United States District Court,
E.D. Michigan, Southern Division.

HAYES LEMMERZ INTERNATIONAL, INC,
Plaintiff.
v.
KUHL WHEELS, LLC and Epilogics Group,
Defendants.

No. 03-CV-70181-DT

April 25, 2007.

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CLAIM CONSTRUCTION OPINION AND ORDER

ROBERT H. CLELAND**, United States District Judge.**

This matter is before the court for construction of United States Patent Number 6,042,194 (the "'194 Patent") and United States Patent Number 6,520,596 (the "'596 Patent") pursuant to Markman v. Westview Instruments, Inc., 52 F.3d 967 (Fed.Cir.1995) (en banc). Claim construction briefs have been submitted by Plaintiff Hayes Lemmerz International, Inc. ("Hayes") Defendants Kuhl Wheels, LLC ("Kuhl") and Epilogics Group ("Epilogics"), and the court conducted a claim construction hearing on the record. In this order, the court will set forth its construction of the disputed terms at issue, as well as its analysis supporting that construction.

I. BACKGROUND FN1

FN1. The facts set forth in the background section are intended purely to provide background and context to this opinion. Nothing in this section should be interpreted as supplementing or supplanting the court's construction as set forth in Section IV., *infra*.

The '194 Patent and the '596 Patent protect designs for stamped steel wheels. Defendant Kuhl, the owner of the patents, and Defendant Epilogics entered into an agreement with Plaintiff Hayes to sell the Kuhl wheel. (Defs.' Br. at 1.) Pursuant to the agreement, Plaintiff was required to "pay a royalty on each wheel sold that was subject to the agreement." (Id.) Defendants allege that, instead of paying royalties, "Hayes had one of its German employees secretly design an alternative wheel using Kuhl's patented wheel as a template[,] then pursued a European patent on its 'new wheel,' which Hayes is poised to sell commercially in the United

States as the Flex or Struktur Wheel." (Id.)

II. STANDARD

Under *Markman,* a court conducting a patent infringement analysis must undertake a two-step process. First, the court must determine the meaning and scope of the protected patents. This is known as the claim construction phase and it is a question of law for the court. Markman, 52 F.3d at 976, 979. Once the court has interpreted the claims at issue, the second step requires comparing the properly construed claim and the accused device to determine whether the accused device is infringing. Id. at 976. The infringement analysis generally is for the jury.

"The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." Embrex, Inc., v. Serv. Eng'g Corp., 216 F.3d 1343, 1347 (Fed.Cir.2000) (quotation omitted). In construing the claim, the court should keep in mind that "the language of the claim defines the scope of the protected invention." Bell Commc'ns Research, Inc. v. Vitalink Commc'ns, Corp., 55 F.3d 615, 619 (Fed.Cir.1995). For this reason, " 'resort must be had in the first instance to the words of the claim,' words [which are ascribed] their ordinary meaning unless it appears the inventor used them otherwise." Id. at 620 (quoting Envirotech Corp. v. Al George, Inc., 730 F.2d 753, 759 (Fed.Cir.1984)). Further, "it is equally 'fundamental that claims are to be construed in light of the specifications and both are to be read with a view to ascertaining the invention.' " *Id.* (quoting United States v. Adams, 383 U.S. 39, 49, 86 S.Ct. 708, 15 L.Ed.2d 572 (1966)).

In construing a claim, the court begins with an analysis of the ordinary meaning of the disputed claim terms. The terms used in the claims bear a heavy presumption that they mean what they say, having the ordinary meaning that would be attributed to those words by persons having ordinary skill in the relevant art. Texas Digital Systems, Inc. v. Telegenix, Inc. 308 F.3d 1193, 1202 (Fed.Cir.2002). The court can then look to other intrinsic evidence, including the specification and the prosecution history if in evidence. Interactive Gift Express, Inc. v. Compuserve, Inc., 256 F.3d 1323, 1331 (Fed.Cir.2001).

After exhausting the available intrinsic evidence, the court may also consider extrinsic evidence "to aid [it] in coming to a correct conclusion as to the true meaning of the language employed in the patent." Markman, 52 F.3d at 980 (quotations omitted). Extrinsic evidence consists of all evidence external to the patent and prosecution history, including testimony of inventors or experts, dictionaries, and learned treatises. *Id.* "However, extrinsic evidence cannot be used to contradict the established meaning of the claim language." Gart v. Logitech, 254 F.3d 1334, 1340 (Fed.Cir.2001). In sum, "the ordinary and customary meaning of a claim term may be determined by reviewing a variety of sources." Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 1298 (Fed.Cir.2003). These sources "include the claims themselves, dictionaries and treatises, and the written description, the drawings, and the prosecution history." *Id.* (internal citations omitted); *see also* Inverness Med. Switzerland GmbH v. Warner Lambert Co., 309 F.3d 1373, 1378 (Fed.Cir.2002) (noting that dictionaries are often helpful in ascertaining plain and ordinary meaning of claim language).

III. DISCUSSION

A. The '194 Patent

Both Plaintiff and Defendants agree that the relevant claims requiring construction are claims 1, 5, 6 and 7. FN2

FN2. Although the parties initially proposed additional phrases for construction, ('194 Patent JCC), the parties have since narrowed the claims for construction in their briefs, and the court will construe only the claims that remain contested.

1. Claim 1

The parties have submitted the following phrases in Claim 1 of the '194 Patent for construction by the court (phrases for construction are underlined):

A wheel support assembly adapted to bolt to an axle of a vehicle for supporting a tire, said assembly comprising:

(a) an outer annular rim having an outer annular surface configured to support a tire and an inner annular surface;

(b) a plurality of spoke arrangements, each of which includes

(i) at least two *elongated spokes* respectively including inner ends and outer ends and

(ii) a cross-bar connecting together the inner ends of the spokes and configured to bolt to said axle for connecting the inner ends of said spokes to said axle, whereby said cross-bar serves as part of a hub of said wheel support assembly, all of said spokes and said cross-bars making up the wheel support assembly being integrally stamp formed into a *single unit* from a single piece of sheet metal, said *single unit* serving as the only strength imparting structure between said rim and the hub; and

(c) *means for connecting the outer ends of said spokes to said rim*.

a. "elongated spokes"

The parties first ask the court to construe the following terms: "spoke," "spokes" and "elongated spokes." Plaintiff defines "spoke" as "any of the braces or bars extending between the hub and the rim of a wheel," and "spokes" to mean "more than one spoke." (Pl.'s Br. at 5.) Plaintiff also proposes construing the term "elongated spokes" as "separate, individual spokes that are spaced apart to inherently define a radially extending opening between the spokes." (Id.) Plaintiff further contends that these elongated spokes are indirectly connected to the rim by a separate connecting member and, therefore, do not extend all the way to the rim. (Id.)

Defendants disagree, and contend that "spokes" are defined as "rods or braces that carry forces between the rim and the hub and extend from the rim to the hub." (Defs.' Br. at 8.) Defendants also assert that the " 'spokes' of Claim 1 need not have a particular shape." (Id. at 13-14.) Furthermore, Defendants claim that "the '194 Patent does not require removing the material [webbing] between the spokes." (Id. at 14.)

As an initial matter, "spokes" and "elongated spokes" have the same meaning. After reviewing the '194 Patent specification, the court notes that "elongated spokes" and "spokes" are used interchangeably by the patentee. Accordingly, the court interprets "spokes" and "elongated spokes" as having the same meaning.

As for the construction of "spoke," the court finds persuasive Defendant's contention that "spokes" are most properly defined as "rods or braces that carry forces between the rim and the hub." FN3 Defendants' proposed construction of the definition and function of "spokes" is supported by the ' 194 Patent specification, which states in relevant part:

FN3. Spokes, however, are not the only structures that carry forces between the rim and the hub. The flanges, though not a part of the spoke arrangement, also provide a force-carrying function between the rim and the hub of the wheel.

Spokes displaced from a radial line carry wheel torque loads as tensile stress. This is beneficial because the spokes are very strong in tension. If spokes were located on a radius, torque loads would be carried as bending stress on the spokes. The spokes are very weak bending in the circumferential (wheel torque) direction.
('194 Patent, col. 3, lns. 64-67; col. 4, lns. 1-2.) This paragraph, when read in conjunction with Figures 2, 3, 4 and 5 regarding both embodiments in the '194 Patent specification, shows that the spokes' specific function is carrying forces (wheel torque loads) between the hub and the rim of the wheel. The court therefore agrees with Defendants' proposed construction of "spokes."
The court also agrees with Defendants' claim that the spokes need not have a particular shape, in that the spokes need not "have a long and narrow shape." FN4 Indeed, the patent specification itself clearly states that "the present invention is not limited to ... spokes that are substantially longer than they are wide." (" Patent, col. 5, In. 51-53.)

FN4. In the joint claim chart, Plaintiff proposes such a construction, though Plaintiff appears to abandon this argument in its brief.

The court does find, however, that the two elongated spokes of each spoke arrangement must be spaced apart by a radially extending opening. Both Figures 2 and 3 of the '194 Patent show an extended opening between two elongated spokes of the spoke arrangement. The extent of the opening is determined by the width of the cross-bar that connects the inner ends of spokes, which can be seen in both Figures 2 and 3. The specification itself frequently refers to the spokes as "two spokes," ('194 Patent, col. 3, In. 15, 18), "spoke pairs," (id. at col. 5, Ins. 11-12, 18-19, 33, 52), and "individual spokes," (id. at col. 5, Ins. 42-43).

Moreover, the '194 patent emphasizes the importance of having the spokes straddle the radius:

[I]t should be noted that the spokes 32a, 32b of each pair[ ] extend inward from rim 26 *on either side but not along a radius* of rim 26. Rather *they straddle a common radius, preferably in approximate parallel relationship with the latter* and, at the same time, they straddle the axis of rotation of the rim. *This is important* for the following reasons. Spokes displaced from a radial line carry wheel torque loads as tensile stress. This is beneficial because the spokes are very strong in tension. If spokes were located on a radius, torque loads would be carried as pending stress on the spokes. The spokes are very weak in bending in the circumferential (wheel torque) direction.

('194 Patent, col. 3, Ins. 58-col. 4, Ins. 2.) As Plaintiff argues, if the two spokes were connected by webbing, instead of being spaced apart by a radially extended opening, that webbing would sit on the radius of the rim and frustrate this important goal.

The patent specification also implies an opening between the spoke pairs by referring to the cross-bar as connecting the inner ends of the two spokes. ('194 Patent col. 3, Ins. 15-18 ("[E]ach spoke arrangement is an integrally formed unit which includes two spokes ... joined together at their radially inner ends by a cross bar ...."); id. at col. 5, Ins. 11-14 ("[E]ach arrangement includes two spokes ... having inner ends joined to one another by a cross-bar ....."). Plaintiff submits that "[i]f the two elongated spokes were already connected by full webbing, there would be no need to connect their ends with a cross-bar." (Pl.'s Br. at 8.) The court finds these arguments persuasive, and will construe the spokes as being spaced apart by a radially extending opening.

Finally, the parties contest whether the spokes must extend from the hub to the rim. Defendants claim that "[t]he spokes must extend from the rim to the hub," (Defs.' Br. at 8), while Plaintiff contends that "[n]othing in the ' 194 Patent explicitly or implicitly[ ] requires that the ... elongated spokes must extend all the way to the rim," (Pl.'s Br. at 8). Defendants rest their argument on Figure 5, which depicts a spoke with length "l" extending the full length between the hub and the rim, and on subsection (c) of Claim 1, which calls for a "means for connecting the outer ends of said spokes to said rim." (Defs.' Br. at 8; '194 Patent col. 6, Ins. 13-14.) Defendants argue that if a spoke does not extend all the way to the rim, that spoke could not be "connected" to the rim. Defendant's position is not supported by the patent specification.

The '194 Patent does not require, by implication or otherwise, that a spoke must come into *direct* contact with the rim. While it is true that the spokes must be connected to the rim, subsection (c) of Claim 1, construed below, provides the means to do so. The means may simply be a bolt, weld or similar fixed connection, if the spoke itself extends to the rim, but it may also be a flange to which the spoke is attached, combined with a bolt, weld or similar fixed connection, allowing the spoke to come into contact with the rim indirectly. Figures 5 and 3 illustrate this point. In Figure 5, the spoke is defined with a length "l" that extends from the hub to the rim. In that case, the only connecting means required would be a bolt, weld or similar fixed connection affixing the spoke to the rim directly. Figure 3, however, shows a spoke with length "l" that extends less than the full distance to the rim, i.e., only to the flange. In this illustration, it is the flange that provides a means to connect spoke to rim.

Defendant's proposed construction would exclude the preferred embodiment shown in Figure 3.FN5 "A claim interpretation that excludes a preferred embodiment from the scope of the claim 'is rarely, if ever, correct.' " Globetrotter Software, Inc. v. Elan Computer Group, Inc., 362 F.3d 1367, 1381 (Fed.Cir.2004) (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583 (Fed.Cir.1996)). Accordingly, the court rejects Defendants' proposed construction, and finds that "spokes" need not extend from the hub to the rim.

FN5. The court rejects Defendants' unsupported conclusion that Figure 3 "is not an embodiment claimed by the '194 Patent." (Defs.' Reply at 8 n.3.)

b. "single unit"

Next, Defendant proposes that the term "single unit" may consist not only of spokes and cross-bars, but also additional structures. Defendant claims that the use of the word "includes" in subsection (b) of Claim 1 allows for an non-exhaustive list, which contains, but is not limited to, the enumerated spokes and cross-bars. (Defs.' Br. at 17-18.) Plaintiff appears not to disagree. FN6 Defendant's proposed construction is supported by the claim language, and the court will therefore adopt it.

FN6. Although Plaintiff initially proposed a different construction in the Joint Claim Chart, Plaintiff appears to have abandoned that argument, and fails to mention this claim in its briefs.

c. "means for connecting the outer ends of said spokes to said rim."

The parties agree that this phrase is a "means-plus-function" element subject to 35 U.S.C. s. 112 para. 6. In construing means-plus-function claim limitations, a court employs a two-step process. First, the court identifies the particular function claimed, often called the stated or claimed function, and second, it identifies the "corresponding structure, material, or acts described [by the claimant] in the specification." 35 U.S.C. s. 112; Budde v. Harley Davidson, Inc., 250 F.3d 1369, 1376 (Fed.Cir.2001); Asyst Tech., Inc. v. Empak, Inc., 268 F.3d 1364, 1369-70 (Fed.Cir.2001) (describing the two steps in construing a means-plus-function limitation). Unlike ordinary claims, a party choosing to write a claim in the means-plus-function format is limited to claiming the corresponding structure actually disclosed in the specification and its equivalents. Kahn v. General Motors Corp., 135 F.3d 1472, 1476 (Fed.Cir.1998).

The parties generally agree that the function to be performed by the claim limitation is connecting the outer end of the spokes to the rim. (Pl.'s Br. at 21.) The parties, however, dispute the identification of the correct corresponding structure. Defendant contends that this corresponding structure is limited to "a weld or its equivalent that will otherwise fixedly connect the spokes to the rim." (Defs.' Br. at 21.) Plaintiff, however, argues that "based upon the patent claims and specification, the only structure disclosed is a short connecting flange in combination with welding." (Pl.'s Br. at 21.)

As the court stated in section (III)(A)(1)(a) above, "spokes" includes both spokes that extend all the way to the rim, as illustrated in Figure 5, and spokes that extend less than the full distance to the rim, as illustrated in Figure 3. Accordingly, the "means for connecting the outer ends of said spokes to said rim" cannot be construed either to necessarily include a flange, as Plaintiff proposes, or to necessarily exclude a flange, as Defendants propose. Those spokes that extend to the rim require a simple connecting means such as a bolt, weld or similar fixed connection. Those spokes that do not extend to the rim require a more complex connecting means such as a flange combined with a bolt, weld or similar fixed connection. The court therefore rejects both Plaintiff's and Defendants' construction as improperly limiting the connecting means, and finds that the "means for connecting the outer ends of said spokes to said rim" is construed as including both (1) a bolt, weld or similar fixed connection only and (2) flanges FN7 and a bolt, weld or similar fixed connection.

FN7. This construction would also extend to equivalents, such as a common cross-bar. *See* Kahn, 135 F.3d at 1476.

Additionally, the court finds that Plaintiff fails to support its argument that the connecting means must constitute only a *short* flange. While the illustrations arguably depict flanges that are "short," the specification does not support this limitation, and Plaintiff's construction improperly limits the Claim language to the illustrated preferred embodiment. *See* Lievel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 906 (Fed.Cir.2004).

2. Claim 5

The parties have submitted the following underlined phrase in Claim 5 of the ' 194 Patent for construction by the court:

wherein each of said spoke arrangements includes a *single rim connecting member* connecting to and extending between the two spokes of that arrangement in a direction generally normal to a radius of said rim for connecting to said rim and thereby serving as part of said connecting means.

('194 Patent, col. 6, Ins. 29-34.)

Defendants ask the court to construe this dependent claim as only requiring "the presence of a metal area between the spokes of the spoke arrangements that is generally 'normal,' (*i.e.*, perpendicular, to the face of the wheel.)" (Defs.' Br. at 22.) Defendants argue that Figure 5 only displays one way this limitation can appear, and claim that "[s]o long as a wheel has metal between the spokes that is generally perpendicular to the plane of the wheel face and is attached to the rim, this element is present." (Id.)

Plaintiff proposes construing the contested language as "only a 'common cross-bar or flange' (or its equivalent) for connecting the outer ends of the spokes to the rim, as discussed in the '194 Patent at column 5, lines 16-22, FN8 and shown at 64 in Figure 5 of the ' 194 Patent." (Pl.'s Br. at 29.) The court finds that Plaintiff's proposed construction is supported by the Claim language. Furthermore, the court finds that the limitation in Claim 1(c) requires construing the "single rim connecting member" in dependent Claim 5 as a common cross-bar, flange, or its equivalent.

FN8. This portion of the '194 Patent claim specification reads as follows: "The outer ends of each spoke pair 62a and 62b are joined by a common cross-bar or flange 64 which, like flanges 38a and 38b, serves as a foot rest against the inner circumferential surface of rim 56 and is welded or otherwise suitably fixedly connected with the rim." ('194 Patent, col. 5 Ins. 18-22.)

3. Claim 6

The parties have submitted the following phrase in Claim 6 of the '194 Patent for construction by the court (phrase for construction is underlined; phrase already construed in Claim 1 is italicized):

A method of making a wheel support assembly adapted to bolt to an axle of a vehicle for supporting a tire, said method comprising the steps of:

a. providing an outer annular rim having an outer annular surface configured to support a tire;

b. providing a single piece of sheet metal and stamp forming from the sheet metal as a single integrally formed unit a plurality of spoke arrangements, each of which is formed to include

i. at least two *elongated spokes* respectively including inner ends and outer ends and

ii. a cross-bar connecting together the inner ends of the spokes and configured to bolt to said axle for connecting the inner ends of said spokes to said axle, whereby to serve as part of a hub of said wheel support assembly, said plurality of spoke arrangements serving as the only spoke arrangements making up said wheel support arrangement and said single integrally formed unit serving as the only strength imparting

structure between said rim and the hub; and

c. *connecting the outer ends of said spokes to said rim*.

The parties differ in their proposed construction of Claim 6(c). Plaintiff asserts that Claim 6(c) "is a function and must be analyzed under 35 U.S.C. 112(6), using a step plus function analysis ." (Pl.'s Br. at 29-30.) As a result, Plaintiff further states that Claim 6(c) is "limited to the connecting means disclosed in the specification: short flanges plus welding." (Id.) Defendants, on the other hand, contend that Claim 6(c) is not a step-plus function but, instead, "[t]he 'connecting' in claim 6 is an act or step involved in effectuating the purpose described in the preamble, namely the making of a wheel support assembly." (Defs.' Reply at 12.)

The Claim 6 preamble sets forth a method of making a wheel support assembly, comprising a number of steps, but does not use the "step for" language that signals the claim drafter's intent to invoke section 112, paragraph 6. Masco Corp. v. United States, 303 F.3d 1316, 1326 (Fed.Cir.2002); Utica Enter., Inc. v. Fed. Broach and Mach. Co., 109 F. App'x 403, 409 (Fed.Cir.2004). Because Claim 6 uses the term "step of" instead, there is no presumption that the Claim 6 limitation is a step-plus function. Masco Corp., 303 F.3d. at 1328. Indeed, "[w]here the claim drafter has not signaled his intent to invoke s. 112, paragraph 6 by using the 'steps for' language, we are unwilling to resort to that provision to constrain the scope of coverage of a claim limitation without a showing that the limitation contains nothing that can be construed as an act." *Id*. at 1327; *see also* Utica, 109 F. App'x at 409; *O.I. Corp.,* 115 F.3d. at 1583. "In general terms, the 'underlying function' of a method claim element corresponds to what that element ultimately accomplishes in relationship to what the other elements of the claim and the claim as a whole accomplish. 'Acts,' on the other hand, correspond to how the function is accomplished." Seal-Flex, Inc. v. Athletic Track & Court Constr. 172 F.3d 836, 849-50 (Fed.Cir.1999).

The disputed language, "connecting the outer ends of said spokes to said rim," merely claims a step by reciting and performing an act, not a function, necessary to complete the method of making a wheel support assembly. "Connect," according to the Oxford Dictionary's definition, means "join (one thing with another)," "join (two things)," and also "be joined or joinable." *The Oxford Dictionary and Thesaurus* 296 (Am. ed.1996). "Connecting the outer ends of said spokes to said rim" should therefore be interpreted to describe not a function, but an act of joining the outer ends of the spokes to the rim, which is a step involved in the making of a wheel assembly. Because Claim 6(c) can be construed to contain an act, it is not a step-plus function claim subject to the requirements of s. 112, paragraph 6.

4. Claim 7

The parties have submitted the following phrases in Claim 7 of the '194 Patent for construction by the court (phrases for construction are underlined; phrases already construed in Claim 1 are italicized):

A wheel support assembly adapted to bolt to an axle of a vehicle for supporting a tire, said assembly comprising:

a. an outer annular rim having an outer annular surface configured to support a tire and an inner annual surface;

b. a plurality of spoke arrangements, each of which includes

i. at least two *elongated spokes* respectively including inner ends and outer ends and

ii. a cross-bar connecting together the inner ends of the spokes and configured to bolt to said axle for connecting the inner ends of said spokes to said axle, whereby said cross-bar serves as part of a hub of said wheel support assembly, said spokes and said cross-bar being integrally stamp formed from a piece of sheet metal, wherein each of said spoke arrangements includes a pair of *rim connecting flanges* respectively connected to the two spokes of that arrangement in a direction generally normal to a radius of said rim for connecting to said rim and thereby serving as part of said connecting means; and

c. *means for connecting the outer ends of said spokes to said rim.*

a. "rim connecting flanges"

The parties agree that Claim 7 is an independent claim that requires outward facing connecting flanges as the means for connecting. The parties again dispute, however, whether Plaintiff's modifier "short" is appropriate. For the reasons stated above in section (III)(A)(1)(c), the court finds that Plaintiff fails to support its argument that the connecting means must constitute only *short* flanges.

b. "means for connecting the outer ends of said spokes to said rim."

Here, the parties again contest whether the "means for connecting the outer ends of said spokes to said rim" consists of a bolt, weld or similar connection only, or both flanges and a bolt, weld or similar connection. For the reasons stated above in section (III)(A)(1)(c), the court finds that the "means for connecting the outer ends of said spokes to said rim" is construed as including both (1) a bolt, weld or similar fixed connection only and (2) a flange combined with a bolt, weld or similar fixed connection.

B. The '596 Patent

Both Plaintiff and Defendants agree that the relevant claims requiring construction are claims 1 and 9.FN9

FN9. Although the parties initially proposed numerous phrases for construction, ('596 Patent JCC), the parties have since narrowed the claims for construction in their briefs, and the court will construe only the claims that remain contested.

1. Claim 1

The parties have submitted the following phrases in Claim 1 of the '596 Patent for construction by the court (phrases for construction are underlined):

A hub for use as part of an overall wheel structure adapted to be mounted to the end plate of a vehicular axle, said wheel structure also having an arrangement of spokes and a rim for receiving a tire, said hub comprising: a plurality of bars which have outwardly-most extending ends, each end of which displays a predetermined curvature, said bars being connected to one another from a hub body defining (1) a common center point and (2) an overall contact face defined in part by said bars; *the contact face including outwardly-most extending ends corresponding to the ends of said bars and displaying predetermined curvatures corresponding to the outwardly-most extending ends of said bars, the predetermined curvatures*

of the ends of said contact face displaying radii of curvature smaller than the distance from said center point of the contact surface to the outwardly-most extending ends of said bars; each of said bars having a through hole (1) which is adapted to receive an axle bolt and (2) which extends in a direction perpendicular to said contact face such that, when the wheel structure is mounted to said vehicular axle, said contact surface is contiguous with the axle end plate.

Plaintiff first proposes construing the term "outwardly-most extending ends" as defining "a 'contact face radius' which is less than the distance from the wheel center to the outwardly-most extending ends of the contact face." (Pl.'s Br. at 31.) Plaintiff next contends that "[t]he 'contact face radius' must be the same as a 'bar radius' defined by the outwardly-most extending ends of the bars." (Id.) Finally, Plaintiff submits that "[b]oth the 'contact face radius' and the 'bar radius' must be 'predetermined', i.e., selected or determined prior to the forming (stamping) operation of the hub." (Id.)

In their brief, Defendants object only to Plaintiff's proposed location of the outwardly-most extending ends, as illustrated by reference numeral 104a in Plaintiff's edited reproduction of Figure 7. (Id. at 32.) Claim 1 requires that the "predetermined curvatures correspond[ ] to the outwardly-most extending ends of said bars." ('596 Patent, col. 4, Ins. 12-14.) Defendants argue that the "outwardly-most extending ends of said bars" are illustrated in Figure 3 by reference numeral 47. (Defs.' Reply at 13 .) Plaintiffs, however, argue that reference numeral 47 only designate the "ends" of the bars and not the "outwardly-most extending ends of said bars." (Pl.'s Sur-Reply at 13.) Plaintiff contends that Figure 3 fails to identify the outwardly-most extending ends, which Plaintiff claims are illustrated in Figure 1 by reference numeral 18 and in Figure 2 by reference numeral 36. (Id.)

Because the '596 Patent specification refers to Figure 3 reference numeral 47 as simply the "end" of the bar, ('596 Patent, col. 3 In. 7, 14), and refers to Figure 1 reference numeral 18 and Figure 2 reference numeral 36 as the "outwardly most extending ends" of the bar, ('596 Patent, col. 2, Ins. 37-38, 58-59), the court finds that only Figures 1 and 2 designate by numerical reference the outwardly-most extending ends of the bar. Plaintiff's edited Figure 7 reference numeral 104a corresponds to Figure 1 reference numeral 18 and Figure 2 reference numeral 36 and appropriately illustrates the outwardly-most extending ends as the ends of the bar that is farthest from the center of the hub. Accordingly, the court will adopt Plaintiff's proposed construction in its entirety.

2. Claim 9

The parties have submitted the following phrase in Claim 9 of the '596 Patent for construction by the court (phrase for construction is underlined; phrases already construed in Claim 1 are italicized):

A wheel support assembly adapted to bolt to a vehicle axle for supporting a tire, said assembly comprising: a) an outer annular rim having an outer annular surface configured to support a tire and inner annular surface; b) a hub adapted to mount to the end plate of a vehicular axle, said hub having a plurality of bars which have *outwardly-most extending ends,* each end of which displays a predetermined curvature, said bars being connected to one another to form a hub body defining (1) a common center point and (2) an overall contact face defined in part by said bars; the contact face including outwardly-most extending ends corresponding to the ends of said bars and displaying predetermined curvatures corresponding to the outwardly-most extending ends of said bars, *the predetermined curvatures of the ends of said contact face displaying the radii of curvature smaller than the distance from said center point of the contact surface to the outwardly-most extending ends of said bars;* each of said bars having a through hole (1) which is

adapted to receive an axle bolt and (2) which extends in a direction perpendicular to said contact face such that, when the wheel structure is mounted to said vehicular axle, said contact surface is contiguous with the axle end plate; and c) a plurality of *spoke arrangements* each having an outer end and a[n] inner end[,] said outer end adapted to connect to said rim, and said inner end adapted to connect to said hub.

The parties agree that "spoke arrangements" are "rods or braces extending between the rim and the hub of the wheel." ('596 Patent JCC at 6.) The parties disagree, however, on whether "spoke arrangements" must contain multiple spokes. Defendants contend that "[t]he '596 Patent, by incorporation of the '194 Patent, defines 'spoke arrangements' to require multiple spokes." (Defs.' Mot. at 25.) Defendants support their argument by submitting that "[t]he patentees chose to employ the term 'spoke arrangements' rather than the term 'spokes,' " (id.), and that Plaintiff "improperly attempts to convert that claim limitation into a 'plurality of spokes,' " (Defs.' Reply at 12). Furthermore, Defendants argue that, by definition, "one needs more than one spoke in order to 'arrange' those spokes." (Defs.' Mot. at 25.) Defendants therefore submit the following proposed construction: "a number of arrangements each of which is comprised of at least two spokes where the spokes of the arrangement reach from the hub to the rim." (Id.)

Plaintiff, however, argues that "[e]ach 'spoke arrangement' does not require 'at least two spokes where the spokes of the arrangement reach from the hub to the rim.' " (Pl.'s Br. at 31.) Plaintiff points out that "[n]owhere in the intrinsic evidence, including the specification of the '596 Patent, is the phrase 'at least two spokes' found." (Id. at 33.) While Plaintiff concedes that the '596 Patent incorporates the '194 Patent by reference, Plaintiff claims that the '596 Patent "did not limit the claims in the ' 596 Patent to any specific wheel assembly structure." (Id.)

The '596 Patent specification does incorporate the '194 Patent by reference: "[t]he present invention relates generally to wheel support assemblies for vehicular tires and more particularly to the center hub portion thereof, especially one of the design disclosed in Assignee's Fitz et al U.S. Pat. No. 6,042,194 which is incorporated herein by reference." ('596 Patent, col. 1, lns. 6-10.) The '596 Patent incorporates the '194 Patent both as an example of a wheel that would benefit from the '596 Patent, and to emphasize that the '596 Patent hubs can be made of stamped sheet metal according to the '194 Patent. ('596 Patent, col. 3, lns. 41-46.)

Although the '596 Patent incorporates the '194 Patent, it does not do so to define the term "spoke arrangements." in the '596 Patent.FN10 No language in the ' 596 Patent specification supports this contention, and the term, "spoke arrangements" has not been specifically defined in the ' 596 Patent. Advanced Display Sys. v. Kent State Univ., 212 F.3d 1272, 1282 (Fed.Cir.2000) (indicating that to incorporate material by reference, the host document must identify with detailed particularity the specific material it is incorporating and clearly indicate where that material is found in the documents); *see also* In re Seversky, 474 F.2d 671, 674 (C.C.P.A.1973).

FN10. Whether, and to what extent, material has been incorporated by reference into a host document is a question of law. Advanced Display Sys. v. Kent State Univ., 212 F.3d 1272, 1283 (Fed.Cir.2000); *see also* Quaker City Gear Works, Inc. v. Skil Corp., 747 F.2d 1446, 1453-54 (Fed.Cir.1984).

Absent an express patent definition, terms expressed in general descriptive words in a claim are to be given their ordinary meaning. Renishaw PLC v. Marposs Societa' Per Azioni, 158 F.3d 1243, 1249 (Fed.Cir.1998); CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1367 (Fed.Cir.2002). Dictionary definitions may be

used to establish a claim term's ordinary meaning. Reinishaw PLC, 158 F.3d at 1249; *Rexnord Corp.,* 274 F.3d at 1344. The construction must be true to the claim language and naturally align with the patent's description. Renishaw PLC, 158 F.3d at 1250; *see also* Young Dental Mfg. Co., Inc., v. Q3 Special Prod., Inc., 112 F.3d 1137, 1142 (Fed.Cir.1997).

The parties agree that spokes are "rods or braces extending between the rim and the hub of the wheel." ('596 Patent JCC at 6 .) The ordinary definitions of the word "arrangement" are "the act or process of arranging or being arranged," "the condition of being arranged," and "the manner in which a thing is arranged." *The Oxford Dictionary and Thesaurus* 1470 (Am. ed.1996). The word "arrange" is ordinarily defined as "put into the required or suitable order." Id. Accordingly, the term "spoke arrangements" can be construed as the "proper order of each of the bars running from the hub to the rim of a wheel." Nothing in either this ordinary dictionary definition or the intrinsic evidence precludes Plaintiff's construction, in which each "spoke arrangement" can consist of either a single spoke or a set of multiple spokes in between the hub and the rim of a wheel. Accordingly, the court finds that each "spoke arrangement" need not contain multiple spokes, and rejects Defendants' proposed construction.

V. CLAIM CONSTRUCTION

In light of discussion and analysis set forth above, the disputed portions of the relevant claims of United States Patent Numbers 6,042,194 and 6,520,596 are construed as follows:

A. United States Patent Number 6,042,194

1. Claim 1

Claim Language	Court's Construction
"elongated spokes"	Both "spokes" and "elongated spokes" are defined as "rods or braces that carry forces between the rim and the hub." The elongated spokes of each spoke arrangement must be spaced apart by a radially extending opening.
	"Spokes" need not extend from the hub to the rim.
"single unit"	A "single unit" includes, but is not limited to, spokes and cross-bars.
"means for connecting the outer ends of said spokes to said rim"	The phrase is a means-plus-function element in accordance with Section 112, paragraph 6, of the Patent Act, 35 U.S.C. s. 112, para. 6. The required structure can consist of either (1) a bolt, weld or similar fixed connection only or (2) flanges (which need not be short) or equivalents and a bolt, weld or similar fixed connection.

2. Claim 5

Claim Language	Court's Construction
"single rim connecting member"	A common cross-bar, flange, or its equivalent.

3. Claim 6

Claim Language	Court's Construction
"connecting the outer ends of said spokes to said rim"	The phrase is an act, and it is therefore not a step-plus function claim subject to Section 112, paragraph 6, of the Patent Act, 35 U.S.C. s. 112, para. 6.

4. Claim 7

Claim Language	Court's Construction
"rim connecting flanges"	These flanges need not be short.
"means for connecting the outer ends of said spokes to said rim"	The phrase is a means-plus-function element in accordance with Section 112, paragraph 6, of the Patent Act, 35 U.S.C. s. 112, para. 6. The required structure can consist of either (1) a bolt, weld or similar fixed connection only or (2) flanges (which need not be short) or equivalents and a bolt, weld or similar fixed connection.

B. United States Patent Number 6,520,596

1. Claim 1

Claim Language	Court's Construction
"the predetermined curvatures of the ends of said contact face displaying radii of curvature smaller than the distance from said center point of the contact surface to the outwardly-most extending ends of said bars"	The outwardly-most extending ends define a contact face radius which is less than the distance from the wheel center to the outwardly-most extending ends of the contact face. The contact face radius must be the same as the bar radius, defined by the outwardly-most extending ends of the bars. Both the contact face radius and the bar radius must be predetermined (selected or determined prior to the forming operation of the hub). The outwardly-most extending ends of said bars are the points of the bars that are the furthest from the center of the hub.

2. Claim 9

Claim Language	Court's Construction

"spoke arrangements"	The proper order of the bars running from the hub to the rim of the wheel. Each spoke arrangement can consist of either a single spoke or multiple spokes.

V. CONCLUSION

For the reasons set forth above, IT IS ORDERED that the claims of United States Patent Numbers 6,042,194 and 6,520,596 are CONSTRUED as set forth in the body of this order.

E.D.Mich.,2007.
Hayes Lemmerz Intern., Inc. v. Kuhl Wheels, LLC