UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 13/476,386 | 05/21/2012 | Christopher James Brown | PA19804US; 67097-2701PUS1 | 2687 |

54549 7590 11/02/2016

CARLSON, GASKEY & OLDS/PRATT & WHITNEY
400 West Maple Road
Suite 350
Birmingham, MI 48009

| EXAMINER | |
|---|---|
| ORLANDO, AMBER ROSE | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1776 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 11/02/2016 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ptodocket@cgolaw.com

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

*Ex parte* CHRISTOPHER JAMES BROWN

---

Appeal 2015-004654
Application 13/476,386
Technology Center 1700

---

Before CHUNG K. PAK, JEFFREY T. SMITH, and
WESLEY B. DERRICK, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

## DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1 through 7, 9 through 14, 17, and 19 through 24. We have jurisdiction under 35 U.S.C. § 6(b).

## STATEMENT OF THE CASE

Appellant's invention is generally directed to a liquid-gas mixer. App. Br. 1. Claim 1 illustrates the subject matter on appeal and is reproduced below:

> 1. A liquid-gas mixer comprising:
> a central passageway provided about an injector axis;
> a first gas passageway and a second gas passageway, the first gas passageway radially outward of the central passageway and radially inward of the second gas passageway; and

> a turbulator provided between the first and second gas passageways, the turbulator including a plurality of first disturbance generators and a plurality of second disturbance generators, the first and second disturbance generators provided about the turbulator in an alternating arrangement.

App. Br. 7, Claims Appendix.

Appellant (*see generally* App. Br.) requests review of the following rejections from the Final Office Action entered September 8, 2014 ("Final Act."):

I. Claims 1, 6, 7, 9, and 17–20 under 35 U.S.C. § 103(a) as unpatentable over Graves (US 5,966,937, issued October 19, 1999, hereinafter "Graves") and Paterson et al. (US 2009/0255242 Al, published October 15, 2009, hereinafter "Paterson").

II. Claims 2–5 and 21–24[1] under 35 U.S.C. § 103(a) as unpatentable over Graves, Paterson, and Bigelow et al. (US 5,129,226, issued July 14, 1992, hereinafter "Bigelow").

III. Claims 10–14 under 35 U.S.C. § 103(a) as unpatentable over Graves, Paterson, and Bigelow.

## OPINION

After review of the respective positions provided by Appellant and the Examiner, we AFFIRM the Examiner's rejections under 35 U.S.C. § 103(a) of claims 1–7, 9–14, 17, and 19– 24. We add the following.

[1] Although the Examiner omitted claim 24 from the initial statement of the second rejection in the Final Office Action, the Examiner addressed claim 24 on pages 8–9 of the Final Office Action.

***Rejection I***[2]

To prevail in an appeal to this Board, an Appellant must adequately explain or identify reversible error in the Examiner's rejections. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2012); *see also In re Jung*, 637 F.3d 1356, 1365–66 (Fed. Cir. 2011) (explaining that even if the examiner had failed to make a prima facie case, it has long been the Board's practice to require an appellant to identify the alleged error in the examiner's rejections); *In re Chapman*, 595 F.3d 1330, 1338 (Fed. Cir. 2010), quoting *Shinseki v. Sanders*, 556 U.S. 396, 409 (2009) ("the burden of showing that the error is harmful normally falls upon the party attacking the agency's determination.").

The dispositive issue on appeal for this rejection is whether Appellant identifies reversible error in the Examiner's determination that the combined disclosures of Graves and Paterson would have suggested a liquid-gas mixer having the features recited in claim 1. On this record, we answer this issue in the negative.

Appellant argues that the Examiner's proposed modification of the wall 18[3] of Graves' radial swirler 16 to incorporate tabs 223, 224[4] as disclosed in Paterson would impermissibly change the basic principle of operation of Graves' radial swirler, which receives a radial flow of air and

---

[2] Appellant argues claims 1, 6, 7, 9, and 17–20 together. *See generally* Appeal Brief. Therefore, we select claim 1 as representative, and claims 6, 7, 9, and 17–20 will stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv) (2015).

[3] Reference numerals used in the discussion of Graves refer to Figure 1 of Graves.

[4] Reference numerals used in the discussion of Paterson refer to Figure 7 of Paterson.

circumferentially swirls that flow about a center line, because Paterson's tabs function to disturb a purely axial fluid flow, and do not create a circumferential swirl. App. Br. 2–5.

However, Appellant's arguments do not persuade us of reversible error in the Examiner's conclusion of obviousness, for at least the following reasons. Graves discloses a fuel injector 10 comprising a fuel nozzle 12 (central passageway), an inner radial swirler 16 including a first air passage and circumferentially spaced vanes 28, and an outer radial swirler 24, including a second air passage and circumferentially spaced vanes 30, which is concentrically disposed relative to the inner radial swirler 16. Graves col. 3, ll. 40–61; Fig. 1. Graves further discloses that the vanes 28 of the inner swirler 16 cause air passing through the air passageway to swirl and form a vortex. Graves col. 6, ll. 40–54. Paterson discloses a system for directing the flow of exhaust gases that includes outward directed tabs 224 that direct a first portion of the flow radially outward, and inward directed tabs 223 that direct a second portion of the flow radially inward. Paterson ¶ 76.

Appellant's Specification states that "the turbulator [] could be provided in any shape," (¶ 40) and the disturbance generators "can be any structures provided in an alternating arrangement," (¶ 33) and we find no definition or description in Appellant's Specification of "first and second disturbance generators provided about the turbulator in an alternating arrangement" that would exclude Graves' inner radial swirler 16 having circumferentially spaced vanes 28 and Graves' outer radial swirler 24 having circumferentially spaced vanes 30. It is well established that "the PTO must give claims their broadest reasonable construction consistent with the specification. . . . Therefore we look to the specification to see if it provides

a definition for claim terms, but otherwise provide a broad interpretation." *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007). "[A]s applicants can amend claims to narrow their scope, a broad construction during prosecution creates no unfairness to the applicant or patentee." *Id.* In other words, due to the absence of limiting disclosure in Appellant's Specification, Graves' inner 16 and outer 24 swirlers constitute a turbulator where there is no particular shape required and the vanes 28, 30 reasonably correspond to first and second disturbance generators provided about a turbulator in an alternating arrangement because the vanes 28 of the inner swirler 16 are positioned in a concentric relationship to the vanes 30 of the outer swirler 24, and thus the vanes of the two swirlers alternate.

Accordingly, we agree with the Examiner that Graves' disclosure of a fuel injector comprising a fuel nozzle and concentrically arranged, or alternating, inner and outer swirlers that each include air passageways and circumferentially spaced vanes, which function to achieve a desired pattern of air flow through the swirlers, in view of Paterson's disclosure of modifying the flow of gases by designing structures (disturbance generators) that redirect the flow to achieve desired flow directions and patterns, reasonably would have suggested to one of ordinary skill in the art at the time of the invention a liquid-gas mixer as recited in claim 1 comprising a central passageway, first and second gas passageways, and a turbulator including a plurality of first and second disturbance generators provided about the turbulator in an alternating arrangement. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (an obviousness analysis "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for [an examiner] can take account of the inferences and creative

steps that a person of ordinary skill in the art would employ.")

Appellant's arguments are therefore unpersuasive of reversible error, and we accordingly sustain the Examiner's rejection of claims 1, 6, 7, 9, and 17–20 under 35 U.S.C. § 103(a).

***Rejections II and III***

Appellant argues claims 2–5, 10–14, and 21–24 together on the basis of claims 2 and 10—argued together—and claim 24, to which we limit our discussion. App. Br. 5.

Claims 2 and 10 require the first and second disturbance generators to extend in radially opposite directions from the free end of the main body portion of the turbulator. Claim 24 requires the free end of the main body portion of the turbulator to be spaced apart from both the central housing and mixing chamber housing of the liquid-gas mixer recited in claim 21.

Appellant argues, with respect to claims 2 and 10, that Paterson's "tabs 223 extend from the inlet ends 238, which are directly connected to the [combustor] can 216. Thus, the tabs 223 cannot be reasonably said to extend from a "free end." App. Br. 5. With respect to claim 24, Appellant argues that because Paterson's tabs 223 do not extend from a free end of the main body portion of the turbulator, they cannot extend from a free end that is spaced apart from both a central housing and a mixing chamber housing. *Id.*

However, as discussed above, Paterson discloses using disturbance generators to achieve a desired gas flow direction and pattern. Patterson ¶ 76. Graves discloses—as illustrated in Figure 4—vanes 28 (disturbance generators) that extend from the end of radial swirler 16 (free end) that does not form the air passage (main body portion) of the radial swirler 16 (turbulator). Accordingly, Appellant has not identified reversible error in

the Examiner's determination that the combined disclosures of Graves and Paterson would have suggested disturbance generators that extend from the free end of the main body portion of a turbulator, as recited in claims 2, 10, and 24, to one of ordinary skill in the art at the time of the invention. We therefore sustain the Examiner's rejection of claims 2–5, 10–14, and 21–24 under 35 U.S.C. § 103(a).

ORDER

For the reasons set forth above and in the Answer, the decision of the Examiner is affirmed.

TIME PERIOD

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).

AFFIRMED