an anhydrous inert gas atmosphere (e.g., N_2 or Ar gas) at a temperature of about 250° -425° C. (480° - 800° F.) for about 48-72 hours. The activating gas itself must be dehydrated prior to the activation procedure. (Col. 8, ll. 22-26).

Alvarez discloses the operating temperature of the gases to be dehydrated can range from 0°-65°C, a temperature that does not exceed the temperature of the activation step (col. 8, l. 67- col. 9, l. 1). Alvarez discloses the operating conditions such as the canister size will be dependent upon the gas flow space velocity, the activity of the absorbent (col. 9, ll. 3-

[2] Appellants have not presented separate specific arguments for any claims on appeal (*see* Brief generally). We select claim 1 as representative of the claims on appeal and will limit our discussion to claim 1.

10). Alvarez also discloses that re-activation can be accomplished by heating the absorbent in an anhydrous inert gas atmosphere (e.g., N_2 or Ar gas) at a temperature of about 250°-425° C. (480° -800°F.) for about 48-72 hours in a nitrogen atmosphere (col. 10, ll. 16-20).

Schulze describes a process for treating absorbent catalysts with gaseous acid such as halogen halides to increase and improve the activity of the catalyst (p. 1, left col., ll. 1-39). Schulze discloses the gaseous acid can be partially or completely saturated with water vapor at the temperature of treatment (p. 1, left col., ll. 42-45). Schulze discloses the operating temperature of the gases treatment can range from 200°-500°C (p. 1, right col., ll. 9-40).

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). "[A]nalysis [of whether the subject matter of a claim is obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007) *quoting In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006); *see also DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006) ("The motivation need not be found in the references sought to be

combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself."); *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969) ("Having established that this knowledge was in the art, the examiner could then properly rely, as put forth by the solicitor, on a conclusion of obviousness 'from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference.'"); *In re Hoeschele*, 406 F.2d 1403, 1406-07, 160 USPQ 809, 811-812 (CCPA 1969) ("[I]t is proper to take into account not only specific teachings of the references but also the inferences which one skilled in the art would reasonably be expected to draw therefrom . . . ."). The analysis supporting obviousness, however, should be made explicit and should "identify a reason that would have prompted a person of ordinary skill in the art to combine the elements" in the manner claimed. *KSR*, 127 S.Ct. at 1731, 81 USPQ2d at 1389.

Applying the preceding legal principles to the factual findings in the record of this appeal, we determine that the Examiner has established a prima facie case of obviousness, which case has not been adequately rebutted by Appellants' arguments. As shown by the factual finding above, we determine that Alvarez describes a method of treating an adsorbent including first heating the absorbent and an anhydrous nitrogen atmosphere of 250°-425°C and subsequently passing a gas stream comprising a halide over the absorbent resin. (Col. 8, ll. 19-27). Alvarez discloses the operating temperature of the gases to be dehydrated (i.e., the second step) occurs at a temperature below the first step, i.e., 0°-65°C (col. 8, l. 68- col. 9, l. 2). Alvarez discloses the operating conditions are dependent upon several

factors (Col. 9, ll. 5-10). Alvarez does not teach performing the second heating step at a temperature that exceeds 100°C. Schulze describes a process for treating absorbent catalysts with gaseous acid such as halogen halides to increase and improve the activity of the catalyst (p. 1, left col., ll.1-39). Schulze discloses the gaseous acid can be partially or completely saturated with water vapor at the temperature of treatment (p. 1, left col., lines 42-45). Schulze discloses the operating temperature of the gases treatment can range up to 500°C (p. 1, right col., ll. 9-40). Thus, a person of ordinary skill in the art would have reasonably expected that the gas dehydration step of Alvarez can be performed at a temperature that was greater than 100°C as proposed by the Examiner. Therefore, we conclude this person in routinely following the combined teachings of Alvarez and Schulze would have reasonably arrived at a process in which the second step of Alvarez is conducted at a temperature less than the first step but greater than 100°C as taught by Schulze.

The Examiner's § 103 rejection is affirmed.

ORDER

The rejection of claims 1-8 under 35 U.S.C. § 103(a) as unpatentable over Alvarez in view of Schulze has been affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2006).

AFFIRMED

tf/

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