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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ZORAN ISKRENOVIC

Appeal 2018-008625
Application 13/460,059
Technology Center 3700

Before PHILIP J. HOFFMANN, AMEE A. SHAH, and
ROBERT J. SILVERMAN, *Administrative Patent Judges*.

SHAH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), the Appellant appeals from the Examiner’s final decision to reject claims 1, 3–5, 7–11, 13–15, and 17–21, which are all of the pending claims.¹ We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. The Appellant identifies Seven International Group, Inc. as the real party in interest. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The Appellant's invention is in the field of water heaters and specifically relates to water heaters using infrared radiation. *See Spec.* ¶¶ 2, 9.

Claims 1, 11, and 21 are the independent claims. Claim 1 is illustrative of the subject matter on appeal and is reproduced below (with added bracketing for reference):

1. A water heater, comprising:

[(a)] a first fluid conduit comprising an elongated, cylindrical piece;

[(b)] a second fluid conduit fluidly coupled to and disposed about at least a portion of the first conduit, wherein the elongated, cylindrical piece of the first fluid conduit extends along a central axis of the second fluid conduit;

[(c)] an infrared bulb disposed entirely between the first and second conduits, and configured to heat water flowing within the first and second conduits; and

[(d)] wherein the second conduit comprises a plurality of stacked pipe segments, each of which is disposed to abut adjacent segments of the second conduit such that the plurality of stacked pipe segments collectively form a primary heat shield about the infrared bulb; and

[(e)] wherein the infrared bulb and the second conduit wrap around the first fluid conduit.

Appeal Br. 14 (Claims App.).

REFERENCES

The prior art relied upon by the Examiner are:

Name	Reference	Date
Blanding	US 1,539,039	May 26, 1925
Andrus	US 2,791,204	May 7, 1957
Bocksruker et al. ("Bocksruker")	US 4,246,871	Jan. 27, 1981
Rezabek	US 5,590,240	Dec. 31, 1996
Castaneda et al. ("Castaneda")	US 2003/0026603 A1	Feb. 6, 2003
Bouhuijs et al. ("Bouhuijs")	US 2003/0216689 A1	Nov. 20, 2003
Johnson et al. ("Johnson")	US 2004/0184794 A1	Sept. 23, 2004

REJECTIONS

Claims 1, 3–5, 7, 11, 13–15, 17, and 19–21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rezabek, Bouhuijs, and Blanding.

Claim 8 stands rejected under 35 U.S.C § 103(a) as being unpatentable over Rezabek, Bouhuijs, Blanding, Castaneda, and Andrus.

Claim 9 and 10 stand rejected under 35 U.S.C § 103(a) as being unpatentable over Rezabek, Bouhuijs, Blanding, and Bocksruker.

Claim 18 stands rejected under 35 U.S.C § 103(a) as unpatentable over Rezabek, Bouhuijs, Blanding, and Johnson.

OPINION

Claims 1, 3–5, 7, and 20

The Appellant contends, in relevant part, that the Examiner's rejection of independent claim 1 is in error because the prior art does not render

obvious an infrared bulb disposed entirely between the first and second conduits and wrapped around the first conduit, as recited in limitations (c) and (e). *See* Appeal Br. 5–6. The Appellant also argues that, to the extent the prior art individually teaches these elements, the Examiner has not provided adequate reasoning why one of ordinary skill in the art would combine the art to make the proposed modification. *Id.*; *see also* Reply Br. 5–6. We agree.

In the Final Action, the Examiner finds, in relevant part, that although Rezabek teaches a “source [that] radiates infrared radiation, as is evident in requiring ‘infrared reflective material’ (Rezabek, Column 1, line 56),” Rezabek does not teach “wherein the second conduit comprises an infrared source that is a bulb, a plurality of stacked pipe segments, each of which is disposed to abut adjacent segments of the second conduit.” Final Act. 3. The Examiner relies on Bouhuijs to teach the infrared bulb and stacked segments (*id.* at 4), determining that it would have been obvious to combine Rezabek and Blanding with Bouhuijs “to ‘shield’ the outside from the heat and also to create a more efficient heater by not losing the radiation to the outside environment (i.e. having it reflected back to heat the liquid).” *Id.* at 4–5.

The Examiner elaborates in the Answer and finds that “it is Blanding that teaches that the heating source (Blanding 22) is entirely between the first (12) and second (19) conduits,” determining that

[i]t would have been obvious to one having ordinary skill in the art at the time of the invention to have an infrared heating element entirely between the pipe sections for the purpose of heating up the fluid as it as the fluid travels on either side of the heating element, making the heating more efficient, since it has been held to be within the general skill of a worker in the art, see

Blanding, to have the heating element between the fluid conduits on the basis of their suitability for their intended use as a matter of obvious design choice. The teaching for this choice is in the prior art. *In re Leshin*, 125 USPQ 416.

Ans. 17. The Examiner further clarifies that Rezabek does not teach abutting segments and the infrared bulb, but “Bouhuijs does teach that the infra-red source (3) is a lamp (which would comprise a bulb) and that the helical segments abut each other (element 2, Fig. 1).” *Id.* at 18. The Examiner determines that it would have been obvious

to modify Rezabek with Bouhuijs, to add the configuration of the helical pipes and the “lamp” to the configuration of Rezabek, in order to heat more efficiently, containing the heat more with the abutting segments so it is better absorbed into the fluid and more efficiently emitting the heat as infra-red with the lamp. There is advantage to this orientation and it is within the general skill of someone with ordinary skill in the art to make such a modification.

Id. Thus, the Examiner finds that Rezabek teaches an infrared heating element that wraps around the first conduit, but not that the element is a bulb that is entirely between the first and second conduits. The Examiner relies on Blanding for teaching a heating source entirely between the first and second conduits and on Bouhuijs for teaching the heating element being an infrared bulb. *See* Final Act. 3–5; *see also* Ans. 17.

Rezabek discloses a “high efficiency, non-contaminating fluid heater” with inner and outer helical passageways and a coiled resistance heater “disposed about the helical outer surface of the inner helical passageway,” with the outer passageway “disposed to enable ultra pure fluid flowing therethrough to absorb radiated and convected heat from the coiled resistance heater to increase the efficiency of the fluid heater.” Rezabek, Abstract. “A housing [22] formed from an infrared reflective material

substantially encloses the inner and outer helical passageways to reflect inward and thereby reduce radiated heat flow from the coiled resistance heater [20] to the ambient environment” outside the housing. *Id.* at col. 1, ll. 55–59, col. 4, ll. 16–21.

Blanding discloses a water heater with pipe 12 surrounded by water coil 19 and insulating core 21 positioned on pipe 12 that supports resistance coil 22 that heats pipe 12 and the interior of the casing. Blanding, ll. 56–66, 76–86.

Bouhuijs discloses “an apparatus for warming blood or other physiological fluids” with a fluid conduit and a heating means of infrared radiation for warming the fluid. Bouhuijs, Abstract. Conduit 2 is formed like a spiral, and inside the spiral shape is an infrared source, such as an infrared lamp 3. *Id.* ¶ 19. “The efficiency and controllability [of the apparatus] is aided in particular by the fact that the conduit extends substantially in the form of a spiral and that its side facing away from the infrared source is provided with an infrared radiation-reflective coating or film.” *Id.* ¶ 11.

As such, we find that Rezabek teaches a heating source (resistance heater 20) that wraps around the first conduit and an infrared element (housing 22) that surrounds both conduits. We also find that Blanding teaches a heating source (resistance coil 22) that wraps around the first conduit and is entirely between the first and second conduits. Further, we find that Bouhuijs teaches an infrared bulb (infrared lamp 3) inside a conduit of a plurality of stacked pipe elements (conduit 2). However, we do not see why one of ordinary skill in the art would replace Rezabek’s resistance heater 20 that wraps around the first conduit and as modified with

Blanding's resistance coil 22 that is entirely between the first and second conduits with Bouhuijs's infrared bulb that sits inside a spiral conduit. *See* Reply Br. 3–4. The Examiner's reason that one would do so “in order to heat more efficiently” is not adequately supported. Ans. 17; *see also* Final Act. 5. Bouhuijs discloses that its efficiency is increased because of the spiral shape of the conduit with the side facing away from the heat source provided with a special coating; it is silent as to how the infrared bulb increases the apparatus's efficiency. *See* Bouhuijs ¶ 11.

Thus, based on the record before us, we are persuaded of Examiner error, and we do not sustain the rejection over Rezabek, Blanding, and Bouhuijs of independent claim 1 and of dependent claims 3–5, 7, and 20, which stand with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Claims 11, 13–15, 17, and 19

The Appellant contends that the Examiner has not adequately explained how the prior art teaches the recited limitations of independent claim 11 of an infrared bulb disposed between a first coiled conduit and a second conduit, the bulb comprising first, second, and third segments. *See* Appeal Br. 7–8, and 15 (Claims App.); *see also* Reply Br. 6. We agree.

The Examiner acknowledges that Rezabek does not teach “an infrared water heater wherein the first infrared light source comprises first, second, and third segments which are adjacent.” Final Act. 6. To correct this deficiency, the Examiner determines that

Blanding teaches a heater parallel to a first linear segment (Blanding, 22; parallel with first segment), and Rezabek teaches that the heater could surround a pipe (Rezabek, 20; parallel with second segment), thus it would have been obvious to one having

ordinary skill in the art at the time of the invention to have different segments match up to their different and respective filaments for ease of placement and for exceptional heating.

Id. at 7. As for the infrared source being a bulb, the Examiner relies on Bouhuijs for teaching this element. *Id.* at 8.

Even were we to accept the Examiner's determination that it would have been obvious to have Rezabek's heating element as modified by Blanding to have first, second, and third segments, the Examiner has not adequately explained why one of ordinary skill in the art would modify that heating element to comprise a segmented infrared bulb. *See* Appeal Br. 7. At best, the Examiner provides reasoning why one of ordinary skill in the art would combine the prior art to

have infrared "lamps" heat the liquid in the pipes in a conventional way, and also to have the pipes stack and reflect back the infrared radiation, to "shield" the outside from the heat and also to create a more efficient heater by not losing the radiation to the outside environment (i.e. having it reflected back to heat the liquid)[.]

Final Act. 8. However, as discussed above with claim 1, the Examiner does not adequately explain how modifying the heater of Rezabek and Blanding to comprise an infrared bulb would create more efficiency.

Thus, based on the record before us, we are persuaded of Examiner error, and we do not sustain the rejection over Rezabek, Blanding, and Bouhuijs of independent claim 11 and of dependent claims 13–15, 17, and 19, which stand with claim 11. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Claim 21

The Appellant contends that the Examiner has not adequately explained how the prior art teaches the recited limitations of independent

claim 21 of “a coiled heating device disposed entirely between the first and second conduits and having stacked segments that parallel the second fluid conduit.” Appeal Br. 7, 16 (Claims App.); *see also* Reply Br. 7. We agree.

The Examiner finds, in relevant part, that Rezabek teaches

a coiled heating device . . . disposed between the first and second conduits (Rezabek, 20), and having stacked segments that parallel the second fluid conduit (Rezabek, Fig.1–4), and wrap around the first fluid conduit, wherein the coiled heating device generates infrared light (Rezabek, Column 1 line 26) to heat water flowing within the first and second conduits (Rezabek, at least Abstract).

Final Act. 11. The Examiner further finds that Blanding teaches a heating element entirely between the first and second conduits. Final Act. 12.

As discussed above with respect to claim 1, Rezabek teaches a coiled heating device having stacked segments, that wraps around the first conduit (heater 20), and that heats water flowing through the conduits. *See* Rezabek, col. 4, ll. 16–21, Fig. 1. Rezabek teaches a separate infrared element that reflects/re-introduces heat (housing 22) and traps heat from heater 20 inside housing 20, “where the heat is absorbed by the ultra pure fluid to heat the fluid in an efficient manner.” *Id.* col. 1, ll. 55–59, col. 4, ll. 26–30.

However Rezabek does not teach its coiled heating element 20 with stacked segments generating infrared heat to heat the water, nor does it teach its infrared housing 22 being a coiled heating elements with stacked segments. Thus, the Examiner’s finding that Rezabek teaches a coiled housing device that wraps around the first conduit, has stacked segments, and generates infrared light is not supported. To the extent the Examiner relies on Bouhuijs to teach the heating device comprising an infrared light, i.e., generating infrared light (*see* Final Act. 11 (“It would have been obvious to

one having ordinary skill in the art at the time of the invention to provide to Rezabek the teachings of Bouhuijs, in order to have infrared ‘lamps’ heat the liquid in the pipes in a conventional way’’), the Examiner’s reasoning for combing Rezabek, i.e., “to create a more efficient heater by not losing the radiation to the outside environment” (*id.* at 11–12), is deficient for similar reasons discussed above with respect to claims 1 and 11. That is, the Examiner does not adequately explain how modifying the coiled heater of Rezabek generates infrared light to have a more efficient heater.

Thus, based on the record before us, we are persuaded of Examiner error, and we do not sustain the rejection over Rezabek, Blanding, and Bouhuijs of independent claim 21.

Claims 8–10 and 18

The Examiner’s rejects claim 8–10 and 18, which ultimately depend from independent claims 1 and 11, as obvious over Rezabek, Blanding, Bouhuijs, and Castaneda and Andrus, Bocksruker, or Johnson. For all of these, the Examiner relies on the same findings and reasoning as for claims 1 and 11. Thus, for the same reasons we do not sustain the rejection of claims 1 and 11 as obvious over Rezabek, Blanding, and Bouhuijs, we also do not sustain the obviousness rejections of dependent claims 8–10 and 18.

CONCLUSION

The Examiner’s decision to reject claims 1, 3–5, 7–11, 13–15, and 17–21 is not sustained.

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3-5, 7, 11, 13-15, 17, 19-21	103(a)	Rezabek, Bouhuijs, Blanding		1, 3-5, 7, 11, 13-15, 17, 19-21
8	103(a)	Rezabek, Bouhuijs, Blanding, Castaneda, Andrus		8
9, 10	103(a)	Rezabek, Bouhuijs, Blanding, Bocksruker		9, 10
18	103(a)	Rezabek, Bouhuijs, Blanding, Johnson		18
Overall Outcome				1, 3-5, 7-15, 17-21

REVERSED