THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte SAMIR S. SHIBAN
and
DANIEL G. MORGAN

_____

Appeal No. 1996-1141
Application 08/109,166[1]

_____

ON BRIEF

_____

Before DOWNEY, WARREN and ELLIS, Administrative Patent Judges.

DOWNEY, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal, under 35 U.S.C. § 134, from the final rejection of claims 20-39, all of the claims pending in the application.

[1] Application for patent filed August 19, 1993. According to the appellants, the application is a division of Application 07/864,673, filed April 7, 1992, now Patent No. 5,271,908, issued December 21, 1993.

The subject matter on appeal is directed to a method of reacting a pyrophoric gas by combining a "first flow of a gas mixture comprising an oxidant" and a "second flow of a second gas mixture comprising a pyrophoric gas in a turbulent environment."

Claims 20, 24, 25, and 30 are illustrative and read as follows:

20. A method [sic: reacting] of a pyrophoric gas comprising the steps of:

introducing a first flow of a first gas mixture comprising an oxidizing species into a chamber through a first inlet located at a first position;

introducing a second flow of a second gas mixture comprising said pyrophoric gas into said chamber through a second inlet located at a second position downstream of said first position, wherein said first flow is turbulent from at least a point upstream of said second position; and,

combining said first and second flows to create a third flow of a third gas mixture comprising said first and said second gas mixtures, said third flow being turbulent from said second position and through at least an additional portion of said chamber, said turbulence causing said first and said second gas mixtures to mix, wherein said turbulence is sufficient to cause said pyrophoric gas to react with said oxidizing species in a controlled manner to be substantially without risk of explosion.

24. The method as described in Claim 20 wherein a sufficient amount of said pyrophoric gas reacts with said oxidizing species such that when said third flow exists said chamber said third flow has a substantially reduced risk of explosion.

25. The method as described in Claim 23 wherein a sufficient amount of said pyrophoric gas reacts with said oxidizing species such that when said third flow exists said chamber said third flow has a substantially reduced risk of explosion.

30. A method of reacting a pyrophoric gas comprising the steps of:

introducing a first flow of a first gas mixture comprising an oxidizing species into a chamber through a first inlet;

introducing a second flow of a second gas mixture comprising said pyrophoric gas into said chamber through a second inlet; and,

combining said first and said second flows to create a third flow of a third gas mixture comprising said first and said second gas mixtures, wherein said third undergoes a change in direction of approximately 90° or more.

The references relied upon by the appellants are:

Soneta et al (Soneta)	4,555,389	Nov. 26, 1985
Shaw	3,880,594	Apr. 29, 1975
Coldren et al. (Coldren)	3,112,988	Dec. 03, 1963

THE REJECTIONS

I. Claims 30-39 stand rejected under 35 U.S.C § 112, first paragraph, as lacking an adequate written description.

II. Claims 24 and 25 stand rejected under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which appellants claim as their invention.[2]

III. Claims 20-29 stand rejected under 35 U.S.C. § 103 as being unpatentable over Soneta and Coldren.

IV. Claims 20-39 stand rejected under 35 U.S.C. § 103 as being unpatentable over Soneta, Coldren and Shaw.[3]

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[2] The appellants in their Brief, page 7, state that one of the issues on appeal is "[W]hether claims 20-29, 31, 33, 35, and 37 are unpatentable under 35 U.S.C. §112, second paragraph, ...". The examiner corrects appellants' statement to reflect that only claims 24 and 25 are rejected under 112, 2nd paragraph (answer, page 2).

[3] The appellants in their Brief, page 7, state that an issue for appeal is "[W]hether claims 30-39 are unpatentable over 35 U.S.C. § 103 as being unpatentable over Soneta et al in view of Coldren et al and further in view of Shaw." The Examiner corrects the appellants statement indicating that claims 20-39 are under rejection (answer, page 2); see also final rejection (Paper No. 8).

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with appellants that the examiner has failed to sustain his burden of showing that the claimed invention would have been obvious to one of ordinary skill in the art at the time the invention was made. Accordingly, the aforementioned rejections under 35 U.S.C. § 103 are not sustained. In addition, the rejection under 35 U.S.C. § 112, second paragraph, is not well founded and is not sustained. The rejection under 35 U.S.C. § 112, first paragraph, is sustained since we do not believe that appellants conveyed with reasonable clarity to those skilled in the art that, as of the filing date sought, they were in possession of the now claimed invention.

Rejections under 35 U.S.C. § 103

Claims 20-29 stand rejected under 35 U.S.C. § 103 as being unpatentable over Soneta in view of Coldren.

Soneta discloses an apparatus and a method of burning an exhaust gas containing silane by introducing a first flow of a first gas mixture comprising an oxidizing species (air) into a chamber through a first inlet located at a first position **9** (Fig. 1). Soneta introduces

a second gas mixture comprising pyrophoric gas (silane) into said chamber through a second outlet at a second position **16** (Fig. 1). Soneta discloses that the second gas mixture flows through a second inlet which is downstream of said first position.[4] Soneta teaches that the first flow of gas (air) and the second flow of gas (silane) are combined (column 6, lines 23-25). Soneta discloses the first flow of gas (air) and the second flow of gas (silane) are burned through the reaction of the first flow of gas (air) and the second flow of gas (silane) in the combustion chamber (column 8, lines 10-13, and claim 1).

Soneta does not disclose the use of turbulence as required by appellants' claim 20 as a step within their method of burning exhaust gases containing gaseous silane.

Coldren teaches the use of turbulence to initiate a reaction between reactive gases in a reaction process which occurs at supersonic velocity (column 4, lines 70-73). Coldren teaches a process for mixing reactive gases such as oxygen and hydrocarbons in which source streams of difference gases are divided into narrow small streams which accelerate to supersonic velocity and then discharged into an elongated mixing zone so that each (except those at the periphery of the zone) is laterally adjacent to a plurality of narrow streams of another gas (column 1, lines 28-30 and column 2, lines 14-20).

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[4] We note that Figure 1 shows that air (first gas mixture) enters air feed pipe **9** and flows into air chamber **7** where air permeates through air permeable porous filler material **19** and into the combustion chamber **5** downstream of the silane (second gas mixture) which enters the combustion chamber through exhaust introduction pipe **13**.

Coldren also teaches that the narrow streams flowing at supersonic speed laterally mix in the mixing zone (column 2, lines 20-24). Coldren teaches that the small mismatch between the stream velocities creates movement of gas molecules between the narrow streams across the boundaries between streams (col. 2, lines 34-35). Coldren further teaches that the slight mismatch is desirable because it creates a slight turbulence which promotes lateral mixing across the streams but does not create a sufficiently high temperature or produces a high temperature for an insufficient time to initiate the chemical reaction (column 4, lines 70-74).

The examiner contends that it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the reaction scheme of Soneta as suggested by Coldren because doing so safely controls the reaction rate and prevents explosions (answer, page 4).

The Patent and Trademark Office has the burden under 35 U.S.C. § 103 of establishing a prima facie case of obviousness. In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). In determining the propriety of the PTO case for obviousness in the first instance, it is necessary to ascertain whether or not the reference(s) teachings would appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed substitution, combination or modification. In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560,

562 (CCPA 1972).

On this record, we find that the examiner has not provided sufficient evidence to establish that it would have been obvious to one of ordinary skill in the art at the time that the invention was made to incorporate turbulence disclosed by Coldren into the method of burning an exhaust gas disclosed by Soneta. The turbulence disclosed in Coldren is created by flowing narrow streams of the gas at a slight mismatch of stream velocities which creates a slight turbulence. The examiner has asserted that it would have been obvious to modify the reaction scheme of Soneta as suggested by Coldren without explaining how the turbulence created in the Coldren method of mixing reactive gases would be incorporated into the Soneta silane gas burning process. Moreover, we agree with appellants that there is nothing to teach or suggest that the Coldren process directed towards mixing gases such as oxygen and methane or ethane would in any way be useful in reacting pyrophoric gases such as silane in Soneta. In our view, the examiner has failed to sustain his burden. Accordingly, the decision of the examiner is reversed.

Claims 20-39 stand rejected under 35 U.S.C. § 103 over the combination of Soneta, Coldren and Shaw.

Soneta differs from claim 30 in that Soneta does not suggest that after combining the first and second flows to create a third flow, said third flow undergoes a change in direction of approximate 90^0 or more.

Shaw discloses a fume incinerator designed to completely burn all of the combustibles within the exhaust fumes from a restaurant comprising a steel baffle plate **8** which extends across the full width of the respective chamber (Figure 2) . Shaw discloses that the flow of air through the steel baffle plate then undergoes a 90^0 change in direction.

The examiner states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings as taught by Shaw because doing so provides an exit for the harmless gas produced by Soneta as taught in col. 5, lines 25-30 therein (answer, page 4).

On the record, we find that the examiner has not provided sufficient evidence to establish that it would have been obvious to one of ordinary skill in this art at the time the invention was made to modify the Soneta process to include 90° turns disclosed by Shaw. The examiner has not adequately explained why one of ordinary skill in the art would have combined the teachings of Shaw which is directed to burning combustibles within the exhaust fumes from a restaurant with an apparatus for burning exhaust gases containing explosive gases. The apparatus of Soneta already has an exit **1**. Specifically the examiner fails to explain how the exit of Soneta is to be modified in view of Shaw. The decision of the examiner is reversed.

Rejections under 35 U.S.C. § 112

Claims 24-25 stand rejected under 35 U.S.C. § 112, second paragraph.

The examiner argues "substantially reduced" in claims 24 and 25 is subjective and thus unclear (answer, page 3). Furthermore, the examiner argues that "since the phrase appears critical to the inventive concept, it should be precise" (answer, page 5). Appellants respond by arguing that "35 U.S.C. § 112, second paragraph, does not require exactitude, but rather requires that one of ordinary skill in the art be reasonably apprised of the claimed invention" (Brief, page 10). Appellants argue further that "one of ordinary skill in the art would understand that there is always some finite degree of risk when dealing with pyrophorics, and that a method which is substantially without risk of explosion would be, for example, a method having an acceptable risk within common commercial standards of safety." We, like appellants, do not believe that the language "substantially reduced" used in the phrase "substantially reduced risk of explosion" violates 35 U.S.C. § 112, second paragraph.

The legal standard for definiteness is whether a claim reasonably apprises those of skill in the art of its scope. In re Warmerdam, 33 F.2d 1354, 361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). If the claims, read in light of the specifications, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the courts can demand no more. Shatterproof Glass Corp. v. Libby-Ownes Ford. Co., 758 F.2d 613, 624, 225 USPQ 634, 641 (Fed. Cir.) cert. denied, 474 U.S. 976 (1985).

Our reviewing court in In re Mattison, 509 F.2d 563, 565, 184 USPQ 484, 486 (CCPA 1975) indicates that the use of term "substantially" does not necessarily mean that a claim violates 35 U.S.C. § 112, second paragraph. Claims do not stand in a vacuum, Id. citing In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). Claims must be read in light of the specification, Id. citing In re Cohn, 438 F.2d 989, 993, 169 USPQ 95, 98 (CCPA 1971).

The specification herein contains the following language:

> Silane concentration has been measured at the exhaust port 13 under a variety of conditions. In the cases where a flame is generated, no silane could be detected in the exhaust stream 52 exiting exhaust port 13. At low silane flows rates, for example, 50 ccm silane in 20 lpm nitrogen entering chamber 10 through gas inlet 12 (i.e., 2,500 ppm silane incoming), the average silane concentration measured at exhaust port 13 was in the range of approximately 0-3 ppm and in no case exceeded 6 ppm. At theses low concentrations, there is no risk of explosion and silane bubble formation (i.e., silane self protection) does not occur. (Page 11, lines 4-13, emphasis added).

We believe the claims, read in light of the specification, reasonably apprise those of ordinary skill in the art of the scope of the invention. The specification teaches how the risk of explosion is reduced because the level of pyrophoric gas exiting the chamber is minimal when compared to that entering the chamber. Accordingly, we reverse the rejection of claims 24-25 under 35 U.S.C. § 112, second paragraph.

Claims 30-39 are rejected under 35 U.S. C. § 112, first paragraph.[5]

The examiner contends that there is no descriptive support in the specification, as originally filed, for the phrase "approximately 90° or more" "literally or conceptually" (answer, pages 3 and 5). In response to the examiner's position, appellants cite page 5, lines 12-13 of the specification which states that "the turbulent flow is provided by a plurality of 90 degree turns." Appellants also cite Figure 1 to show "the flow undergoes successive 90° turns, or a 180° change in direction, twice, to provide the tiered configuration." We disagree with appellants that the above cited language supports the language "approximately 90° or more."

The function of the description requirement is to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him. In re Edwards, 568 F.2d 1349, 1351, 196 USPQ 465, 467 (CCPA 1978). To comply with the description requirement, it is not necessary that the application describe the claimed invention in ipsis verbis, In re Lukach, 442 F. 2d 967, 968-69, 169 USPQ 434, 437 (CCPA 1977); all that is required is that it reasonably convey to persons skilled in the art that, as of the filing date, thereof, the inventor had possession of the subject matter later claimed by him. In re Driscoll, 562 F.2d 1245,1247, 195 USPQ 434, 437 (CCPA 1977).

[5] Claims 30-39 stand or fall together.

Contrary to appellants' arguments, we do not find that appellants' specification, at page 5, lines 12-13 nor the preferred embodiment as shown in Figure 1, supports the now claimed range. The language at page 5, lines 12-13 refers to a "plurality of 90° turns" and Figure 1 shows the flow undergoing successive 90° turns, or a 180° change in direction. However, the disclosure cited by appellants does not support for the phrase "approximately 90° or more" which describes changes in direction other than the two angles disclosed, 90° and 180°. We do not find that the appellants' disclosure at the time of the filing describes a gas flow in which the gas may undergo changes of direction in the range of 90° to 180°.

Appellants further argue that one of ordinary skill in the art would understand that the present invention includes embodiments with changes of direction of approximately 90^0 or more. However, the question is not whether a claimed invention is an obvious variant of that which is disclosed in the specification. Rather, the specification itself must describe an invention, and do so in sufficient detail that one of ordinary skill in the art can clearly conclude that the inventor was in possession of the invention at the time of the filing date sought. Lockwood v. American Airlines Inc., 107 F.3d 1565, 1571, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). An applicant is entitled to claim as broad as the prior art *and his disclosure* will allow. The Gentry Gallery, Inc. v. Berkline Corp., 134 F.3d 1473, 1479, 45 USPQ2d 1498, 1503 (Fed. Cir. 1998). Here the narrow disclosure of the change in

direction of the third flow does not support the now claimed language of "approximately 90° or more." Accordingly, we sustain the examiner's rejection of claims 30-39 under 35 U.S.C. § 112, second paragraph, as not finding descriptive support in the specification as originally filed.

CONCLUSIONS

We affirm the rejection of claims 30-39 under 35 U.S.C. § 112, first paragraph. We reverse the rejection of claims 24 and 25 under 35 U.S.C. § 112, second paragraph; the rejection of claims 20-29 under 35 U.S.C. § 103 over the combination of Soneta and Coldren and the rejection of claims 20-39 under 35 U.S.C. § 103 as being unpatentable over Soneta, Coldren, and Shaw.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

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