US008966935B2

(12) **United States Patent**
Nelson

(10) **Patent No.: US 8,966,935 B2**
(45) **Date of Patent: Mar. 3, 2015**

(54) **HEAT EXCHANGER**

(75) Inventor: **Bruce I. Nelson**, Colville, WA (US)

(73) Assignee: **Colmac Coil Manufacturing, Inc.**, Colville, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 456 days.

(21) Appl. No.: **13/527,958**

(22) Filed: **Jun. 20, 2012**

(65) **Prior Publication Data**

US 2013/0340979 A1 Dec. 26, 2013

(51) **Int. Cl.**
F25B 39/02 (2006.01)

(52) **U.S. Cl.**
USPC **62/525**; 62/112; 165/104.26

(58) **Field of Classification Search**
USPC 62/112, 498, 509, 525; 165/104.26, 165/174, 178
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,171,560	A		9/1939	Holmes et al.
3,070,963	A		1/1963	Dubouchet
3,665,714	A		5/1972	Bunger
4,577,468	A	*	3/1986	Nunn et al. 62/113
5,674,029	A		10/1997	Smith et al.
7,958,738	B2		6/2011	Nelson
2001/0013226	A1	*	8/2001	Potnis et al. 62/271
2009/0301112	A1	*	12/2009	Nelson 62/112

OTHER PUBLICATIONS

Unknown, Weir Calibration, Technical publication, pp. 1-4.

* cited by examiner

Primary Examiner — Melvin Jones

(74) *Attorney, Agent, or Firm* — Paine Hamblen, LLP

(57) **ABSTRACT**

A heat exchanger is described and which includes a heat exchanger portion defining a multiplicity of internal passageways, and wherein at least one of the passageways is defined in part by a wicking structure; a refrigerant distributor coupled in fluid flowing relation relative to the defined passageways of the heat exchanger portion; and a source of ammonia refrigerant which is supplied to the internal passageways of the heat exchanger portion, and wherein substantial equal amounts of liquid refrigerant are supplied to each of the passageways defined by the heat exchanger portion.

31 Claims, 9 Drawing Sheets