

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

CHEESE SYSTEMS, INC.,

Plaintiff,

v.

TETRA PAK CHEESE AND POWDER
SYSTEMS, INC. and TETRA LAVAL
HOLDINGS & FINANCE S.A.,

Defendants,

v.

CUSTOM FABRICATING & REPAIR, INC.

Third Party Defendant.

In this civil action, plaintiff Cheese Systems, Inc., seeks a declaration that its “high solids cheese vat” does not infringe United States Patent No. 5,985,347 (the ‘347 patent) and that the ‘347 patent is invalid. Defendants Tetra Pak Cheese and Powder Systems, Inc. and Tetra Laval Holdings & Finance S.A. (whom I will refer to hereafter simply as defendant, because their interests in this case are identical) allege in their counterclaim that plaintiff and third-party defendant Custom Fabricating & Repair, Inc. willfully infringed the

‘347 patent.

Now before the court are the parties’ cross-motions for summary judgment, dkt. #56; dkt. #62, and defendant’s motion to strike portions of plaintiff’s experts’ declarations. Dkt. #71. I will grant defendant’s motion for summary judgment on infringement because I conclude that plaintiff’s cheese vat practices all elements of claims 1 and 10 of the ‘347 patent or their equivalent. I will also grant defendant’s motion for summary judgment on invalidity, because plaintiff has failed to show that the ‘347 patent is indefinite, was anticipated by prior art or was obvious in light of prior art.

MOTION TO STRIKE

Defendant filed a motion to strike portions of declarations from plaintiff’s experts as untimely and outside the scope of their reports. Dkt. #71. Consistent with the pretrial conference order, the parties exchanged opening expert reports on October 21, 2011 and responsive reports on November 21, 2011. Plaintiff submitted reports on invalidity by Jeffrey Jay, John Zirbel and Dr. Robert Bradley and reports on infringement by Jay, Zirbel and Timothy Isenberg. Defendant later deposed Jay and Zirbel and asked them about the limits of their reports. Defendant also filed an interrogatory asking plaintiff to define the legal and factual basis for its noninfringement contentions. In its supplemental response, plaintiff answered without objection and referred only to its three original infringement

reports.

On January 23, 2012, plaintiff filed separate declarations by Jay and Zirbel in support of its motion for summary judgment. Jay's declaration, dkt. #60, contains the following opinions and arguments not contained in his prior report:

- Paragraph 18 defines the person of ordinary skill in the art;
- Paragraphs 20 through 25 offer two and half pages of analysis of Austrian Patent No. 384,523 ("AT '523 patent"), but his report contained a single paragraph of analysis with no citations to the patent, dkt. #60-1, at 6;
- Paragraphs 36, 37 and 38 offer opinions that the axes of plaintiff's vat are angled with respect to the ground

In addition, plaintiff has filed a supplemental declaration from Jay, dkt. #86, in which Jay avers that he has read a translation of the AT '523 patent for the first time and it confirms his prior conclusions. The Zirbel declaration includes similar opinions not presented earlier that plaintiff's vat is tilted. Dkt. #61, at ¶¶ 36, 38 and 39. In addition, plaintiff did not advance this theory of non-infringement in its Rule 26(a) reports or its supplemental interrogatory response.

Plaintiff offers no excuse for its untimely disclosures, and its arguments that they are not prejudicial are unconvincing. I will grant defendant's motion to strike these paragraphs from the declarations. Fed. R. Civ. P. 37(c)(1); David v. Caterpillar, Inc., 324 F.3d 851, 857 (7th Cir. 2003). I will not consider proposed facts resting on these opinions. However,

insofar as these opinions rely on legal or common sense arguments that plaintiff has also made in its briefs, I will address them in the opinion.

Defendant also argues that Jay has attempted to bolster his conclusions about U.S. Pats. Nos. 5,513,559 and 5,606,907 with new arguments, set out in paragraphs 8, 9, 10 and 12-14 of his declaration. Dkt. #60. In particular, Jay states for the first time that the panels could be rearranged by “flipping over” the panels on one shaft. Jay’s declaration is more specific than his reports about how to rearrange the panels and it mentions a figure that was not discussed explicitly in his report. However, his report conveyed the substance of his opinion about these two patents and gave sufficient notice of his reasoning to allow defendant to challenge his opinions. Meyers v. National Railroad Passenger Corp., 619 F.3d 729, 734 (7th Cir. 2010) (“The purpose of the report is to provide adequate notice of the substance of the expert's forthcoming testimony and to give the opposing party time to prepare for a response.”). Therefore, I will deny the motion to strike these paragraphs.

Form the parties’ proposed findings of fact, I find the following facts material and undisputed.

UNDISPUTED FACTS

A. The Parties

Defendant Tetra Pak is a Delaware corporation with its principal place of business

in Minnesota. Tetra Pak designs, manufactures and sells cheese processing technology, including vertical and horizontal cheese vats as well as dual-shaft horizontal cheese vats. Defendant Tetra Laval is a corporation organized under the laws of Switzerland with its principal place of business in Pully, Switzerland.

Plaintiff Cheese Systems, Inc. is a Wisconsin corporation with its principal place of business in Marshfield, Wisconsin. It designs equipment for cheese processing, including the accused product called the “high solids cheese vat.” Third-party defendant Custom Fabricating & Repair, Inc. is a Wisconsin company with its headquarters in Marshfield, Wisconsin. It manufactures the high solids cheese vats for plaintiff.

B. Background Regarding Cheese Vats

Cheese vats are large containers in which milk and additives are processed into cheese by a process of heating, cooling, cutting and stirring. As the milk coagulates, it forms a semi-solid mass called coagulum. Cheese vats may be open or enclosed and horizontal or vertical. Open vats use overhead stirring mechanisms with distinct cutting and stirring equipment. Enclosed vats use agitators that serve both cutting and stirring functions. Enclosing the vats increases efficiency by retaining heat and reducing the potential for contamination.

Horizontal and vertical vats are distinguished by the orientation of their axes. The axes of a horizontal vat extend horizontally, although many horizontal vats are installed with

a slight tilt toward one end so the contents can be drained more easily during the cheese making process. The angle is achieved by placing the vat on a stand with longer legs at one end than the other.

The '347 patent was prosecuted between 1998 and 1999. At that time, cheese producers used vertical and horizontal enclosed vats with one or two shafts. The vertical vats were effective for small vessels but lost efficiency as their size increased because they needed to create vertical movement. The horizontal vats with one shaft caused less damage to the cheese curds and retained more fat but had a major drawback: the contents tended to move away from the cutting blades. Increasing the cutting velocity diminished this problem but also caused more damage to the curd. Some horizontal vats had two parallel shafts that rotated in the same direction, either clockwise or counterclockwise. These vats had panels mounted on the shaft for cutting, stirring and mixing the cheese curd and whey.

C. The Jay Patents

Jeffrey L. Jay is the sole inventor of three prior art patents, all issued on February 5, 1991. All three were disclosed to the examiner during the prosecution of the '347 patent and discussed in the background section of the '347 patent.

U.S. Pat. No. 4,989,504 (the Jay '504 patent) was issued to Jay and assigned to a predecessor of defendant Tetra Pak. It describes a horizontal cheese vat with two shafts on

which a series of distinct “paddles” are attached in staggered rows or in a row wrapped spirally around the shaft. The distance between the shafts is greater than the length of the paddles. The side frames of each paddle may have a slight angle. With respect to the orientation of the paddles, the Jay ‘504 patent states:

[t]he blades are sharpened on one side only and fixed in such a way that if the shaft is rotated in one direction then the sharp edges of the blades will be presented to the food product and cutting will take place; whereas, if the shaft is rotated in the other direction the blunt side of the blades will be presented to the food product and stirring will take place.

Jay ‘504 pat., dkt. #32-2, at col. 2, lns. 45-52.

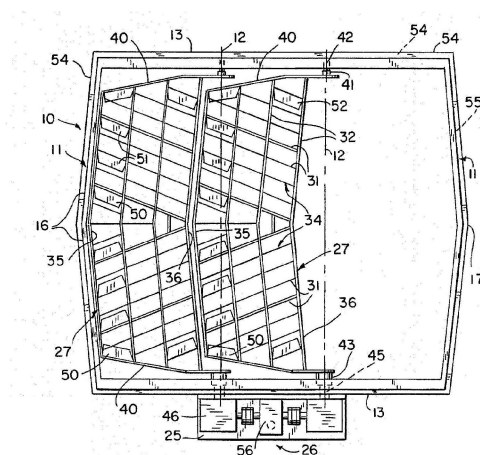
The claims of the Jay ‘504 patent do not describe a direction of rotation. The specification states:

[t]he direction of rotation of the shafts is normally the same such that the flow patterns collide in the common portion of the swept volumes of the inner wall sections. In another form of the invention, the shafts are arranged to contra rotate thereby creating opposite torrodial [sic] flow patterns around each of the shafts in the vat such that the flow patterns are in unison in the common second portion of the swept volumes

Id. at col. 2, lns. 61-66. The patent contains no further discussion of contra rotation or the opposite toroidal flow patterns. (The parties use “counter rotating” and “contra rotating” as synonyms for rotating in opposite directions; I will use the terms in the same way.) The Jay ‘504 patent does describe the benefit of rotating the panels in the same direction. When the side frames on each shafts are angled in opposite directions, rotating the panels in the

same direction creates a toroidal flow that runs along the shaft down one wall of the vat and up the other, helping to insure even heat distribution within the vat. Id. at col. 7, ln. 62 - col. 8, ln. 4.

U.S. Pat. No. 5,513,559 (the Jay '559 patent) was issued to Jay and assigned to a predecessor of defendant Tetra Pak. The Jay '559 patent claims a dual-axes food processing vat with a single panel on each axis. One long panel runs along each axis of the vat and is



Jay '559 patent, Figure 2

mounted to the end walls of the vat without a shaft, as shown in Figure 2 of the Jay '559 patent. The distance between the axes is smaller than the radius of the swept volume. Each panel is shaped so that it can pass through the space that would otherwise have been occupied by the shaft of the other panel.

The specification of the Jay ‘559 patent describes the benefits of rotating its panels in the same direction. In particular, it notes that “[t]he overall agitation pattern is such that

the contents of the vat will be induced to rotate in the same direction as the agitator with significant cross-cutting action and other interactions in the zone where the agitator panels overlap.” Id. at col. 2, ln. 65 - col. 3, ln. 2. Cross-cutting occurs because the panel on one axis cuts the common volume in an upward direction while the panel on the other axis cuts it in a downward direction. The patent states that such cross-cutting improves cheese processing by requiring lower speeds that cause less damage to the curd.

The specification of the Jay ‘559 patent also mentions rotating the panels in opposite directions, stating that “[a]gitators normally rotate co-directionally but can be arranged for counter rotation where specific production criteria demand it.” Id. at col. 3, lns. 26-28. It contains no additional discussion of counter rotation. With respect to the mounting or orientation of the cutting and stirring faces of the paddles, the Jay ‘559 patent states that

[t]he blades are sharpened on one side only and fixed in such a way that if the agitator means is rotated in one direction the sharp edges will be presented to the food product and cutting will take place, whereas, if the agitator means is rotated in the opposite direction the blunt edges of the blades will be presented to the food product and stirring will take place.

Id. at col. 2, lns. 55-61.

U.S. Pat. No. 5,606,907 (the Jay ‘907 patent) was issued to Jay and assigned to a predecessor to defendant Tetra Pak. The Jay ‘907 patent is a continuation of the application that issued as the Jay ‘559 patent, and its description is the same in all respects relevant to this litigation.

D. European Patent No. EP 0 133 587 A2 and Austrian Patent No. 384 523 B

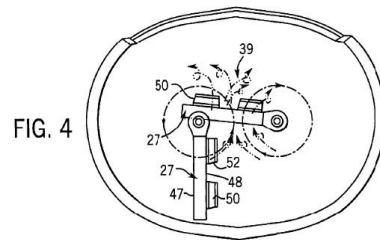
The European Patent Application No. EP 0 133 587 A2, dkt. #64-5, is a German language patent issued in 1985 that describes a vertical cheese vat with two vertical agitator means. The EP '587 patent describes a dual-axes vat with a conical floor to facilitate draining, an improvement over vertical vats with a flat floor mounted at a permanent tilt or placed on a tipping apparatus. The Austrian Patent No. 384 523 B is a German language patent issued in 1987 that describes a vertical cheese vat. Dkt. ##64-4. The AT '523 patent describes a curved valve or plate affixed to the agitator panels on a hinge, an improvement on similar hinged, flat plates because the arc reduces disturbance during cutting. Neither the EP '587 nor the AT '523 patent was presented to the examiner during prosecution of the '347 patent.

D. The '347 Patent

The '347 patent entitled "Cheese Processing Vat and Method" was issued to inventor Stephen J. Ejnik on November 16, 1999. Defendant Tetra Laval is the owner by assignment of the '347 patent and defendant Tetra Pak is the exclusive licensee of the '347 patent.

The '347 patent claims a cheese vat and a method for processing cheese. It describes a dual-shafted, horizontal cheese processing vat with agitator panels that rotate in opposite directions, as shown in Figure 4 of the '347 patent. The panels comprise a framework of

generally flat blades sharpened on one edge and left blunt on the other. These blades are



‘347 Pat., dkt. #1-1, Figure 4

aligned to form a sharp cutting face on one side and a blunt stirring face on the other.

The panels on each axis are oriented in a reverse configuration. As a result, when the panels are rotated in opposite directions, one face is presented to the curd: either the cutting face or the stirring face. The panels move through the volume of product between the shafts in the same direction, cutting it in an upward motion or stirring it in a downward motion. Rotating the agitators in a cheese vat in opposite directions in this fashion improves the cutting of coagulated milk and increase the cheese yield. (Defendant proposed additional facts about why it is advantageous to rotate panels in opposite directions and about the result of tests performed by Ejnik, but I have disregarded these because they are not supported by admissible evidence. Dft.’s PFOF, dkt. #89, at ¶¶ 14, 15, 52, 53, 60, 61, 62.)

The ‘347 patent has two independent claims. In claim 1, the ‘347 patent claims

1. In a cheese processing vat having a pair of interconnected generally cylindrical wall portions with horizontally disposed axes, the axes of the generally cylindrical wall portions positioned in parallel horizontally spaced

relation, and common opposite end walls forming with the generally cylindrical wall portions an enclosed vat containing a mixture of cheese curd solids and liquid whey, said vat having a generally oval cross section in a plane perpendicular to said axes, the improvement comprising:

an agitator panel rotatably mounted on the axis of each wall portion to sweep a generally cylindrical volume;

each agitator panel including a cutting face having a plurality of sharp cutting edges disposed in a generally common first plane and an opposite stirring face having a plurality of blunt stirring edges disposed in a generally common second plane;

the axes of rotation of the agitator panels being spaced to provide a common volume between said axes swept by the respective agitator panels;

a drive for rotating said panels in opposite rotational directions through the mixture in the vat such that said panels move through the common volume in the same direction, and means for mounting said panels with the respective cutting and stirring edges oriented such that during rotation only the stirring edges of the panels or only the cutting edges of the panels are moving toward the common volume and such that one of said panels trails the other of said panels during movement through said common volume.

Id. at col. 8, lns. 29-58. The second independent claim is claim 10:

10. A method for processing cheese in a vat having a pair of interconnected generally cylindrical wall portions with horizontally disposed axes, the axes of the generally cylindrical wall portions positioned in parallel horizontally spaced relation, and common opposite end walls forming with the generally cylindrical wall portions an enclosed vat having a generally oval cross section in a plane perpendicular to said axes, said method comprising the steps of:

(1) introducing into the vat raw materials for producing a mixture of cheese curd solids and liquid whey;

(2) rotatably mounting an open-framed agitator panel on the axis of each wall portion to sweep a generally cylindrical volume;

(3) spacing the axes of rotation of the panels to provide a common volume between said axes swept by the respective panels;

(4) providing each panel with a cutting face having a plurality of sharp cutting edges disposed in a generally common first plane and an opposite

stirring face having a plurality of blunt stirring edges disposed in a generally common second plane;

(5) mounting said panels to present the respective stirring faces in one direction of movement through said common volume and to present the respective cutting faces in the opposite direction of movement through said volume;

(6) driving said panels in opposite rotational directions through the mixture in the vat and causing said panels to move through said common volume in the same direction, wherein only the cutting edges of the panels or only the stirring edges of the panels are moving toward the common volume; and,

(7) causing one of said panels to trail the other panel during movement through said common volume.

Id. at col. 9, ln. 24 - col. 10, ln. 24. (Both claims have several dependent claims but their precise content is not relevant to the analysis.)

The background section of the '347 patent describes the Jay '559, '709 and '504 patents. It states that the beanstalk paddle arrangement of the Jay '504 patent causes product to congeal around the shaft, making maintenance and cleaning difficult. Regarding the Jay '559 and '709 patents, it states that rotating the panels in the same direction causes the curd to pile up on the side of the vat where the panels move upwardly. Increasing the velocity of rotation reduces the problem but overagitates the curd, causing loss of solids and less desirable product. This also overutilizes the upward moving agitator compared to the downward moving agitator. As a result, the rotation must be periodically reversed to move the curd to the other side, which causes additional undesirable cutting.

E. Prosecution of the '327 Patent

During the prosecution of the '347 patent, the Jay '504, '559, and '907 patents were included as references in the applicant's informational disclosure statement, dkt. #64-10, at 3, and discussed in various applicant remarks. Dkt. #64-25 at 2-3; dkt. # 64-11 at 4-7.

On November 2, 1998, the patent examiner issued his first office action in the case. He allowed claims 1 and 6-9 and rejected claims 3-5 and 10-13 under 35 U.S.C. § 112, ¶ 2 as indefinite. Claim 13 was the method claim that was later renumbered claim 10 in the issued patent. On November 10, 1998, the examiner and the prosecuting attorney held an interview to discuss the rejections. In the interview summary, the examiner wrote:

Attorney will make further changes in claims 1 and 13 changing 'an agitator panel' to a single unitary agitator panel and defining the cutting and stirring edges as lying in respective common planes . . . in order to additionally patentably distinguish claims 1 and 13 over the '504 patent.

On February 25, 1999, the examiner and prosecuting attorney conducted a second interview in which they discussed the pending claims and the Jay '504 patent. The examiner noted the passage relating to contra rotating and toroidal flows quoted above. In the interview summary, the examiner wrote: "Examiner pointed out that claims 1 and 13 as amended patentably distinguish over the Jay '504 patent and they would be allowed if presented in a formal amendment."

After the second interview, the applicant submitted amended claims and remarks

responding to the office action. Amend., dkt. #64-11. The amendments differed from the amendments discussed at the interview. Claims 1 and 13 were amended to add the “generally common first plane,” “generally common second plane” and “means for mounting” limitations. The applicant omitted the proposed “single unitary agitator” amendment because he considered it unnecessary to distinguish over prior art. In the remarks, the applicant wrote:

In the Examiner Interview Summary, certain specific additions are identified, including changing an agitator panel to -- a single unitary agitator panel . . . In twice amended claims 1 and 13 set forth above, . . . the recitation of -- a single unitary agitator panel -- has not been included in either claim. This limitation is believed to be unnecessary to distinguish over the art, particularly in view of other additions which have been made to these claims, which other additions further define the structure and operating steps which provide the improved performance of the vat in optimizing cutting and reducing the vat-to-vat deviation in moisture content.

Id. at 5. The applicant continues, identifying these added features to

include the modified panel mounting means such that the panels, when driven in a counter rotating manner, present only stirring edges or only cutting edges during movement through the common volume. This important feature is not shown or suggested in any of the horizontal cheese vat prior art and, moreover, not shown or suggested in any of the older vertical cheese vat prior art.

Id.

The amendment remarks also discussed the sentence in the Jay ‘504 patent stating that the shafts can be arranged to contra rotate. He distinguished these statements, saying

As indicated in the remarks accompanying the Preliminary Amendment, contra rotation of the shafts in the vat, by itself, does little or nothing to improve the processing [of] the curds and whey mixture to provide a high yield cheese with optimum moisture content.

Applicant, on the other hand, has found that counter rotation of the shafts combined with means for mounting the panels on the shafts to present respective cutting and stirring edges in the common volume between the shafts, oriented to work together, such that only stirring edges or only cutting edges move toward and through the common volume, provides significant improvements in processing performance.

Id. at 4-5. The applicant continued:

Simply reversing the rotation of one shaft to cause the shafts to ‘contra rotate,’ as taught by ‘504, may alleviate the problem of the coagulum mass ‘running away’ from the rotating panels, but without more, i.e., remounting the panels to assure that, during rotation, only stirring edges or only the cutting edges move toward and through the common volume between the shafts, other processing deficiencies remain. These include inadequate and inefficient cutting, and inconsistent yield in terms of quality and moisture content.

Id. The examiner issued the ‘347 patent over the Jay ‘504 patent.

H. Plaintiff’s High Solids Cheese Vat

In early 2010, plaintiff began operations and set out to design a dual-shafted horizontal cheese vat. Plaintiff’s employees read the ‘347 patent before designing its vat. In April 2010, plaintiff began displaying and offering for sale a dual-shaft horizontal cheese vat with counter rotating agitators, which it calls the high solids cheese vat. In its marketing, plaintiff explains that its vat increases cheese yield and the percentage of fat in the cheese.

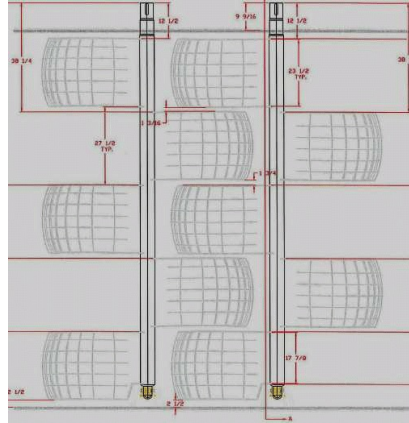
Plaintiff has manufactured three models of its high solids cheese vats with a capacity of 40,000, 50,000 and 60,000 pounds. The photograph below depicts one of plaintiff's vats with a 50,000 pound capacity. In all three models, the HSCV is an enclosed vat formed by



two cylindrical wall portions oriented on their side and by generally flat end walls. The legs of the vat are slightly taller on one end, so that the axes of the vat are angled to a small degree relative to the ground to facilitate draining.

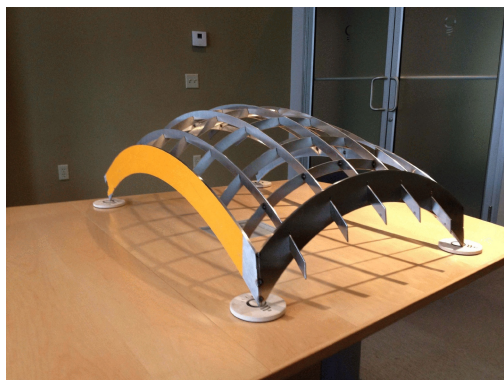
Inside the vat, two parallel shafts run the length of the vat from end wall to end wall. An electric motor is attached to the shafts to turn them in opposite rotational directions. A series of panels are mounted along each shaft and extend radially outward. The distance between the shafts is slightly larger than the length of the panels. The panels are spaced intermittently and offset by 180° so that consecutive panels on the same shaft are on the opposite sides, in what the parties describe as the beanstalk or corkscrew configuration

depicted in the figure below. (Plaintiff refers to these as “blades” or “paddles” and defendant



refers to them as “agitator panels.” I will use “panels,” with no intention to prejudice the claims construction of “agitator panel.”)

The panels in plaintiff’s vat are formed by a grid of interconnected blades that are sharpened along one edge for cutting and blunt on the opposite edge for stirring. The blades are arranged so that the cutting edges form one face of the panel and all of the blunt edges form the opposite face of the panel. As depicted in the photograph below, the blades and panels are curved. The cutting edge of each blade is concave and its stirring edge is convex.



Together, the cutting edges form a concave surface while the blunt edges form a roughly parallel convex surface on the opposite side. Plaintiff manufactured a panel with a convex cutting face and a concave stirring face but chose not to test the panel in a vat. Plaintiff submitted a chart listing the radius of curvature for each blade in its panels. (The radius of curvature is “the radius of a circle which touches the curve . . . at the point in question. “Curvature,” Chambers Dictionary of Science & Technology 304 (2007). The larger the radius of the approximating circle, the less curved the line is at that point.)

The panels are mounted so that their cutting and stirring surfaces face the same rotational direction. When stationary, successive panels on the same shaft face opposite directions as depicted in the photograph below. When the cutting face of one panel faces



upward, the cutting face of the next panel on that shaft is on the opposite side and faces downward. However, when the shafts rotate in opposite directions, all of the panels will present only cutting faces or only stirring faces to the coagulum.

Plaintiff’s vats have been manufactured so that all the cutting faces move upward

through the common volume between the shafts and the stirring faces move downward through it. Plaintiff installed vats at the American Milk Producers facility configured in this fashion. In another embodiment, plaintiff's vat has been manufactured so that its cutting faces move downward and its stirring faces move upward through the common volume.

Each panel has a corresponding panel on the opposite shaft. These pairs will pass through the same volume of coagulum between the shafts in a repeating pattern. The first panel travels through the space between the shafts. When the shafts rotate 180°, the second panel travels in the same direction through the same volume. This repetitive process can also be described from the perspective of all the panels. One half of the panels on both shafts enter the volume between the shafts simultaneously. As the shafts rotate by 180°, this first set of panels moves out of the coagulum and the remaining one half of the panels pass through the common volume in the same direction. Again, this second set of panels on both shafts enters the common volume simultaneously.

J. Procedural Background

Shortly after plaintiff displayed its vat in April 2010, defendant brought the '347 patent to plaintiff's attention and pointed out the likelihood of infringement. Plaintiff brought this declaratory action and defendant filed counterclaims that plaintiff and third party defendant infringed its '347 patent. The court granted the parties' motion for a hearing

on claims construction with respect to three terms and, after a claims construction hearing, issued an order partially construing three terms of the ‘347 patent: (1) “a plurality of sharp cutting edges disposed in a generally first common plane;” (2) “a plurality of blunt stirring edges disposed in a generally second common plane;” and (3) “agitator panel.” Dkt. #45.

OPINION

I. PATENT INFRINGEMENT

Patent infringement analysis proceeds in two steps: first, the patent claims must be interpreted or construed to determine their meaning and scope; second, the properly-construed claims are compared to the process or product accused of infringing. Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995). The first step of this analysis, claim construction, is a matter of law reserved to the court. Id. at 970-71.

“Direct infringement requires a party to perform or use each and every step or element of a claimed method or product.” BMC Resources, Inc. v. Paymentech, L.P., 498 F.3d 1373, 1381 (Fed. Cir. 2007). Plaintiff offers four reasons why its high solid cheese vat does not literally infringe claims 1 and 10 of the ‘347 patent: (1) its cutting and stirring edges form curved surfaces, not a “generally common . . . plane”; (2) each of its two agitator panels has many paddles and thus many faces, not a single agitator panel with “a cutting face and . . . an opposite stirring face”; (3) each of its two agitator panels has many paddles that

travel through the common volume simultaneously, not a single agitator panel that “trails the other of said panels . . . through the common volume”; and (4) its axes are tilted, not “horizontally disposed.”

A. Direct Infringement

1. “a plurality of sharp cutting edges disposed in a generally common first plane” and “a plurality of blunt stirring edges disposed in a generally common second plane”

Claims 1 and 10 claim agitator panels with “a plurality of sharp cutting edges disposed in a generally common first plane” and “a plurality of blunt stirring edges disposed in a generally common second plane.” The parties dispute the “generally common . . . plane” limitation. Plaintiff says that it means a surface that is approximately flat within mechanical variance; defendant says it is a functional limit that excludes only surfaces so curved that they wrap around like a hook.

According to the Court of Appeals for the Federal Circuit, “generally” and “substantially” are descriptive terms used to broaden patent claims by avoiding mathematically precise parameters. Anchor Wall Systems, Inc. v. Rockwood Retaining Walls, Inc., 340 F.3d 1298, 1311 (Fed. Cir. 2003). The ordinary meaning of “generally” is “in disregard of specific instances and with regard to an overall picture; on the whole, as a rule.” Id. (quoting Webster's Third New International Dictionary 945 (1993)). In the claims construction phase, I concluded that “generally” broadens “common plane” to include

flat surfaces with some degree of curvature. However, I found that the parties had failed to support their specific constructions and I asked them to identify at summary judgment a construction that would further clarify the degree of curvature encompassed by this term.

Instead, the parties presented their prior constructions in new clothes. Defendant contends that “generally common plan” identifies a functional limit. When agitators rotate in opposite directions, the blades must be arranged so each face forms “a generally consistent surface” to avoid damaging the curd by cutting and stirring simultaneously. Dft.’s Br. in Opp., dkt. #78, at 22. Defendant concludes that this claim “permits a degree of curvature . . . less than the degree at which both stirring edges and cutting edges travel toward the common volume at the same time.” Dft.’s Br. in Supp., dkt. #66, at 54. In other words, the curved surface cannot wrap back around like a hook. I rejected this specification during claims construction because it read “plane” out of the claim. Dkt. #45, at 7.

Plaintiff proposes to construe the term as “an arrangement that appears to the human eye to be disposed in a surface that is for the most part flat.” This construction is the same as its previous proposal of “approximately flat,” because plaintiff treats the phrase “for the most part” as a synonym for “approximately” (though it means “on the whole” or “with respect to the larger part”) and the “human eye” limitation as a specification of mechanical imperfection. Again, I rejected both aspects of this proposed construction earlier. Id.

To its credit, plaintiff asks the court to revisit its conclusion that a generally common

plane can encompass curved surfaces. It identifies no new evidence for its construction, but it does emphasize a case not cited in previous briefs. In Arvin Industries, Inc. v. Berns Air King Corp., 525 F.2d 182, 185 (7th Cir. 1975), the Court of Appeals for the Seventh Circuit stated that “the imprecision of [a modifier] cannot be allowed to negate the meaning of the words it modifies.” Applying this canon of construction, the court concluded that the term “generally planar” “was intended to allow for irregular deviations from a perfectly flat surface and not to broaden the scope of ‘planar’ to encompass surfaces which are distinctly arcuate by design.” Id. In Arvin Industries, however, the patentee had amended his claim to a “generally planar” reflector in order to distinguish a prior patent with curved reflectors. Id. at 184. Plaintiff identifies no similar amendment or disclaimer of curved panels in this case. The general principle of Arvin Industries is sound but offers no guidance for determining when a surface is generally planar rather than “distinctly arcuate.” It raises the same question: in the ‘347 patent, what amount of curvature can be permitted without negating the meaning of planar?

When construing terms of degree, a court must determine whether the intrinsic evidence provides some standard for measuring the bounds of the term. Exxon Research & Engineering Co. v. United States, 265 F.3d 1371, 1381 (Fed. Cir. 2001). When the patent offers no such guidance, it is reversible error to impose a precise boundary. PPG Industries v. Guardian Industries Corp., 156 F.3d 1351, 1355 (Fed. Cir.1998); Playtex Products., Inc.

v. Procter & Gamble Co., 400 F.3d 901, 907 (Fed. Cir. 2005) (error to use manufacturing tolerance to supply bounds for the term “substantially flattened surfaces”).

Instead, the Federal Circuit often construes terms like “substantially” or “generally” in vague terms and leaves specific judgments to the fact finder. In Anchor Wall Systems, 340 F.3d at 1311, the court interpreted “generally parallel” as “envision[ing] some amount of deviation from exactly parallel.” In Liquid Dynamics Corp. v. Vaughan Co., 355 F.3d 1361, 1369 (Fed. Cir. 2004), the court construed “substantial helical flow patterns” as flow patterns that are “generally, though not necessarily perfectly, spiral, and that fill much, though not necessarily all, of the tank's volume.” In Playtex Products, 400 F.3d at 908, the court construed “substantially flattened” to mean “materially flatter than” a cylindrical portion of the invention. Without offering any further guidance about the meaning of “materially,” the court stated that “the point at which the gripping area curvature ceases to be substantially flattened and becomes generally cylindrical is a question of fact.” Id. See also Synthes USA, LLC v. Spinal Kinetics, Inc., 2011 WL 337797, at *3-4 (N.D. Cal. 2011) (declining to construe “substantially cylindrical” before sending issue to jury because plain meaning indicated “approximate” and intrinsic evidence suggested no precise set of bounds).

Neither the intrinsic nor extrinsic evidence suggests a precise set of bounds for a “generally common plane” as used in the ‘347 patent. Accordingly, I will adopt the ordinary language construction of “generally” suggested in Anchor Wall Systems, 340 F.3d at 1311.

The phrase “a generally common . . . plane” includes surfaces that are on the whole flat but include some amount of curvature.

Although generally common planes may have some curvature, no reasonable jury could conclude that the cutting or stirring edges of plaintiff’s vat form a surface that is on the whole flat. The difference between a curved surface and one that is on the whole flat is one of degree about which reasonable persons may disagree. However, based on the photograph of the panels in plaintiff’s vat and the radius of curvature measurements supplied in the design specifications, I conclude that the degree of curvature in plaintiff’s panels is more substantial than any question of degree that must be determined by the jury.

2. “agitator panel”

Plaintiff’s second and third infringement arguments rest on its construction of the term “agitator panel.” Claims 1 and 10 claim “an agitator panel rotatably mounted on the axis of each wall portion.” Plaintiff argues that “an agitator panel” means a single agitator panel on each axis and that each axis of its high solids cheese vat has multiple paddles but only one agitator panel. Defendant contends that “agitator panel” in the ‘347 patent refers to “structures of blades mounted on the axis of a cylindrical vat to cut and stir the coagulum” and that “an” retains its presumed meaning as “one or more.”

During claims construction, I rejected plaintiff’s proposed construction of “agitator

panel” as “the entire structure between the end of the walls of the cheese processing vat that rotates to agitate the mixture,” because the term “agitator panel” could not refer to the entire structure without rendering several other limitations nonsensical. In its summary judgment brief, plaintiff asks the court to construe “agitator panel” as “the assembly including all cutting edges and stirring edges that rotates about a common axis of rotation.” Plaintiff adds the phrase “rotating about a common axis” to clarify that “agitator panel” refers to each individual assembly, rather than both simultaneously.

My prior concerns still apply to plaintiff’s new construction. It is primarily a rehash of plaintiff’s strained interpretation of the prosecution history, which I rejected during claims construction. The only new evidence plaintiff presents is a statement in the Jay ‘559 and ‘907 patents describing two embodiments of its agitator panel. In one embodiment, the agitator panel is a series of blades mounted directly to the end wall without a shaft. The alternate construction is a beanstalk design.

In an alternate construction, *one of the blade groups 34 of the agitator panel* may be positioned rotationally 180° from its position in a panel 27 of the preferred embodiment. This would create a sort of crank configuration to the agitator panels which might be desirable for certain types of processing.

Jay ‘559 pat., dkt. # 59-2, at cl. 7, ln. 63 - cl. 8, ln. 4 (emphasis added). According to plaintiff, the emphasized clause demonstrates that one agitator panel may be composed of several distinct blade groups and each blade group is not, thereby, its own agitator panel.

Although this is a fair inference from the quoted language, a single sentence is insufficient to overcome the intrinsic evidence.

The indefinite article “an” “carries the meaning of ‘one or more’ ” except when the claim identifies a specific number or in the “rare circumstances when the patentee evinces a clear intent to . . . limit the article” to a single instance. KCJ Corp. v. Kinetic Concepts, Inc., 223 F.3d 1351, 1356 (Fed. Cir. 2000); Elkay Manufacturing Co. v. Ebco Manufacturing Co., 192 F.3d 973, 977 (Fed. Cir. 1999) (limiting “an upstanding feed tube” to a single tube because applicant distinguished prior art using multiple tubes). The ‘347 patent does not identify a number and the patentee did not evince a clear intent to limit the article. The prosecution history indicates that neither the examiner nor the applicant intended the claim to be so limited. They discussed the Jay ‘504 patent, which discloses an agitator with multiple panels on each shaft. Although the examiner proposed amending the claim to include “a single unitary panel,” the patentee rejected this amendment and disavowed any suggestion that the claim was limited to a single panel. The examiner issued the patent nonetheless.

Moreover, this interpretation is consistent with the use of agitator panel by those of ordinary skill in the art. Even plaintiff’s expert Jay acknowledged implicitly that multiple agitator panels can be present on a single shaft, that each of the panels on the shafts of the HSCV vats is an “agitator panel,” and that each agitator panel on the vat had two faces. Jay

Dep., dkt. #50, at 76. Therefore, I will reject plaintiff's proposed construction and adopt defendant's proposed construction. An agitator panel includes a structure of blades that is rotatably mounted on the axis of the cylindrical vat to cut and stir the coagulum. As used in claim 1 and 10, "an agitator panel" may include more than one agitator panel.

Plaintiff's second and third infringement arguments fall with its construction of "an agitator panel" as a single unitary construction. Plaintiff argues that its vat does not meet the limitation in claim 1 that "each agitator panel includ[es] a cutting face . . . and an opposite stirring face" or the limitation in claim 10 that "each panel [has] a cutting face . . . and an opposite stirring face." Plaintiff contends that each paddle on its vat has a cutting face and an opposite stirring face, but the paddles are staggered so the agitator panel on each axis does not have one cutting face and one opposite stirring face.

However, because I have construed an agitator panel as a group of blades rotatably mounted on a shaft, each axis of plaintiff's vat has many agitator panels. Each agitator panel includes a pair of radial arms and curved blades sharpened on one side for cutting and left blunt on the opposite side for stirring. The blades form roughly parallel curved surfaces on opposite sides of each agitator panel. On one side the sharp blades form a curved cutting face and on the opposite side the blunt blades form a curved stirring face. Accordingly, no reasonable juror could conclude that the agitator panels on plaintiff's vats do not include a cutting face and an opposite stirring face.

Plaintiff next argues that its agitator panels do not meet the limitation of claims 1 and 10 that “one of said panels trails the other of said panels during movement through said common volume.” Relying on its assumption that each axis of its vat has one agitator panel, plaintiff argues that one-half of the paddles on each agitator panel occupy the common volume simultaneously and thus the panels do not trail one another. However, as I have construed “agitator panel,” plaintiff’s vat has multiple agitator panels on each shaft. Each agitator panel has a corresponding agitator panel on the opposite axis and the two panels sweep the shared common volume between them. After one agitator panel sweeps the common volume, it is followed in the same direction by its corresponding panel on the opposite shaft. Therefore, no reasonable juror could conclude that the agitator panels on plaintiff’s vat do not trail one another through the common volume.

3. “horizontally disposed axes”

The preambles to claims 1 and 10 describe a vat “having a pair of interconnected generally cylindrical wall portions with horizontally disposed axes.” ‘347 pat., dkt. #59-1, col. 8, lns. 29-31 & col. 9, lns. 25-26. Plaintiff argues that “horizontally disposed” means disposed “at right angles to the vertical; parallel to level ground,” dkt. #57, at 34 (quoting www.dictionary.com) and that its high solids cheese vats are not horizontally disposed because they have a slight incline relative to the ground. Plaintiff contends that the

preamble must mean “exactly horizontal” because it uses “horizontally” without a modifier while the preferred embodiment describes the axes as disposed “generally horizontally.” ‘347 pat., dkt. #59-1, at col 4, ln. 35. Defendant responds that “horizontally disposed axes” means “axes oriented lengthwise rather than oriented vertically,” consistent with the common distinction in cheese-making between horizontal and vertical vats.

Defendant’s construction is more convincing. A person of ordinary skill in the art would distinguish horizontal from vertical cheese vats in comparative terms, rather than requiring horizontal vats to be precisely horizontal. Many horizontal cheese vats have a slight incline relative to the ground to facilitate draining, which they achieve by placing the vat body on a stand with longer legs at one end. The prior art examples describe horizontal and vertical vats with a slight tilt. E.g., Jay ‘504 pat., dkt. #32-4, at col. 5, lns. 14-16; EP ‘587 pat., dkt. #64-4, at 4. The specification of the ‘347 patent is clear that the invention concerns a horizontal cheese vat. Its background describes the advantages of horizontal vats compared to vertical vats and the limits of prior horizontal vats. A person of ordinary skill reading the preamble in light of the specification would conclude that the term “horizontally disposed axes” means axes oriented generally horizontally with respect to the ground, as compared to axes generally vertically with respect to the ground.

Plaintiff does not dispute that its vat is horizontally disposed as I have construed the term. Plaintiff’s experts recognize that its high solids cheese vat is a horizontal cheese vat.

Jay Dep., dkt. #50, at 72; Bradley Dep., dkt. #51, at 74. One of plaintiff's employees testified that the shafts in its vat are positioned horizontally relative to the ground. Isenberg Dep., dkt. #53, at 22-23.

In summary, I conclude that plaintiff's HSCV meets all the literal elements of claims 1 and 10, except the limitations that the panels comprise "a plurality of sharp cutting edges disposed in a generally common first plane" and "a plurality of blunt stirring edges disposed in a generally common second plane."

B. Doctrine of Equivalents

Under the doctrine of equivalents, a product that does not practice claim limitations may still infringe if (1) the differences "can be fairly characterized as an insubstantial change from the claimed subject matter without rendering the pertinent limitation meaningless," Freedman Seating Co. v. American Seating Co., 420 F.3d 1350, 1359 (Fed. Cir. 2005), or (2) "the accused device performs substantially the same function in substantially the same way to obtain the same result as the claim limitation." Catalina Marketing International, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 813 (Fed. Cir. 2002) (quotation omitted). Each limitation or its equivalent must be present in an accused product for infringement to be found. Freedman Seating, 420 F.3d at 1358. Defendant has the burden of proof with respect to infringement under the doctrine of equivalents, so it had to submit evidence to

show that the curved panels of the plaintiff's vat and panels "disposed in a generally common . . . plane" are equivalent. Intellicall, Inc. v. Phonometrics, Inc., 952 F.2d 1384, 1389 (Fed. Cir. 1992)

1. Prosecutorial estoppel under Festo

Plaintiff first argues that defendant is estopped from arguing that curved edges are equivalent to "edges disposed in a generally common . . . plane." As a general rule, a patent owner is estopped from asserting infringement under the doctrine of equivalents if the applicant secured its patent by making a narrowing amendment that disclaimed the allegedly equivalent elements. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 736 (2002). An applicant who adds degree language to a claim may raise the Festo presumption and surrender its rights to equivalents beyond that degree. Liquid Dynamics Corp., 355 F.3d at 1369 (by amending to "substantial helical flow path" to distinguish prior patent claiming "helical flow paths," applicant "surrendered its rights to all flows that are not substantially helical, even if they perform the same function as a substantially helical flow").

"[T]he prosecution history must be viewed as a whole to determine whether and what subject matter was surrendered to procure issuance of the patent." Mark I Marketing Corp. v. R.R. Donnelley & Sons Co., 66 F.3d 285, 292 (Fed. Cir. 1995). The patent holder "bears the burden of showing that the amendment does not surrender the particular equivalent in

question,” which it may meet by showing some reason why it “could not reasonably be expected to have described the insubstantial substitute in question,” such as that the equivalent was unforeseeable at the time of the application or the reason for the amendment bears only a tangential relation to the alleged equivalent. Festo, 535 U.S. at 740-41.

The examiner allowed claim 1 initially without the common plane limitation. However, to help avoid the indefiniteness objection to claims 3-5 and 10-13, the applicant later amended claims 1 and 10 to include the “disposed in a generally common . . . plane” limitation, explaining that the amendment described the structure of the invention that enabled it to perform its function. Defendant argues plausibly that the common plane language makes it clear how to design panels to counter rotate without presenting cutting and stirring faces simultaneously. Unless the cutting and stirring faces form opposite sides of a generally common flat surface, the agitator panels would stir and cut at the same time.

The prosecution history contains no hint of any need by the applicant to add an amendment distinguishing curved panels or any intention by the applicant to do so. Neither the applicant nor the examiner mentioned curved panels. Plaintiff has cited no mention of curved panels in the prior art. Rather, plaintiff states that its high solids cheese vat was the first to include curved panels, and it was designed eleven years after the ‘347 patent issued. In this context, no reasonable jury could conclude that the applicant disclaimed curved panels to procure the ‘347 patent. Festo, 535 U.S. at 738 (“There is no reason why a

narrowing amendment should be deemed to relinquish equivalents unforeseeable at the time of the amendment and beyond a fair interpretation of what was surrendered.”). Defendant is not estopped from arguing that cutting and stirring edges disposed in a curved surface are equivalent to cutting and stirring edges disposed in a common plane.

2. Equivalence of curved edges to edges disposed in a generally common plane

Defendant’s theory of equivalence is short but sufficient to meet its burden of production given the nature of the technology. Defendant’s expert testified that the panels of the ‘347 patent and plaintiff’s curved panels perform the same function of stirring the coagulum and cutting the cheese curds into smaller pieces. Flat and curved panels cut and stir in substantially the same way when rotated in opposite directions. The curved panels have opposite cutting and stirring faces and are mounted so that when rotated in opposite directions they travel through the coagulum presenting only a face made up of sharp cutting edges or only a face made up of blunt stirring edges. When plaintiff advertises its high solids cheese vat, it touts performance benefits similar to those of the ‘347 patent: less curd damage, higher fat retention and increased yield.

Plaintiff has two arguments in support of its position that the panels do not perform the same function in the same way, but neither is sufficient to survive summary judgment. First, plaintiff argues that defendant’s equivalence analysis encompasses panels with any

degree of curvature and thus violates the “all elements rule.” However, a theory of equivalence does not vitiate a claim simply because “a claim limitation does not literally read on an element of an accused device.” DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc., 469 F.3d 1005, 1018 (Fed. Cir. 2006). As the court explained in DePuy Spine,

A holding that the doctrine of equivalents cannot be applied to an accused device because it "vitiates" a claim limitation is nothing more than a conclusion that the evidence is such that no reasonable jury could conclude that an element of an accused device is equivalent to an element called for in the claim, or that the theory of equivalence to support the conclusion of infringement otherwise lacks legal sufficiency.

Id. The Federal Circuit has typically found that a theory of equivalence is legally insufficient only when the range of alleged equivalents lacks any limitation. E.g., Tronzo v. Biomet, Inc., 156 F.3d 1154, 1160 (Fed. Cir. 1998) (“any shape would be equivalent to the conical limitation”). That is not the situation in this case. Not all panel arrangements will infringe defendant’s patent; some will fall outside defendant’s asserted class of equivalents, such as panels presenting both cutting and stirring faces or blade arrangements that do not form a common surface.

Plaintiff’s second argument is that a reasonable jury could conclude that its curved panels do not operate in the same fashion as generally flat panels. It cites the testimony of three experts to explain how curved panels cut and stir differently. Plaintiff’s first expert, Jay, concludes that the curved paddles of the high solids cheese vat are more efficient, which

he believes is a “fairly logical application of a slicing action rather than a pushing action.” Jay Dep., dkt. #50, at 77-79. However, Jay has no physical analysis to support his conclusion that curved blades “slice” the coagulum while flat blades “push” it. He performed no tests to determine the force exerted by a curved paddle on a liquid surface or the yield of a vat using curved paddles. His conclusory assertions are entitled to no weight.

Plaintiff’s second expert, Isenberg, concludes that coagulum “pushes away” from curved paddles less than flat paddles because flat paddles contact the entire surface at once while curved paddles have one point of entry and “roll” into the coagulum. Isenberg Dep., dkt. #53, at 176-77. He bases this conclusion on his intuition about the effect of curved and flat shapes and his visual observations of the movement of the coagulum during testing of vats with flat and curved panels. Id. at 178-80. Defendant challenges the reliability of Isenberg’s conclusions for a number of reasons: Isenberg took no measurements and was unaware of any objective method to measure his result; he admitted that visual recordings would have permitted someone to confirm his observations, but he made no recordings. Furthermore, he compared a vat with flat panels rotating in the same direction to one with curved panels rotating in opposite directions, an uncontrolled variable that is likely to affect the movement of the coagulum.

Last, plaintiff’s third expert Zirbel, states that in his opinion the points of the curved panels enter the vat before the entire blade mass and that the pitch of the blades moves the

cheese slightly as it cuts, so the blade does not pass through the same cut on its next rotation. Zirbel Dep., dkt. #54, at 62-63. Again, defendant challenges the reliability of this testimony, noting that it is based entirely on Zirbel's intuitive analysis of how the paddles function and not on any test results or other empirical data.

The more important problem with plaintiff's argument is that these alleged differences claimed by Isenberg and Zirbel are irrelevant for infringement analysis. A designer cannot avoid infringement under the doctrine of equivalents by adding elements, even if the additional elements improve the claimed invention. Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp., 320 F.3d 1339, 1352 (Fed. Cir. 2003) ("a patentee is not estopped from establishing infringement under the doctrine of equivalents merely because an accused infringer improves upon the claimed invention"). Even if plaintiff's curved panels cut or stir coagulum better than flat panels, this improvement is legally insufficient to show that curved edges function in a substantially different fashion during counter rotation from edges disposed in a generally common plane. Because plaintiff has not presented any evidence from which a reasonable jury could conclude that the curved edges on plaintiff's vats function in a substantially different manner, I will grant defendant's motion for summary judgment on infringement of claims 1 and 10.

II. PATENT INVALIDITY

A. Indefiniteness

Because patents are presumed valid, 35 U.S.C. § 282, a party asserting invalidity bears the burden of persuasion and must meet a clear and convincing standard of proof. Microsoft Corp. v. i4i Ltd. Partnership, 131 S. Ct. 2238, 2242 (2011). Plaintiff argues that the ‘347 patent is indefinite under the court’s construction of the term “disposed in a generally common . . . plane.” Claim limitations are indefinite if they “are not amenable to construction or are insolubly ambiguous. . . . Thus, the definiteness of claim terms depends on whether those terms can be given any reasonable meaning.” Young v. Lumenis, Inc., 492 F.3d 1336, 1346 (Fed. Cir. 2007) (internal quotation omitted). An ordinary language construction like “on the whole” is not indefinite merely because it is vague. Id. (“near” not indefinite when construed as “close to”). Words of degree do not necessarily require a precise measurement or range when the art does not call for such specificity. Enzo Biochem, Inc. v. Applera Corp., 599 F.3d 1325, 1335 (Fed. Cir. 2010).

When the term “disposed in a generally common . . . plane” is construed as “surfaces that are on the whole flat but have some amount of curvature,” this limitation is consistent with the degree of precision offered in the prior art and is sufficient to provide notice of potential infringement. Reasonable persons might disagree about how to apply this term, but the Court of Appeals for the Federal Circuit has permitted constructions with similar

range of indeterminacy without raising issues of indefiniteness. Anchor Wall Systems, Inc. v. Rockwood Retaining Walls, Inc., 340 F.3d 1298, 1311 (Fed. Cir. 2003); Liquid Dynamics Corp. v. Vaughan Co., 355 F.3d 1361, 1369 (Fed. Cir. 2004).

B. Anticipation and Obviousness

Anticipation and obviousness are particularly difficult to prove when the prior art was before the patent examiner during prosecution. Id. at 2249-51. In that situation, the plaintiff “has the added burden of overcoming the deference that is due to a qualified government agency presumed to have properly done its job, which includes one or more examiners who are assumed to have some expertise in interpreting the references and to be familiar from their work with the level of skill in the art and whose duty it is to issue only valid patents.” American Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1360 (Fed. Cir. 1984). The dispositive issue for all of plaintiff’s anticipation and obviousness claims is whether the cited prior art teaches (1) rotating the agitator panels in opposite directions and (2) flipping over all the panels on one axis so that they cut or stir only when rotated in opposite directions.

1. Anticipation by the Jay ‘559 and ‘907 patents

A patent is invalid as anticipated if “the four corners of a single, prior art document

describe every element of the claimed invention, either expressly or inherently.” Advanced Display Systems, Inc. v. Kent State University, 212 F.3d 1272, 1282 (Fed. Cir. 2000). In other words, “[t]here must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention.” Scripps Clinic & Research Foundation v. Genentech, Inc., 927 F.2d 1565, 1576 (Fed. Cir. 1991). A claimed limitation is not “inherent in prior art” simply because the prior art might be used in the claimed fashion; the prior art must “necessarily function[] in accordance with, or include[], the claimed limitations.” MEHL/Biophile Intern. Corp. v. Milgraum, 192 F.3d 1362, 1365 (Fed. Cir. 1999).

Plaintiff contends that claims 1, 3, 9 and 10 of the ‘347 patent were anticipated by the Jay ‘559 and ‘907 patents. The Jay ‘559 and ‘907 patents mention “counter rotation” but say nothing about reorienting the panels. Plaintiff argues that reorienting the panels is inherent in the idea of counter rotation because a person of ordinary skill would recognize the undesirability of simultaneous cutting and stirring of cheese. This argument is insufficient to establish anticipation in the absence of any instruction about implementing counterrotation. It would be entirely possible to rotated the panels in opposite directions without reorienting their faces. Doing so may be less effective for cheese production but the patents are not directed only at cheese production; other products might not require alternating cutting and stirring. The allegedly anticipating patents never explain what

“production criteria demand counter rotation” and never describe using counter rotation for cheese production.

Because no reasonable jury could conclude that reorienting the panels is inherent in the idea of counter rotation, I need not address whether the Jay ‘559 or ‘907 patents disclose the remaining limitations. The Jay ‘559 and ‘907 patents do not anticipate claims 1 and 10; it follows that they do not anticipate the dependent claims, which include all limitations in the independent claims.

2. Obviousness

A patent is invalid as obvious “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a). Obviousness is a question of law based on underlying facts. Winner International Royalty Corp. v. Wang, 202 F.3d 1340, 1348 (Fed. Cir. 2000). The obviousness analysis is guided by the four Graham factors:

(1) the scope and content of the prior art; (2) the differences between the claimed invention and the prior art; (3) the level of ordinary skill in the art; and (4) any relevant secondary considerations

DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co., 464 F.3d 1356, 1360 (Fed. Cir. 2006) (citing Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966)). The

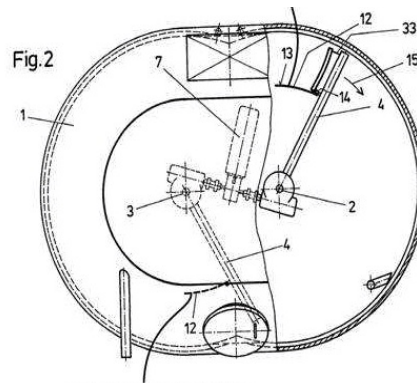
court should consider the “interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” KSR International Co. v. Teleflex Inc., 550 U.S. 398, 418 (2007). In moving for summary judgment on this issue, defendant argues that plaintiff has not shown that the ‘347 patent is obvious in light of any prior art, including the AT ‘523 patent, the EP ‘587 patent and the Jay ‘559, ‘907 and ‘504 patents.

a. Obviousness in light of the AT ‘523 patent and the EP ‘587 patent

Plaintiff’s position is that the dual-axes vertical vats in the AT ‘523 patent and the EP ‘587 patent describe counter rotation with the panel on one axis reoriented so the panels present only cutting and stirring faces during counter rotation. It argues further that applying this technology to horizontal vats is a trivial modification for a person of ordinary skill in the art.

Plaintiff relies primarily on the opinions of Jeffrey L. Jay, but these opinions are supported. Jay’s invalidity expert report included a single paragraph analyzing both the AT ‘523 and EP ‘587 patents simultaneously and without any citations to either patent. Jay Rep. dkt. #60-1, at 6. The patents are in German; Jay does not speak German; and he did

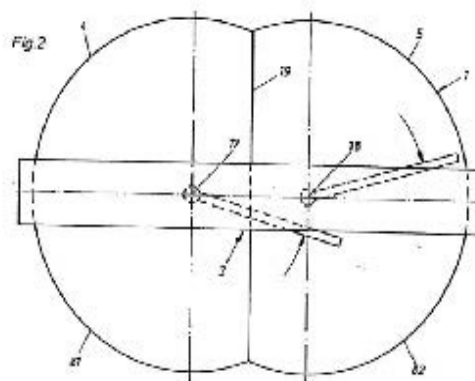
not have access to English translations before issuing his opinion. As revealed in his



AT '523 Patent, Figure 2

deposition, Jay's analysis was based entirely on his interpretation of the patent figures. Jay Dep., dkt. #50, at 122-123.

The figures that Jay used for his conclusions are not self-explanatory. Figure 2 of the



EP '587 patent, Figure 2

AT '523 patent has a single arrow (15) which, if it is a directional arrow, indicates clockwise

rotation. From the diagram, it is not clear whether the panels are cutting or stirring or both. Figures 2, 4 and 6 of the EP '587 patent include two arrows that suggest the panels may rotate in opposite directions. However, the arrows are not labeled in the diagram or the patent. The diagrams do not indicate whether the panels have opposite cutting and stirring faces or whether they cut the product when rotated in one direction and stir it when rotated in the other. Although Jay submitted two new declaration setting forth new reasons for his opinions about the patents, dkt. #60 and dkt. #86, I have excluded them as untimely.

Plaintiff attempts to resurrect Jay's opinions as a common sense interpretation of the patent figures. With respect to figure 2 of the AT '523 patent, plaintiff argues that (12) depicts "agitation plates" on the stirring faces. The plates remain closed to increase agitation when the panels move in the stirring direction. When they move in the cutting direction, the plates open to trail behind the panel without stirring the cheese. Accordingly, the open agitator plates in figure 2 show that the panels are revolving in opposite directions and are oriented to present only cutting or stirring faces.

This argument does not advance plaintiff's case. Plaintiff does not explain how the its inferences it draws from figure 2 are consistent with the claims or description of the AT '523 patent. Claim language must be read in light of the specification and its drawings, but the claim language itself is the starting point for interpreting the invention. MBO Laboratories, Inc. v. Becton, Dickinson & Co., 474 F.3d 1323, 1330-31 (Fed. Cir. 2007).

The translated text of the patent submitted by defendant does not confirm plaintiff's argument. The invention has nothing to do with the rotation of the panels and makes no claims about the direction of rotation. The description defines the arrow in figure 2 (15) only as "the revolving cutting direction" or the "revolving direction." AT '523 pat., dkt. #64-5, at 6, 7. The patent never states that the panels rotate in opposite directions or that they are mounted facing opposite rotational directions. In fact, the description states:

The shafts (2 and 3) are connected to these arranged frames (4, 5) with a gearbox (7) that can be operated in either revolving direction, whereby the clockwise revolving direction is noted as the cutting direction and the counter-clockwise revolving direction is noted as the stirring direction.

Id. at 5. Plaintiff argues that this describes the gearbox rotating in a clockwise direction, which then causes the panels to rotate in opposite directions. However, this paragraph describes the "clockwise revolving direction" as "the cutting direction," and the rotational direction of the panel determines whether it cuts or stirs, not the rotational direction of the gearbox. I conclude that plaintiff has not shown that the AT '523 patent discloses agitator panels rotating in opposite directions and mounted so that they only cut or only stir when so rotated.

With respect to the EP '587 patent, plaintiff's argument is limited to one sentence asserting that the two arrows in Figures 2, 4 and 6 indicate panels rotating in opposite directions. The arrows are not labeled in the diagram or the patent. The text of the EP '587

patent does not mention the direction of rotation. The patent describes a “double mixing apparatus 3 [which] includes two cutting and mixing wings,” EP ‘587 pat., dkt. # 64-4, at 5, but it is not clear whether “wings” refer to different faces on each panels or the two panels individually. The patent does not describe the orientation of the wings.

Plaintiff has failed to show that the AT ‘523 or EP ‘587 patents describe panels that rotate in opposite directions and are oriented so that they present only cutting or stirring faces in the direction of rotation, as claimed in the independent claims 1 and 10. Accordingly, I need not consider whether these patents also make the dependent claims 2, 3, 9, 11 and 12 obvious or whether a person of ordinary skill would have reason to apply this technology to horizontal vats.

b. Obviousness in light of the Jay patents

Plaintiff also argues that the Jay ‘559, ‘907 and ‘504 patents render the ‘347 patent obvious. The specifications of the Jay ‘559 and ‘907 patents state that the “agitators normally rotate co-directionally but can be arranged for counter rotation where specific production criteria demand it.” They explain nothing more about counter rotation. They do not explain what production criteria demand counter rotation, why cheese production would benefit from counter rotation or how to arrange the agitator panels to avoid simultaneous cutting and stirring. They extol the benefits of rotating the panels in the same

direction to induce movement in the same direction and enable “cross-cutting.”

The summary of the Jay ‘504 patent states that the shafts normally rotate in the same direction but, “[in] another form of the invention, the shafts are arranged to contra rotate thereby creating opposite torrodial [sic] flow patterns around each of the shafts in the vat such that the flow patterns are in unison in the common second portion of the swept volumes” Jay ‘504 pat., dkt. #32-4, at col. 2, lns. 62-65. This is the only mention of contra rotation and it says only that the shafts are arranged to contra rotate, not that the panels are reoriented to avoid cutting and stirring simultaneously. The inventor never explains why one would want to contra rotate the shafts or produce the described flow patterns.

The preferred embodiment of the Jay ‘504 patent contains a section that describes how to use the panels specifically for cheese processing. This section describes rotating the panels in the same directions. After initial mixing and a period of rest for “satisfactory coagulation, the horizontal shafts are first rotated in one direction to present the sharpened edges of the blades to the coagulum in order to achieve a cutting action until the coagulum is reduced to the desired mixture of curds and whey. Then, the paddles are rotated in the opposite direction in order to achieve agitation of the curds and whey with a minimum of further cutting.” Id. at col. 7, lns. 55-61. The patent continues on to describe the benefits for cheese production of rotating the panels in the same direction: the product flows along

the shaft down one wall and up the other, more evenly distributing the heat. Id. at col. 7, ln. 62 - col. 8, ln. 4. The section on cheese production does not mention contra rotating the panels or explain why contra rotation would be beneficial for cheese production.

The prior art discloses the possibility that agitator panels in a food production vat might be rotated in opposite directions but does not describe using counter rotation for cheese production or reorienting the panels so that they present only cutting or only stirring faces in the direction of rotation.

I turn next to the legal question whether it would have been obvious to one of ordinary skill in the art to modify the agitator panels described in the Jay patents to encompass the remaining limitations of the '347 patent. The guiding question is "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent." KSR International, 550 U.S. at 418. A person of ordinary skill is presumed to know the prior art. In re GPAC Inc., 57 F.3d 1573, 1579 (Fed. Cir. 1995). For "fairly straightforward" patents, "logic, judgment and common sense" may be a sufficient basis to conclude on summary judgment that there was an apparent reason to combine prior art, even in the face of conflicting expert testimony. Wyers v. Master Lock Co., 616 F.3d 1231, 1239 (Fed. Cir. 2010) (citing KSR, 550 U.S. at 427).

Plaintiff argues that a person of ordinary skill would know about counter rotation from the Jay patents and common sense dictates turning over the agitator panels on one axis.

When a vat is used for counter rotation, there are two possible panel orientations: (1) the panels may be arranged as described in the Jay patents or (2) the panels on one axis may be turned over. In the first arrangement in the Jay patents, one-half of the vat is stirred while the other half is cut and the common volume is stirred and cut. According to plaintiff's experts, a person of ordinary skill in cheesemaking would know that simultaneous cutting and stirring is undesirable. Zirbel Rep., dkt. #64-23, at 2; Jay Rep., dkt. #60-1, at 2, 4, 5; Bradley Rep., dkt. #64-24, at 2, 4, 5. Consequently, plaintiff argues, common sense dictates that the only way to design a functional counter rotating cheese vat is to flip the panels over. KSR International, 550 U.S. at 421 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.")

However, it is not sufficient for plaintiff to argue that it was logical to reorient the panels when counter rotating the panels, because plaintiff has not established a reason to rotate the panels in opposite directions in the first place. Parties may use a variety of evidence to establish a reason to combine prior art: the interrelated teachings of prior art references; the knowledge of skilled artisans that certain disclosures are of special importance; problems known in the field at the time of invention; the nature of the problem; market forces; design incentives; and the background knowledge, creativity, and common

sense of the person of ordinary skill. Perfect Web Technologies, Inc. v. InfoUSA, Inc., 587 F.3d 1324, 1329 (Fed. Cir. 2009) (quotations omitted). The only evidence that plaintiff presents about the reason to rotate the panels in opposite directions is the background of the ‘347 patent itself. Plt.’s Br. in Supp., dkt. #57, at 47. According to the background of the ‘347 patent, rotating the panels in the same direction causes the curds to flow in one direction and to mat and pile up on the side where the agitator panel is moving upwardly. Increasing the speed of rotation reduces the piling up but agitates the cheese too much and overworks the upward moving agitator while underutilizing the other agitator. Periodic reversal is necessary to move the curd back to the other side and causes additional undesirable cutting. Rotating the panels in the opposite direction solves the “piling up” problem without similar drawbacks.

Obviously, plaintiff cannot rely only on the teachings of the very patent it is challenging to establish a motivation for combining prior art. In any case, the ‘347 patent does not state that piling up is a well known problem in the art or that increasing the speed or reversing the rotation has known drawbacks. The Jay patents do not mention piling up or explain that counter rotation might alleviate the problem. They describe the benefits of rotating the panels in the same direction and, in particular, the flow patterns the rotation creates. Plaintiff’s experts did not identify any reason why a person of ordinary skill would have wanted to rotate the panels in opposite directions at the time the ‘347 patent issued.

They state only that counter rotation without reorienting the cutting faces would damage the coagulum. Plaintiff has adduced no evidence that piling up was a known problem in horizontal cheese vats or that counter rotation was its obvious solution.

Furthermore, the examiner was aware that prior art described rotating the panels in opposite directions. Plaintiff has cited no prior art that was not before the examiner. The applicant disclosed all three Jay patents during prosecution; the '347 patent discusses them in its background section; and the examiner and applicant discussed the passage in the Jay '504 patent describing contra rotation and flow patterns. The throwaway line about counter rotation in the '559 and '907 patents adds nothing to the information before the patent examiner. From his knowledge of the prior art and of the ordinary skill level, the examiner concluded that the disclosure of counter rotation in the Jay '504 patent did not render the '347 patent obvious and that reorienting the panels was not common sense.

Plaintiff proffered no new evidence about counter rotation or the teachings of the Jay '504 patent about product flow. Instead, it argues only that the examiner would not have allowed the '347 had he noticed the portion of the Jay '504 patent implying that only cutting or only stirring faces should be presented during cheese production. I will not assume the examiner failed to read the prior patents and was too naive to know what plaintiff asserts is common sense.

I conclude that plaintiff has identified insufficient evidence that a person of ordinary

skill would have considered it obvious to rotate the agitator panels of a cheese vat in opposite directions and to reorient the agitator panels to present only cutting or only stirring faces in the direction of rotation. Consequently, I need not consider plaintiff's argument that the dependent claims are obvious or defendant's arguments that the prior art does not disclose "trailing" or a drive to counter rotate, or that the secondary considerations support a finding that the '347 patent was not obvious. I will grant summary judgment to defendant on plaintiff's claim in count II of its complaint that the '347 patent is invalid.

ORDER

It is ORDERED that

1. The motion to strike, dkt. #71, filed by defendants Tetra Pak Cheese and Powder Systems, Inc. and Tetra Laval Holdings & Finance S.A. is GRANTED IN PART and DENIED IN PART, as follows:

a. Paragraphs 18, 20-25 and 36-38 of the Declaration of Jeffrey L. Jay, dkt. #60, are STRICKEN;

b. Paragraphs 36, 38, 39 and 46 of the Declaration of John Zirbel, dkt. #61, are STRICKEN;

c. The motion is DENIED in all other respects.

2. Defendants' motion for summary judgment, dkt. #62, is DENIED with respect to

their claim of literal infringement of claims 1 and 10 of U.S. Pat. No. 5,985,347 and GRANTED with respect to (a) defendants' counterclaim of infringement of claims 1 and 10 of U.S. Pat. No. 5,985,347 patent; (b) plaintiff's claim for a declaratory judgment of non-infringement; and (c) plaintiff's claim for a declaratory judgment that the '347 patent is invalid because anticipated or obvious.

3. The motion for summary judgment, dkt. #56, filed by plaintiff Cheese Systems, Inc. and third party defendant Custom Fabricating & Repair, Inc. is DENIED and plaintiff's complaint is DISMISSED.

Entered this 15th day of May, 2012.

BY THE COURT:
/s/
BARBARA B. CRABB
District Judge