



# 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.
11/563,728	11/28/2006	Daniel Bidon	5956-007	1435
24112	7590	02/26/2013	EXAMINER	
COATS & BENNETT, PLLC 1400 Crescent Green, Suite 300 Cary, NC 27518			WALBERG, TERESA J	
			ART UNIT	PAPER NUMBER
			3744	
			MAIL DATE	DELIVERY MODE
			02/26/2013	PAPER

**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.

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

*Ex parte* DANIEL BIDON and JEAN-CLAUDE GALLOT

---

Appeal 2010-006134  
Application 11/563,728  
Technology Center 3700

---

Before: WILLIAM V. SAINDON, SCOTT A. DANIELS, and NEIL T.  
POWELL, *Administrative Patent Judges*.

DANIELS, *Administrative Patent Judge*.

DECISION ON APPEAL

## STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from a rejection of claims 1, 3, 8-11, 15, 17, 18 and 41-55. Claims 1, 11, 44 and 50 are the independent claims, and claims 2, 4-7, 12-14, 16 and 19-40 are canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

## THE INVENTION

The claims are directed to an evaporator, and more specifically to “heat exchangers to transfer heat between a heat transfer medium, often steam, and the liquid.” Spec. 1, para. [0002]. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. An evaporator for evaporating a liquid, comprising:
  - a. a housing;
  - b. a heat exchanger for transferring heat from a heat transfer medium to the liquid and producing a vapor and a product liquid;
  - c. a vapor collector disposed substantially within the housing and including a vapor inlet having a downward-facing portion;
  - d. wherein the vapor produced by the heat exchanger flows downwardly past an upper portion of the vapor collector and upwardly into the vapor inlet; and
  - e. wherein the heat exchanger includes a liquid inlet, an outlet for product liquid and vapor, and a bank of tube plates with each tube plate including a pair of corrugated sheets secured together wherein each corrugated sheet includes a series of alternating concave and convex segments with adjacent segments being generally mirror images of each other, and wherein the corrugated sheets comprising each tube plate are disposed such that each concave segment of one sheet faces a concave segment of the other sheet, and wherein each convex segment of one sheet contacts or lies closely adjacent a convex

Appeal 2010-006134  
Application 11/563,728

segment of the other sheet and wherein the tube plates are spaced apart and spacing the tube plates includes bracing the tube plates with two or more plates with each plate having openings shaped to generally conform to the tube plates and thereby adapted to retain the shape of each tube plate when exposed to pressure.

#### REFERENCES

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Harrison	US 1,005,028	Oct. 3, 1911
Protze	US 2,873,954	Feb. 17, 1959
Rosenblad `119	US 3,351,119	Nov. 7, 1967
Rosenblad `709	US 3,371,709	Mar. 5, 1968
Sephton	US 6,309,513	Oct. 30, 2001

#### REJECTIONS

The Examiner made the following rejections:

Claims 1, 8, 41 and 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rosenblad `119 and Harrison. Ans. 3.

Claims 3, 11, 17, 18, 44 and 45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rosenblad `119, Harrison and Protze. Ans. 5.

Claims 15 and 43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rosenblad `119, Harrison, Protze and Rosenblad `709. Ans. 6.

Claims 9, 10, and 50-53 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rosenblad `119, Harrison, Protze and Sephton. Ans. 6.

Claims 46-49, 54 and 55 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rosenblad, Harrison `119, Protze and Sephton.  
Ans. 7.

#### ANALYSIS

*Claims 1, 8, 41 and 42 as unpatentable over Rosenblad `119 and Harrison.*

The Examiner found that Rosenblad `119 discloses each of the limitations of the evaporator recited in claim 1 with the exception of “tube plates including pairs of corrugated sheets secured together and plates holding the tube plates in spaced positions.” Ans. 4. The Examiner turned to Harrison for the disclosure of a heat exchanger having “tube plates (5 in Fig. 5) including pairs of corrugated sheets (Fig. 5 and page 2, lines 10-13) secured together (at 14 and 15) and plates (at 7 in Fig. 2) holding the tube plates (5) in spaced positions (page 2, lines 4-6).” *Id.* The Examiner reasoned that it would have been obvious to include the corrugated sheets forming tube plates from Harrison in Rosenblad `119’s heat exchanger “to increase the rate of heat transfer due to increased surface area of the plates.”  
Ans. 4.

Appellants draw our attention to the fact that Rosenblad `119 relates to a falling film heat exchanger using inverted “V”-shaped baffles 50, as shown in Rosenblad `119’s Figure 5, which evenly distribute the liquid as a uniform film onto the surfaces of heat exchanger plates 16<sup>1</sup>. App. Br. 8-9. Appellants argue that Harrison’s radiator, having corrugated tubes through which the fluid to be cooled flows, cannot be substituted for the heat transfer

---

<sup>1</sup> The Appeal Brief refers to Rosenblad `119’s “heat exchanger plates 44.” Our review of the reference indicates that the plates are more properly “plates 16” where the description of element 44 refers to the “first baffle members” which form the upper edge, or peak, of the exchanger plates. App. Br. 9; Rosenblad `119, col. 4, ll. 51-52.

Appeal 2010-006134  
Application 11/563,728

plates 16 in Rosenblad `119, “and still maintain Rosenblad [ `119] 's object of distributing a uniform thickness of liquid over the entire surface area of the corrugated tubes.” App. Br. 10. Appellants assert that the modification of Rosenblad `119 with Harrison’s corrugated tubes would render Rosenblad `119 inoperable for its intended purpose. App. Br. 12. Appellants contend that the use of corrugated tubes would destroy the efficiency and performance of Rosenblad `119’s heat exchanger which is predicated upon the uniformity of the liquid film evenly distributed across the entire surface of the heat exchanger plates 16. App. Br. 12-13.

As noted by Appellants, Rosenblad `119 is directed specifically to development of a uniformly distributed film of liquid across the entire surface(s) of the heat exchanger plate(s) describing

[a] plate type heat exchanger of the falling film type, such heat exchanger having an improved liquid distribution device which insures the creation of substantially uniform falling films on the entire heating surfaces of the heat exchanger plates.

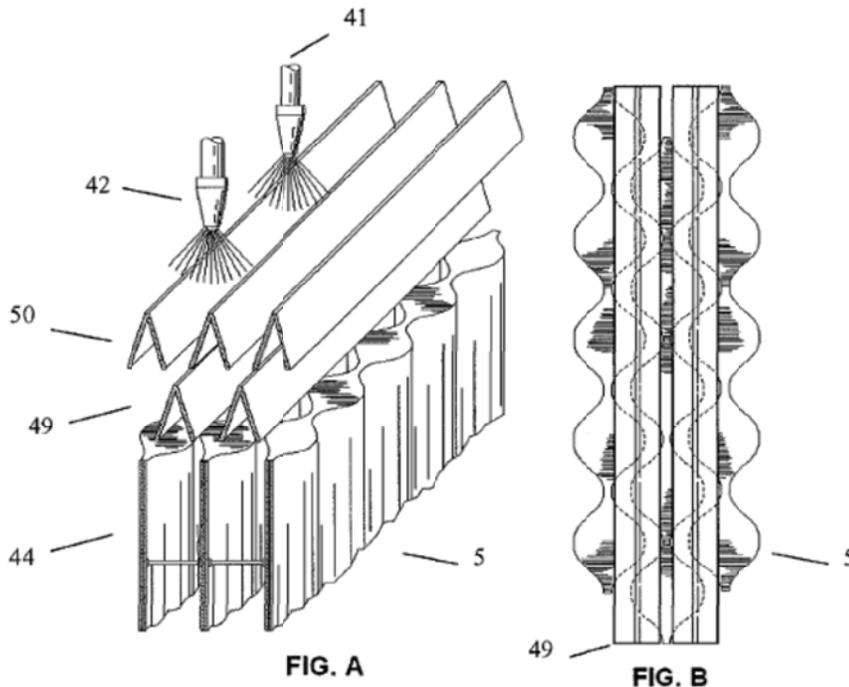
Rosenblad `119, col. 1, ll. 10-14. To facilitate the uniformity of the fluid flow across the heat exchanger plates 16 (and down the heating channels 17) Rosenblad `119 provides baffle means 50 “in the form of inverted V's which are symmetrically disposed above the upper edges of the heating channels **17.**” *Id.*, col. 4, ll. 53-55. These inverted “V” baffles include first baffle members 44 which form a central peak as the top portion of the heat exchanger plates 16, and additionally a second row 49, and third row 50, of additional “V”-shaped baffle members disposed above the first baffle members 44. As described in Rosenblad `119

spray from the nozzle forms into films on the successive baffle means **50, 49**, the films flowing downwardly to drop upon plates **45** of baffle means **44**. By the time the films have

reached the upper edges of plates **16** they are of substantially uniform thickness and extend throughout the entire horizontal length of each of such plates.

*Id.*, col. 5, ll. 10-16.

Based on Rosenblad `119's disclosure being predicated on the ideals of such a uniform film, or flow, Appellants' position is that "substituting the corrugated tubes 5 for plates [16] will make it impossible for the modified Rosenblad [119] evaporator to distribute a uniform thickness of liquid over the entire surface area of the corrugated tubes 5." App. Br. 14. Urging us to accept this position, Appellants provide a hypothetical representation of what the Examiner's modification of Rosenblad `119 with Harrison would impart. Appellants' hypothetical representation, illustrated as Figures A and B, is reproduced below:



Figures A and B depict the corrugated tubes 5 of Harrison placed below the nozzles 41 and 42 and the baffles 49 and 50 of Rosenblad `119. App. Br.

14-15. Keeping in mind that Rosenblad `119 is unwaveringly focused on providing a uniform flow across the entirety of the heat exchanger plates 16, we accept Appellants' position that by providing Harrison's corrugated tubes 5 in Rosenblad `119, "as shown in Fig. B above, a significant portion of the corrugated sheets (shown in dotted lines) is disposed under the inverted V-portion of the baffles. The liquid distributed by the baffles cannot be uniformly distributed to these portions of the corrugated sheets." App. Br. 15.

The Examiner's reasoning that corrugated sheets would increase the heat transfer surface area and thus provide an increase in overall heat transfer to improve the overall functioning of the heat transfer device is inadequately supported. Ans. 9. The Examiner provides no rationale or explanation to support the finding that forming tubes from conjoined corrugated sheets would provide any additional surface area besides that already provided by the plates 16 in Rosenblad `119. *Id.* We also do not agree with the Examiner's supposition that there is "nothing in this liquid distributing means that would preclude the use of corrugated plates in the heat transfer device." *Id.* As shown by Appellants' hypothetical Figures A and B above, the entire purpose of the baffles developing even, uniform flow across the entire plate is compromised with such corrugated tubes.

Accordingly, we cannot sustain the rejection of independent claim 1 as unpatentable over Rosenblad `119 and Harrison. As claims 8, 41 and 42 each depend directly from claim 1, we also do not sustain these rejections.

*Claims 3, 11, 17, 18, 44 and 45 as unpatentable over Rosenblad `119, Harrison and Protze.*

Protze discloses a heat exchanger having cylindrical sheet metal rings acting as anti-splashing plates 19 at the surface of the water. Protze, col. 4,

Appeal 2010-006134  
Application 11/563,728

ll. 16-53 *and* fig. 1. Protze explains that in order “[t]o avoid excessive splashing, when the jet reaches the water surface, the latter is subdivided into small zones by the cylindrical anti-splashing-sheets **19**. *Id.*, col. 4, ll. 51-53. The Examiner does not make any findings with respect to Protze to correct the deficiencies with respect to the underlying combination of Rosenblad `119 and Harrison. Claim 3 depends from claim 1 and thus for the reasons discussed *supra*, we reverse the rejection of claim 3.

Independent claims 11 and 44 include the same limitations as claim 1 with respect to the bank of tube plates formed from a pair of corrugated sheets and thus the rejection of these claims, and their respective dependent claims 17, 18 and 45 over Rosenblad `119, Harrison and Protze is also reversed.

*Claims 15 and 43 as being unpatentable over Rosenblad `119, Harrison, Protze and Rosenblad `709.*

Rosenblad `709 is cited for the proposition of angling a series of spaced apart plates forming the anti-splash device as recited in claim 15, and for disclosing that the liquid and heat transfer medium flow in a normal direction to one another as recited in claim 43. Ans. 6. Again, the Examiner makes no findings based on Rosenblad `709 to cure the deficiencies of Rosenblad `119 and Harrison, and where claims 15 and 43 depend directly from independent claim 11 the rejection of claims 15 and 43 also cannot be sustained.

*Claims 9, 10, and 50-53 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenblad `119, Harrison, Protze and Sephton.*

Sephton discloses a plurality of vertically stacked tube bundles or modules in a single unit to provide efficient evaporation for liquids. Sephton, col. 3, ll. 8-15. The Examiner fails to find any basis in Sephton to cure the deficiencies with respect to Rosenblad `119 and Harrison as discussed above. Independent claim 50 includes the same limitations as the

Appeal 2010-006134  
Application 11/563,728

previously discussed independent claims, and thus the rejections of claims 9, 10 and 50-53 are also not sustained.

*Claims 46-49, 54 and 55 as unpatentable over Rosenblad `119, Harrison, Protze and Sephton.*

Claims 46-49 depend directly from independent claim 44, and claims 54 and 55 both depend directly from independent claim 50. As discussed *supra*, the Examiner has provided no findings from Protze, nor Sephton to cure the deficiencies of Rosenblad `119 and Harrison. Accordingly, we also reverse the rejection of claims 46-49, 54 and 55.

#### DECISION

For the above reasons, the Examiner's rejection of claims 1, 3, 8-11, 15, 17, 18, 41-55 is REVERSED.

REVERSED

mls