NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

(Serial No. 11/407,778)

IN RE GILBERT CHEVALIER, ALAIN VILLERMET, AND CHRISTIAN LARQUET

2012-1254

Appeal from the United States Patent and Trademark Office, Board of Patent Appeals and Interferences.

Decided: January 7, 2013

ALLEN E. WHITE, Air Liquide USA, LLC, of Houston, Texas, for appellants.

RAYMOND T. CHEN, Solicitor, Office of the Solicitor, United States Patent and Trademark Office, of Alexandria, Virginia, for respondent. With him on the brief were MONICA B. LATEEF and SYDNEY O. JOHNSON, JR., Associate Solicitors.

Before PROST, MAYER, and MOORE, *Circuit Judges*.

PROST, *Circuit Judge*.

Gilbert Chevalier, Alain Villermet, and Christian Larquet ("Chevalier") appeal from a decision of the Board of Patent Appeals and Interferences ("Board"). The Board affirmed the examiner's rejection of claims 1-6, 8, 9, 11 and 12 of U.S. Patent Application 11/407,778 ("Chevalier Application") covering a device for stirring a liquid in a reactor and for injecting gas into the liquid in order to form a gas-liquid dispersion under 35 U.S.C. § 103. We *affirm*.

I. BACKGROUND

A. The Chevalier Application

The claims of the Chevalier Application are drawn to a device that stirs a liquid while injecting a gas into the liquid in order to form a gas-liquid dispersion. Claim 1 is representative:

> A device for stirring a liquid in a reactor and for injecting a gas into the said liquid in order to form a gas-liquid dispersion, comprising:
>
> a) a drive device positioned above the reactor, provided with a vertical output shaft fitted at its lower end with at least one axial flow rotor immersed in the liquid;
>
> b) means for introducing gas above the axial flow rotor; and
>
> c) a deflector placed above the axial flow rotor preventing the gas-liquid dispersion from rising, wherein said device comprises a deflector secured to the shaft placed below the axial flow rotor converting the axial flow of the said rotor into a radial flow.

The claimed apparatus comprises a drive device, which has a vertical output shaft fitted with one or more axial rotors and deflector at its lower end. During operation the shaft is immersed in liquid and a deflector, which is attached to the shaft below the rotor, converts the axial flow into a radial flow. The drive device also includes a means for introducing gas above the axial flow rotor and a second deflector, placed above the axial flow rotor, to prevent the gas-liquid dispersion from rising. The specification explains that one of the essential features of the invention lies in the deflector that is placed below the axial flow rotor and converts the axial flow created by the rotor into a radial flow.

B. Proceedings Below

The Board affirmed the examiner's rejection under 35 U.S.C. § 103(a) based on the following prior art: (1) U.S. Patent No. 4,290,885 issued September 22, 1981 to Dochan Kwak ("Kwak") (2) U.S. Patent No. 4,310,437 issued January 12, 1982 to Anselm Schreiber ("Schreiber"); (3) U.S. Patent No. 6,142,458 issued November 7, 2000 to Richard A. Howk ("Howk"); and (4) U.S. Patent No. 6,270,061 issued August 7, 2001 to Florent Bouquet et al. ("Bouquet"). Claims 1-6, 8, 9, and 11 were rejected as obvious over the combination of Kwak and either Howk or Schreiber.[1] Claim 12 was rejected as obvious over the combination of Kwak and either Howk or Schreiber in view of Bouquet. Chevalier limits his challenge of the Board's decision to claim 1 and does not argue that the other claims are independently patentable. As such, we limit our discussion to claim 1.

[1] The Board found the Schreiber and Howk references to be cumulative and selected only Howk for discussion. Likewise, we too limit our discussion to the Howk reference.

Kwak teaches a device for injecting a gas into a liquid that creates a flow pattern in the gas-liquid mixture to achieve effective aeration. The Board found that Kwak teaches each limitation of claim 1, except that Kwak's deflector is not attached to the drive shaft. The Kwak deflector, like the Chevalier deflector, is placed below the rotor and converts the axial flow of the liquid-gas mixture into radial flow. The Kwak deflector, however, is attached to the floor of the basin rather than the drive shaft.

Howk also teaches a device for dispersing gas into a liquid. Howk utilizes a deflector to covert the axial flow of the liquid-gas mixture into radial flow. Like the deflector of the claimed invention, the Howk deflector is secured to the drive shaft below the rotor.

The examiner found and the Board agreed that it would have been obvious to one skilled in the art to modify the Kwak device in view of the teachings of Howk by attaching the deflector to the drive shaft in order to facilitate a more rapid and more complete conversion of axial flow to radial flow in the gas-liquid mixture.

II. DISCUSSION

A. Standard of Review

"Obviousness is a question of law based on underlying findings of fact." *In re Kubin*, 561 F.3d 1351, 1355 (Fed. Cir. 2009). Factual inquiries relevant to the obviousness determination include: (1) the scope and content of the prior art, (2) the differences between the prior art and the claims at issue, (3) the level of ordinary skill in the pertinent art, and (4) secondary considerations of nonobviousness. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406

(2007) (citing *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17-18 (1966)). Additionally, "[t]he presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact." *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). This court reviews the Board's determination of obviousness de novo and the Board's factual findings for substantial evidence. *Id.* Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938). "[T]he possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency's finding from being supported by substantial evidence." *Consolo v. Fed. Mar. Comm'n*, 383 U.S. 607, 620 (1966).

B. Obviousness

Chevalier contends that there is no motivation to combine the teachings of Kwak and Howk because the resulting combination would be inoperable. Chevalier bases his argument on his own interpretive drawings, which allegedly demonstrate that a literal physical combination of the Kwak and Howk devices would not effectively convert the axial flow of the gas-liquid mixture to radial flow. According to Chevalier, the combination device would direct the radial liquid flow into the wall of a tube wall found in the Kwak device, thus preventing the gas-liquid mixture from achieving suitable aeration. The examiner disagreed and explained that the length of the drive shaft could be easily modified by one of ordinary skill in order to avoid this alleged problem associated with physically combining the prior art devices. The Board reviewed Chevalier's contentions and the examiner's answer and chose to credit the examiner's explanation.

We find the Board's determination both well reasoned and supported by substantial evidence.

Moreover, Chevalier's arguments demonstrate that he misapprehends the nature of the obviousness inquiry. The obviousness inquiry does not ask "whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole." *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc); *see also In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (stating "[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference"). Rather, in a case such as this where each of the elements of the claim are known to the art, the obviousness inquiry requires a finding that the combination of known elements was obvious to a person with ordinary skill in the art. *KSR*, 550 U.S. at 420. Here, each of the elements of the claim is taught by Kwak with the exception that the Kwak deflector is not attached to the drive shaft. This deficiency in Kwak is supplemented by Howk, which teaches a deflector attached to the drive shaft. The examiner found, and the Board affirmed, that one of ordinary skill would be motivated to modify Kwak in view of Howk because the modification "would facilitate a more rapid and more complete conversion from axial flow to radial flow of the liquid exiting from the bottom of the device." *Ex Parte Gilbert Chevalier, Alain Villermet & Christian Larquet*, No. 2010-008166, 2011 WL 6747404 (B.P.A.I. Dec. 21, 2011). Chevalier does not challenge this finding. Accordingly, we find no error in the Board's determination that Kwak and Howk could be combined to achieve the claimed invention, nor do we find any error in the Board's determination that one of ordinary skill would be motivated to combine these references to achieve an aeration device that more rapidly and more completely

converts axial flow to radial flow in the gas-liquid mixture.

Our conclusion is strengthened by Chevalier's admission that the deflectors of Kwak and Howk are "recognized equivalents performing the same function of converting axial flow to radial flow." Appellant's Br. 9. The Supreme Court stated in *KSR* that "when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 50-51 (1966)). Here, the claimed invention merely substitutes the deflector of Howk, which is attached to the drive shaft, for the deflector of Kwak, which is attached to the floor of the basin. This substitution achieved only the predictable result of converting the axial flow of the gas-liquid mixture to radial flow.

III. CONCLUSION

For the foregoing reasons, this court concludes that the decision of the Board is supported by substantial evidence. Therefore, the decision of the Board is affirmed.

AFFIRMED