

United States District Court,
S.D. Texas, Houston Division.

ITP, INC. and ITP, S.A,
Plaintiffs.

v.

BP CORPORATION NORTH AMERICA, INC,
Defendant.

May 2, 2005.

Edward W. Goldstein, Goldstein Faucett LLP, Houston, TX, for Plaintiffs and Counter Defendant.

C. Graham Gerst, Kirland Ellis LLP, Michelle Jordan, William A. Streff, Jr., Kirland Ellis LLP, Chicago, IL, Michael O. Sutton, Tanya Lynn Chaney, Locke Liddell Et Al, Houston, TX, for Defendant.

REPORT AND RECOMMENDATION ON CLAIM CONSTRUCTION

JOHNSON, Magistrate J.

The *Markman* hearing was held on April 13, 2005. The patent at issue in this case is U.S. Patent No. 6,145,547 (" '547 patent"). The '547 patent issued on November 14, 2000. The subject of the '547 patent is a double-casing insulated pipe designed primarily for use in transporting oil products.

The court has considered the hearing testimony, all relevant filings, the arguments of counsel, and the applicable law. The court RECOMMENDS the following construction. FN1

FN1. This case was referred to the undersigned magistrate judge pursuant to 28 U.S.C. s. 636(b)(1)(A) and (B), the Cost and Delay Reduction Plan under the Civil Justice Reform Act, and Fed.R.Civ.P. 72. Docket Entry No. 31. Although claim construction is not dispositive of a claim or a defense of a party, it is such an important aspect of a patent case that the court has chosen to issue its ruling as a recommendation.

I. Legal Standard for Claim Construction

In *Markman v. West view Instruments, Inc.*, the United States Supreme Court affirmed that the construction of patent claims is a matter of law exclusively for the court. 517 U.S. 370, 372, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). The court deciphers the meaning of the patent without reference to the accused device. *Jurgens v. McKasy*, 927 F.2d 1552, 1560 (Fed.Cir.1991). In order to fulfill this obligation, the court may rely on two types of evidence: intrinsic (e.g., claims language, patent specification, and prosecution history) and extrinsic (e.g., expert testimony, inventor testimony, technical writings, etc.). *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996). The court should look first to the intrinsic evidence, relying on extrinsic evidence only if a disputed claim term remains ambiguous after a thorough examination

of the intrinsic record. *W.E. Hall Co. v. Atlanta Corrugating, LLC*, 370 F.3d 1343, 1350 (Fed.Cir.2004); *Interactive Gift Exp., Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1332 (Fed.Cir.2001). Among the intrinsic evidence, the claims are given the most weight, then the specification, and, finally, the prosecution history. *Interactive Gift Exp., Inc.*, 256 F.3d at 1331; *see also* *Nystrom v. Trex Co., Inc.*, 374 F.3d 1105, 1112-13 (Fed.Cir.2004); *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342-43 (Fed.Cir.2001); *Vitronics Corp.*, 90 F.3d at 1582-83.

Claim construction "begins and ends in all cases with the actual words of the claim." *W.E. Hall Co.*, 370 F.3d at 1353 (quoting *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed.Cir.1998)); *Teleflex, Inc. v. Ficoso N. Am. Corp.*, 299 F.3d 1313, 1324 (Fed.Cir.2002) (same); *see also* *Nystrom*, 374 F.3d at 1111 (stating that the focus begins and remains centered on the claim language). The words used in the claims are presumed to carry their ordinary and customary meanings. *W.E. Hall Co.*, 370 F.3d at 1350; *Int'l Rectifier Corp. v. IXYS Corp.*, 361 F.3d 1363, 1369 (Fed.Cir.2004). The ordinary meaning of a claim term, particularly a technical term, is determined from the perspective of a person of ordinary skill in the relevant art at the time of the invention. *Teleflex, Inc.*, 299 F.3d at 1325. The court may turn to dictionaries, encyclopedias, and treatises that were publicly available at the time the patent was issued as objective and reliable sources for the meanings ascribed to the terms by those of skill in the art. *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202-03 (Fed.Cir.2002), *cert. denied*, 538 U.S. 1058, 123 S.Ct. 2230, 155 L.Ed.2d 1108 (2003).

Provided the claim language is unambiguous, the court reviews the other intrinsic evidence only to determine whether the patentee intended any deviation from that clear meaning. *Interactive Gift Exp., Inc.*, 256 F.3d at 1331; *see also* *Tex. Digital Sys., Inc.*, 308 F.3d at 1204. However, if any ambiguity should arise from the plain and ordinary meaning of a claim term, the objective and contemporaneous record found within the intrinsic evidence provides "the most reliable guide" to aid the court in determining which of the various meanings the inventor intended. *Tex. Digital Sys., Inc.*, 308 F.3d at 1203; *see also* *W.E. Hall Co.*, 370 F.3d at 1350; *Interactive Gift Exp., Inc.*, 256 F.3d at 1331. When multiple meanings prove consistent with the use of the words in the intrinsic evidence, the terms "may be construed to encompass all such consistent meanings." *Tex. Digital Sys., Inc.*, 308 F.3d at 1203; *see also* *Nystrom*, 374 F.3d at 1112. In fact, a court may narrow the ordinary meaning of a claim term only if: 1) the inventor "acted as his own lexicographer;" 2) the patentee distinguished the claim term from a prior invention, expressly disclaimed subject matter, or described a particular embodiment as "important" to the invention; 3) the term deprives the claim of clarity without resort to other intrinsic evidence; or 4) the claim is limited by the rules of means-plus-function. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366-67 (Fed.Cir.2002); *see also* *W.E. Hall Co.*, 370 F.3d at 1353; *see also* *Int'l Rectifier Corp.*, 361 F.3d at 1370; *Rexnord Corp.*, 274 F.3d at 1342-43.

If the court finds no remaining ambiguity in the claim terms after reviewing the intrinsic evidence, the court need not consider any of the available extrinsic evidence. *Dow Chem. Co. v. Sumimoto Chem. Co.*, 257 F.3d 1364, 1373 (Fed.Cir.2001). The instances in which a court needs to rely on extrinsic evidence are rare. *Interactive Gift Exp., Inc.*, 256 F.3d at 1332; *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308-09 (Fed.Cir.1999). However, a court may consult extrinsic evidence for the purpose of understanding the technology at issue. *Interactive Gift Exp., Inc.*, 256 F.3d at 1332; *Pitney Bowes, Inc.*, 182 F.3d at 1308, 1309; *see also* *Karlin Tech., Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 971 (Fed.Cir.1999).

II. Claim Construction of the '547 Patent

A. Background of the '547 Patent

The '547 patent involves technology for heat-insulated double-casing pipes for use in pipelines. FN2 Particularly in the case of offshore oil pipelines, the absence of good heat insulation for transport of subsea oil gives rise to the formation of solid deposits in the pipelines, which can cause pipe blockage. FN3 Blockages slow or halt the production of oil, costing oil companies millions of dollars in repair expenses and lost revenues. FN4 Prior to this invention, the primary industry methods for achieving thermal insulation included single pipe designs with "wet" insulation on the outside of the pipe, pipe-in-pipe designs with polyurethane foam or fiberglass insulation between the pipes, and pipe-in-pipe designs with a vacuum in the space between the pipes. FN5 Despite some efficacy, these methods were disadvantaged by expense and/or poor quality and durability of insulation. FN6

FN2. *See* Complaint, Docket Entry No. 1, Ex. A, '547 patent; Plaintiffs' Opening Claim Construction Brief, Docket Entry No. 22, Ex. 1, '547 patent; Defendant's Brief on Claim Construction, Docket Entry No. 23, Ex. A, '547 patent. Hereinafter, references to the '547 patent are made in "column:line" format, without citation to the case file.

FN3. *See id.* at 1:6-34; Plaintiffs' *Markman* hearing presentation.

FN4. *See* Plaintiffs' *Markman* hearing presentation.

FN5. *See id.*

FN6. *Cf.* '547 patent at 1:66-67 (stating that the invention was designed "to cut expenses and improve the standard and durability of heat insulation").

The present invention teaches a double-casing pipe in which the annular space between the pipes contains a thin layer of microporous insulation and a free passageway, throughout which low pressure is maintained. FN7 The combination of microporous insulation and low pressure allows for improved thermal insulation at reduced costs. FN8 Although adaptable for other uses, a preferred embodiment is well-suited for transporting oil products along a seabed. FN9

FN7. *See id.* at 2:1-10.

FN8. *See id.* at 3:20-37; 3 :65-4 :7.

FN9. *See id.* at abstract; 4:8-11; 6:18-24; 7:49-9:2.

B. The Claims of the '547 Patent

Of the sixteen claims in the '547 patent, claims 1, 9, 15, and 16 are independent. Claim 16 is a method claim, and the remainder of the claims are apparatus claims. The claims in dispute in this lawsuit are claims 9, 10, 11, 14, and 15. These claims read as follows:

9. A heat-insulating double casing pipe to be especially used in offshore oil pipelines, characterized in that, in an annular sealed space located between an inner tube and an outer tube, both coaxially arranged inside each other, there is included a self-sustaining plate made of open-pore microporous material, which is flexible enough to be wound around the inner tube, and in that there is provided outside said material within said annular space, a free passageway to allow longitudinal gas flow, whereby low pressure is maintained throughout said annular space;

characterized further in that the portion of open pores in the material forming said plate is 85 to 95% based on total pore volume, with an average pore diameter less than or equal to 0.1 (μ)m.

10. A pipe according to claim 9, further comprising:

centering spacers positioned between said inner tube and said outer tube, regularly arranged in a tight fit on said inner tube throughout the pipe, said spacers forming reinforcing elements and longitudinal thrust-blocks for individual plates of said microporous material.

11. A pipe according to claim 9, further comprising:

a foil for protecting said plate, said foil being circumferentially applied around said plate and having a low surface friction factor.

....

14. A pipe according to claim 9, wherein:

said outer tube is a steel tube which is fitted externally along an inner tube also made of steel, provided with said plate of microporous material, said annular space being subsequently hermetically sealed at both ends of the pipe by an intermediate ferrule located between said coaxial tubes.

15. A heat-insulating double casing pipe to be especially used in offshore oil pipelines, characterized in that, in an annular sealed space located between an inner tube and an outer tube, both coaxially arranged inside each other, there is included a self-sustaining plate made of open-pore microporous material, which is flexible enough to be wound around the inner tube, and in that there is provided outside said material within said annular space, a free passageway to allow longitudinal gas flow, whereby low pressure is maintained throughout said annular space;

characterized further in that said microporous material is in the form of ceramic-based insulation plates arranged throughout the pipe;

characterized further in that said microporous material consists of a mixture containing a major portion of silica together with a minor portion of titanium dioxide;

characterized further in that the portion of titanium dioxide present in said material is comprised between 30

and 35% by wt. for a silica content of 60 to 70% by wt., based on total weight of the composition thereof.FN10

FN10. *Id.* at 9:42-10:6; 10 :16-43.

Numerous terms in independent claims 9 and 15 are in dispute. The court addresses each term, noting the particular concerns raised by the parties in their multiple briefs and at the *Markman* hearing. Unless otherwise noted, a term retains the same meaning throughout the '547 patent. *See* Nazomi Communications, Inc. v. Arm Holdings, PLC, 403 F.3d 1364, 2005 WL 820491, at (Fed.Cir. Apr.11, 2005); Rexnord Corp., 274 F.3d at 1342.

C. Discussion of the Terms in Dispute

1. Coaxially Arranged (Claims 9 and 15)

Plaintiffs submit that the term "coaxially arranged" needs no construction because one skilled in the relevant art would know "that a coaxial arrangement of a pipe-in-pipe system merely requires that one pipe be fitted within another and generally centered." FN11 Defendant originally proposed that the term "means that the inner tube and the outer tube share the same central axis for their entire lengths." FN12 At the *Markman* hearing, Defendant retracted its suggestion that the tubes must be centered for the entire length of the pipeline, contending instead that the ordinary interpretation of the term means that "the inner and outer tubes are on a common axis." FN13 Defendant particularly takes issue with Plaintiffs' attempt to interject the modifier, "generally," to broaden the claim meaning.

FN11. Plaintiffs' Brief in Opposition to Defendant's Opening Claim Construction Brief, Docket Entry No. 27, p. 3.

FN12. Defendant's Brief on Claim Construction, Docket Entry No. 23, p. 9.

FN13. Defendant's *Markman* hearing arguments.

Although the definition of "coaxially arranged" may be obvious to one skilled in the art, as argued by Plaintiffs, it may not be so clear to a member of the jury. The term, therefore, requires construction in order to obviate the parties' desire to educate the jury regarding the understandings of one skilled in the art.

"Coaxially arranged" is not defined by the patentee in the claims themselves or anywhere in the intrinsic evidence. The court, therefore, finds it appropriate to turn to a dictionary definition. The 1994 edition of a scientific dictionary defines "coaxial" as "[s]haring the same axes." McGraw-Hill Dictionary of Scientific and Technical Terms 394 (5th ed.1994). Similarly, a Webster's desk-reference dictionary defines "coaxial" as "[h]aving or mounted on a common axis." Webster's II New Riverside University Dictionary 275 (1984). The term "arrange" is not defined in the scientific dictionary, but is given the following meaning by the Webster's dictionary: "[t]o put in a specific order or relation." *Id.* at 126. Combining the two, "coaxially arranged" can be defined as associated in such a way as to share a common axis. The common axis in a

pipe-in-pipe design is an imaginary line down the center of the inner pipe. Accordingly, the shared axis is "central."

Looking to the specification for confirmation, the court notes that the purpose of the coaxial pipe-in-pipe arrangement is to allow free space between the insulation and the outer pipe all the way around so that low pressure can be achieved and maintained between the pipes.FN14 On the whole, the description suggests that some amount of space is critical to successful implementation of the invention, but not that absolute uniformity is required. In fact, the limitation in dependent clause 10, which teaches the use of centering spacers, suggests the patentee's recognition that, absent spacers, the pipes in claim 9 may not remain perfectly centered throughout the length of the pipeline.FN15 On this point, the specification states, "According to still another feature of the invention, there is provided with advantage spacers aimed at centering the inner tube inside the outer tube by maintaining an adequate minimal gap between the inner and the outer tube sequentially from one portion to another through the entire length of the pipe." FN16 Furthermore, the patent description recognizes that variations in wall thickness and roundness may occur during pipe manufacturing and are tolerated by persons skilled in the relevant art.FN17

FN14. *See* '547 patent at 2:11-14; 3:39-44, 49-57.

FN15. *See id.* at 9:56-10:2.

FN16. *Id.* at 5:61-66.

FN17. *See id.* at 3:58-64; 6 :49-54.

From these references, the court concludes that an annulus of perfectly equal free space throughout may be ideal, but is not necessary. On the other hand, the amount of free space called for by the patent is measured in millimeters, FN18 which leaves little room for variance. The court certainly would not consider such a small deviation to warrant the interjection of the term "generally" into the definition. Overall, the court finds no justification for narrowing the term by requiring the pipes to be perfectly centered or for broadening the term by adding the modifier "generally."

FN18. *See, e.g., id.* at 3:49-57; 4 :15-18.

Accordingly, the court recommends that "coaxially arranged" can be defined as put together in such a way as to share a common central axis.

2. Plate ... Which is Flexible Enough to be Wound Around the Inner Tube (Claims 9 and 15)

Three words of this phrase, "plate," "flexible," and "wound," drew special attention from the parties. The court addresses each word separately and then places them in the context of this entire phrase.

Plaintiffs find it unnecessary to give the term "plate" any specific definition.FN19 But, in response to

Defendant's proffered definition, Plaintiffs argue that the patent itself provides the following definition: a three-dimensional structure that fits within the sealed annular space lying between the inner and outer tube, which forms a casing around the inner tube. FN20 Defendant originally offered the following definition: "a smooth, flat thin piece of material." FN21 At the hearing, Defendant dropped the adjective "smooth" from its definition. FN22 Plaintiffs insist that a plate need not be flat either. FN23

FN19. Plaintiffs' Brief in Opposition to Defendant's Opening Claim Construction Brief, Docket Entry No. 27, p. 5; Plaintiffs' *Markman* hearing arguments.

FN20. Plaintiffs' *Markman* hearing arguments (citing '547 patent at 2:2-5, 40-44; 3:63-64).

FN21. Defendant's Brief on Claim Construction, Docket Entry No. 23, pp. 2, 9.

FN22. Defendant's *Markman* hearing arguments.

FN23. Plaintiffs' *Markman* hearing arguments.

The word "plate" is used at least seventeen times throughout the sixteen patent claims with no apparent variation in meaning. *Cf.* *Nazomi Communications, Inc.*, 403 F.3d 1364, 2005 WL 820491, at *5 (generally referring to the rule that a claim term is construed consistently throughout the patent); *Rexnord Corp.*, 274 F.3d at 1342 (same). As defined in the design engineering field, a "plate" is "[a] rolled, flat piece of metal of some arbitrary minimum thickness and width depending on the type of metal." *McGraw-Hill Dictionary of Scientific and Technical Terms* 1524 (5th ed.1994). In more common parlance, a "plate" has several definitions, including "[a] flat, smooth, relatively thin, rigid body of uniform thickness." *Webster's II New Riverside University Dictionary* 900 (1984). Although some aspects of both of these definitions obviously are not accurate descriptions of a plate in the context of this patent, the court notes that both describe a plate as flat. "Flat can be defined as "[a] smooth, even surface" or as "[a]n object with a broad, shallow or thin form." *McGraw-Hill Dictionary of Scientific and Technical Terms* 769 (5th ed.1994). As the adjective "flat" is the most significant point of contention, the court looks to the intrinsic evidence for verification that the plates of this invention have either a smooth, even surface or a broad, shallow or thin form.

From the claims themselves, the court can determine little about the precise shape of the plates of insulation. The claims generally indicate that the plates are made of microporous insulating material, are flexible, and are self-sustaining. FN24 Some of the claims that are not in issue in this suit specify the thickness of the plates of insulation, indicating that the plates are quite thin. FN25 Nothing in the claims specifically requires that the plates be smooth or even. The specification does not offer much additional guidance, except to emphasize that the layer of microporous insulation is thin. FN26

FN24. *See, e.g.*, '547 patent at 9:46-47; 10:27-28.

FN25. *See, e.g.*, *id.* at 9:18-23; 10 :53-57.

FN26. *See, e.g., id.* at 4:8-14 (suggesting a thickness of ten millimeters for use with oil pipelines and a thickness of up to thirty millimeters for other applications).

The portions relied on by Plaintiffs indicate that the structure is three dimensional and forms a casing around the inner pipe.FN27 Plaintiffs convincingly argue that not all commonly recognized plates have smooth, even surfaces, e.g., a plate of armor, a gold plate on a piece of jewelry and that nothing in the patent requires smooth, even surfaces of the plates.FN28

FN27. *See id.* at 2:2-6, 40-44; 3 :63-64.

FN28. *See* Plaintiffs' *Markman* hearing arguments.

Even Defendant dropped the word "smooth" from its proposed definition as not being descriptive of the invention. However, Defendant cites the court to a reference in the specification to "planar plates." The specification reads, "[T]he plates of microporous material which are commercially available as planar plates have enough flexibility to be intimately wound around the inner tube or plated thereon with no trouble." FN29 The court agrees that "planar" can mean "flat" or "two dimensional," FN30 but disagrees that "planar" should be read into the claims from this reference. *Cf. Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed.Cir.1998)(reaffirming that limitations from the specification cannot be read into the claims). Instead, this quoted portion seems to address the flexibility of certain commercially available planar plates of microporous material and their compatibility with the invention, rather than to require planar plates. In fact, the use of planar in that context, but not in the claim language leads the court to the conclusion that the plates of insulation need not be flat in the two-dimensional sense. Based on the above discussion, the court finds that a "plate," in the context of this patent, is a broad, thin, flexible piece of material.

FN29. '547 patent at 5:3-6.

FN30. *See* Webster's II New Riverside University Dictionary 898 (1984).

This brings the court to the second of the three terms in this phrase to be interpreted: flexible. Plaintiffs state that flexible means capable of bending without cracking.FN31 As it appears that Defendant does not dispute Plaintiffs' definition, the court adopts it.

FN31. Plaintiffs' *Markman* hearing arguments; *see also* Plaintiffs' Brief in Opposition to Defendant's Opening Claim Construction Brief, Docket Entry No. 27, pp. 5-6. Plaintiffs' definition is supported by Federal Circuit case law interpreting "capable of flexing" as "capable of bending." *See Arlington Indus., v. Bridgeport Fittings, Inc.*, 345 F.3d 1318, 1326 (Fed.Cir.2003).

The third and final term in this phrase, wound, remains a sticking point for the parties. Plaintiffs argue that wound is part of the phrase that describes a characteristic of the plate.FN32 They also contend that the word "wound" could be replaced by words such as "placed," "located," or "fitted," referring to where the insulation is applied, rather than how it must be attached to the inner tube during the assembly process.FN33 Defendant contends that the term means that "the plate of insulation is bent from its initial flat shape into a different, final shape wrapped around the inner tube." FN34

FN32. Plaintiffs' *Markman* hearing arguments.

FN33. *Id.*

FN34. Defendant's *Markman* hearing arguments; *see also* Defendant's Brief on Claim Construction, Docket Entry No. 23, pp. 2, 9.

Every appearance of the term "wound" in the patent claims is within the same nonessential phrase: "which is flexible enough to be wound around the inner tube." FN35 Without a doubt, wound denotatively and connotatively carries a meaning that involves wrapping, encircling, spiraling, curving, twisting, coiling, or some similar motion around another object. *See Webster's II New Riverside University Dictionary* 1320 (1984)(defining "wind"). Therefore, the court is unconvinced that the word could be replaced with a term indicating the location of the insulation plate, as argued by Plaintiffs. On the other hand, the phrase in which it is used describes the plate of open-pore microporous material, not the manner in which that plate is attached to the inner tube. The claims do not require that the insulation necessarily be fitted onto the inner tube by being wound around it, only that the plate of insulation be flexible enough for such action. The specification supports this understanding. The specification discusses an assembly method whereby the insulation is applied in parallel plane strips longitudinally along the inner pipe.FN36

FN35. *See* '547 patent at 9:9-10, 47-48; 10:28-29.

FN36. *See id.* at 4:60-63.

Under these circumstances, the court finds it inappropriate to infer from the use of the word "wound," as is suggested by Defendant, that the plate is initially flat. Rather, the court agrees with Plaintiffs that the phrase "which is flexible enough to be wound around the inner tube" refers to the degree of flexibility necessary within the plate of insulation.

Putting all of these terms together, the court recommends that "plate ..., which is flexible enough to be wound around the inner tube" means a broad, thin piece of material that is sufficiently capable of bending that it can be wound around the inner tube without cracking or breaking.

3. Open-pore Microporous Material (Claims 9 and 15 FN37)

FN37. Microporous material is also referenced in claims 10 and 14.

Plaintiffs define open-pore microporous material as "material having a microcellular structure forming pores, the average size of which is 0.1 microns or less," "in which essentially all pores are open intercommunicating pores." FN38 At the hearing, Plaintiffs refined its definition to comport with the National Insulation Association's Insulation Science Glossary (2004) definition of microporous material: "material with an average interconnecting pore size comparable to or below the mean free path of air molecules at standard atmospheric pressure." FN39 Citing to the specification, Plaintiffs define "open-pore" as "where open intercommunicating pores represent essentially all pores contained in the microporous structure." FN40

FN38. Plaintiffs' Opening Claim Construction Brief, Docket Entry No. 22, p. 10.

FN39. Plaintiffs' *Markman* hearing arguments.

FN40. *Id.*

Defendant offers a less complicated definition of "open-pore microporous material" as referring to "a material having very fine pores, essentially all of which are open and intercommunicating." FN41 Despite using the words "essentially all" in its own definition, Defendant expressed some concern at the hearing that "essentially all" is not sufficiently descriptive for independent claim 9 because it contains the further limitation that eighty-five to ninety-five percent of the total pore volume must be open-pore.

FN41. Defendant's Brief on Claim Construction, Docket Entry No. 23, p. 10.

The patentee defined open-pore in the specification as follows:

Those skilled in the art will recognize that porosity is said to be open where open intercommunicating pores represent essentially all pores contained in the microporous structure, that is in practice in the range of 85 to 95% by volume based on total pore volume, which is itself close to 80% of apparent volume.FN42

FN42. '547 patent at 3:1-6.

The court accepts this definition. As for the definition of "microporous material," the court finds no reason to strike out on its own when the parties agree. Because Defendant raised no objection to the definition provided by Plaintiffs from the National Insulation Association's Science Glossary FN43 and the definition harmonizes with the specification, FN44 the court adopts that definition. FN45

FN43. Plaintiffs represented to the court that the definition in 1996 would have not differed from the National Insulation Association's 2004 definition. As the representation was made without objection, the court accepts it as true.

FN44. See '547 patent at 2:65-3:1; 3:9-11.

FN45. Plaintiffs also mentioned that the microporous material may contain opacifiers to reduce the amount of radiant heat transmitted. Plaintiffs' *Markman* hearing arguments. Defendant objected to including this remark in the definition in light of claim 15, which further defines ingredients of the microporous material. Defendant's *Markman* hearing arguments. The court addresses Defendant's point about claim 15 in a subsequent section. However, the court agrees that whether the microporous material may or may not contain opacifiers is a gratuitous addition to the definition that could interfere with consistent construction of the term open-pore microporous material.

Combining the definition of "open-pore" with that of "microporous material," the court recommends that the term be defined as material with an average interconnecting pore size comparable to or below the mean free path of air molecules at standard atmospheric pressure in which the intercommunicating open pores represent essentially all pores contained in the microporous material.

This definition is subject to the more specific limitation of claim 9, in which the portion of open pores of the material "is 85 to 95% based on total pore volume, with an average pore diameter less than or equal to 0.1 (μ)m." FN46 The court finds this limitation sufficiently clear on its face.

FN46. '547 patent at 9:53-55.

4. Longitudinal Gas Flow (Claims 9 and 15)

Plaintiffs' definition of this term is "the air flow along a length of pipe within the annular space." FN47 Defendant originally argued that the gas movement must continue for the entire length of pipe.FN48 Defendant modified its position at the hearing and presented the following definition: "gas movement in the free passageway in a direction lengthwise of the pipe, along the entire length of a pipe section." FN49

FN47. Plaintiffs' Opening Claim Construction Brief, Docket Entry No. 22, p. 10; Plaintiffs' *Markman* hearing arguments.

FN48. Defendant's Brief on Claim Construction, Docket Entry No. 23, pp. 3, 11.

FN49. Defendant's *Markman* hearing arguments.

In light of the general consensus on this definition, the court recommends a hybrid: the movement of air in the annular space lengthwise along an entire pipe section. This definition is supported by references in the specification FN50 and should be adopted.

FN50. See '547 patent at 3:39-44, 49-57; 7:16-23.

5. Free Passageway (Claims 9 and 15)

Plaintiffs do not offer a definition for "free passageway," separate from that for "longitudinal gas flow." Defendant's first proffered definition was "an open passageway that extends unblocked along the entire length of the pipe, outside of the microporous material, inside of the outer tube." FN51 In connection with Defendant's changed position regarding the need for air flow throughout the entire length of the pipe, Defendant changed the words "the pipe" to "a pipe section." FN52 In response to the whole definition, Plaintiffs voiced their concern that the definition may not allow for the placement of spacers that could partially block the free passageway.

FN51. Defendant's Brief on Claim Construction, Docket Entry No. 23, pp. 3, 10.

FN52. Defendant's *Markman* hearing arguments.

The specification explains that a free passageway, of potentially very narrow proportions, exists between the microporous material and the outer tube in order to facilitate the flow of air when reducing pressure.FN53 Air is drawn radially across the microporous material into the free passageway, where it travels longitudinally along the outer pipe in the direction of the suction. FN54 The patent also teaches the use of spacers to aid in centering the inner tube inside the outer tube, to lock the microporous material in place, and to provide reinforcement.FN55 These spacers may partially block the free passageway.FN56

FN53. *See* '547 patent at 2:7-14; 3:39-44, 49-54; 7:13-15.

FN54. *See id.* at 3:54-57.

FN55. *Id.* at 6:55-61.

FN56. *See* Plaintiffs' *Markman* hearing arguments and expert testimony; Defendant's *Markman* hearing arguments.

As the court understands the patent and the *Markman* hearing explanations of both parties, if an air molecule encounters a spacer (or, for that matter, some other element of the pipe) that blocks its path when the pressure is being reduced, it will be drawn around that element toward the source of the suction. Accordingly, the passageway may be partially, but not totally, blocked. Defendant's inclusion of the word "unblocked," therefore, is an overstatement.

The court recommends that "free passageway" be construed as the open space that extends along the entire pipe section outside the microporous material and inside the outer tube.

6. *Whereby Low Pressure is Maintained Throughout said Annular Space (Claims 9 and 15)*

Plaintiffs focus on the term "low pressure" and define it as "any pressure below atmospheric pressure." FN57 Defendant's position is that the whereby clause is meaningful and is limiting.FN58 Defendant focuses on three terms within the clause, "low pressure," "maintained," and "annular space." Defendant originally argued that the term "low pressure" is a relative term that is vague in the context of claims 9 and 15 because it lacks a reference point.FN59 In its response brief, Defendant suggested that the specification and prosecution history dictate a meaning of "less than approximately 100 mbars." FN60 Defendant argues that "to maintain" means actively to keep in existing state.FN61 As for "annular space," Defendant proposes that it includes both the free passageway and the microporous insulation.FN62 Plaintiffs do not contest that the clause has meaning, but take issue with Defendant's definitions of "low pressure" and "maintained."

FN57. Plaintiffs' Opening Claim Construction Brief, Docket Entry No. 22, p. 9; Plaintiffs' *Markman* hearing arguments.

FN58. *See* Defendant's Brief on Claim Construction, Docket Entry No. 23, pp. 11-14; Defendant's *Markman* hearing arguments.

FN59. Defendant's Brief on Claim Construction, Docket Entry No. 23, p. 3.

FN60. Defendant's Response Brief on Claim Construction, Docket Entry No. 26, p. 3; *see also* Defendant's *Markman* hearing arguments.

FN61. Defendant's Brief on Claim Construction, Docket Entry No. 23, p. 13; Defendant's *Markman* hearing arguments.

FN62. Defendant's Brief on Claim Construction, Docket Entry No. 23, pp. 3, 14; Defendant's *Markman* hearing arguments.

Although the court does not agree with Defendant's reasoning, the court does agree that the whereby clause has meaning as a limiting clause. Of the three terms in that clause on which Defendant focused, only one, "low pressure," requires much discussion. The court begins there. One dictionary definition of the word "low" is "[b]elow a standard or average." Webster's II New Riverside University Dictionary 706 (1984). The court is convinced that atmospheric pressure (1000 millibars or 1 bar) is a standard recognized by persons skilled in the art of the patent. Accordingly, the definition proposed by Plaintiffs, "any pressure below atmospheric pressure," provides the term with its ordinary meaning. The term is easily understood and is not vague.

"[U]nless compelled otherwise, a court will give a claim term the full range of its ordinary meaning as understood by persons skilled in the relevant art." *Tex. Digital Sys., Inc.*, 308 F.3d at 1202. A court should not narrow a claim term simply based on descriptions of the invention in the specification and prosecution

history. *See* CCS Fitness, Inc., 288 F.3d at 1366. Rather, the ordinary meaning applies unless the patentee expressly narrows it, for example, by providing his own definition, by distinguishing the claim term from a prior invention, or by disclaiming certain subject matter. *Id.* at 1366-67. The party seeking to narrow the definition bears the burden of overcoming the presumption in favor of the term's ordinary meaning. *Id.* at 1366.

Defendant's efforts to narrow the meaning to cover only pressures below 100 millibars are unavailing for several reasons. First, the doctrine of claim differentiation supports the conclusion that different claims have different scopes. *See* Sunrace Roots Enter. v. Sram Corp., 336 F.3d 1298, 1302 (Fed.Cir.2003). "Our court has made clear that when a patent claim does not contain a certain limitation and another claim does, that limitation cannot be read into the former claim in determining either validity or infringement." *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1326 (Fed.Cir.2003)(internal quotation marks omitted). In this case, only claim 1 is limited to pressures below 100 millibars.FN63 If not for this difference, claims 9 and 15 could have been written as dependent claims on claim 1. FN64

FN63. *Compare* '547 patent at 9:13-14 (stating "whereby low pressure below 100 millibars is maintained throughout said annular space") *with* *id.* at 9:50-51; 10 :32-33 (stating "whereby low pressure is maintained throughout said annular space").

FN64. Defendant contends that low pressure can only be construed to mean pressure below 100 millibars and, therefore, must be so construed throughout the patent. Defendant relies on *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed.Cir.1991), which quotes *Autogiro Co. of Am. v. United States*, 181 Ct.Cl. 55, 384 F.2d 391, 404 (Ct.Cl.1967), as stating:

The concept of claim differentiation ... states that claims should be presumed to cover different inventions. This means that an interpretation of a claim should be avoided if it would make the claim read like another one. Claim differentiation is a guide, not a rigid rule. If a claim will bear only one interpretation, similarity will have to be tolerated.

Because the court disagrees with Defendant that "low pressure" is narrowed in any respect by the intrinsic evidence as explained in this section, the court finds that the cited case law is inapplicable. Certainly, "low pressure" retains the same meaning throughout the claims, it simply does not retain the added limitation of claim 1.

Second, the specification supports a broad reading of "low pressure." In one place, the specification calls for pressure in the range of .5 millibars to 100 millibars, stating: "[O]ne result achieved by the invention is that a partial vacuum will prove sufficient resulting advantageously in a reduced pressure of between 0.5 mbars and 100 mbars." FN65 However, in another embodiment, it is contemplated that "depression on the order of 1 to 100 mbars, which optionally might not exceed a low pressure value of about 900 mbars" could be used under certain circumstances.FN66 In light of this second embodiment, the first does not evidence an intention to depart from the full range of ordinary meaning. Rather, the two references together support a finding that the patentee intended for low pressure to carry a broad meaning.

FN65. '547 patent at 3:26-29; *see also* 7:19-20, 64-67.

FN66. *Id.* at 8:41-52, 384 F.2d 391 (emphasis added). Because the remainder of this sentence also refers to

a pressure of fifty bars, the section is confusing to Defendant. *See* Defendant's Response Brief on claim Construction, Docket Entry No. 26, pp. 1-2. "It is unclear from that passage exactly what pressure would be considered 'low.'" *Id.* at p. 2, 384 F.2d 391. The court is not similarly confused. The sentence speaks of "overpressure" and pressures "as high as 50 bars," while specifically referring to 900 mbars as "a low pressure value." '547 patent at 8:47, 49, 52.

Third and last, the prosecution history indicates that the patentee relinquished a portion of the full range of meaning attributable to the term "low pressure" with regard only to claim 1. Upon application, the examiner rejected claims 1-3 over U.S. Patent No. 4,718,459 ("Adorjan").FN67 Interestingly, the rejected claim 3 included a pressure requirement of 0.5 to 100 millibars.FN68 The examiner explained that Adorjan discloses a double-casing pipe for subsea pipelines, an annular sealed space, coaxially-arranged pipes, flexible open-pore microporous material, and a free passageway for gas flow.FN69 With regard to low pressure, he noted that Adorjan "described that the gas can be at 0.896 Pascals in certain water depths, which suggests at lesser depths lesser pressure is needed, and that this pressure falls between the range set forth in claim 3." FN70

FN67. Defendant's hearing exhibits, Tab 6, Office Action Summary dated Aug. 18, 1999, p. 3. The original claims read as follows:

1. A double casing pipe to be especially used in offshore oil pipelines, characterized in that, in an annular sealed space (5) located between an inner tube (1) and an outer tube (2) both coaxially arranged inside each other, there is included a self-sustaining plate (7, 8, 9) made of open pore-microporos [sic] material, which is flexible enough to be wound around the inner tube (1), and in that there is provided outside said material within said annular space, a free passageway to allow longitudinal gas flow whereby low pressure is maintained throughout said annular space.
2. A pipe according to claim 1, characterized in that said passageway is in the form of an annular layer which remains free between the plate of microporous material and the inner wall of the outer tube, said plate being inferior in thickness to said annular space (5).
3. A pipe according to to [sic] claims [sic] 1 or 2, characterized in that said low pressure is comprised between 0,5 [sic] and 100 millibars.

Defendant's hearing exhibits, Tab 2, original claims.

FN68. *Id.*

FN69. Defendant's hearing exhibits, Tab 6, Office Action Summary dated Aug. 18, 1999, p. 3.

FN70. *Id.*

In his responsive amendment, the patentee made several changes to claim 1, but did not amend the low pressure requirements.FN71 Instead, he argued that Adorjan requires that high pressure, not low pressure, be maintained in the annular space, in order to keep water out.FN72 In response to this attempt to traverse his rejection by distinguishing Adorjan, the examiner stated:

FN71. *See* Defendant's Brief on Claim Construction, Docket Entry No. 23, Ex. B, Amendment dated Nov.

17, 1999, pp. 3-4.

FN72. *Id.* at pp. 6-7, 384 F.2d 391.

With respect to the gas pressure, applicant only claims low pressure, which is a relative term, and therefore the pressure set forth in *Adorjan* is considered to be a low pressure. Also, due to the fact that the pressure of *Adorjan* is dependent upon depth of the pipe in water, a pipe used for shallow water depths would have a relatively low gas pressure needed, and would still meet applicant's claim language.FN73

FN73. Defendant's Response Brief on Claim Construction, Docket Entry No. 26, Ex. A, Office Action Summary dated Feb. 2, 2000, p. 5.

Thereafter, the patentee acquiesced and added the limitation to claim 1 requiring that pressure below 100 millibars be maintained.FN74 This amendment also contained two previously dependent claims rewritten into what eventually became claims 9 and 15.FN75 Neither contained the 100 millibar limitation.FN76 The patentee explained the changes to claim 1, "In order to overcome [the] rejection, Claim 1 has been amended to make it clear that the self-sustaining plate is made of an open-pore microporous insulating material and that low pressure below 100 mbars is maintained throughout the annular space in which the self-sustaining plate is located." FN77 In addition, the patentee again argued against the examiner's position that *Adorjan* employs low pressure in the annulus:

FN74. *See* Defendant's Brief on Claim Construction, Docket Entry No. 23, Ex. E, Amendment dated May 2, 2000, p. 1.

FN75. *Id.* at p. 2, 384 F.2d 391.

FN76. *See id.*

FN77. *Id.* at p. 5, 384 F.2d 391.

[C]ontrary to the present invention, *Adorjan* teaches that a *high* pressure should be maintained throughout the annular space.

... [T]he Examiner relies upon a typographical error ... wherein *Adorjan* states, 'at 300 feet (91.4 meters), the external pressure on a pipeline will be 129.9 pounds per square inch (0.896 Pa). Thus, gas in the annulus must be pressurized to a value greater than 129.9 psi (0.896 Pa).'

This statement contains an error because the text should read, '0.89 MPa' and not merely 0.896 Pa. If one thinks about it, the value of 0.896 Pa is completely absurd since a person of ordinary skill in this technology knows that 91.4 meters of water produce a pressure of about 9 bars which is 0.9 MPa. Thus, the apparent inadvertent deletion of the M creates an error by a factor of approximately 1 million.FN78

Ultimately, the examiner approved the '547 patent with the additional low pressure limitation in claim 1, but not in claims 9 and 15. The discourse between patentee and examiner suggests at least two plausible reasons for approval; either the two clarifications to claim 1 satisfied the examiner or the patentee convinced the examiner that he had misread Adorjan. Either way, the examiner allowed the patentee's choice of words in claims 9 and 15, which facially did not include the limitation that the pressure be below 100 millibars. The court concludes from this fact that claims 9 and 15 were patentable (because of other limitations they contained), without narrowing the bounds of "low pressure." Defendant conceded as much during the *Markman* hearing.FN79

FN79. Defendant's *Markman* hearing arguments.

From a close review of the prosecution history, the court concludes that the only clear disavowal of subject matter in the prosecution history relates to claim 1. *Cf.* Sunrace Roots Enter., 336 F.3d at 1306 (stating that prosecution history cannot be used to narrow a claim absent a clear disavowal). Even though prosecution history estoppel affects claim 1, it does not preclude the construction of "low pressure" advanced by Plaintiffs and recommended by this court or otherwise limit claims 9 and 15 in any way.

The next term of the whereby clause that is in contention is "maintained." "Maintain" means to continue, to carry on, or to preserve or to keep in an existing condition. Webster's II New Riverside University Dictionary 717 (1984). The court finds no support in the intrinsic evidence or elsewhere for Defendant's suggestion that the pressure must be actively maintained. Sealing a pipe section effectively maintains the pressure. Finally, with regard to "annular space," the parties agree that it includes both the free passageway and the microporous material. To the extent any definition is necessary, the court concurs with the parties.

In summary, the court recommends that "whereby low pressure is maintained throughout said annular space" be construed to refer to pressure below atmospheric pressure that is preserved within the annular space, which includes both the free passageway and the microporous insulation.

7. Consists of (Claim 15)

The term "consists of" in Claim 15 presents an interesting construction challenge. Both parties agree that it is a term of art used in a patent to limit the claimed invention to those elements specifically listed in the claim. However, they disagree on what the term limits. Plaintiffs argue that "consists of" only refers to "a mixture" while the broader term "containing" refers to the particular ingredients of the mixture.FN80 Defendant contends that "consists of" belongs with the entire phrase, "a mixture containing a major portion of silica together with a minor portion of titanium dioxide," limiting the ingredients of the mixture to only silica and titanium dioxide.FN81

FN80. Plaintiffs' *Markman* hearing arguments.

FN81. Defendant's Brief on Claim Construction, Docket Entry No. 23, p. 18; Defendant's *Markman* hearing arguments.

Case law dictates that "consists of" or "consisting of" at the beginning of a claim means "the claimed invention contains only what is expressly set forth in the claim." *Norian Corp. v. Stryker Corp.*, 363 F.3d 1321, 1331 (Fed.Cir.2004)(interpreting a claim with "consisting of" in its introductory phrase). When inserted in a particular element of a claim, the phrase limits the invention to that which follows the words "consisting of." *See Vehicular Techs. Corp. v. Titan Wheel Int'l Inc.*, 212 F.3d 1377, 1383 (Fed.Cir.2000)(interpreting a phrase within a claim limitation).

In the '547 patent, claim 15 begins, "A heat-insulating double casing pipe to be especially used in offshore oil pipelines, characterized in that...." FN82 The claim continues, "characterized further in that said microporous material consists of a mixture containing a major portion of silica together with a minor portion of titanium dioxide." FN83 Immediately, the claim language asserts itself. The claim literally states that the insulation material *consists of* a mixture, not that the insulation material *consists of* silica and titanium dioxide or even that the mixture *consists of* silica and titanium dioxide. According to the claim, the mixture "contains" silica and titanium dioxide. "Mixture" and "contains" are both open-ended terms, not subject to an inference of restriction. *See Mars, Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1375 (Fed.Cir.2004). On the other hand, reading "consists of" as applying only to "a mixture" fails to impose any real consequence on the patentee for his selection of words. Arguably, either interpretation is consistent with case law.

FN82. '547 patent at 10:23-24.

FN83. *Id.* at 10:36-38, 384 F.2d 391.

Other language in the claim begins to clarify this ambiguity. In a subsequent "characterized further in that" limitation, the claim teaches that "the portion of titanium dioxide present in said material is comprised between 30 and 35% by wt. for a silica content of 60 to 70% by wt." FN84 Before addressing how the language helps to clarify the previous limitation, the court notes that this particular limitation neither contains the words "consists of" nor, because of its separate and distinct structure, is bound by those words. Moreover, this limitation refers back to "said material," rather than to "said mixture." Certainly, therefore, no proper reading of the claim would permit the conflation of this limitation with the previous one to further narrow the claim.

FN84. *Id.* at 10:39-41, 384 F.2d 391 (emphasis added).

That said, the percentages taught in the limitation can shed some light on the prior claim language. Simple math reveals that the patentee left open the possibility that a very small percentage of the material might be something other than silica or titanium dioxide. When the uppermost percentage of silica is added to the lowermost percentage of titanium dioxide, the total is only ninety-five percent. If silica and titanium dioxide were intended as the only possible components of the microporous material, the patentee would not have disclosed sixty percent silica content without teaching a corresponding amount of titanium dioxide that, in combination, would total one hundred percent. Therefore, although the claim requires silica and titanium dioxide in percentages within the range provided, it does not eliminate the presence of a small percentage of

other ingredients.

This conclusion is further supported by the specification, which favorably mentions contemporaneously manufactured microporous materials "wherein the proportion of titanium dioxide exceeds 20% by weight based on total weight, up to 30 to 35% by weight of silica, disregarding minor portions of other mineral oxides which represent all combined at least 5% by weight." FN85

FN85. Id. at 2:58-64, 384 F.2d 391.

The court recommends that the phrase "consists of a mixture containing a major portion of silica together with a minor portion of titanium dioxide" does not require that the ingredients of the mixture be limited only to those ingredients listed in the claim.

8. Other Terms

Defendant originally briefed four other terms/phrases: 1) "said spacers forming reinforcing elements and longitudinal thrust-blocks;" 2) "foil;" 3) "hermetically sealed at both ends of the pipe by an intermediate ferrule;" and 4) "titanium dioxide." FN86 Plaintiffs argue that none of the terms require construction and disagree with aspects of Defendant's proffered definitions.FN87 At the *Markman* hearing, Defendant represented that it no longer believed these terms to be in dispute. The court concludes, from Defendant's representations and its own review of the briefs, that these terms do not need construction.

FN86. See Defendant's Brief on Claim Construction, Docket Entry No. 23, pp. 15-18.

FN87. See Plaintiffs' Brief in Opposition to Defendant's Opening Claim Construction Brief, Docket Entry No. 27, pp. 6-9.

III. Conclusion

The court finds no other terms that need construction. Should the parties believe that other terms in the patent need interpretation, the parties must include those terms and their proposed interpretations in timely filed objections to this Report and Recommendation.

The Clerk shall send copies of the Report and Recommendation on Claim Construction to the respective parties who have ten days from the date mediation is completed to file written objections thereto. The original of any written objections shall be filed with the United States District Clerk, either electronically or by mail to P.O. Box 61010, Houston, Texas, 77208. Copies of such objections shall be mailed to opposing parties and to the chambers of the undersigned, 515 Rusk, Suite 11009, Houston, Texas 77002.

IV. Order to Mediation

Pursuant to its authority under Federal Rule Civil Procedure 16 and the court's inherent power to manage its own affairs to achieve the orderly and expeditious disposition of cases, the court has determined that this case is appropriate for referral to mediation.

Mediation is a mandatory but nonbinding settlement conference in which the parties attempt to resolve their differences with the assistance of a third party mediator. All mediation proceedings are confidential and privileged from discovery. No subpoena, summons, or other process shall be served at or near the location of any mediation session, upon any person entering, leaving, or attending any mediation session.

Counsel and parties shall proceed in good faith to resolve this case through mediation. Each party who is a natural person must be present during the entire mediation process. Each party that is not a natural person must be represented by a principal, partner, officer, or official with authority and discretion to negotiate a settlement. If one or more insurance companies must be involved in the settlement of this case, a representative from each insurance company with authority and discretion to negotiate a settlement shall be present during the entire mediation process.

The parties shall make independent arrangements for payment of fees for mediation. The costs of mediation are to be divided and borne equally by the parties unless otherwise agreed and ordered.

Following the mediation, the mediator will advise the court if the case settled. No other information concerning the mediation may be given to the court by the mediator or any other party.

The parties have ten business days to inform the court of the name of an agreed mediator. If the parties are unable to agree on a mediator, they each must submit three names to the court and the court will designate a mediator. Mediation must be completed by July 1, 2005.

If the mediation is unsuccessful, the ten-day objection period for the Report and Recommendation on Claim Construction will commence on the day on which the mediator declares an impasse.

S.D.Tex.,2005.

ITP, Inc. v. BP Corp. North America, Inc.

Produced by Sans Paper, LLC.