The opinion in support of the decision being entered today
is *not* binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ENNO J. VROLIJK
and DERK VEGTER

Appeal 2007-3496
Application 10/344,472
Technology Center 3700

Decided: August 28, 2007

Before CHUNG K. PAK, CHARLES F. WARREN, and
PETER F. KRATZ, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting for at least the second time claims 1, 2, 11, 14, 18, and 20 through 26 in the Office Action mailed March 21, 2006. 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2005).

We reverse the decision of the Primary Examiner.

Claim 1 illustrates Appellants' invention of a control method for providing a gas flow and a combustion air flow in a gas-air mixture to a burner to produce a burner flame, and is representative of the claims on appeal.

1. A control method for providing a gas flow and a combustion air flow in a gas-air mixture to a burner to produce a burner flame, and for using a sensor that produces an ionization signal to adapt the gas-air mixture to different gas qualities, the method comprising the steps of:

optically determining when the burner flame sweeps over the sensor;

using the ionization signal of the sensor for setting a mixing ratio of the gas-air mixture when the burner flame sweeps over the sensor; and

setting the mixing ratio of the gas-air mixture based on the gas flow and the combustion air flow when the burner flame does not sweep over the sensor.

The Examiner relies on the evidence in these references:

de Haan	US 4,595,353	Jun. 17, 1986
Sebastiani	WO 97/36135	Oct. 2, 1997

The Examiner applies de Haan in view of Sebastiani to all the claims under 35 U.S.C. § 103(a), the ground of rejection submitted for review on appeal by Appellants (Answer 3-6; Br. 7).

The claimed method encompassed by claim 1 comprises at least the steps of optically determining when the burner flame sweeps over a sensor that produces an ionization signal, using the ionization signal when the burner sweeps over the sensor to set a gas-air mixing ratio, and when the burner does not sweep over the sensor, setting the gas-air mixing ratio based on the gas flow and the combustion air flow.

The dispositive issue is whether prima facie one of ordinary skill in this art would have found in de Haan the teachings or inferences[1] that the burner apparatus containing ignition electrode 8, which can detect flame generation in tubular element 6 via ionization, and optical detector 30, which monitors flame generation in the reactor, act together in determining when the combined pilot flame produced in element 6 sweeps over ignition electrode 8, as found by the Examiner (Answer 3-4 and 7-8, citing de Haan col. 2, ll. 47-64, col. 3, ll. 3-21 and 65-68, and col. 4, ll. 37-54).

The Examiner contends de Haan teaches ignition electrode 8 and optical monitor 30, coupled to optical fiber 13, "provide for control of the flame formed within tubular element (6) and outside of the burner . . . but does not explicitly provide . . . that the flame control is provided through adjusting of the mixing ratio of the gas-air mixture (Answer 4, citing de Haan col. 3, ll. 12-21). The Examine contends that the pilot flame "ignites an additional flame in tubular element (6)," which flame is "termed both the 'resulting flame' . . . and later the 'small flame'[,] . . . is distinguished from the initial pilot flame," and "serves to ignite the main burner flame" (*id.* 7, citing de Haan col. 2, l. 64, to col. 3, l. 5, col. 4, ll. 43-46, and Fig. 3). The Examiner contends "once the main flame . . . is formed, the small or resulting flame[] and the main flame are considered to then become part of

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[1] It is well settled that a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in this art would have reasonably been expected to draw therefrom, *see In re Fritch*, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir. 1992); *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968), presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

the same flame" the presence of which is detected by optical monitoring means 30 (*id.*).

Appellants contend the Examiner's interpretation of de Haan and thus that the optical monitor determines when the flame sweeps over the ignition electrode is not supported by the disclosure in the reference (Br. 7-8) Appellants contend optical fiber 13 is connected to a receiver and transducer which measure the intensity of the flame during operation of the burner, and ignition electrode 8 detects flame generated in tubular element 6, which is disclosed to provide separate control of the flame in the tubular element and the flame in the burner (*id.*, citing de Haan col. 3, ll. 6-19 and 65-68; *see also* Reply Br. 1-2). Appellants contend it can be seen in de Haan Fig. 2 that "when a pilot flame is present inside the tubular element 6, the flame would not appear to be detected by the infrared detector 30, which is located outside the tubular element 6," and "if the main flame is ignited by the pilot flame, and the pilot flame goes out, the infrared detector 30 would not appear to be able to detect this" (*id.* 8). Appellants contend de Haan "teaches that a small flame is first generated in the tubular element and is monitored and controlled by the ionization electrode," and "[t]hen, the small flame generates the main flame outside the tubular element, and it is this main flame that is monitored by the optical monitoring means (30)" (id. 8-9, citing de Haan col. 4, ll. 37-56).

We find de Haan would have disclosed to one of ordinary skill in this art burner 1 for start-up operations in which, for example, it is "used for ignition of a main burner operating on, for example, pulverized coal" in combustion chamber 5, wherein the burner is provided with an ignition device that is an electrically ignited auxiliary burner (de Haan, e.g., col. 1, ll. 5-11, col. 2, ll. 16-19, col. 2, l. 68, to col. 3, l. 5, col. 3, ll. 25-35 and 46-50, col. 4, ll. 57-60, and Fig. 1). The ignition device is a separate burner within burner 1, wherein conduits and other elements 14,15,16,17,18,19 supply gas at varying velocity to the annular space within tubular element 6 in which ignition electrode 8 is retracted from inboard end 7 of annular front wall 4 (*id.*, e.g., col. 2, ll. 20-46, col. 3, ll. 51-60, col. 4, ll. 1-12, and Figs. 1 and 3). In this arrangement, ignition electrode 8 can be used to detect flame generation in the annular space via ionization (*id.*, e.g., col. 3, ll. 6-11, col. 4, ll. 50-54, and Figs. 1 and 3).

The other burner of burner 1 is facing forward on annular front wall 4, wherein conduits 20,21 supply gas to nozzles 22,23 (*id.*, e.g., col. 2, ll. 24-29, col. 3, ll. 22-33, col. 4, ll. 13-24, and Figs. 1-3). In this arrangement, "the ultimately flame generated outside the burner [1 in chamber 5] may be detected . . . preferably based on detection of infrared radiation which is transmitted via optical fiber means," such as infrared detector 30 mounted on annular front wall 4 and coupled to optical fiber 13 located in tubular element 6, wherein optical fiber 13 is connected to "receiver and transducer (not shown) for measuring the intensity of light emitted by the flame generated during operation of the burner" (*id.*, e.g., col. 3, ll. 12-21 and 62-68, col. 4, ll. 54-56, and Figs. 1-3).

We find de Haan discloses in operation, ignition electrode 8 ignites a low velocity gas mixture in the annular space to generate a stable pilot flame which ignites a higher velocity gas mixture to form a small flame in the same space, which latter flame ignites the gases issued by nozzles 22,23 on the annular front wall 4 to form the start-up flame in reaction chamber 5, which ignites the main burner (de Haan, e.g., col. 2, l. 46, to col. 3, l. 5, and col. 4, ll. 37-60). We find no disclosure in de Haan which provides a teaching or inference that ignition electrode 8 and infrared detector 30 detect a flame in other than their respective spaces.

On this record, we agree with Appellants that the teachings and inferences one of ordinary skill in this art would have found in de Haan do not support the Examiner's position. Like Appellants, we determine one of ordinary skill in the art would have found that during burner operation, the pilot flame and the small flame sweep over and cover ignition electrode 8 and are thus detected by the ignition electrode in the annular space, and that the infrared radiation detector 30, in detecting the intensity of the light emitted by the flame formed in the reactor by gases from nozzles 22,23 on annular front wall 4, would not function to monitor the flame sweeping over the ignition electrode in the annular space.

Thus, the Examiner has not established a prima facie case of obviousness over the combined teachings of de Haan and Sebastiani, and accordingly, we reverse the ground of rejection under 35 U.S.C. § 103(a).

The Primary Examiner's decision is reversed.

REVERSED

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