IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

KX INDUSTRIES, L.P. and KOSLOW TECHNOLOGIES CORPORATION,	)	
Plaintiffs,	)	
v.	)	Civil Action No. 99-275-RRM
PUR WATER PURIFICATION PRODUCTS, INC.,	)	
Defendant.	)	

OPINION

Steven J. Balick, Esquire and Steven T. Margolin, Esquire, Ashby & Geddes, Wilmington, Delaware; Jeffrey I. D. Lewis, Esquire, Scott B. Howard, Esquire, Karla G. Sanchez, Esquire and Benjamin Levi, Esquire, Patterson, Belknap, Webb & Tyler LLP, New York, New York; counsel for plaintiffs.

Patricia Smink Rogowski, Esquire and Francis DiGiovanni, Esquire, Connolly Bove Lodge & Hutz LLP, Wilmington, Delaware; Peter M. Lancaster, Esquire, A. Marie Villafaña, Esquire and Robinson W. Clark, Esquire, Dorsey & Whitney LLP, Minneapolis, Minnesota; counsel for defendant.

Wilmington, Delaware

August 9, 2000

McKELVIE, District Judge

This is a patent case. Plaintiff KX Industries, L.P. is a Delaware limited partnership with its principal place of business in Orange, Connecticut. Plaintiff Koslow Technologies Corporation is a Connecticut corporation with its principal place of business in Orange, Connecticut. Koslow Technologies owns U.S. Patent No. 5,019,311 (the '311 patent) which describes a method for producing a composite material used in water filters. KX Industries is the exclusive licensee of the '311 patent. Defendant PUR Water Purification Products, Inc. is an Ohio corporation with its principal place of business in Cincinnati, Ohio.

On May 4, 1999, KX Industries and Koslow Technologies (collectively, "KXI") filed a complaint alleging that Recovery Engineering, Inc., a predecessor of PUR, infringes one or more claims of the '311 patent. Recovery answered the complaint on July 1, 1999, denying plaintiffs' allegation of infringement, asserting affirmative defenses of invalidity, prosecution history estoppel and unclean hands, and seeking a declaratory judgment of noninfringement and invalidity.

In November 1999, Proctor & Gamble Co. acquired Recovery and the parties substituted P&G as the defendant. On February 16, 2000, P&G amended its pleading to assert an additional defense and counterclaim of unenforceability of the '311 patent.

On March 6, 2000, P&G moved for a summary judgment that it does not infringe the claims of the '311 patent. On April 4, 2000, KXI filed a cross-motion for a summary judgment of infringement. The parties have completed briefing on the motions. On July 26, 2000, the court heard oral argument on the motions and held a

trial in accordance with Markman v. Westview Instruments, Inc., 517 U.S. 370 (1996), to construe disputed claims of the '311 patent. During the pretrial hearing on the same day, counsel for P&G stated that P&G had merged Recovery into a subsidiary called PUR Water Purification Products, Inc. The court substituted PUR as the defendant.

This is the court's construction of the disputed claims and its decision on the motions for summary judgment.

I. FACTUAL AND PROCEDURAL BACKGROUND

The court draws the following facts from the affidavits and documents submitted by the parties and from the prosecution history of the '311 patent.

A. The Parties

1. Plaintiffs

Koslow Technologies owns the '311 patent and KX Industries is the exclusive licensee of the patent. KX Industries designs, manufactures and sells carbon blocks used in residential and commercial water filters. Dr. Evan E. Koslow is the inventor of the '311 patent. Koslow is also the founder and chief executive officer of KX Industries and the founder and president of Koslow Technologies.

2. Defendant

Defendant PUR is a subsidiary of P&G. PUR manufactures carbon blocks used in water purification products. PUR manufactures its carbon blocks through a compression molding process called the Omega Machine.

B. General Description of the Technology

The technology at issue relates to a method for producing composite materials such as carbon block filters that are used in water filtration products. Carbon block filters are solid filters that use carbon to remove particulate and chemical impurities from water. They are made of granular activated carbon and a plastic binder material that has a lower softening temperature than carbon. Carbon block can be produced using a variety of processing techniques including extrusion and compression molding.

In extrusion, a powdered mixture of carbon and binder is forced through a die in the same way dough is pushed through a die in a pasta maker. In compression molding, a powdered mixture of carbon and binder is placed in a metal mold. In both processes, the carbon and binder particles are subjected to heat, pressure and shear. The structure of the composite material produced in each process varies depending on how the heat, pressure and shear are applied to the particles.

One method of producing a structure containing immobilized carbon particles is disclosed in U.S. Patent No. 4,664,683 ("Degen") which issued to Peter J. Degen and Thomas C. Gsell on May 12, 1987. According to Degen, low levels of compression may be applied to the mixture before or during heating. The specification of Degen provides that "[p]ressures in the range of up to the crush strength of the carbon, which is about 400 psi, are suitable although, from a practical perspective, pressures up to about 40 psi are preferred and from about 0.3 to about 10 psi are most preferred."

C. Prosecution of the ’311 Patent

Koslow invented a method for producing a composite material characterized by a continuous webbing structure or forced point-bonds. Koslow’s method can be used with a variety of processing techniques including extrusion and compression molding. Koslow distinguished his invention from Degen and other prior art methods based on his adjustments to the operating conditions affecting the application of heat, pressure and shear. Koslow states in the specification of the ’311 patent that his invention is faster than the prior art methods. In addition, he states that the “unique structures” created with his invention can be used for a wider range of applications.

1. Application of December 22, 1989

On December 22, 1989, Koslow applied to the U.S. Patent and Trademark Office (“PTO”) for a patent claiming a method of producing a composite material that is characterized by a continuous webbing structure or forced point-bonds. The application was a continuation of a February 23, 1989 parent application that was subsequently abandoned. As it was originally submitted, the application for the ’311 patent contained 207 claims. Claim 170 is the only independent claim that is relevant to the present dispute. Throughout this opinion, the court will refer to the claim as Claim 94, the number of the claim as it issued in the ’311 patent.

Claim 94 describes a four-step method for producing a composite material characterized by a continuous webbing structure or forced point-bonds: (1) mixing the

primary and binder particles; (2) heating the mixture; (3) applying pressure and shear to the mixture; and (4) rapidly cooling the mixture to obtain the desired structure. While the four-step method is generally applicable in a variety of conventional processing techniques, the specification identifies certain variations for extrusion and compression molding.

a. Mixing the Primary and Binder Materials

The first step in the method disclosed by the '311 patent is to thoroughly mix together the binder and primary particles. The pertinent language from Claim 94 reads as follows:

> combining the first and second quantities of particles in a substantially uniform mixture wherein said binder material is present in an amount of at least about 3% by weight of the mixture;

The specification discloses that this step is "important to insure that the binder is sufficiently evenly distributed throughout the primary particles that, upon later conversion, it will entrap or bond to substantially all of them."

b. Heating the Mixture

The second step in the claimed method is to heat the mixture to a temperature substantially above the softening temperature of the binder particles but below the softening temperature of the primary particles. The specification discloses that this heating step occurs "in the absence of pressure or shear sufficient to convert the binder particles." The pertinent language from Claim 94 reads as follows:

> heating said substantially uniform mixture, in the absence of pressure or shear sufficient to convert the binder particles, to a temperature substantially above the softening temperature of said binder material but to a temperature less than the softening temperature of said primary material;

The specification states that heat is applied after the mixing step, "preferably in the absence of any significant pressure or shear . . . ." The specification also provides, however, that in a compression molding process, no pressure is applied during the heating step. The specification reads as follows:

> During heating [in a compression molding process], no pressure is applied and no effort is made to consolidate the powder. The powder must be at the desired temperature before pressure and shear are applied. Once the powder has reached the desired temperature, the mold is closed and brought to high pressure as quickly as possible.

c. Applying Pressure and Shear

The third step is to apply pressure and shear to the mixture to convert at least a portion of the binder material into a continuous web between the primary particles. The specification discloses that the pressure must be "sufficient to 'activate' the binder and is applied only after reaching the necessary temperature" mentioned in step two. The pertinent language from Claim 94 reads as follows:

> thereafter applying pressure and shear to the heated mixture sufficient to substantially immediately convert at least a portion of the binder material particles into a substantially continuous webbing structure or cause forced point-bonding of the particles of the primary material by the binder material;

In the specification of the '311 patent, Koslow distinguishes his invention from Degen. Koslow states that the level of pressure applied in Degen is "exceedingly low" compared

to the level of pressure applied in his invention. The specification provides:

> The levels of compression disclosed by Degen et al. are exceedingly low, 0.3-10 psi . . . most preferred maximum 40 psi . . . . Accordingly, it describes process conditions well outside the range of compression utilized in the present invention, which would be 400-1000 psi . . . for granular materials . . . and approximately 8,000 psi . . . or more for powders . . . . Without such higher pressures, the binder resins are not activated and the novel structures produced by the current invention are not obtained.

d. Rapidly Cooling the Mixture

The fourth step in the claimed method is to rapidly cool the mixture to a temperature below the softening point of the binder to stabilize the structure once it is formed. The pertinent language from Claim 94 reads as follows:

> substantially immediately after formation of said binder particles into a webbing structure or forced point-bonds, rapidly cooling said mixture to below the melting point of the binder material to retain said converted binder material in its continuous webbing structure or forced point-bonded condition to produce the composite material.

In the specification, Koslow states that the mixture is "relatively quickly cooled." In describing the method used in a compression molding process, however, the specification provides that "[o]nce the desired pressure has been achieved, the pressure is removed and the part is allowed to cool as quickly as possible."

e. Continuous Webbing Structure or Forced Point-Bonds

The four-step method described in the '311 patent produces a composite material characterized by either a continuous webbing structure or forced point bonds. The specification defines a "continuous webbing structure" as a permeable structure with

"large volumes of pores filled with air or other atmospheric gas." The specification defines "forced point-bonds" as "adhesive-like bonds between the particles caused by the melting of the binder resin and squeezing this material to a point insufficient to consolidate into a continuous web."

The specification states that either structure can result from the method disclosed in the patent depending on the level of pressure and shear applied to the carbon and binder mixture. Koslow explains the difference between a continuous webbing structure and forced point-bonds as follows:

> In many cases involving porous materials such as activated carbon, activated aluminas, and similar porous adsorbents, the binding agent is forced into the macropores and exterior voids of the individual particles to form physical connections between particles. This 'forced point-bonding" (FPB) results in structures that are generally more fragile than those having the continuous web matrix structure.

2. Notice of Allowability

On July 25, 1990, the PTO allowed Claims 1-86, 166-182, 192-205 and 207 of the application. The claims were re-numbered 1-118.

3. Issuance of the '311 Patent

On May 28, 1991, the PTO issued the '311 patent to Koslow Technologies as assignee of the inventor, Koslow. The '311 patent is entitled "Process for the Production of Materials Characterized by a Continuous Web Matrix or Force Point Bonding." Claim 94 describes a method for producing a composite material which has either a continuous webbing structure or forced point-bonds. Claim 94 reads as follows:

94. A method of forming a composite material which comprises:
providing a quantity of first particles of a binder material, said first particles having diameters between about 0.1 and about 150 micrometers;
providing a quantity of second particles of a primary material having a softening temperature substantially greater than the softening temperature of said binder material, said second particles having diameters between about 0.1 and about 3,000 micrometers;
combining the first and second quantities of particles in a substantially uniform mixture wherein said binder material is present in an amount of at least about 3% by weight of the mixture;
heating said substantially uniform mixture, in the absence of pressure or shear sufficient to convert the binder particles, to a temperature substantially above the softening temperature of said binder material but to a temperature less than the softening temperature of said primary material;
thereafter applying pressure and shear to the heated mixture sufficient to substantially immediately convert at least a portion of the binder material particles into a substantially continuous webbing structure or cause forced point-bonding of the particles of the primary material by the binder material; and
substantially immediately after formation of said binder particles into a webbing structure or forced point-bonds, rapidly cooling said mixture to below the melting point of the binder material to retain said converted binder material in its continuous webbing structure or forced point-bonded condition to produce the composite material.

Claim 95, which is dependent on Claim 94, discloses the same process wherein the resulting composite material is characterized only by forced point-bonds. Claim 95 reads as follows:

95. The method of Claim 94 wherein the pressure applied causes forced point-bonding of the particles of primary material by the binder material.

D. The Accused Device

PUR manufactures carbon block filters for its water purification products using a compression molding process called the Omega Machine. PUR submitted the affidavits of Ronald Westby, the designer of the Omega Machine, and Richard Hembree, Vice President of Engineering at PUR, to describe the method used in the Omega Machine.

According to Hembree and Westby, the carbon and binder mixture is first deposited into a compression cavity in the Omega Machine. Pressure levels of 60 to 90 psi are applied to the mixture, which results in effective pressures from 95 psi to 140 psi. Next, the mixture is heated for a maximum of five seconds. According to Hembree, the pressure remains constant throughout the heating process. Finally, the mixture is allowed to cool in the mold for 20 to 60 seconds. Hembree states that "no additional substance or process is applied to the mixture in order to force it to cool rapidly."

E. The Lawsuit

On May 4, 1999, KXI filed a complaint alleging that the Omega Machine infringes Claims 94, 95, 96 and 102 of the '311 patent.[1] PUR's predecessor, Recovery, answered the complaint on July 1, 1999, denying plaintiffs' allegation of infringement, asserting affirmative defenses of invalidity, prosecution history estoppel and unclean

[1] At the pretrial conference, KXI stated that it was dropping Claim 94 from the case. However, PUR contends that Claim 94 is still in the case because of its counterclaim for invalidity. The court reserved decision on the issue pending further briefing by the parties.

hands, and seeking a declaratory judgment of noninfringement and invalidity. On February 16, 1999, the defendant amended its pleading to assert an additional defense and counterclaim of unenforceability of the ’311 patent.

On March 6, 2000, PUR moved for a summary judgment that it does not infringe the asserted claims of the ’311 patent. According to PUR, the claims require: (1) heating in the absence of pressure or shear; (2) applying pressure greater than 400 psi after the heating step; and (3) rapidly cooling the mixture. PUR contends that summary judgment is appropriate in this case because the Omega Machine does not contain any of these three limitations.

On April 4, 2000, KXI filed a cross-motion for a summary judgment of infringement. KXI argues that the Omega Machine infringes the claims of the ’311 patent because: (1) PUR does not apply sufficient pressure and shear to convert the binder until after the mixture has been heated above the softening temperature of the binder; (2) PUR applies pressure in excess of 40 psi; and (3) PUR cools its structure in a sufficiently short time to prevent degradation of the forced point-bonds. KXI submitted the expert reports of Professor Tim A. Osswald, Ph.D. and Professor Linn Hobbs. Osswald and Hobbs conclude that the Omega Machine infringes the asserted claims of the ’311 patent.

II. DISCUSSION

To determine whether PUR infringes the claims of the '311 patent, the court performs a two-step analysis. Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995). First, the court construes the claims of the patents. Id. at 976. Second, the court compares the properly construed claims of the patents to the accused products to determine whether all of the limitations of the claims are present. Id. Where the parties do not dispute relevant facts regarding the accused products, but disagree over which of two possible meanings of a claim is the proper one, the question of patent infringement collapses to one of claim construction and is thus amenable to summary judgment. Athletic Alternatives, Inc. v. Prince Mfg., Inc., 73 F.3d 1573, 1578 (Fed. Cir. 1996).

A. Claim Construction of the '311 Patent

Claims are construed from the vantage point of a person of ordinary skill in the art at the time of the invention. Markman, 52 F.3d at 986. In construing a claim, a court looks to the intrinsic evidence of record, namely, the claims, the specification and the prosecution history. Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1309 (Fed. Cir. 1999).

The starting point in claim construction is the words of the claims themselves. Id. Words in the claims are generally given their ordinary and customary meaning unless a patentee clearly sets forth a different definition in the specification or file history.

Vitronics Corp. v. Conceptronics, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996). Thus, the claims must also be read in view of the specification, of which they are a part. Markman, 52 F.3d at 979. As the Federal Circuit has stated:

> The specification contains a written description of the invention which must be clear and complete enough to enable those of ordinary skill in the art to make and use it. Thus, the specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.

Vitronics, 90 F.3d at 1582. In addition, the prosecution history is often of critical significance in determining the meaning of the claims. See Markman, 52 F.3d at 980 ("The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.").

Although the Federal Circuit has held that claims should be read in view of the specification and the prosecution history, the court has repeatedly cautioned against limiting the scope of a claim to the preferred embodiment or specific examples disclosed in the specification. See, e.g., Ekchian v. Home Depot, Inc., 104 F.3d 1299, 1303 (Fed. Cir. 1997); Intervet America, Inc. v. Kee-Vet Laboratories, Inc., 887 F.2d 1050, 1053 (Fed. Cir., 1989) ("[L]imitations appearing in the specification will not be read into claims, and . . . interpreting what is meant by a word in a claim 'is not to be confused with adding an extraneous limitation appearing in the specification, which is improper.'") (citation omitted).

In March 1999, this court construed the claims of the '311 patent during an infringement action filed by KX Industries and Koslow Technologies against Culligan Water Technologies, Inc. KX Indus., L.P. v. Culligan Water Techs., Inc., 46 F. Supp.2d 308, corrected 90 F. Supp.2d 461 (D. Del. 1999) (hereinafter, Culligan). While the court's previous opinion does not have issue preclusive effect against PUR in this case, to the extent the parties do not raise new arguments, the court will defer to its previous construction of the claims. See Markman v. Westview Instr., Inc., 517 U.S. 370, (1996) (holding that issue preclusion cannot be asserted against new defendants but noting that generally, stare decisis should promote uniformity in the claim construction of a given patent).

1. "heating . . . in the absence of pressure or shear sufficient to convert the binder particles"

KXI contends that the phrase "heating . . . in the absence of pressure or shear sufficient to convert the binder particles" allows the application of some pressure or shear while the mixture is being heated. Therefore, according to KXI, pressure or shear can be applied to the mixture during heating. KXI argues that the only limitation of the phrase is that any pressure or shear applied during heating must not be sufficient to convert the binder particles into the continuous web matrix or forced point-bonds. KXI states that the court adopted its proposed construction of this phrase in Culligan.

For the most part, PUR appears to agree with KXI that the phrase "heating . . . in the absence of pressure or shear sufficient to convert the binder particles" allows the

application of some pressure or shear during heating. In a compression molding process, however, PUR contends that no pressure or shear is applied during the heating step. In describing how the invention is used in compression molding, the specification states that "[d]uring heating, no pressure is applied and no effort is made to consolidate the powder. The powder must be at the desired temperature before pressure and shear are applied."

In Culligan, the court found that "heating . . . in the absence of pressure or shear sufficient to convert the binder particles" allows some pressure or shear to occur during the heating step. In that case, however, it was not necessary for this court to decide whether Koslow disclaimed applying pressure or shear during heating in compression molding because both KXI and Culligan used extrusion processes. Thus, in its claim construction in Culligan, the court did not rely on the statement in the specification cited by PUR in this case because that statement was made in the context of a discussion of compression molding.

The court finds, as it did in Culligan, that "heating . . . in the absence of pressure or shear sufficient to convert the binder particles" allows some pressure or shear to occur during the heating step. Accordingly, the court construes the phrase to mean that any pressure or shear applied to the mixture during heating must not be sufficient to convert the mixture into a continuous webbing structure or forced point bonds. In compression molding, however, the court agrees with PUR that Koslow disclaimed

applying any level of pressure or shear during heating. See Southwall Tech., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1576 (Fed. Cir. 1995) ("The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.").

2. "heating . . . to a temperature substantially above the softening temperature of said binder material"

KXI and PUR agree, as does the court, that the phrase "heating . . . to a temperature substantially above the softening temperature of said binder material" should be construed in this case the same way the phrase was construed in Culligan. Therefore, the court finds that "heating . . . to a temperature substantially above the softening temperature of said binder material" means heating to a temperature sufficiently above the softening temperature of the binder to allow conversion of the binder to a continuous web matrix or forced point bonds.

3. "thereafter applying pressure and shear to the heated mixture"

KXI contends that the phrase "thereafter applying pressure and shear to the heated mixture" requires the application of pressure and shear sufficient to convert the binder after at least a portion of the binder has been heated to a temperature substantially above its softening temperature. KXI argues that the pressure and shear may be applied even if the entire mixture has not been heated to a temperature above the softening temperature of the binder.

PUR counters that the phrase "thereafter applying pressure and shear to the heated mixture" in a compression molding process means that pressure is applied only after the prior heating step. PUR argues that the plain language of the phrase reiterates the fact that heating occurs before the maximum levels of pressure or shear are applied. According to PUR, "the heating without pressure step followed by the 'thereafter' pressurizing step thus requires at least an increase in pressure between the heating and pressurizing phases, such that the level of pressure is great enough to 'convert' the mixture after but not before or during heating."

The court finds, as it did in Culligan, that the phrase "thereafter applying pressure and shear to the heated mixture" means that the pressure and shear sufficient to convert at least a portion of the binder material occurs after the entire mixture has been heated to a temperature above the softening temperature of the binder material.

4. "pressure . . . sufficient to substantially immediately convert at least a portion of the binder material"

KXI and PUR disagree over how much pressure is "sufficient to substantially immediately convert at least a portion of the binder material." Based on the court's claim construction in Culligan, KXI contends that the claims require pressure greater than 40 psi. PUR counters that the pressure must be greater than 400 psi.

In the specification of the '311 patent, Koslow distinguishes his invention from Degen. Koslow explains that his invention applies pressures in excess of 400 psi while Degen applies "exceedingly low" pressures, "most preferred maximum 40 psi." The

pertinent section of the specification of the ’311 patent reads as follows:

> The levels of compression disclosed by Degen et al. are exceedingly low, 0.3-10 psi . . . most preferred maximum 40 psi . . . . Accordingly, it describes process conditions well outside the range of compression utilized in the present invention, which would be 400-1000 psi . . . for granular materials . . . and approximately 8,000 psi . . . or more for powders . . . . Without such higher pressures, the binder resins are not activated and the novel structures produced by the current invention are not obtained.

On its face, the language of the specification supports both KXI’s position that Koslow disclaimed pressures below 40 psi and PUR’s position that Koslow disclaimed pressures below 400 psi.

The specification of Degen states that “[p]ressures in the range of up to the crush strength of the carbon, which is about 400 psi, are suitable although, from a practical perspective, pressures up to about 40 psi are preferred . . . .” Thus, while Degen teaches that pressures below 40 psi are preferred, Degen discloses that the claimed invention may work with pressures up to 400 psi.

In Culligan, this court stated that “Koslow disclaimed using pressures below 40 psi in the claimed invention.” The opinion published in the Federal Supplement, 2d series, however, states that “Koslow disclaimed pressures below 400 psi.” Culligan, 46 F. Supp.2d 308, 338 (D. Del. 1999). KXI argues that the “400 psi” in the published opinion is a typographical error which West Publishing corrected in a subsequent revised opinion. See Culligan, 90 F. Supp.2d 461, 491 (D. Del. 1999). PUR counters that the “400 psi” appearing in the original published opinion is correct.

After reviewing Degen and the specification of the '311 patent, the court finds that its earlier opinion in Culligan about the scope of Koslow's disclaimer was wrong. Degen covers pressures up to 400 psi. Koslow distinguished his invention from Degen on the basis that his invention applies pressures greater than 400 psi. Therefore, the court agrees with PUR that Koslow disclaimed using pressures below 400 psi in the claimed invention. See Southwall, 54 F.3d at 1576.

5. "shear . . . sufficient to substantially immediately convert at least a portion of the binder material"

KXI contends that the phrase "shear . . . sufficient to substantially immediately convert at least a portion of the binder material" requires some movement of particles relative to each other after the mixture has been heated to a temperature substantially greater then the softening temperature of the binder. PUR counters that the phrase refers to shear that exceeds the level of shear that is inevitable in any compression molding process, such as the process disclosed in Degen.

After reviewing the specification, the court finds that the phrase, "shear . . . sufficient to substantially immediately convert at least a portion of the binder material" should be construed according to its plain meaning. See Vitronics, 90 F.3d at 1582 (holding that words in the claims are generally given their ordinary and customary meaning unless a patentee clearly sets forth a different definition in the specification or file history). Koslow did not clearly set forth an alternative definition in the specification or file history. Therefore, the court will adopt the existing language of the claim.

6. "continuous webbing structure"

KXI and PUR apparently agree, as does the court, that the phrase "continuous webbing structure" should be construed in this case the same way the phrase was construed in Culligan. Therefore, the court finds that "continuous webbing structure" means a thin, substantially continuous film or "web" which may have a large volume of pores or voids, and which has the purpose to create a self-supporting structure for the primary materials, and which is convertible into fibers.

7. "forced point-bonding"

KXI contends that the phrase "forced point-bonding" means two or more primary particles joined together by an adhesive where the binder has been forced under pressure into some of the primary particle's macropores or exterior voids. PUR counters that "forced point-bonding" means two or more primary particles joined together by an adhesive. PUR states that the court adopted its proposed construction of the phrase in Culligan.

The specification of the '311 patent states that forced point-bonding materials have "adhesive-like bonds between the particles caused by the melting of the binder resin and squeezing this material to a point insufficient to consolidate into a continuous web." The specification also explains forced point-bonding as follows:

> In many cases involving porous materials such as activated carbon, activated aluminas, and similar porous adsorbents, the binding agent is forced into the macropores and exterior voids of the individual particles to form physical connections between particles. This 'forced point-bonding"

(FPB) results in structures that are generally more fragile than those having the continuous web matrix structure.

Based on this language in the specification, the court agrees with KXI that "forced point-bonding" means two or more primary particles joined together by an adhesive where the binder has been forced under pressure into some of the primary particle's macropores or exterior voids.

8. "rapidly cooling"

KXI contends that "rapidly cooling" means cooling the mixture to below the melting point of the binder material in a sufficiently short enough time to prevent deterioration of the bonds. PUR counters that "rapidly cooling" means cooling as quickly as possible and that the cooling step must commence after heat and pressure form the continuous web matrix or forced point-bonds.

In this case, the court finds, as it did in Culligan, that "rapidly cooling" means cooling the mixture to below the softening temperature of the binder material in a sufficiently short enough time to prevent deterioration of the bonds.

B. Motion for Summary Judgment

Summary judgment is appropriate when the "pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56.

[T]he plain language of Rule 56(c) mandates the entry of summary

> judgment, after adequate time for discovery and upon motion, against a party who fails to make a showing sufficient to establish the existence of an element essential to that party's case, and on which that party will bear the burden of proof at trial.

Celotex Corp. v. Catrett, 477 U.S. 317, 322 (1986). The moving party bears the initial burden of demonstrating the absence of material issues of fact. Id. at 323. When deciding a motion for summary judgment, the court views the facts, and all permissible inferences from those facts, in the light most favorable to the non-moving party. Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 587-88 (1986). To establish that it is entitled to a summary judgment of noninfringement, PUR has the burden of demonstrating that the accused process does not contain all of the limitations of the claims either exactly or by substantial equivalent. See Glaxo, Inc. v. Novopharm, Ltd., 110 F.3d 1562, 1566 (Fed. Cir. 1997). If any of the claim limitations is absent from PUR's process, there can be no infringement, either literally or under the doctrine of equivalents. Dolly, Inc. v. Spalding & Evenflo Cos., 16 F.3d 394, 397 (Fed. Cir. 1994).

In this case, PUR contends that it is entitled to a summary judgment that it does not literally infringe the claims of the '311 patent because the Omega Machine does not contain the limitations set forth in the asserted claims. Specifically, PUR argues that summary judgment is appropriate because the Omega Machine (1) does not heat in the absence of pressure or shear; (2) does not "thereafter" apply pressure greater than 400 psi; and (3) does not "rapidly cool."

KXI counters that the court should grant its cross-motion for a summary judgment of literal infringement because: (1) PUR does not apply sufficient pressure and shear to convert the binder until after the mixture has been heated above the softening temperature of the binder; (2) PUR applies pressure in excess of 40 psi; and (3) PUR cools its structure in a sufficiently short time to prevent degradation of the forced point-bonds. In the alternative, KXI argues that there are genuine issues of material fact that preclude the entry of summary judgment in favor of PUR.

The court finds that three controlling facts in this case are undisputed. First, PUR uses a compression molding process. Second, PUR applies some pressure and shear during heating. Third, PUR applies pressures from 60 to 90 psi. Based on the court's construction of the disputed claim terms, a compression molding process does not literally infringe the asserted claims of the '311 patent if pressure and shear are applied during heating. In addition, an accused process does not literally infringe the asserted claims if the pressure applied is below 400 psi. Based on the undisputed facts in this case, the court finds that no reasonable jury could conclude that PUR's Omega Machine literally infringes the asserted claims of the '311 patent.

Furthermore, the court finds that KXI is estopped from arguing infringement under the doctrine of equivalents. Prosecution history estoppel bars a patentee from recapturing through equivalence certain coverage disclaimed during prosecution. Hilgraeve Corp. v. McAfee Assoc., Inc., 2000 WL 1059659, at *6 (Fed. Cir. Aug. 2,

2000). In Hilgraeve, the U.S. Court of Appeals for the Federal Circuit affirmed the district court's finding that prosecution history estoppel barred Hilgraeve from arguing that McAfee's VirusScan product infringed any claim of the patent under the doctrine of equivalents. The Federal Circuit stated that by limiting its claims to "screening before storage," Hilgraeve surrendered the possibility of infringement by equivalence of any product that screens after storage. Id.

In this case, the specification of the '311 patent clearly states that no pressure or shear are applied during heating in a compression molding process. In addition, the specification disclaims applying pressures below 400 psi. Because the patentee set forth clear limitations in the specification, KXI may not now argue that an accused device which lacks those limitations is equivalent. See id. Therefore, the court will grant PUR's motion for a summary judgment of no infringement under the doctrine of equivalents.

The court will enter an order in accordance with this opinion.