United States District Court,
N.D. Illinois, Eastern Division.

PAPST LICENSING GMBH AND CO. KG,
Plaintiff.
v.
SUNONWEALTH ELECTRIC MACHINE IND. CO., LTD., Sunon Inc., and Beyond Components of Illinois, Inc,
Defendants.
SUNON INC,
Counter-Plaintiff.
v.
PAPST LICENSING GMBH AND CO. KG,
Counter-Defendant.

March 19, 2004.

Jerold B. Schnayer, John L. Ambrogi, Jeffrey Wayne Salmon, Welsh & Katz, Ltd., Chicago, IL, for Plaintiff/Counter-Defendant.

Daniel J. O'Connor, David I. Roche, Baker & McKenzie, Chicago, IL, for Defendants.

MEMORANDUM OPINION AND ORDER

ST. EVE, J.

Plaintiff Papst Licensing GmbH and Co. KG ("Papst"), a German company, accuses Defendants Sunon Inc., a California corporation, and Beyond Components of Illinois, Inc., an Illinois corporation (collectively "Sunon"), FN1 of infringing United States Patent No. 4,734,015 ("the '015 patent"). On March 2, 2004, the Court conducted a hearing during which it heard evidence and argument regarding the construction of Claim 29 of the '015 patent, the only disputed claim. The Court's construction of Claim 29 is set forth below.

FN1. The complaint also names as a defendant Sunonwealth Electric Machine Co., Ltd., a Taiwanese company, but Papst has not yet served Sunonwealth Electric.

LEGAL STANDARD

I. Claim Construction

A determination of patent infringement is a two-step process in which the Court first construes the claims. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1454 (Fed.Cir.1998) (*en banc*). Claim construction, the interpretation of the patent claims that define the scope of a patentee's rights under a patent, is a matter of

law exclusively for the court. Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-971 (Fed.Cir.1995) (*en banc*), *aff'd* 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). The factfinder then compares the properly construed claims to the accused device to determine, as a question of fact, whether all of the claim limitations are present in the accused device. Cybor, 138 F.3d at 1454.

The language of the claims is the starting point for all claim construction analysis, because it frames and ultimately resolves all issues of claim interpretation. Robotic Vision Sys., Inc. v. View Eng'g, Inc., 189 F.3d 1370, 1375 (Fed.Cir.1999); Abtox, Inc. v.. Exitron Corp., 122 F.3d 1019, 1023 (Fed.Cir.1997). In construing an asserted claim, the analytical focus of the construction must begin, and remain centered, on the language of the claims themselves. Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1201-02 (Fed.Cir.2002).

In the absence of an express intent by the patentee to impart a novel meaning to a claim term, the words are presumed to take on the ordinary and customary meaning attributed to them by those of ordinary skill in the art. Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1325 (Fed.Cir.2002). The Court may determine the ordinary and customary meaning of a claim term by reviewing a variety of sources, beginning with the intrinsic evidence consisting of the claim terms themselves, the written specification, drawings, and prosecution history. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). The Court may consult dictionaries, encyclopedias and treatises to determine the ordinary meaning of a word. Texas Digital, 308 F.3d at 1202-1203.

II. Means-Plus-Function Claims

A claim limitation may be expressed in means-plus-function format in accordance with 35 U.S.C. s. 112, para. 6. FN2 Section 112, para. 6 allows the patentee to define the structure for performing a particular function generically through the use of a means expression, provided that it discloses specific structure corresponding to that means in the patent specification. Kemco Sales, Inc. v. Control Papers Co., 208 F.3d 1352, 1360-61 (Fed.Cir.2000). Whether claim language invokes section 112, para. 6 is an exercise of claim construction and is therefore a question of law. Wenger Mfg., Inc. v. Coating Mach. Sys., Inc., 239 F.3d 1225, 1231 (Fed.Cir.2001).

FN2. Section 112, para. 6 provides: "An element of a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. s. 112, para. 6.

The use of the word "means" gives rise to "a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses." Micro Chem., Inc. v. Great Plains Chem. Co., 194 F.3d 1250, 1257 (Fed.Cir.1999). This presumption, however, is not conclusive. For example, where a claim uses the word "means," but specifies no corresponding function for the "means," section 112, para. 6 does not apply. Rodime PLC v. Seagate Tech., Inc., 174 F.3d 1294, 1302 (Fed.Cir.1999); York Prods., Inc. v. Cent. Tractor Farm & Family Ctr., 99 F.3d 1568, 1574 (Fed.Cir.1996). Similarly, where a claim recites a function, but then goes on to elaborate sufficient structure, material, or acts within the claim itself to perform entirely the recited function, the claim is not in means-plus-function format. Sage Prods. v. Devon Indus., Inc., 126 F.3d 1420, 1427-28 (Fed.Cir.1997); Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531 (Fed.Cir.1996).

BACKGROUND

The '015 patent discloses an axial-flow fan having a higher efficiency than known axial-flow fans. The fan operates as follows. The fan blades (impellers) are rotated by a motor contained in the hub. The hub and motor are fixed to the fan housing by means of a motor mounting flange. The rotation of the motor and the fan blades causes air to enter the inlet side of the fan, accelerate, and blow out of the outlet side of the fan. Axial-flow fans of this type are typically used in applications where low noise, high air output, and small size are required. One such application is cooling computer equipment.

Papst alleges that Sunon manufactures various axial-flow fans that infringe Claim 29. Claim 29 recites:

An axial-flow fan comprising

a drive motor means,

a scroll plate means surrounding an impeller means having a hub,

an inner contour of said scroll plate means having a *cylindrical configuration* in a vicinity of an axial median plane of the fan and extending towards an inlet side of the fan and

with an outlet side of the scroll plate means formed into a *polygonal profile* circumscribing an impeller diameter and

accompanied by formation of *corner areas,* and

a central, coaxial core means formed by the drive motor means, the impeller hub and a mounting flange for the drive motor means,

said core means having an *annular surface reduced in diameter towards the inlet side,*

the annular surface having an axial length *extending for a given distance* along the length of the hub, and

with respect to the axial median plane, the scroll plate means being *asymmetrical in the corner areas* and

being *cylindrical* over a longer distance from the axial medial plane to the inlet side than to the outlet side and

wherein the impeller means has an *outside edge* which extends from an area adjacent the inlet side of the fan into the corner areas.

'015 patent, col. 9, ll. 19-39 (emphases added). The disputed claim language is emphasized. For convenience, the Court addresses each of the eleven disputed elements in the order in which they appear in Claim 29.

ANALYSIS

I. The Disputed Claim Terms

A. Element 1: "Drive Motor Means"

Element 1 contains the term "drive motor means." The use of the word "means" creates a presumption that section 112, para. 6 applies. Personalized Media Communications, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 702 (Fed.Cir.1998). Sunon contends that section 112, para. 6 applies to Element 1, and that the recited "function" of the "drive motor means" is to "drive the blades of the fan." (R. 96-1, Defs.' Claim Constr. Br. at 11.) Papst argues that section 112, para. 6 does not apply because the claim does not recite a function that corresponds to the means. The Court agrees with Papst.

The claim language does not state a function. Rather, the claim term "drive motor means" recites a definite structure, *i.e.,* the drive motor. *See* Cole, 102 F.3d at 531; *see also* Pirelli Cable Corp. v. Ciena Corp., 988 F.Supp. 424, 434 (D.Del.1997) (holding that the term "optical coupling means" recites a definite structure, "the optical coupler"). Sunon fails to identify any language within Claim 29-or anywhere else in the patent-that suggests that the term "drive motor means" has a corresponding function, and that the corresponding function is "to drive the blades of the fan." Because there is no corresponding function for the "means," section 112, para. 6 does not apply to the "drive motor means" term. Rodime PLC v. Seagate Tech., Inc., 174 F.3d 1294, 1302 (Fed.Cir.1999); Sage Prods., 126 F.3d at 1427; York Prods., 99 F.3d at 1574.

Papst argues that the Court should define the term "drive motor means" to mean any type of electric motor that is used to drive a fan. The parties do not dispute the meaning of the word "motor," and the specification indicates that the "drive motor" is simply an electric motor that drives the fan. *See* '015 patent, col. 5, ll. 51-53. Papst contends that the Court should further construe the term "drive motor means" to specifically include both types of motors that are typically used to drive fans-AC motors and DC motors. Papst argues that Figure 2 of the '015 patent depicts a squirrel cage motor, which one skilled in the art would recognize as an AC motor. Nothing in the claim language or the specification, however, expressly includes or excludes any particular type of electric motor from the scope of the claim. Accordingly, the Court interprets Element 1 to mean any type of electric motor that is used to drive a fan.

B. Element 2: "A Scroll Plate Means Surrounding An Impeller Means Having A Hub"

Element 2 of Claim 29 requires "a scroll plate means surrounding an impeller means having a hub." For clarity, the Court separately addresses whether section 112, para. 6 applies to the terms "scroll plate means" and "impeller means."

1. Section 112**, para. 6 Does Not Apply To Either Term**

a. "Scroll Plate Means"

Sunon asserts that the use of the word "means" creates a presumption that section 112, para. 6 applies, and that the function of the "scroll plate means" is "to surround the impeller means." (R. 96-1, Defs.' Claim Constr. Br. at 12.) The word "surrounding," however, does not specify a function. Rather, the word "surrounding" refers to a structural relationship between the fan housing, the fan blades, and the hub. Further, the term "scroll plate means" recites structure, *i.e.,* the scroll plate (the fan housing). Cole, 102 F.3d at 531; Pirelli Cable, 988 F.Supp. at 434. Because there is no corresponding function for the "means," section 112, para. 6 does not apply to the "scroll plate means" term. Rodime, 174 F.3d at 1302; Sage Prods.,

126 F.3d at 1427; York Prods., 99 F.3d at 1574.

b. "Impeller Means"

Sunon argues that the use of the word "means" creates a presumption that section 112, para. 6 applies, and that the function of the "impeller means" is "the impelling of air through the fan." (R. 96-1, Defs.' Claim Constr. Br. at 13.) The function of "impelling ... air through the fan," however, does not appear in Claim 29, and the term "impeller means" recites structure, *i.e.,* the "impeller" (the fan blades). Cole, 102 F.3d at 531; Pirelli Cable, 988 F.Supp. at 434. As the Court has already noted, where a claim uses the word "means" but specifies no corresponding function for the "means," it does not implicate section 112, para. 6. Rodime, 174 F.3d at 1302; Sage Prods., 126 F.3d at 1427; York Prods., 99 F.3d at 1574. Accordingly, section 112, para. 6 does not apply to the "impeller means" term.

2. "A Scroll Plate Means Surrounding An Impeller Means Having A Hub"

Papst argues that the Court should construe the claim term in its entirety to mean the fan housing that surrounds a number of fan blades attached to a hub. The Court agrees. The claim language does not limit the scroll plate means to a particular fan housing. Similarly, the specification simply refers to the scroll plate means as the "housing." '015 patent, col. 3, ll. 11-12 ("The impeller is installed into a scroll plate or housing."). The specification describes the structural relationship of the housing, fan blades, and hub. '015 patent, col. 3, ll. 60-63 ("[I]n the construction according to the present invention, the fan blades 4 are surrounded over a relatively large axial area by the cylindrical area 5 of the scroll plate 2 ...") Further, Figures 1 and 2 of the '015 patent make clear that the housing surrounds the fan blades and the hub.

Similarly, the claim language does not limit the impeller means to any particular structure or material. FN3 While the specification describes the preferred structure and material of the blades, *see* '015 patent, col. 6, ll. 42-61 and Fig. 10, neither the claim language nor the specification limits the impeller to that particular structure and material. The Court may not interpret claims by adding limitations appearing only in the specification where the specification does not clearly require it. Laitram Corp. v. Cambridge Wire Cloth Co., 863 F.2d 855, 865 (Fed.Cir.1989).

FN3. If section 112, para. 6 applied to this claim term, it would be proper to limit the impeller to the corresponding structure and material in the specification, as Sunon contends. Section 112, para. 6, however, does not apply.

Accordingly, the Court interprets Element 2 to mean the housing of a fan that surrounds a number of fan blades that are attached to a hub.

C. Element 3: "An Inner Contour Of Said Scroll Plate Means Having A Cylindrical Configuration In A Vicinity Of An Axial Median Plane Of The Fan And Extending Towards An Inlet Side Of The Fan"

Element 3 of Claim 29 requires "an inner contour of said scroll plate means having a cylindrical configuration in a vicinity of an axial median plane of the fan and extending towards an inlet side of the fan." This term refers to the inner surface of the fan housing surrounding the fan blades. The parties dispute the proper meaning of the term "cylindrical."

Papst argues that the Court should broadly construe the term "cylindrical" to mean "substantially cylindrical." In support of this construction, Papst relies on the following language in the specification: "The channel wall 67 which only for manufacturer tolerances is not exactly cylindrical, extends toward the inlet side from the center plane A .... " '015 patent, col. 4, l. 67-col. 5, l. 1. Papst contends that the specification teaches that the inner surface of the housing is not exactly cylindrical in view of imperfections inherent in the manufacturing process.

Sunon argues that the term "cylindrical" is unambiguous, and that the ordinary dictionary definition of "cylindrical" controls. The Court agrees. There is a heavy presumption that the ordinary meaning of a word in a claim applies. FN4 CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366 (Fed.Cir.2002). The Court may consult dictionaries, encyclopedias and treatises to determine the ordinary meaning of a word. Texas Digital, 308 F.3d at 1202-1203. "As a general rule, the construing court interprets words in a claim as one of skill in the art *at the time of the invention* would understand them." Eastman Kodak Co. v. Goodyear Tire & Rubber Co., 114 F.3d 1547, 1555 (Fed.Cir.1997) (emphasis added). The '015 patent issued on March 29, 1988. Accordingly, the Court consults Webster's Third New International Dictionary (Merriam-Webster Inc.1981).FN5

FN4. The "heavy presumption" can be overcome by any of four ways, none of which is relevant here. "First, the claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.... Second, a claim term will not carry its ordinary meaning if the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention.... Third, ... a claim term also will not have its ordinary meaning if the term 'chosen by the patentee so deprive[s] the claim of clarity' as to require resort to the other intrinsic evidence for a definite meaning.... Last, as a matter of statutory authority, a claim term will cover nothing more than the corresponding structure or step disclosed in the specification, as well as equivalents thereto, if the patentee phrased the claim in step- or means-plusfunction format." CCS Fitness, 288 F.3d at 1366-67.

FN5. Because Sunon does not disclose the year in which its cited dictionary was published, the Court consults the 1981 edition of Webster's. The Court notes, however, that the definitions from the 1981 edition do not differ materially from the definitions proposed by Sunon.

The dictionary definition of "cylindrical" is "relating to or having the form or properties of a cylinder." Webster's Third New Int'l Dict. at 565 (Merriam-Webster Inc.1981). The definition of "cylinder" is "the surface traced by any straight line moving parallel to a fixed straight line and intersecting a fixed curve." *Id.* Accordingly, the Court construes the term "cylindrical configuration" to mean that the inner contour of the fan housing must form a surface that is parallel to the axis of rotation of the fan at the mid-point between the inlet and outlet sides of the fan.FN6

FN6. The testimony of Georg Papst, the managing director of Papst, is extrinsic evidence entitled to little weight. Texas Digital, 308 F.3d at 1212 ("Where the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no weight."). In any event, his testimony does not trump the ordinary meaning of "cylindrical."

Papst complains that Sunon improperly reads the additional word "exactly" into the claim, and that in any event, Sunon's definition is overly technical and "mathematical." Papst contends that "nothing in the claim language ... limits the term 'cylindrical configuration' to an exactly cylindrical shape." (R. 99-1, Pl.'s Claim Constr. Br. at 8.) Papst's argument is misguided. Papst-not Sunon-is improperly adding words to the claim. Sunon's proposed construction comports with the ordinary meaning of the word "cylindrical." In contrast, Papst's proposed construction incorporates the word "substantially," a broadening modifier that alters the ordinary meaning of the word "cylindrical." If Papst did not intend for the word "cylindrical" to take on its ordinary meaning, then Papst should have modified it with an adjective such as "generally," "substantially," "essentially," or "practically" when it drafted the claim. Papst hinges its argument on language from the specification, but fails to explain why the Court should look to the specification to alter the ordinary meaning when the term has a readily ascertainable ordinary meaning. *See* CCS Fitness, 288 F.3d at 1366-67. Papst cannot rewrite the claim to add the broadening modifier "substantially."

Accordingly, the ordinary meaning of "cylindrical" applies, and the Court construes Element 3 to mean that the inner contour of the fan housing must form a surface that is parallel to the axis of rotation of the fan at the mid-point between the inlet and outlet sides of the fan. Additionally, the cylindrical configuration must extend from the mid-point towards the inlet side of the fan.

D. Element 4: "With An Outlet Side Of The Scroll Plate Means Formed Into A Polygonal Profile Circumscribing An Impeller Diameter"

Element 4 of Claim 29 requires "an inner contour of said scroll plate means ... with an outlet side of the scroll plate means formed into a polygonal profile circumscribing an impeller diameter." The parties dispute which area of the fan housing must have a "polygonal profile."

Papst contends that it is the "external profile of the outlet side" of the fan housing that must have a "polygonal profile," and that, in addition, "in at least some of the cross-sections of the fan taken perpendicular to the rotational axis of the fan blades are non-circular in shape." (Pl.'s Proposed Order para. 4; *see also* R. 99-1, Pl.'s Claim Constr. Br. at 10.) Sunon contends that the "polygonal profile" limitation refers to the shape of the outlet side of the inner contour of the fan housing, whereby facets are formed by the corner areas of the housing. (R. 96-1, Defs.' Cl. Constr. Br. at 19.)

The Court agrees with Sunon. The plain language of the claim supports this construction. The claim requires that the "polygonal profile circumscribe an impeller diameter." It is the "inner contour" of the fan housing, rather than the "external profile," that necessarily circumscribes the path of the fan blades.

The sentence structure of the claim further supports this construction. Claim 29 requires that the inner contour of the scroll plate means has three characteristics:

an inner contour of said scroll plate means having [1] a *cylindrical configuration* in a vicinity of an axial median plane of the fan and extending towards an inlet side of the fan and [2] with an outlet side of the scroll plate means formed into a *polygonal profile* circumscribing an impeller diameter and [3] accompanied by formation of *corner areas*.

'015 patent, col. 9, ll. 21-27 (emphases added). Thus, Element 4 is part of a prepositional phrase modifying the "inner contour" of the scroll plate means as recited in Element 3, such that the "inner contour" of

Element 3 has an "outlet side ... formed into a polygonal profile." This language makes clear that the "polygonal profile" refers to the inner contour of the fan housing, not to the overall external shape of the fan.

The prosecution history also supports this construction. In response to an obviousness rejection of Claim 1 FN7 in view of United States Patent No. 4,225,285 to Sturm in combination with United States Patent No. 4,373,861 to Papst et. al,FN8 Papst FN9 argued that the Sturm fan-a box fan with a square external profile-did not have a "polygonal profile." In traversing the rejection, Papst argued that

FN7. This portion of the prosecution history relates to Claim 1. Claim 29 was introduced later during prosecution by way of amendment. When the applicant introduced Claim 29, he stated that Claim 29 is identical to Claim 1 except for a change in wording in the last line. The applicant's arguments made to overcome rejections with respect to Claim 1 are therefore binding as to the identical "polygonal profile" limitation of Claim 29, even though Claim 29 was not itself amended. Intermatic Inc. v. Lamson & Sessions Co., 273 F.3d 1355, 1366-67 (Fed.Cir.2001); Builder's Concrete, Inc. v. Bremerton Concrete Prods. Co., 757 F.2d 255, 260 (Fed.Cir.1985).

FN8. The '861 Papst patent is not involved in this suit.

FN9. The parties refer to the arguments as having been made by Papst, although technically they were made by the applicant Wrobel (the named inventor of the '015 patent). It is undisputed that Wrobel's arguments are binding on Papst, the assignee of the '015 patent. Accordingly, the Court adopts the parties' convention throughout its analysis of the prosecution history.

Sturm's fan does not have substantially polygonal inlets and outlets with a substantially circular mid section axially in the flow direction. Sturm has substantially circular cross sections of his outer casing throughout its entire length. Although there is a mid section of constant cross-section, *the inlet and outlet portions are still circular.... Sturm does not have a scroll plate means ... extending towards the inlet side and the outlet side in a polygonal configuration ....*
(Oct. 9, 1985 Amendment at 2-3 (emphasis added).) Despite the fact that the Sturm fan had a square external shape, Papst argued that the Sturm fan did not have a "polygonal profile." Thus Papst distinguished the Sturm fan on the basis of the Sturm fan's circular, non-polygonal inner contour at the inlet and outlet sides, not the overall external shape. Papst's argument that the "polygonal profile" refers to the fan's external profile is therefore inconsistent with this prosecution history.
Papst further urges the Court to define "polygonal profile" to require that "at least some cross-sections of the fan taken perpendicular to the rotational axis of the fan blades are non-circular in shape." Papst argues that "[t]he claim contains no specific description of the dimensions or location of the claimed 'polygonal profile circumscribing the impeller diameter' other than that it be on the 'outlet side' of the fan," and that the polygonal profile can be located at any cross-section parallel to the axial median plane. (R. 99-1, Pl.'s Claim Constr. Br. at 10.) But the plain language of the claim clearly specifies that the "polygonal profile" is located on the outlet side, and nothing in the claim or specification suggests that "cross-sections" may be taken at any other location.

Finally, Papst argues that Sunon is "trying to read the specific polygonal profile shown, for example, in

Figure 2 of the '015 patent into the claim." (R. 103-1, Pl.'s Opp'n to Defs.' Initial Claim Constr. Br. at 8.) Sunon's proposed construction does not, however, limit the claim to the particular size and shape of the preferred embodiment of the '015 patent. It requires only that the inner contour have a "polygonal profile," which can mean *any* polygonal shape.FN10

FN10. A "polygon" is "a closed figure consisting of straight lines joined end to end." Webster's Third New Int'l Dict. at 1758.

Accordingly, the Court construes Element 4 to mean that the outlet side of the inner contour of the fan housing is non-circular in shape due to facets formed by the corner areas of the fan housing on the outlet side.

E. Element 5: "accompanied by formation of corner areas"

Element 5 of Claim 29 requires the fan housing to be "accompanied by formation of corner areas." Papst urges the Court to define "corner areas" to "include at least the volume of the fan that is enclosed by the core means [as defined by Paragraph 6] and by an inner surface of the fan housing that defines a broadened area at the outlet side of the fan." (Pl.'s Proposed Order para. 5.) Sunon argues that the Court should define "corner areas" to mean the "non-circular areas that surround the path formed by the fan blades." (R. 96-1, Defs.' Claim Constr. Br. at 23.) Neither party's proposed construction is entirely consistent with the claim language, specification, and prosecution history. Accordingly, the Court turns to the intrinsic evidence for guidance as to the appropriate construction.

1. The Intrinsic Evidence

a. The Claim Language

It is undisputed that the claim language is ambiguous and that the term "corner areas" appears in two separate claim elements. First, Claim 29 requires "an inner contour of said scroll plate means ... accompanied by formation of corner areas." '015 patent, col. 9, ll. 21-27. Second, Claim 29 requires that the outside edge of the fan blade "extends ... into the corner areas." '015 patent, col. 9, ll. 37-39. The Court further notes that the claim consistently refers to plural "corner areas," thereby requiring multiple "corner areas."

b. The Specification

The parties appear to agree that the specification requires the "corner areas" to be bounded in part by a sloping wall. The specification teaches that "[t]owards the outlet side 8, the scroll plate in the corner areas extends from the axial median plane A with a sloping wall 17, so that an overall asymmetrical construction with respect to the axial median plane A between the inlet side half and the outlet side half of the axial-flow fan results. " '015 patent, col. 3, ll. 47-52. Further, Figure 1 identifies the "corner areas" as four distinct cut-out surfaces in the fan housing, designated by reference numeral 6, created by the sloping wall 17. Thus, in the embodiment in Figure 1, the sloping wall 17 does not extend around the entire circumference of the inner contour of the fan housing.

The Court agrees that the "corner areas" are bounded in part by a sloping wall that defines the broadened shape at the outlet side of the fan.

c. The Prosecution History

The prosecution history makes clear that the "corner areas" must include at least the volume into which the fan blades extend. In response to an obviousness rejection in view of United States Patent No. 4,482,302 to Grignon and United States Patent No. 4,373,861 to Papst et. al,FN11 Papst made the following remarks:

FN11. Again, the Court notes that the '861 Papst patent is not involved in this suit.

Accordingly, one skilled in the art would not use the device of Grignon on Papst ['861], which can be both a blowing fan or a suction fan, and would not use the expedient of Figure 6 with a fan blade that extended all the way to the inlet and extended to the widened area of the outlet....
Additionally, *it is not seen why one would use such a configuration in a fan where the blade extends all the way to the inlet and into the flared outlet section. It is only the Applicant which teaches such an arrangement.*

It is the combination of these features which renders the Applicant's device an improvement over the prior art....

(July 10, 1986 Amendment at 7-8 (emphasis added).) Papst further argued that "[a]t no time does Grignon show the outer edge of his fan blade extending to the inlet and into the rear end flared portion of the fan housing." (Id. at 6.) Figure 1 of the Grignon patent shows that the fan blades do not extend into the flared outlet section defined by a sloping portion of the fan housing, although the fan blades do extend all the way to the inlet side.
Thus Papst distinguished the Grignon reference on the basis that his fan blades do in fact extend into the broadened area on the outlet side. The patentable difference between the Papst fan and Grignon is the fact that the fan blades in the Papst fan "extend into the corner areas," *i.e.,* into the broadened area at the outlet side. Thus, according to Papst's own argument during prosecution, the corner areas are areas into which the edges of the fan blades actually extend. This is the basis on which Papst traversed Grignon, and in response to these arguments the Examiner ultimately issued a Notice of Allowance.

2. The Court Adopts A Modified Version of Papst's Proposed Construction

Papst contends that the Court should define the "corner areas" to "include at least the volume of the fan that is enclosed by the core means [as defined by Element 6] and by an inner surface of the fan housing that defines a broadened area at the outlet side of the fan." In other words, Papst defines the "corner areas" as bounded by the hub, the motor, the fan blades, and the sloping wall 17. This construction, however, is not entirely consistent with the plain language of the claim and the prosecution history. Two modifications are necessary.

Papst's proposed construction defines a volume that encompasses the entire volume between the fan housing and the core means, resulting in a single, unbounded "corner area." The plain language of Claim 29, however, requires multiple "areas" that are located in "corners." FN12 To give effect to the word "corner" and create plural "corner areas" as required by the claim language and specification, Papst's proposed construction must be modified to include another boundary.

FN12. "Corner" is defined as "the point or place where converging lines, edges, or sides meet." Webster's

Third New Int'l Dict. at 507.

The additional boundary logically is formed by a series of planes perpendicular to the axial median plane that intersect at point B in Figure 1. This series of planes divides the outlet side of the fan into several discrete areas. (From the view of Figure 1, these planes appear to slice the outlet side of the fan into wedges, like a pie.) The fan in Figure 1 has four corners with clearly marked cut-out surfaces.FN13 A first plane extends from point B (the center of the outlet side of the fan as shown in Figure 1) toward an endpoint of the cut-out surface of the housing that defines the broadened area at the outlet side and forms the "polygonal profile" (the cut-out surfaces are designated by reference numeral 6 in Figure 1). A second plane extends from point B toward the other endpoint of that cut-out surface. Similarly, other planes are drawn toward the endpoints of each cut-out surface. Thus, the embodiment of Figure 1 has a total of four "corner areas" that are each bounded by the fan housing and two planes extending from the center point B toward the endpoints of the cut-out surfaces.FN14

FN13. These cut-out surfaces form the "polygonal profile" of the inner contour analyzed under Element 4.

FN14. Perhaps an argument could be made for a different location of this additional boundary. It is unlikely, however, that the construction of Element 5 will be dispositive of infringement, given the parties' cursory arguments regarding the proper construction of Element 5 and Sunon's concession at the *Markman* hearing that he "could live with" Papst's proposed construction of "corner areas."

Yet another boundary is needed to construe "corner areas" consistently with the prosecution history. Papst distinguished Grignon on the basis that the fan blades of the Grignon fan did not extend into the flared-out section on the outlet side. If the "corner areas" are defined to include the entire space between the inlet side and outlet side of the fan, then the fan blades of the Grignon fan would indeed extend into "corner areas," rendering the Grignon patent an invalidating reference. As a result, Papst's proposed construction of "corner areas" includes too much space, and another boundary is required. The second additional boundary is a plane that is parallel to the axial median plane and is situated at the point where the sloping wall begins to slope. In other words, the "corner areas" do not extend all the way toward the inlet side, but are bounded between the outlet side and a plane parallel to the axial median plane that is situated at the point where the shape of the inner contour of the fan housing changes to define a broadened area at the outlet side.

Accordingly, the Court construes "corner areas" as follows: the volume of the fan that is enclosed by (1) the hub, motor, and fan blades (the "core means"); (2) the inner surface of the fan housing that defines a broadened area at the outlet side of the fan (the sloping wall); (3) the outlet side of the fan; (4) a series of planes extending from the center point B (the axis of rotation at the center of the hub) toward each endpoint of each cut-out surface of the housing that defines the broadened area at the outlet side; and (5) a plane parallel to the axial median plane situated at the point where the fan housing defines a broader area at the outlet side of the fan.

2. Sunon's Construction Is Inconsistent With The Claim Language

Sunon's proposed construction is inconsistent with the plain language of Claim 29. Sunon contends that the "corner areas" should be construed to mean "the non-circular areas that surround the path formed by the fan

blades." Claim 29 requires that the outside edge of the fan blade "extends ... into the corner areas." As Papst correctly points out, this would require the fan blades to somehow downwardly extend into the portion of the broadened area at the outlet side of the fan that does not include the path formed by the fan blades. In other words, Sunon's construction requires the fan blades to "extend into" an area of the fan that surrounds the path formed by the fan blades. This construction excludes the preferred embodiment of the patent. The Court will not construe a claim so as to exclude the preferred embodiment. Vitronics, 90 F.3d at 1583 (noting that a claim construction that would exclude the preferred embodiment "is rarely, if ever, correct and would require highly persuasive evidentiary support.").FN15

FN15. Papst's argument that the Court must construe the claim in view of Sunon's "admissions" is misguided. Arguments in a brief are not intrinsic evidence. The Court therefore need not consider whether Sunon "admitted" anything regarding the proper scope of the claim term "corner areas."

F. Element 6: "A Central, Coaxial Core Means Formed By The Drive Motor Means, The Impeller Hub And A Mounting Flange For The Drive Motor Means"

Element 6 of Claim 29 requires "a central, coaxial core means formed by the drive motor means, the impeller hub and a mounting flange for the drive motor means." The parties' only dispute is whether section 112, para. 6 applies to the "drive motor means" term .FN16 The Court already addressed this question in analyzing Element 1, and the Court's analysis need not be repeated here. Section 112, para. 6 does not apply, and the Court will interpret the claim term in accordance with its ordinary meaning.

FN16. The parties agree that section 112, para. 6 does not apply to the "core means" term. (R. 96-1, Defs.' Claim Constr. Br. at 23.)

The parties agree that this claim term simply lists several easily-defined components. Accordingly, the Court construes Element 6 to mean any type of electric motor that is used to drive a fan, the hub onto which the fan blades are mounted, and a flange, connected to the fan housing, upon which the motor is mounted.

G. Element 7: "Said Core Means Having An Annular Surface Reduced In Diameter Towards The Inlet Side"

Element 7 of Claim 29 requires a "said core means having an annular surface reduced in diameter towards the inlet side." The parties agree that the ordinary meaning of the word "annular" is "shaped like or forming a ring." The parties dispute whether the resulting conical shape is the only shape of the annular surface supported by the claim.

Sunon argues that the claim language requires the "annular surface" to mean only a conical shape. Papst argues that the specification demonstrates that the "annular surface" should not be limited to any particular shape. The Court agrees with Papst.

Figures 2 and 8 illustrate two examples of the "annular surface reduced in diameter." Figure 2 depicts a conical surface, and Figure 8 depicts a curved surface. Accordingly, because the specification depicts two examples of the "annular surface reduced in diameter," no particular shape is required as long as the diameter is reduced toward the inlet side. The Court construes Element 7 to mean that a portion of the impeller hub adjacent to the inlet side of the fan is reduced in diameter as compared to the remainder of the

impeller hub.

H. Element 8: "The Annular Surface Having An Axial Length Extending For A Given Distance Along The Length Of The Hub"

Element 8 requires "the annular surface having an axial length extending for a given distance along the length of the hub." Papst argues that the Court should not limit the "given distance" to any particular distance. Sunon asserts that the Court should limit the "given distance" to a distance of "at least one-third of the axial length of the hub." The Court agrees with Sunon.

Because the term "a given distance" is ambiguous, the Court may turn to the specification for guidance as to how to construe the term. An examination of the written description and drawings is necessary to determine whether the patentee has disclaimed subject matter or has otherwise limited the scope of the claims. Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1343 (Fed.Cir.2001). The specification of the '015 patent unequivocally requires the distance to be "at least one-third of the hub length" in order for the invention to work as intended. In the Summary of the Invention, the patentee stated:

According to the present invention, *this problem* [of increasing air flow efficiency] *is solved in that the axial length of the conical annular surface amounts to at least 1/3 of the hub length* and in that with respect to the axial median plane, the scroll plate is asymmetrical in the corner areas and is constructed cylindrically over a longer distance from the axial median plane to the inlet side than to the outlet side.

It has been discovered that these measures lead to a considerable improvement in the performance, without having to modify the external dimensions of the axial-flow fans. *It has also been found that the improved action does not occur to any noticeable extent, i.e., occurs only barely, unless the axial length of the conical ring surface corresponds to at least one third of the total hub length. Only the combination of the two features mentioned above leads to the surprising improvement ....*

'015 patent, col. 1, l. 52-col. 2, l. 1 (emphases added).

The requirement that the distance be "at least one-third of the hub length" is not, as Papst argues, simply a best mode.FN17 Rather, it is an essential feature of the invention, the purpose of which is to maximize the efficiency of air flow. '015 patent, col. 1, l. 47-49 ("The task of the present invention is therefore to *provide an axial-flow fan, which has a higher efficiency* than the known fans of this type."). The invention will not fulfill this purpose if the "given length" is less than one-third the length of the hub. "When the specification 'makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question." ' Microsoft Corp. v. Multi-Tech Sys., Inc., 357 F.3d 1340, 1347 (Fed.Cir.2004), quoting SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1341 (Fed.Cir.2001). This is particularly true where, as here, the patentee made the broad, unequivocal statement in the "Summary of the Invention." Microsoft, 357 F.3d at 1348 ("Those statements, some of which are found in the 'Summary of the Invention' portion of the specification, are not limited to describing a preferred embodiment, but more broadly describe the overall invention of the [patent]."). In this case, the patentee limited the scope of his invention to a particular length of the "given distance" by unequivocally stating that the invention will not work as intended with a distance less than one-third the distance of the length of the hub.

FN17. The best mode requirement provides that "[t]he specification ... shall set forth the best mode contemplated by the inventor of carrying out his invention." 35 U.S.C. s. 112, para. 1. The best mode requirement creates a statutory bargained-for exchange by which a patentee obtains the right to exclude others from practicing the claimed invention for a certain time period, and the public receives knowledge of the preferred embodiments for practicing the claimed invention. Eli Lilly & Co. v. Barr Labs., Inc., 251 F.3d 955, 963 (Fed.Cir.2001). The purpose of the best mode requirement is to restrain inventors from applying for patents while at the same time concealing from the public preferred embodiments of the inventions. Teleflex, 299 F.3d at 1330.

The prosecution history is not to the contrary. After the '015 patent issued, the patentee filed for a continuation and a broadening amendment. As originally issued, Claim 29 required the distance to be "one-third the length of the hub." In the broadening amendment, Papst sought to replace the "one-third" requirement with the phrase "a given distance." The examiner allowed the broadening amendment, and Claim 29 reissued with the broader claim language. The fact that the PTO allowed the broadening amendment, however, is not dispositive. It simply means that prosecution history estoppel does not bar a broad construction of "any given distance." But prosecution history is not the only means by which the patentee may limit the scope of his claims-limiting the claim scope via disclaimers in the specification is another. As the Court discussed, that is what happened here.

Accordingly, the Court construes Element 8 to mean that the axial length (in a direction parallel to the axis of rotation) of the "annular surface" of the impeller hub defined by the reduced diameter portion corresponds to at least one-third of the total hub length.

I. Element 9: "With Respect To The Axial Median Plane, The Scroll Plate Means Being Asymmetrical In The Corner Areas"

Element 9 of claim 29 recites "with respect to the axial median plane, the scroll plate means being asymmetrical in the corner areas ."

Papst contends that the Court should construe the claim to mean that due to the presence of "corner areas" on the outlet side of the fan, the portions of the fan housing on opposite sides of the axial median plane do not have the same configuration. Sunon's proposed construction is not materially different. Sunon contends that the Court should construe the claim to mean that "in the corner areas, the scroll plate must be different on one side of the axial median plane as compared to the other side of the plane." (R. 96-1, Defs.' Claim Constr. Br. at 25.)

Papst argues that Sunon's proposed construction is confusing because it implies that Claim 29 requires that there be "corner areas" on the inlet side of the fan, whereas the claim language makes clear that "an outlet side of the scroll plate means ... [is] accompanied by formation of corner areas." (R. 103-1, Pl.'s Opp'n to Defs.' Initial Claim Constr. Br. at 13-14.) The Court agrees that Papst's construction more closely tracks the claim language.

The Court construes Element 9 to mean that the portions of a fan housing on opposite sides of the axial median plane do not have the same configuration due to the presence of "corner areas" on the outlet side of the fan.

J. Element 10: "Cylindrical Over A Longer Distance From The Axial Median Plane To The Inlet Side Than To The Outlet Side"

Element 10 of Claim 29 recites "being cylindrical over a longer distance from the axial medial plane to the inlet side than to the outlet side." The only disagreement between the parties with respect to Element 10 involves the meaning of the term "cylindrical ." The Court previously addressed the parties' positions regarding this term in its analysis of Element 3. That analysis need not be repeated here.

Accordingly, the Court construes Element 10 to mean that the length in a direction along the axis of rotation of the fan blade of a cylindrical portion (as defined in Element 3) of the fan housing on the inlet side of the fan is longer than the length of the cylindrical portion on the outlet side of the axial median plane.

K. Element 11: "Wherein The Impeller Means Has An Outside Edge Which Extends From An Area Adjacent The Inlet Side Of The Fan Into The Corner Areas"

Element 11 of Claim 29 recites "wherein the impeller means has an outside edge which extends from an area adjacent the inlet side of the fan into the corner areas." The parties disagree over the meaning of the term "outside edge." Papst asserts that the term "outside edge" may refer to "one or more outside edges of one or more fan blades [that] extend into the [corner areas]." (R. 99-1, Pl.'s Claim Constr. Br. at 20.) Sunon contends that the term "outside edge" refers to only the "radial outer edge" of each fan blade. (R. 104-1, Defs.' Resp. Br. at 14.) Because the term "outside edge" is ambiguous, the Court looks to the specification.

The specification of the '015 patent refers to three different fan blade edges: the "inlet edge," the "outlet edge," and the "radial outer edge. " '015 patent, col. 6, ll. 51-66. It is clear that only one of these three edges is capable of meeting the limitation described by the plain language of Claim 29. As the claim recites, "[the] outside edge extends from an area adjacent the inlet side of the fan into the corner areas." It is undisputed that the "corner areas" referred to are located on the outlet side of the fan. As such, the "inlet edge" lies on the inlet side of the fan, while the "outlet edge" lies on the outlet side of the fan. The "radial outer edge" is the only edge capable of extending from the inlet side to the outlet side of the fan as required. Therefore, the term "outside edge" is construed to refer to the "radial outer edge" of the impeller blade(s).

Accordingly, the Court construes Element 11 to mean that the radial outer edge of one or more of the fan blades extends into the "corner areas" as defined in Element 5.

II. The Court's Construction Of The Disputed Claim Terms

The Court having considered all of the submissions and the oral presentation of Papst and Sunon, and been fully advised, IT IS HEREBY ORDERED as follows:

1. Claim 29 recites "a drive motor means." The Court interprets this claim element to mean any type of electric drive motor that is used to drive a fan.

2. Claim 29 recites "a scroll plate means surrounding an impeller means having a hub." The Court interprets this claim element to mean the housing of a fan that surrounds a number of fan blades that are attached to a hub.

3. Claim 29 recites "an inner contour of said scroll plate means having a cylindrical configuration in a vicinity of an axial median plane of the fan and extending towards an inlet side of the fan." The Court

interprets Element 3 to mean that the inner contour of the fan housing must form a surface that is parallel to the axis of rotation of the fan at the mid-point between the inlet and outlet sides of the fan. Additionally, the cylindrical configuration must extend from the mid-point towards the inlet side of the fan.

4. Claim 29 recites "with an outlet side of the scroll plate means formed into a polygonal profile circumscribing an impeller diameter." The Court interprets this claim element to mean that the outlet side of the inner contour of the fan housing is non-circular in shape due to facets formed by the corner areas of the fan housing on the outlet side.

5. Claim 29 recites "accompanied by the formation of corner areas." The Court interprets this claim element to mean that the outlet side of the fan includes "corner areas," which include the volume of the fan that is enclosed by (1) the hub, motor, and fan blades (the "core means"); (2) the inner surface of the fan housing that defines a broadened area at the outlet side of the fan (the sloping wall); (3) the outlet side of the fan; (4) a series of planes extending from the center point B (the axis of rotation at the center of the hub) toward each endpoint of each cutout surface of the housing that defines the broadened area at the outlet side; and (5) a plane parallel to the axial median plane situated at the point where the fan housing defines a broader area at the outlet side of the fan.

6. Claim 29 recites "a central, coaxial core means formed by the drive motor means, the impeller hub and a mounting flange for the drive motor means." The Court interprets this claim element to mean any type of electric motor that is used to drive a fan, the hub onto which the fan blades are mounted, and a flange, connected to the fan housing, upon which the motor is mounted.

7. Claim 29 recites "said core means having an annular surface reduced in diameter towards the inlet side." The Court interprets this claim element to mean that a portion of the impeller hub adjacent to the inlet side of the fan is reduced in diameter as compared to the remainder of the impeller hub.

8. Claim 29 states, "the annular surface having an axial length extending for a given distance along the length of the hub." The Court interprets this claim element to mean that the axial length (in a direction parallel to the axis of rotation) of the "annular surface" of the impeller hub defined by the reduced diameter portion corresponds to at least one-third of the total hub length.

9. Claim 29 recites "with respect to the axial median plane, the scroll plate means being asymmetrical in the corner areas." The Court interprets this claim element to mean that the portions of a fan housing on opposite sides of the axial median plane do not have the same configuration due to the presence of "corner areas" on the outlet side of the fan.

10. Claim 29 states, "scroll plate means" "being cylindrical over a longer distance from the axial medial plane to the inlet side than to the outlet side." The Court interprets this claim element to mean that the length in a direction along the axis of rotation of the fan blade of a cylindrical portion (as defined in Element 3) of the fan housing on the inlet side of the fan is longer than the length of the cylindrical portion on the outlet side of the axial median plane.

11. Claim 29 recites "wherein the impeller means has an outside edge which extends from an area adjacent the inlet side of the fan into the corner areas." The Court interprets this claim element to mean that the radial outer edge of one or more of the fan blades extends into the "corner areas" as defined in Element 5.

N.D.Ill.,2004.
Papst Licensing GmbH and Co. KG v. Sunonwealth Elec. Machine Ind. Co., Ltd.