



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.
14/280,329	05/16/2014	Todd R. NOLAN	2010-036-US-CNT	5520
141825	7590	09/30/2020	EXAMINER	
The Lincoln Electric Company 22801 Saint Clair Avenue Legal Department Cleveland, OH 44117			JONES, LOGAN P	
			ART UNIT	PAPER NUMBER
			3762	
			NOTIFICATION DATE	DELIVERY MODE
			09/30/2020	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):

desiree_cunin@lincolnelectric.com
ginger_mcghee@lincolnelectric.com
ip@lincolnelectric.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TODD R. NOLAN

Appeal 2019-003138
Application 14/280,329
Technology Center 3700

Before WILLIAM A. CAPP, BRANDON J. WARNER, and
PAUL J. KORNICZKY, *Administrative Patent Judges*.

KORNICZKY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE¹

Pursuant to 35 U.S.C. § 134(a), Appellant² appeals from the Examiner's decision to reject claims 21, 23–35, and 37–42. *See* Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

CLAIMED SUBJECT MATTER

The claims are directed to a swirl combustion air fuel torch.

Claim 21, reproduced below, is illustrative of the claimed subject matter:

21. A torch, comprising:
 - a torch body having;
 - an upstream cavity,
 - a mixture cavity, and
 - a tube connection portion downstream of said mixture cavity, where said mixture cavity has at least one first bore through a sidewall of said mixture cavity to permit a flow of air into said mixture cavity, and said tube connection portion has a second bore to receive a flow from said mixture cavity and direct said flow to an exit of said tube connection portion;
 - a tip orifice structure inserted into said upstream cavity, said tip orifice structure having a third bore through a center thereof, said third bore having a first diameter and where said third bore directs a fuel to said mixture cavity; and
 - a tube coupled to said tube connection portion which receives said flow from said tube connection portion, and has an

¹ In this Decision, we refer to (1) the Examiner's Final Office Action dated August 30, 2018 ("Final Act.") and Answer dated January 22, 2019 ("Ans."), and (2) Appellant's Appeal Brief dated November 7, 2018 ("Appeal Br.") and Reply Brief dated February 11, 2019 ("Reply Br.").

² We use the word Appellant to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Lincoln Global, Inc., which is a subsidiary of The Lincoln Electric Company. Appeal Br. 3.

inner diameter, where said tube delivers said flow to a flame at an exit of said tube;

wherein a ratio of said first diameter to said inner diameter of said tube is in a range of 5.4 to 6.6%,

wherein said fuel is acetylene, and wherein said second bore in said tube connection portion has an expansion cavity in a downstream portion of said second bore in said tube connection portion.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Hughey	US 2,438,170	Mar. 23, 1948
Locke	US 3,574,506	Apr. 13, 1971
Aske	US 3,905,755	Sept. 16, 1975
Baranowski	US 4,255,124	Mar. 10, 1981
Nelson	US 4,666,399	May 19, 1987
Burdsall	US 2011/0053103 A1	Mar. 3, 2011
Wolfinger	US 2012/0034567 A1	Feb. 9, 2012
Ridley	EP 0583941 A1	Feb. 23, 1994

REJECTIONS

The Examiner made the following rejections:

1. Claims 21, 24, 27, 28, and 30 stand rejected under pre-AIA 35 U.S.C. § 103(a) as unpatentable over Ridley and Burdsall. Final Act. 4–8.
2. Claim 23 stands rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Ridley, Burdsall, and Locke. Final Act. 8–9.
3. Claims 25 and 26 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Ridley, Burdsall, and Aske. Final Act. 9–12.
4. Claims 29 and 30 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Ridley, Burdsall, and Wolfinger. Final Act. 12–14.

5. Claims 31, 32, 34, 35, and 37 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Baranowski, Nelson, and Hughey. Final Act. 15–19.

6. Claim 33 stands rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Baranowski, Nelson, Hughey, and Locke. Final Act. 19–20.

7. Claim 38 stands rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Baranowski, Nelson, Hughey, and Nelson. Final Act. 20–21.

8. Claim 39 stands rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Baranowski, Nelson, Hughey, and Wolfinger. Final Act. 21–22.

9. Claim 40 stands rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Nelson and Hughey. Final Act. 22–24.

10. Claims 41 and 42 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Ridley, Burdsall, and Hughey. Final Act. 24–26.

OPINION

*Rejection 1: Claims 21, 24, 27, 28, and 30
as Unpatentable over Ridley and Burdsall*

The Examiner concludes that claims 21, 24, 27, 28, and 30 are unpatentable over Ridley and Burdsall. Final Act. 2, 4–8. The Examiner finds that Ridley discloses all of the limitations in independent claims 21 and 30, except for the limitation requiring “a ratio of said first diameter to said inner diameter of said tube is in a range of 5.4 to 6.6%.” *Id.* The Examiner states that, although “Ridley does not explicitly disclose wherein a ratio of

said first diameter to said inner diameter of said tube is in a range of 5.4 to 6.6%,” it has been held that “[w]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *Id.* at 6 (citing MPEP § 2144.05(II)(A) (quoting *In re Aller*, 220 F.2d 454, 456, (CCPA 1955)). The Examiner recognizes that “[a] particular parameter must first be recognized as a result-effective variable, i.e. a variable which achieves a recognized result, before determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.” *Id.* (citing MPEP § 2144.05(II)(B) (quoting *In re Antonie*, 559 F.2d 618 (CCPA 1977)).

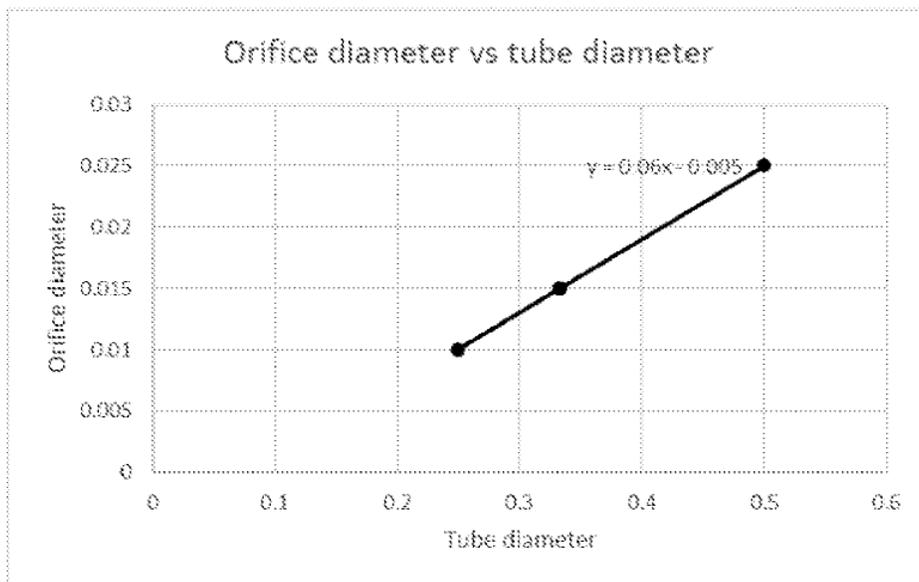
The Examiner finds that Ridley discloses that a ratio of the first diameter of the tip orifice structure to the inner diameter of the tube delivering the air flow to a flame is a result-effective variable. Final Act. 2, 4–5. A table from page 6 of Ridley is reproduced below:

Flame size, in.	1/4	3/8	1/2
Burn tip length 27 in. (approx.)	1 1/2	1 1/4	1 2/3
Burn tip clearance 28 in. (approx.)	1/4	1/3	1/2
Through-hole clearance 49 in. (approx.)	1/10	1/8	1/8
Orifice clearance 1n. (approx.)	0.01	0.015	0.025

This table presents examples of burn tip and venturi means combinations for 1/4, 3/8, and 1/2 inch flame sizes. Ridley, 6. According to the Examiner, for “1/2 inch flame size, Ridley discloses approximately 0.5 inch tube diameter and approximately .025 inch orifice diameter,” and “0.46 inches is

proximate to 0.5 inches” so that “[v]alues of 0.025 and 0.46 yield a ratio of 5.4%.” Final Act. 2, 5. The Examiner also states that the table above

shows approximate burner tip clearances [diameter of the tube] and approximate orifice clearances [diameter of the tip orifice] for desired flame size. The graph below [provided by the examiner] plots the diameters against each other and shows a substantially linear relationship. Ridley states “Although . . . relatively few variations of the burner tips and venturi means [have been described], it will at once be apparent to those skilled in the art that other variations may be made within the spirit and scope of the invention.” Therefore, the values in the table are examples illustrating a trend described by the equation $y=0.06*x-0.005$ [generated by Excel based on the data in the table] where x is the diameter of the tube and y is the diameter of the orifice. The claimed range exists on this line outside of the explicitly given values. For example, when x is equal to 0.85 inches the corresponding y value is 0.046 inches and y/x is 0.054 or 5.4%. A burn tube with a diameter of 0.085 would be used for a larger flame based on the data in the table of Ridley. Burdsall teaches “The performance of a torch is based on the size and quality of the generated flame. Typically, a larger burn tube creates a larger flame with greater heat impact.”



Final Act. 6–7; *see also* Ans. 3–5. The Examiner determines that “one would modify the flame and tube size to modify the performance and/or heat impact of the torch.” Final Act. 7.

Appellant argues that the Examiner’s rejection is erroneous because Ridley omits “essential elements” as the Examiner “admits that Ridley does not explicitly disclose wherein a ratio of said first diameter to said inner diameter of said tube is in a range of 5.4 to 6.6%.” Appeal Br. 18 (emphasis omitted). Appellant argues that the Examiner “attempts to linearly extrapolate the example given in Ridley to arrive at a ratio of the first diameter to the inner diameter that is 5.4% based on the claims of the present application,” and the “linear extrapolation takes the inner diameter from 0.5 inches all the way up to 0.85 inches before a ratio of 5.4% is achieved.” *Id.*; *see also* Reply Br. 5 (“The fact that the Examiner cannot rely on the cited references by themselves as given and has to rely on his own made-up graph, drawing, and biased interpretations, using the present application as a blueprint, is a clear indication to the Appellant that the claims of the present application are not obvious based on the cited art.”) (emphasis omitted). According to Appellant, “[n]one of Ridley, Burdsall, or the present application discusses a torch having such a large inner diameter,” and the Examiner “has not shown that effective operation of a torch would be achievable over such a large linear range of inner diameters, or even that the linearity over such a large range of inner diameters would hold in reality.” Appeal Br. 18. Appellant further argues that “it is also unknown whether or not practical flow rates (SCFH) and practical pressures (PSI) could be achieved at such large inner diameters and corresponding first diameters while achieving the claimed ratios,” and the Examiner “is relying on pure

speculation and an assumption of linearity over a wide range in an attempt to make its argument, using the claims as a blueprint” and “hindsight reconstruction.” *Id.* (emphasis omitted); *see also* Reply Br. 5.

Appellant’s arguments are not persuasive because Appellant does not address, much less refute, the Examiner’s finding that the claimed ratio of the first diameter of the tip orifice structure to the inner diameter of the tube delivering the air flow to a flame is a “result-effective variable” and that the determination of the optimum or workable ranges of a result-effective variable is achievable by routine experimentation. Final Act. 4–5; Reply Br. 5. Because Appellant does not address the conclusion of the rejection as articulated by the Examiner, Appellant does not show error by the Examiner.

Appellant also argues that

it is not clear to the Appellant that what Ridley is calling burn tip clearance and orifice clearance in a table of Ridley are related to, respectively, the inner diameter of the tube and the first diameter of a third bore of the tip orifice structure of independent claims 21 and 30 claims of the present application, as interpreted by the Examiner.

Reply Br. 5–6. Appellant’s argument is not persuasive. Ridley’s use of different terminology for the claimed “tube” and “tip orifice structure” does not persuade us of error in the Examiner’s finding that Ridley’s burn tip and orifice correspond to the claimed “tube” and “tip orifice structure,” respectively. Final Act. 2, 5–6; Ans. 3–4; *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990) (explaining there is no *ipsisimis verbis* test for determining whether a reference discloses a claim element, i.e., identity of terminology is not required).

For the reasons above, the rejection of independent claims 21 and 30 is sustained. Because Appellant does not argue claims 24, 27, and 28 separately from independent claim 21, from which they depend, the rejection of claims 24, 27, and 28 is also sustained.

Rejections 2–4 and 10: Claims 23, 25, 26, 29, 30, 41, 42

In response to the Examiner’s rejections of claims 23, 25, 26, 29, 30, 41, and 42 over certain combinations of Ridley, Burdsall, Locke, Aske, Wolfinger, and/or Hughey (Final Act. 8–14), Appellant argues that Locke, Aske, Wolfinger, and Hughey do not remedy the deficiencies of Ridley and Burdsall as discussed above in connection with Rejection 1. Appeal Br. 20–22, 34–35. For the reasons discussed above in connection with Rejection 1, we are not apprised of such deficiencies, and the rejections of claims 23, 25, 26, 29, 30, 41, and 42 are sustained.

*Rejection 5: Claims 31, 32, 34, 35, and 37
as Unpatentable Over Baranowski, Nelson, and Hughey*

Appellant argues claims 31, 32, 34, 35, and 37 as a group. Appeal Br. 23–27. We select independent claim 31 as the representative claim, and claims 32, 34, 35, and 37 stand or fall with claim 31. 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds that Baranowski and Nelson disclose all of the limitations of claim 31 except for those reciting “a fourth bore disposed downstream of said upstream cavity” and “wherein said third bore directs a fuel to said mixture cavity via said fourth bore, and wherein a diameter of said fourth bore is same as said first diameter.” Final Act. 15–19. For these

missing limitations, the Examiner finds that Hughey teaches a fourth bore disposed downstream of said upstream cavity (e.g., “Figure 1, element 5”); wherein said third bore directs a fuel to said cavity via said fourth bore (e.g., the “bore of element 5 directs fuel to the cavity 2 via the bore 5”); wherein a diameter of said fourth bore is the same as said first diameter (e.g., the “diameter of 5' is the same as the bore of 5 which is the first diameter [the diameter of the tip orifice structure]”); and wherein said cavity separates said fourth bore and said second bore (e.g., “[c]avity 2 separates bores 5' and 17”). *Id.* at 17–18.

The Examiner states that Baranowski does not disclose the particular claimed configuration of the tip orifice communicating with the downstream chamber through a fourth bore, but “the court has held that changes in shape are a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed element were significant.” Final Act. 18–19 (citing *In re Dailey*, 357 F.2d 669 (CCPA 1966)). The Examiner explains that, in this case, Appellant “has not provided any significance to the fourth bore,” and, to the contrary, Appellant states “‘Figure 2 depicts a cross-section of a body 103 in accordance with an exemplary embodiment of the present invention. In the embodiment shown there is no upstream portion 114A of the bore 114 (as discussed above), but the cavity 110 is directly coupled to the cavity 113.’” *Id.* at 18 (citing Spec. ¶ 15). The Examiner further finds that the inclusion of a fourth bore to be a matter of design choice and, thus, reasons that it would have been obvious to one of ordinary skill in the art “to modify the shape of the shape of the torch of Baranowski to include a fourth bore as taught by Hughey.” *Id.* at 18.

Appellant argues that the Examiner's rejection is erroneous. Appeal Br. 24–25. According to Appellant, “element 5 of Hughey is a nipple 5 that is just a simple fitting that provides a gas mixture to a distribution header.” *Id.* at 25. Appellant argues that characterizing “the passage 5' of Hughey as a fourth bore disposed downstream of said upstream cavity” and “the nipple 5 of Hughey as having a third bore and the distributing chamber 2 of Hughey as a mixture cavity, where the bore of element 5 directs fuel to the cavity 2 via the bore 5” is erroneous because there “appears to be only one passage or bore 5' in the nipple 5 of Hughey” and there “does not appear to be a third bore and a fourth bore as characterized by the [Examiner].” *Id.*

Appellant's arguments are not persuasive because the Examiner relies on Hughey for its teachings of a bore arrangement where a fuel supply (nipple 5) encounters burner fitting 1 at the location where a bore is divided and part of the bore belongs to the nipple and part of the bore belongs to the fitting. Final Act. 18–19; Ans. 5–6. The Examiner's reference to “third” and “fourth” bores are merely naming or identifying conventions for certain structures, as recited in claim 31. In addition, Appellant does not address, much less refute, the Examiner's finding that the inclusion of a fourth bore is a matter of design choice and reasoning that it would have been obvious to one of ordinary skill in the art “to modify the shape of the shape of the torch of Baranowski to include a fourth bore as taught by Hughey.” Final Act. 19. As the Examiner correctly states, “the difference between Baranowski or Nelson and the claim language is how the spud or nipple meets the main body” and the “results of switching the connection type would have been predictable. Namely, a connection between the spud or nipple and the main body that allows gas to flow through the spud or nipple and into the main

body.” Ans. 5. Because Appellant does not address the rejection as articulated by the Examiner, Appellant does not identify error.

For the reasons above, the rejection of independent claim 31 is sustained. Because Appellant does not argue claims 32, 34, 35, and 37 separately from claim 31, from which they depend, the rejection of claims 32, 34, 35, and 37 is also sustained.

Rejections 6–9: Claims 33 and 38–40

In response to the Examiner’s rejections of claims 33 and 38–40 over certain combinations of Baranowski, Nelson, Hughey, Locke, and Wolfinger (Final Act. 19–24), Appellant argues that Locke, Aske, and Wolfinger do not remedy the deficiencies of Baranowski, Nelson, and Hughey as discussed above in connection with Rejection 5. Appeal Br. 27–40. For the reasons discussed above in connection with Rejection 5, we are not apprised that the combination of Baranowski, Nelson, and Hughey has any deficiencies, and the rejections of claims 33 and 38–40 are sustained.

CONCLUSION

The Examiner’s rejections of claims 21, 23–35, 37–42 are
AFFIRMED.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
21, 24, 27, 28, 30	103(a)	Ridley, Burdsall	21, 24, 27, 28, 30	
23	103(a)	Ridley, Burdsall, Locke	23	
25, 26	103(a)	Ridley, Burdsall, Aske	25, 26	
29, 30	103(a)	Ridley, Burdsall, Wolfinger	29, 30	
31, 32, 34, 35, 37	103(a)	Baranowski, Nelson, Hughey	31, 32, 34, 35, 37	
33	103(a)	Baranowski, Nelson, Hughey, Locke	33	
38	103(a)	Baranowski, Nelson, Hughey, Nelson	38	
39	103(a)	Baranowski, Nelson, Hughey, Wolfinger	39	
40	103(a)	Nelson, Hughey	40	
41, 42	103(a)	Ridley, Burdsall, Hughey	41, 42	
Overall Outcome			21, 23–35, 37–42	

TIME PERIOD FOR RESPONSE

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

AFFIRMED