IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

PACKLESS METAL HOSE, INC.	§	
	§	
Vs.	§	CIVIL ACTION NO. 2:09-CV-265-JRG
	§	
EXTEC ENERGY EQUIPMENT	§	
(ZHEJIANG) CO., LTD., ET AL	§	

MEMORANDUM OPINION AND ORDER

Before the Court is the parties' claim construction briefing. The Court held a claim construction hearing on September 27, 2012. The Court has considered the parties' arguments, the relevant portions of the record, and the applicable law. This Memorandum Opinion and Order addresses the parties' various claim construction disputes. The Court will first discuss the technology of the patents-in-suit and then turn to the merits of the claim construction issues.

I. BACKGROUND AND THE PATENTS-IN-SUIT

This case involves heat exchanger technology. In particular, this case involves heat exchangers constructed with helically convoluted heat exchange elements. Plaintiff Packless Metal Hose, Inc. ("Packless") is the owner of United States Patent Nos. 5,409,057 ("the '057 Patent") and 5,551,504 ("the '504 Patent"). The '504 Patent is a divisional of the '057 Patent. For ease of reference, the Court will cite to the specification of the '057 Patent.

In the Background of the Invention, the patentee observes that finned heat exchange elements are well known in the art for use in radiators, heat exchangers, refrigerators, and condensers, '057 Patent, 1:14-15. For example, in an automobile radiator, the heat from the engine coolant passes from the coolant to the interior surface of the radiator and then onto the

metal fins that extend from the body of the radiator. A fan blows air into the fins and away from the radiator.

Helically convoluted heat exchangers were also known in the art. They operate somewhat differently from a finned heat exchanger. By creating spiral-shaped channels in the walls of a metal tube, the surface area of the interior wall is increased, and the fluid passing through the tube is turbulated so that more of the fluid passing through the tube comes into contact with the wall. A tube made from metal like copper easily conducts heat through the metal from the interior wall of the tube to the exterior. By creating spiral channels in the tube, the heat spreads away more evenly and efficiently from the fluid to the wall of the tube than it would through a tube that is not "helically convoluted." Methods for making helically convoluted exchangers are described in U.S. Patent Nos. 4,377,083 and 4,514,997. '057 Patent 1:15-22.

The patents-in-suit claim improvements over the prior art. As described in the Summary of the Invention:

> An embodiment of the invention relates to a multi-passage heat exchange element which includes a central first fluid passage for passage of a first fluid of a heat exchanger, a plurality of substantially helically convoluted second fluid passages for a second fluid of a heat exchanger, the second fluid passages substantially helically surrounding at least a portion of the first fluid passage, and a plurality of substantially helically convoluted first fluid passages substantially surrounding at least a portion of the second fluid passages.

The specification explains the manufacturing process for an embodiment of the improved heat exchanger element. According to the specification, the process begins by tapering the ends of a metal tube with a tapering die. The tube, with its tapered ends, is depicted in Figure 3:

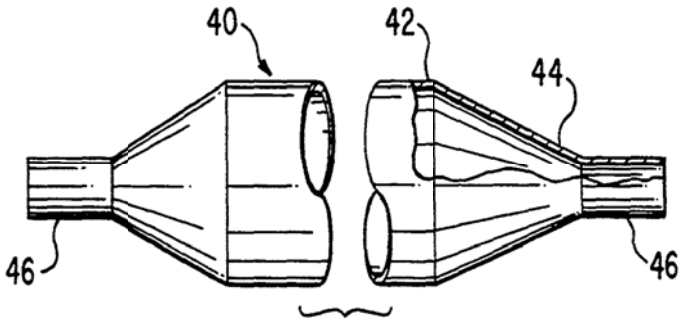

FIG. 3

The tapered tube is then passed into a tube corrugating die as shown in Figures 4-5. The die teeth are arranged so that when the tapered tube is passed into the die and the die is rotated about the tube, the resulting tube is a helically convoluted heat exchange element depicted in Figure 6, a cross-section of which is shown in Figure 7:

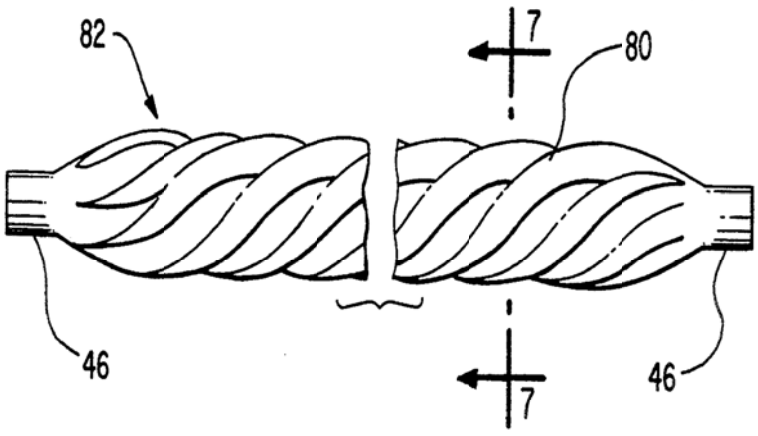

FIG. 6

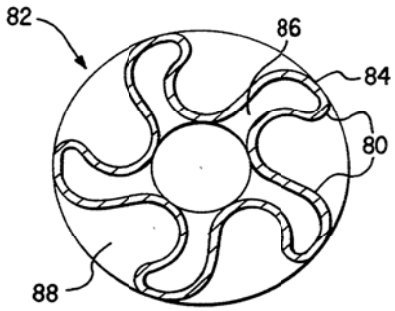

FIG. 7

The specification explains that this process facilitates the production of channels 88 which later become passages 5. '057 Patent, 21-40. Although the corrugated tube 82 shown in Figure 7 may be used as a heat exchange element, the specification explains that, preferably, the corrugated tube 82 is passed through a reducing die as shown in Figures 8 and 9. Essentially, the reducing die compresses the tube to reduce its diameter. By doing so, the channels and corrugations depicted in Figure 7 are formed into passages. "The resultant multi-passage element is shown in FIGS. 10-11." '057 Patent, at 3:50-51.

Figures 10 and 11 show a side view and cross-section of an example of the improved heat exchange element:

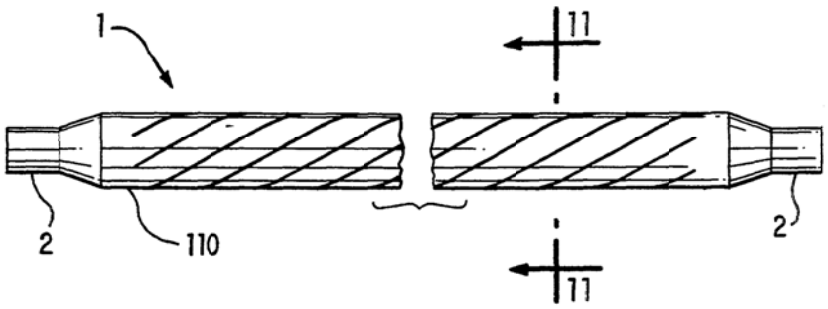

FIG. 10

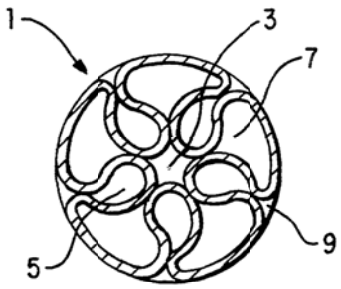

FIG. 11

The preferred embodiment of the heat exchange element shown in Figs. 10 and 11 has a central passage 3 through which a first fluid may flow, surrounded by helically convoluted second fluid passages 5, through which a second fluid may flow. The fluid from the central first fluid passage may be directed into the helically convoluted first fluid passages 7 that surround the second fluid passages. The arrangement of the helically convoluted passage improves the efficiency of the heat exchanger, and, as the results of the experiment cited in the patent demonstrate, this configuration also allows the elements to be constructed with a smaller square footage of physical heat transfer area. '057 Patent at 5:44-6:27.

II. LEGAL PRINCIPLES

"A claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using or selling the protected invention." *Burke, Inc. v. Bruno Indep. Living Aids, Inc*., 183 F.3d 1334, 1340 (Fed. Cir. 1999). Claim construction is an issue of law for the Court to decide. *Markman v. Westview Instruments, Inc*., 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996).

To ascertain the meaning of claims, the Court looks to three primary sources: the claims, the specification, and the prosecution history. *Markman*, 52 F.3d at 979. The specification must contain a written description of the invention that enables one of ordinary skill in the art to make

and use the invention. *Id*. A patent's claims must be read in view of the specification, of which they are a part. *Id*. For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. *Id*. "One purpose for examining the specification is to determine if the patentee has limited the scope of the claims." *Watts v. XL Sys., Inc*., 232 F.3d 877, 882 (Fed. Cir. 2000).

Nonetheless, it is the function of the claims, not the specification, to set forth the limits of the patentee's invention. Otherwise, there would be no need for claims. *SRI Int'l v. Matsushita Elec. Corp*., 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc). The patentee is free to be his own lexicographer, but any special definition given to a word must be clearly set forth in the specification. *Intellicall, Inc. v. Phonometrics, Inc*., 952 F.2d 1384, 1388 (Fed. Cir. 1992). Although the specification may indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than the embodiments. *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc*., 34 F.3d 1048, 1054 (Fed. Cir. 1994).

The Court's claim construction decision must be informed by the Federal Circuit's decision in *Phillips v. AWH Corporation*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the Court set forth several guideposts that Courts should follow when construing claims. In particular, the Court reiterated that "the claims of a patent define the invention to which the patentee is entitled the right to exclude." 415 F.3d at 1312 (emphasis added) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc*., 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To that end, the words used in a claim are generally given their ordinary and customary meaning. *Id*. The ordinary and customary meaning of a claim term "is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as

of the effective filing date of the patent application." *Id*. at 1313. This principle of patent law flows naturally from the recognition that inventors are usually persons who are skilled in the field of the invention and that patents are addressed to and intended to be read by others skilled in the particular art. *Id*.

Despite the importance of claim terms, *Phillips* made clear that "the person of ordinary skill in the art is deemed to read the claim terms not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id*. Although the claims themselves may provide guidance as to the meaning of particular terms, those terms are part of "a fully integrated written instrument." *Id*. at 1315 (quoting *Markman*, 52 F.3d at 978). Thus, the *Phillips* Court emphasized the specification as being the primary basis for construing the claims. *Id*. at 1314-17. As the Supreme Court stated long ago, "in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims." *Bates v. Coe*, 98 U.S. 31, 38 (1878). In addressing the role of the specification, the *Phillips* Court quoted with approval its earlier observations from *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998).

> Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.

Phillips, 415 F.3d at 1316. Consequently, *Phillips* emphasized the important role the specification plans in the claim construction process.

The prosecution history also continues to play an important role in claim interpretation. Like the specification, the prosecution history helps to demonstrate how the inventor and the Patent and Trademark Office ("PTO") understood the patent. *Id*. at 1317. Because the file history, however, "represents an ongoing negotiation between the PTO and the applicant," it may lack the clarity of the specification and thus be less useful in claim construction proceedings. *Id*. Nevertheless, the prosecution history is intrinsic evidence that is relevant to the determination of how the inventor understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims. *Id*.

Phillips rejected any claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. The *en banc* Court condemned the suggestion made by *Texas Digital Systems, Inc. v. Telegenix, Inc*., 308 F.3d 1193 (Fed. Cir. 2002), that a Court should discern the ordinary meaning of the claim terms (through dictionaries or otherwise) before resorting to the specification for certain limited purposes. *Phillips*, 415 F.3d at 1319-24. The approach suggested by *Texas Digital*—the assignment of a limited role to the specification—was rejected as inconsistent with decisions holding the specification to be the best guide to the meaning of a disputed term. *Id*. at 1320-21. According to *Phillips*, reliance on dictionary definitions at the expense of the specification had the effect of "focus[ing] the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent." *Id*. at 1321. *Phillips* emphasized that the patent system is based on the proposition that the claims cover only the invented subject matter. *Id*. What is described in the claims flows from the statutory requirement imposed on the patentee to describe and particularly claim what he or she has invented. *Id*. The definitions found in

dictionaries, however, often flow from the editors' objective of assembling all of the possible definitions for a word. *Id*. at 1321-22.

Phillips does not preclude all uses of dictionaries in claim construction proceedings. Instead, the Court assigned dictionaries a role subordinate to the intrinsic record. In doing so, the Court emphasized that claim construction issues are not resolved by any magic formula. The Court did not impose any particular sequence of steps for a Court to follow when it considers disputed claim language. *Id*. at 1323-25. Rather, *Phillips* held that a Court must attach the appropriate weight to the intrinsic sources offered in support of a proposed claim construction, bearing in mind the general rule that the claims measure the scope of the patent grant.

III. CONSTRUCTION OF DISPUTED TERMS

The parties have presented five terms for construction. The Court will discuss each in turn.

A. "substantially helically convoluted second fluid passages" ('057 Patent, Claim 1; '504 Patent, Claims 1, 21, and 37)

Plaintiff's Proposed Construction	Defendant's Proposed Construction
Multiple elongated passages that are substantially helically convoluted and substantially surround at least a portion of the central first fluid passage, for the passage of a second fluid which is different from the first fluid.	Multiple elongated passages, which are distinct from the central first fluid passage and the first fluid passages, of the metal tubing heat exchange element that are substantially helically convoluted and substantially helically surround at least a portion of the central first fluid passage, for the passage of a second fluid which is different from the first fluid.

The primary dispute between the parties is the definition of a "passage" and whether the second fluid passages must be "distinct from" the central first fluid passages.

Read as a whole, the specification resolves the parties' dispute. The specification describes both "channels," which are not distinct from the central first fluid passage, and

"passages," which are distinct from the central first fluid passage. In particular, when the specification describes Figures 6 and 7, it states:

> It is believed that the larger head portions 84 and the thinner neck portions 86 in the corrugations 80 facilitate production of *channels* 88, which *later become passages* 5 in the finished element.

'057 patent at 3:28-32 (emphasis added). This passage indicates that channels and passages are two different things. It also indicates that, contrary to the Plaintiff's argument, Figure 7 is not an embodiment of the invention.

In addition, when describing the manufacturing process, the specification explains that the heat exchange element described in Figures 6 and 7 is passed through an additional die. Once again, the specification draws a distinction between the channels shown in Figures 6 and 7 and the "multi-passage" element shown in Figures 10 and 11. *See* '057 patent at 3:50-51 ("[t]he resultant multi-passage element is shown in FIGS. 10-11").

Finally, the patent describes directing the second fluid from "channels 88" into the "passages 5" of the heat exchange element. '057 patent at 3:61-64. This, too, illustrates that channels and passages are different things in the patents.

In every discussion or illustration of "passages" in the patent, the passage is shown as a distinct, or enclosed, path through which fluid may flow. The cross-sectional depictions of the heat exchange element through the manufacturing process shows that a channel opens into a central portion of the tubing. The passages, however, are surrounded by walls on their perimeters.

The other limitations in the claims also support this construction. The claims require the fluids in the central first fluid passage and the helically convoluted second fluid passages to be different fluids. The illustrative experiment used water as the first fluid and Freon as the second fluid. Although some fluid leakage between the passages may occur as a result of pressure

differentials and the hydraulic efficiency of the passages, ’057 patent at 4:34-44, the specification nevertheless supports Defendant’s argument that the passages be distinct from one another.

Although the Court agrees with the Defendant that the passages must be distinct from each other, the Court rejects the other limitations included in the Defendant’s definition. Defendant’s construction also requires that the heat exchange element be made of “metal tubing” and that the second passages substantially helically surround at least a portion of the central first fluid passage. Although the preferred embodiment describes a manufacturing process directed toward a metal tube with thin walls, nothing in the claims requires the heat exchange element to be constructed from metal. In addition, although the claim requires the second fluid passages to be helically convoluted, the claim language does not explicitly require that the passages helically surround the central first fluid passages. The Defendant’s brief does not attempt to support these additional limitations, and the Court declines to import them into the construction of this term.

Accordingly, the Court hereby construes the term **“substantially helically convoluted second fluid passages”** to mean **“multiple elongated passages, distinct from the central first fluid passage and the first fluid passages, that are substantially helically convoluted.”** The balance of the claim language needs no additional construction.

B. “substantially helically convoluted first fluid passages” (’504 Patent, Claims 1 and 21)

The disputes with respect to this term are the same as with respect to the previous term. For the same reasons described above, the Court concludes that the passages are distinct from one another. Accordingly, the Court hereby construes **“substantially helically convoluted first fluid passages”** to mean **“multiple elongated passages, distinct from the central first fluid passage and the second fluid passages, that are substantially helically convoluted.”** The balance of the claim language needs no additional construction.

C. "passageway" ('057 Patent, Claims 1 and 21)

Plaintiff's Proposed Construction	Defendant's Proposed Construction
a passage by which fluid can travel	a passage of the metal tubing heat exchange element connecting the central first fluid passage to at least one of the substantially helically convoluted first fluid passages through which the first fluid can pass from the central first fluid passage to the at least one of the substantially helically convoluted first fluid passages, and from the at least one of the substantially helically convoluted first fluid passages to the central first fluid passage

Claim 1 of the '057 Patent requires "a passageway connecting the central first fluid passage to at least one of the substantially helically convoluted first fluid passages." The parties agree that the essential function of the passageway is to allow fluid to travel between the central first fluid passage and at least one of the substantially helically convoluted first fluid passages. Defendant's definition merely incorporates many of the claim limitations into the definition of passageway. Further, Plaintiff's proposal of construing the term as meaning "a passage by which fluid can travel" adds nothing that is not already present in the plain and ordinary meaning of the term. *See, e.g.*, *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."). The Court hereby construes **"passageway"** as having its plain and ordinary meaning.

D. "outer second fluid passage" ('057 Patent, Claims 11, 13, 24, 28, 30, 32, and 39; '504 Patent, Claims 10, 12, 28, and 30)

Plaintiff's Proposed Construction	Defendant's Proposed Construction
An outer passage for the second fluid	An elongated passage of the metal tubing heat exchange element that is substantially surrounding at least a portion of the substantially helically convoluted first fluid passages [and/or at least a portion of the substantially helically convoluted second fluid passages], for passage of the second fluid

The term "outer second fluid passage" appears in claims 11, 13, 24, 28, 30, 32, and 39 of the '057 Patent, and claims 10, 12, 28, and 30 of the '504 Patent. For example, claim 11 of the '057 Patent depends from claim 1, and requires "the element of claim 1, further comprising an outer second fluid passage, the outer second fluid passage substantially surrounding at least a portion of the first fluid passages."

The specification describes an embodiment whereby an additional outer passage for the second fluid surrounds the other fluid passages. In particular, the specification states that "[e]lement 1 may further include an outer second fluid passage, the outer second fluid passage 9 substantially surrounding at least a portion of the first fluid passages and/or at least a portion of the second fluid passages." '057 Patent, 4:15-19.

Although Defendant slightly modified its construction in response to Plaintiff's arguments, most of the language in Defendant's construction is found in the claims themselves. To the extent it is not, the construction attempts to import limitations (e.g., elongated passage of the metal tubing . . .) that are not properly found in the claims. On balance, after considering the parties' constructions, the Court concludes that the term **"outer second fluid passage"** is defined as **"an outer passage for the second fluid."** The balance of the language of the claims sufficiently defines the orientation of the outer second fluid passage relative to the other claimed passages.

E. "a single-piece construction" ('057 Patent, Claims 23, 27, 31, 35, and 38)

Plaintiff's Proposed Construction	Defendant's Proposed Construction
The heat exchanger is formed into a single piece whether formed into one piece or multiple pieces connected together	The metal tubing heat exchange element is constructed such that the central first fluid passage, the plurality of substantially helically convoluted second fluid passages, and the plurality of substantially helically convoluted first fluid passages of the metal tubing heat exchange element are all formed from one piece of material

The specification supports certain aspects of the Defendant's construction. The relevant claims are referring to the individual heat exchange *elements*, not the entire heat exchanger. It is true, as Plaintiff argues, that the specification allows the connection of multiple elements together to form the entire heat exchanger. It is also true that the specification allows for individual elements to be constructed in a single piece or multiple pieces. This limitation, however, is referring to the construction of individual elements. The relevant passage provides:

> Preferably element 1 is a single-piece construction made from a single piece of material such as metal (e.g. copper tubing). In this context "single piece" refers to an embodiment wherein the central passage 3, and the passages 5 and 7, are all formed from one piece of material (versus alternate embodiments wherein passages 5 or 7 may be made separately and then connected to the central passage 3). It is contemplated that various single piece elements may be joined end-to-end together in a heat exchanger. Even when joined together as such, however, each element would still be a "single piece" element within the scope of the definition given above.

'057 Patent, 4:3-14.

Read as a whole, the passage is discussing an embodiment wherein the individual elements are each constructed out of separate pieces of tubing. A single piece of tubing is passed through the various die to be tapered, corrugated, and compressed into the multi-passage heat exchange element. Although some of the Defendant's limitations are not appropriate, on balance, its construction is closer to correct than Plaintiff's. Accordingly, the Court hereby construes **"single piece construction"** to mean:

The heat exchange element is constructed such that the central first fluid passage, the plurality of substantially helically convoluted second fluid passages, and the plurality of substantially helically convoluted first fluid passages of the heat exchange element are all formed from one piece of material.

IV. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit. The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

So ORDERED and SIGNED this 23rd day of January, 2013.

RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE