United States District Court,
D. Oregon.

OLD TOWN CANOE COMPANY,
Plaintiff.
v.
AZJS, INC., and Confluence Holdings Corp,
Defendants.

Civil No. 02-93-AS

March 2, 2004.

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OPINION AND ORDER

ASHMANSKAS**, United States Magistrate Judge.**

Before the court is the issue of claim construction of the language of United States Patent No. 4,836,963 ("the '963 patent"), which discloses a rotary molding method. The court conducted a *Markman* hearing on the issue of claim construction on June 2, 2003. The following claim construction is made after consideration of the materials and testimony presented.

BACKGROUND

The parties are manufacturers of layered polyethylene canoes. Plaintiff is the assignee of the '963 patent, which discloses a rotational molding process to create a multilayered part, such as a hull. Plaintiff filed the present action asserting that defendants' manufacturing process infringes the '963 patent.

In the most general terms, the rotational molding process described in the ' 963 patent consists of releasing successive charges of particulate plastic into a mold, which has been heated within an oven. During the molding process, the mold is rotated on two axes. That and the elevated temperature cause the particulate plastic to be distributed along, and adhere to, the interior wall of the mold.

An embodiment described in the '963 patent and utilized by plaintiff produces what is referred to as a "skin-foam-skin" product. In producing a skin-foam-skin product, the first charge, consisting of particulate plastic is released into the mold. Once the first charge has reached an appropriate state, the second charge is released, usually from a drop box inside the mold. The second layer includes a foaming agent. Once the second layer has reached an appropriate state, a third charge is released. The mold is subsequently removed from the oven but continues to be rotated while it cools.

The timing of the release of the successive charges is important. The underlying layer must have reached an appropriate state before the release of a successive charge. The end product will not be useable if a successive charge is released too early or too late, when the underlying layer is not in an appropriate state. This claims construction dispute essentially concerns when the patent teaches to release the successive charges of particulate plastic into the mold.

The primary disputed term in this claims construction is "coalesce" and its forms, which the claims, specifications and illustrations use to describe the condition of the layers of particulate plastic during phases of the molding process. Claim 1 provides the following context:

"1. A rotational molding method for making a laminated plastic structure in a mold assembly mold cavity, comprising:

"rotating the mold assembly containing a first charge of particulate thermoplastic material within the mold cavity within an oven heated to a temperature to *coalesce* the thermoplastic material along the cavity wall to form a first layer;

"releasing into the mold cavity a second charge of a particulate thermoplastic material while continuing rotation of the mold assembly within the oven;

"continuing such mold assembly rotation within the oven until the second charge begins to *coalesce* along the first layer to form a second layer; and

"removing the mold assembly from the oven for cooling prior to *completion of the coalescence* of said second charge;

"whereby the cooling of the mold assembly and the first layer is concurrent with *completion of the coalescence* of the second layer so as to shorten the elapsed time during the molding process."

First Affidavit of Mark J. Lee ("First Lee Aff."), Ex. J, pp. 6-7, Col. 6, ll. 58-68, Col. 7, ll. 1-11 (emphasis supplied.)

The parties agree that "coalescence" is a process. Defendants assert that "coalescence" occurs when the plastic particles begin to adhere together and concludes when the particles have formed a layer. Defendants assert that there is no meaningful distinction between the terms "coalescence" and "completion of coalescence." Plaintiff asserts that "coalescence" encompasses a longer process and is not complete until the plastic particles have formed a smooth, homogeneous layer. Plaintiff asserts that the only thing that happens after "coalescence" is complete is cooling or undesirable over-curing.

The parties also dispute the sequencing of the process, specifically, whether the patent teaches to release successive charges during or after coalescence of the underlying layer. This sequencing issue is dependent upon construction of the terms "coalesce" and "completion of coalescence." Finally, the parties dispute the meaning of the term "air cooling."

LEGAL STANDARDS

A literal patent infringement analysis involves two steps: the proper construction of the asserted claims and a determination of whether the accused product infringes the asserted claim as properly construed. Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed.Cir.1995) (en banc), aff'd 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). The construction of patent claims, including terms of art within the claims, is a matter of law exclusively for the court. Id. at 979. In determining the proper construction of the claim, the court looks first to the language of the claim itself. *Id*.

Terms in a claim are given their ordinary meaning as would have been understood by one of ordinary skill in the art at the time of the invention. *Id*. at 986. Dictionaries, encyclopedias and treatises publically available at the time the patent was issued are reliable sources of the meanings that would have been attributed to the claim terms by those of skill in the art. Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202-03 (Fed.Cir.2002), *cert. denied,* 538 U.S. 1058, 123 S.Ct. 2230, 155 L.Ed.2d 1108 (2003).

Although claim terms generally will be ascribed their ordinary meaning, the patentee may chose to be his own lexicographer, provided the special definition is clearly stated in the patent specification or file history. Vitronics Corporation v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). Because the patent specification must contain a written description of the preferred embodiment of sufficient detail to allow one possessing ordinary skill in the art to make and use the invention, it acts as a dictionary or road map for the invention and may, either expressly or by implication, define terms used in the claims. Markman, 52 F.3d at 979. Accordingly, "it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning." Vitronics, 90 F.3d at 1582. Nonetheless, limitations cannot be read into a claim from the specification apart from a need to interpret the meaning of a particular word or phrase. E.I. Du Pont De Nemours & Co. v. Phillips Petroleum, 849 F.2d 1430, 1433 (Fed.Cir.), *cert. denied,* 488 U.S. 986, 109 S.Ct. 542, 102 L.Ed.2d 572 (1988).

The court should also consider the patent's prosecution history when construing claim language. Markman, 52 F.3d at 980. "This undisputed public record of proceedings in the Patent and Trademark Office is of primary significance in understanding the claims." *Id*. (internal quotation marks and citation omitted).

Extrinsic evidence in the form of expert and inventor testimony may be used by the court to assist in claim construction. *Id*. However, when the ordinary meaning of a claim term can be discerned from the intrinsic evidence and dictionary definitions, it is not necessary to examine expert testimony. *See* CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1368 (Fed.Cir.2002).

DISCUSSION

There are three dominant issues in this claims construction:

I. What is the meaning of "coalesce," "coalescence" and "completion of coalescence" (claims 1-10)?

II. What does the patent teach regarding when subsequent charges should be released (claims 1 through 10)?

III. What is the meaning of "air cooling" (claims 9 and 10)?

I. Construction of "Coalesce," "Coalescence" and "Completion of Coalescence"

The '963 patent uses a form of the word "coalesce" 47 times in the specification and claims, but the term is not specifically defined in the patent. Both parties urge the court to apply the ordinary meaning of the term but disagree as to what that is. Plaintiff urges the court to adopt the following definition of "coalescence":

"The process of forming a uniform, homogeneous body, or combining into one body or growing together, through the merger of smaller particles of the same material."

Plaintiff's Memorandum in Support of Markman Hearing ("Plaintiff's Brief"), pp. 17-18. Defendants urge the following definition of "coalescence": "the uniting together of plastic particles to form a layer." Defendants' Markman Brief ("Defendants' Brief"), p. 15.

There is no dispute that "coalescence" is a process, but the parties disagree as to what that process

encompasses. The parties illustrate their respective positions through reference to an illustration by defendants' expert, Paul Nugent. Plaintiff's Brief, p. 6; Defendants' Response Brief, Ex. 8, p. 4. The illustration shows plastic particulate adhering to the interior wall of a mold at seven successive stages. The parties agree that defendants' definition of "coalescence" corresponds to stages one though two or three, during which the particles form a layer on the interior wall of the mold or preceding layer. The caption under stage two is "Powder and Molten Layer," and the caption under stage three is "Uneven and Bubbles." The parties further agree that plaintiff's definition of "coalescence" corresponds to stages one through five, during which the particles form a smoother and denser layer then is present at the end of stage two or three. The caption under stage five is "Optimum." Stages 6 and 7 consist of undesirable over-curing.

The parties cite definitions from various sources in existence at the time the patent was issued to support their respective positions. Among these are the definitions of "coalesce" from: (1) *Webster's Third New International Dictionary* (1971), "1: to grow together ...: unite by growth into one body ... 2 a: to unite or join together into one body or product: become integrated into a whole"; (2) *The Phillips Petroleum Glossary of Plastic Terms,* 4th Ed. (1965), "[t]o combine into one body or to grow together"; (3) *The Random House Dictionary of the English Language,* 2nd Ed. (1987), "1. to grow together or into one body ... 2. to unite so as to form one mass, community, etc ... 3. to blend or come together ... 4. to cause to unite in one body or mass."

Plaintiff asserts that defendants seek to impose a limitation that is not supported by the definitions-specifically that "coalescence" does not include any part of the process after the particles have formed a layer. The definitions support plaintiff's position that "coalescence" may include the subsequent part of the process leading to a more homogeneous body, i.e., one that is more dense and smooth. Plaintiff's position is supported by the inclusion in the definitions of the concepts of growing together, integrating or blending into one body, mass or product.

The parties also rely on the prior art to support their respective positions, including patent No. 3,936,565 obtained by Elmer Good in 1976 for a molded plastic article and method ("the Good patent"). Among other instances, the Good patent uses the term "coalesce" in the following manner:

"During the rotation of the mold assembly, with the first charge of plastic material in the interior of the mold, the particles initially adhere to the heated mold surface, and thereafter *coalesce* into a continuous skin element which follows the contour of the interior of the mold. Thereafter, and in sequence and while the mold assembly is still within the heated oven the second charge of plastic is introduced in to the interior of the mold, and the rotation continued until the second material *coalesces* over the first. In the event that a third charge is used, the third charge is thereafter sequentially released to form the inner skin element."

First Lee Aff., Ex. E, p. 6, Col. 7, ll. 21-33 (emphasis supplied). The Good patent describes the particles as initially adhering to the heated mold surface and thereafter coalescing into a continuous skin element. That use supports plaintiff's position that "coalescence" encompasses more than the forming of a layer, because the Good patent describes coalescence to include the process following the particles adhering to the mold surface, *i.e.,* following their forming of a layer.

Likewise, the Good patent also provides:

"For purposes of explanation, and referring to FIG. *5b,* a point is reached during the processing of the first introduced plastic material in which a continuous skin 36 is formed on the interior wall 33 of the mold, and an assemblage of particles 32 is adhered to the continuous skin 36 but not yet *coalesced* since the heat transfer through the mold wall and the skin is a progressive transmission of heat."

Id. at Col. 7, ll. 60-67 (emphasis supplied). Here too the Good patent uses "coalescence" to include the process that follows the particles adhering the mold wall to form a layer. Figure *5b* shows particulate plastic

united to form a layer (32) over the continuous skin (36), and the description specifies that, at that point, the layer (32) has not yet coalesced. This supports plaintiff's position that "coalescence" is a process that includes more than the particles uniting to form a layer.

The parties also cite patent No. 3,455,483 obtained by P.A. Inklaar in 1969 for a "foam-sintering" molding process and products ("the Inklaar patent"). The Inklaar patent uses "coalesce" to describe a process that includes melting and fusion: "The finely divided thermoplastic material to be used is one that will coalesce into a fused layer or film by melting." First Lee Aff., Ex. R, p. 3, Col. 3, ll. 37-39. Likewise, the Inklaar patent also provides:

"while heating the mold externally at a temperature above the melting range of the material of the charge until the heat passed through the mold and by conduction from said surface has *coalesced* such particles into a shape-retaining coherent fused layer of required thickness over said surface ..."

First Lee Aff., Ex. R, p. 6, Col. 10, ll. 40-45. Here too the Inklaar patent uses "coalesced" to refer to a process that produces a "coherent fused layer of required thickness." Inklaar's usage supports plaintiff's position that "coalescence" includes the process beyond the formation of a layer, in which the layer becomes more homogeneous and smooth.

Also at issue is the meaning of "completion" as used in the phrase "completion of the coalescence" contained in Claims 1 and 9. Specifically, Claim 1 provides:

"removing the mold assembly from the oven for cooling prior to *completion of the coalescence* of said second charge;

"whereby the cooling of the mold assembly and the first layer is concurrent with *completion of the coalescence* of the second layer so as to shorten the elapsed time during the molding process."

First Lee Aff., Ex. J, p. 7, Col. 7, ll. 4-11 (emphasis supplied). Similarly, Claim 9 provides:

"removing the mold assembly from the oven prior to *completion of the coalescence* of the third charge;

"air cooling the mold assembly after removal of the mold assembly from the oven while continuing mold assembly rotation during continued coalescence of the third charge; and

"opening the mold assembly *after coalescence of the third charge is completed* while continuing to air cool the mold assembly so as to expose the mold cavity to cooling air."

Id. at Col. 8, ll. 37-47 (emphasis supplied). The meaning of "completion" is provided by dictionary definitions, since there is no indication that the ' 963 patent used the term in any sense other than its ordinary meaning. Thus, completion means: having all necessary parts, elements or steps; brought to an end; fully carried out. See First Lee Aff., Ex. X, p. 4.

In light of the intrinsic record and published definitions at the time of the invention, "coalescence" is the process of forming a uniform, homogeneous body, or combining into one body or growing together, through the merger of smaller particles of the same material. "Coalescence" is "complete" when it has all necessary parts, elements or steps, or is fully carried out.

This construction of "coalescence" and "completion of coalescence" is supported by the specification, which provides:

"Before *completion of coalescing* of the third charge as inside layer 16, the rotating mold assembly 22 is

removed from the oven 20 when door 32 is opened. Rotation continues in cooling area 30 as fans 34 blow air at mold assembly 22. During such early portion of the cooling time, the mold cavity remains closed and *coalescing of the third charge continues. Inside layer 16 formed by the coalescing third charge* will be intimately joined with insulating layer 14.

"When coalescing of the third charge is completed, the mold cavity is opened and rotation of mold assembly 22 continues as fans 34 continue to blow air on the assembly."

First Lee Aff., Ex. J, p. 6, Col. 6, ll. 3-16 (emphasis supplied). Here, inside layer (16) is described as being formed by the "coalescing" third charge. As such, it would be understood that "coalescence" is not complete merely because a layer has been formed. Furthermore, the specification teaches to open the mold cavity when coalescence of the third charge is complete. Under the construction urged by defendants, the specification would teach that the cavity should be opened for cooling when the inside layer consists of a powder and molten layer, or is uneven with bubbles, i.e., at stage two or three of the Nugent diagram. One of ordinary skill in the art would not understand that to mean that the mold cavity should be opened for cooling as soon as the particles had united to form a layer, because that would produce an unuseable part. Rather, one of ordinary skill in the art would understand that to mean that the mold cavity should be opened for cooling when the particulate had reached its optimum state, such that the inside layer is appropriately smooth and homogeneous, to produce a useable part.

Defendants cite portions of the specification to support that "coalescence" means only to unite to form layer. These include:

"the first charge will begin to melt and *coalesce* on the mold cavity wall to *form outer layer* 12 of the laminate.

"After *coalescing* of the first charge in this manner and before cross-linking of outer layer 12 is completed, the second charge will be released from the insulating box....

"After *coalescence* of the second charge *as insulating layer* 14, the third charge is released...."

First Lee Aff., Ex. J, p. 6, Col. 5, ll. 51-68 (emphasis supplied). Defendants argue that, because "coalesce" is repeatedly used in tandem with terms describing the formation of a layer, it means to form a layer. However, if that were the case, it would not be necessary to include the words of limitation about the formation of a layer because it would be implicit in the term "coalesce" itself. The more reasonable interpretation is that the words of limitation were included to direct the user to a specific point in the longer coalescence process, which is consistent with plaintiff's position that "coalescence" incorporates the process beyond the formation of a layer, to the point when the plastic reaches its optimum state.

In sum, "coalescence" is the process of forming a uniform, homogeneous body, or combining into one body or growing together, through the merger of smaller particles of the same material. "Coalescence" is "complete" when it has all necessary parts, elements or steps, or is fully carried out. The construction of these terms bears on the next major issue: what does the patent teach regarding when to release successive charges? This issue, which the parties refer to as the "sequencing of steps," is addressed below.

II. ***Sequencing of Steps***

Plaintiff maintains that the patent teaches to drop a subsequent charge sometime after the prior charge begins to coalesce. In contrast, defendants maintain that the patent teaches to drop a subsequent charge after the coalescence of the prior charge is complete. Plaintiff argues that one of ordinary skill in the art of rotational molding would understand that the time to release a subsequent charge depends upon the beginning of coalescence, creation of an insulating layer and the presence of sufficient heat to melt the next

charge. Plaintiff's position is supported by the fact that the patent does not explicitly state that a subsequent charge should be dropped after "completion of coalescence" of the prior charge, whereas the patent uses that phrase to control the sequence of other steps. For example, claims 1 and 9 use "completion of coalescence" as a point that controls the sequence of certain steps, specifically when to remove the mold from the oven (before completion) and when to open the mold cavity (after completion). Because the limitation "completion of coalescence" is used elsewhere in the patent, it is reasonable to assume that it would have been used to limit when to drop a subsequent charge if the patent was intended to teach that. However, there appears to be no such limitation.

Defendants rely heavily on Figure 1 of the '963 patent, arguing that it teaches that subsequent charges are to be dropped only upon completion of the coalescence of a preceding charge. *See* First Lee Aff., Ex. J, p. 2. While Figure 1 does use the word "after" in regard to coalescence, *e.g.,* "after initial charge has coalesced as outer layer," and "after particulate plastic charge No. 2 has coalesced as insulating layer," Figure 1 does not use the word "complete" or "completion." Given the restriction following "coalesced," which in each case describes generally the state of the prior layer, the figure does not unequivocally teach that coalescence of the prior layer must be complete before the subsequent charge is dropped. In other words, it is only necessary, for example, that the layer has coalesced to the point that it forms an appropriate outer layer. Defendants attempt to use Figure 1 to mandate a limitation where none is indicated, especially in light of the language of the specifications and claims. Furthermore, as discussed below, the patent prosecution history demonstrates that the specific state of the preceding layer was disclaimed. Consequently, the state of the preceding layer should not be applied as a limitation.

The issue of what state the preceding layer must be in before a subsequent charge is released was raised during the prosecution history. First Lee Aff., Ex. L, p. 4; Ex. O, p. 5; Ex. S, p. 2; Ex. U, p. 2. When confronted with the examiner's concern about lack of specificity as to the sequence for making the preceding layer, the applicant explained:

"it is of no moment that Claims 3 [which became Claim 1] and 10 [which became Claim 5] fail to recite the nature of the first outer layer formed in the process steps, and the process limitations necessary to form that layer. Applicant's invention is not the formation of that layer; rather it is the steps recited in the claims which feature removal of the mold from the oven at the times specified in those claims in order to yield shorter molding process times and eliminate warpage and other damage to the molded item during cooling."

First Lee Aff., Ex. P, pp. 8-9. Thus, any need to precisely define the steps of forming preceding layers was disclaimed, because it would be understood by one of ordinary skill in the art. Consequently, it would be incorrect to read into the claims, specifications or prosecution history any precision as to the sequence and timing of forming layers, including when charges are dropped. In other words the patent does not mandate that subsequent charges be dropped only upon completion of coalescence of the prior charge. Rather the decision of exactly when to release a subsequent charge was left to the user, as it would be understood by one of ordinary skill in the art.

Moreover, in the Further Description of Preferred Methods, the patent teaches to drop the second charge after the first charge begins to coalesce, not when coalescence is complete:

"When the temperature of the mold cavity wall rises to the melting point of the first charge, then the first charge will *begin to melt and coalesce* on the mold cavity wall to form outer layer 12 of the laminate.

"After coalescing of the first charge *in this manner* and before cross-linking of outer layer 12 is completed, the second charge will be released from insulating box 26 into the mold cavity while rotation of mold assembly 22 continues in oven 20. The temperature of outer layer 12 is high enough to start the melting of the second charge."

First Lee Aff., Ex. J, p. 6, Col. 5, ll. 49-60 (emphasis supplied). Likewise, as to dropping of the third charge, the patent teaches to do so when the second charge coalesces to become an "insulating layer," not when coalescence is complete. Id. at ll. 65-68. The time to drop the subsequent layer is based upon the temperature of the insulating layer being "high enough to start the melting of the third charge." Id. at Col. 6, ll. 1-2. During prosecution, the applicant explained that "specificity as to the formation of the insulating layer is not necessary since the insulating layer is naturally formed and the term 'insulating layer' was merely used as a handy reference to refer to the layer which has insulating properties." First Lee Aff., Ex. M, p. 7.

In light of the intrinsic evidence, including the patent prosecution history, defendants' argument-that the patent teaches to release successive charges only after coalescence of the prior layer is complete-must fail.

III. *Construction of "Air Cooling"*

The parties agree that "air cooling" means to reduce in temperature using air. See, Plaintiff's Brief, p. 4; Defendants' Brief, p. 23. The parties disagree as to whether the patent limits "air cooling" to a specific cycle in the process.

Defendants argue that the patent limits "air cooling" to a cycle that begins when the mold is opened and ends when the part is stripped from the mold. Plaintiff asserts that the patent contains no such limitation-that "air cooling" happens at any point that air is used to reduce the temperature of the mold assembly, the mold cavity or the molded part.

Claims 9 and 10 provide, in relevant part:

"air cooling the mold assembly after removal of the mold assembly from the oven while continuing mold assembly rotation during continued coalescence of the third charge; and

"opening the mold assembly after coalescence of the third charge is completed while continuing to air cool the mold assembly so as to expose the mold cavity to cooling air"

"The rotational molding method as in claim 9 wherein the air cooling step comprises blowing air against the mold assembly."

First Lee Aff., Ex. J, p. 7, Col. 8, ll. 39-49 (emphasis supplied). As such, the patent does not require that the mold assembly be open before "air cooling" begins. In fact, it expressly teaches the opposite-that air cooling begins when the assembly is removed from the oven, as it rotates during coalescence of the third charge, while the mold is still closed.

Furthermore, the claims contain no limitation that "air cooling" be completed before demolding begins. Defendants admit that the meaning of "air cooling" is to reduce in temperature using air, but then try to limit the term only to temperature reductions that occur after the mold is opened and before the part is stripped. There is no support for such a limitation in the patent.

CONCLUSION

In sum:

I. "Coalescence" is the process of forming a uniform, homogeneous body, or combining into one body or growing together, through the merger of smaller particles of the same material. "Coalescence" is "complete" when it has all necessary parts, elements or steps, or is fully carried out.

II. There is no limitation in the patent that coalescence of the prior layer must be complete before a

subsequent charge of particulate plastic is released.

III. "Air cooling" means to reduce in temperature using air. "Air cooling" is not limited only to temperature reductions that occur when the mold cavity is exposed to air. "Air cooling" may also occur when the mold assembly is removed from the oven and when the part is stripped from the mold.

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