IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

STEUBEN FOODS, INC., Plaintiff, v. SHIBUYA HOPPMANN CORP., SHIBUYA KOGYO CO., LTD., and HP HOOD LLC, Defendants.	C.A. No. 19-2181-CFC

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MEMORANDUM OPINION

March 14, 2023
Wilmington, Delaware

COLM F. CONNOLLY
CHIEF DISTRICT JUDGE

I held a five-day jury trial in this patent infringement case filed by Plaintiff Steuben Foods, Inc. against Defendants Shibuya Hoppmann Corp., Shibuya Kogyo Co., Ltd., and HP Hood LLC (collectively, Shibuya). The asserted patents are directed to apparatuses and methods for aseptic bottle filling. Steuben asserted five claims at trial: claims 3 and 7 of U.S. Patent No. 6,702,985 (the #985 patent); claims 19 and 22 of U.S. Patent No. 6,536,188 (the #188 patent); and claim 26 of U.S. Patent No. 6,209,591 (the #591 patent). The jury found that Shibuya's bottle filling machines infringed all the asserted claims, that the asserted claims were not invalid, and that Steuben was entitled to approximately $38 million in damages. D.I. 787.

Pending before me is Shibuya's Motion for Judgment as a Matter of Law or, Alternatively, for a New Trial (D.I. 795). Shibuya brings the motion pursuant to Federal Rule of Civil Procedure 50(b). It seeks by the motion a judgment of noninfringement of the asserted patents, invalidity of the #591 and #188 patents for lack of adequate written description and enablement, and invalidity of the #985 and #591 patents for obviousness. It asks in the alternative for a new trial and vacatur of the jury's damages award.

I. MOTION FOR JUDGMENT AS A MATTER OF LAW

A. Legal Standard

"If the court does not grant a motion for judgment as a matter of law made under Rule 50(a), . . . the movant may file a renewed motion for judgment as a matter of law and may include an alternative or joint request for a new trial under Rule 59." FED. R. CIV. P. 50(b). A motion filed under Rule 50(b) "should be granted only if, viewing the evidence in the light most favorable to the nonmovant and giving it the advantage of every fair and reasonable inference, there is insufficient evidence from which a jury reasonably could find liability." *Lightning Lube, Inc. v. Witco Corp.*, 4 F.3d 1153, 1166 (3d Cir. 1993).

B. Analysis

1. Noninfringement of the #985 Patent

Asserted claims 3 and 7 of the #985 patent depend from claim 1, which requires among other things that a "sterilant [be] intermittently added to [a] conduit." PTX-112 at claim 1 (19:56–57). Before trial, by stipulation of the parties, I construed the term "intermittently added" to mean "[a]dded in a non-continuous manner." D.I. 529-1 at 2; D.I. 531 at 7.

It is undisputed that the accused machines add sterilant to their conduit continuously. Steuben's expert, Dr. Sharon, expressly "agree[d] that in the accused system, the addition of the sterilant, the atomized sterilant[,] to the conduit is continuous." Tr. 446:8–11 (Sharon). Steuben nevertheless maintained at trial

that the accused machines infringe the "intermittently added" limitation under the doctrine of equivalents. Dr. Sharon explained Steuben's equivalents infringement theory to the jury as follows:

> Q. Okay. So, now you have said that, nevertheless, you think that the machine infringes under the doctrine of equivalents; is that right?
>
> A. Correct.
>
> Q. And let me see. And if I understand your point correctly, your point is that the way you read the patent, the point of the intermittent adding is to ensure that the right amount of sterilant is added; right?
>
> A. That is correct.
>
> Q. Okay. And so whatever structures in Shibuya's machine allow the right amount of sterilant to be added will be equivalent to whatever structure intermittently adds in the patent. Is that fair?
>
> A. I'd agree with that.

Tr. 446:12–25 (Sharon).

At the close of Steuben's case, Shibuya moved for judgment of noninfringement of the #985 patent as a matter of law. Tr. 621:14–18; *see also* D.I. 780. At Steuben's urging, I reluctantly reserved ruling and let the issue go to the jury. Tr. 625:12–19; 1068:14–18.

In his closing argument, Steuben's counsel argued:

> You heard a lot and you may hear it on closing that intermittent is not the same as continuous, as if that is the

> question you're being asked to answer, but that's not the precise question.
>
> Dr. Sharon was very specific. It's not just adding sterilant continuously, it's doing that using flow sensors and metering pumps to achieve a very precise amount of sterilant that's going into the system, and so that's the alleged equivalent. *You can do it intermittently or as in the accused machines, you can do something continuously, but very precisely and* [*with*] *control.* That's the equivalent that's being talked about here from Dr. Sharon.

Tr. 1265:20–1266:6 (emphasis added). The jury found that Shibuya infringed claims 3 and 7 of the #985 patent under the doctrine of equivalents. D.I. 787 at 1.

Shibuya argues, and I agree, that as a matter of law the "intermittently added" limitation cannot be met under the doctrine of equivalents by a continuous addition of sterilant. This conclusion is required by *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997), in which a unanimous Supreme Court held:

> Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety.

Id. at 29. Here, Steuben's equivalency theory effectively eliminates the "intermittently added" limitation in its entirety, and therefore a judgment of

noninfringement is warranted as a matter of law. No reasonable juror could conclude that adding sterilant continuously is substantially the same as adding sterilant intermittently.

"Intermittently" and "continuously" are *antonyms* of each other, not equivalents. *See Intermittently*, Merriam-Webster.com Thesaurus, https://www.merriam-webster.com/thesaurus/intermittently (last visited Mar. 6, 2023). As noted above, at the request of both sides, I construed "intermittently added" to mean "[a]dded in a non-continuous manner." D.I. 529-1 at 2; D.I. 531 at 7. As a matter of logic and contrary to counsel's statements in his closing argument, doing something in a non-continuous manner cannot be achieved by doing it "continuously" even if you were doing it "continuously, but very precisely and with control." Steuben's doctrine of equivalents theory defies logic, vitiates the "intermittently added" limitation of the asserted claims, and therefore cannot be sustained as a matter of law. *Warner-Jenkinson*, 520 U.S. at 29; *see also Planet Bingo, LLC v. GameTech Int'l, Inc.*, 472 F.3d 1338, 1345 (Fed. Cir. 2006) (affirming district court's refusal to find infringement by equivalents where "proposed application of the doctrine of equivalents would change 'before' to 'after'" and noting that "[t]his court has refused to apply the doctrine in other cases where the accused device contained the antithesis of the claimed structure"); *Asyst Techs., Inc. v. Emtrak, Inc.*, 402 F.3d 1188, 1195 (Fed. Cir. 2005) (holding that

"the district court was correct in ruling that the doctrine of equivalents cannot be extended to reach an 'unmounted' system . . . without vitiating the 'mounted on' limitation altogether"); *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1346 (Fed. Cir. 2001) ("[T]he doctrine of equivalents cannot be employed in a manner that wholly vitiates a claim limitation. Thus, if a patent states that the claimed device must be 'non-metallic,' the patentee cannot assert the patent against a metallic device on the ground that a metallic device is equivalent to a non-metallic device." (internal citations omitted)); *Moore U.S.A., Inc. v. Standard Reg. Co.*, 229 F.3d 1091, 1106 (Fed. Cir. 2000) (holding that patentee's "use of the term 'majority' is not entitled to a scope of equivalents covering a minority" for the independent reason that "it would defy logic to conclude that a minority—the very antithesis of a majority—could be insubstantially different from a claim limitation requiring a majority, and no reasonable juror could find otherwise").

Steuben insists that in *Epos Technologies, Ltd. v. Pegasus Technologies, Ltd.*, 766 F.3d 1338 (Fed. Cir. 2014), "the Federal Circuit rejected [the idea that there is] a 'binary choice' between the very same terms ***continuous*** and ***intermittent***." D.I. 798 at 14 (emphasis in original). But the construction of those terms by the district court in *Epos Technologies* makes that case inapplicable here. The patents at issue in *Epos Technologies* covered digital pens and receiver

devices; a claim limitation of one of the patents—the #371 patent—required a "device for receiving or transmitting an 'intermittent' ultrasound signal." 766 F.3d at 1347. Based on the undisputed fact that the accused devices "generate[d] a continuous ultrasound signal," the district court rejected the plaintiff's infringement theory under the doctrine of equivalents and granted summary judgment of noninfringement. *Id.* at 1348. The district court "reasoned that allowing continuous ultrasound signals to be equivalents 'would eliminate the intermittent limitation entirely,' and that 'the doctrine of equivalents cannot extend that far.'" *Id.* (internal citations omitted). The Federal Circuit reversed that decision and remanded the case for further consideration, finding that "the district court 'shortcut' the [doctrine of equivalents] inquiry by identifying a binary choice (continuous or intermittent) that is not compelled by the [#]371 patent and the record evidence." *Id.*

Epos Technologies is distinguishable from this case because, unlike here, the district court in *Epos Technologies* had not construed the intermittent limitation to necessarily preclude a device that generated a continuous ultrasound signal. Rather, the district court had construed "'intermittent' as 'something that occurs occasionally, in a non-continuous manner, in a random or unpredictable manner, *or* at selected times.'" *Id.* at 1347 (emphasis added). In this case, however, I construed "intermittently added" to mean—and only mean—"[a]dded in a non-

continuous manner." D.I. 529-1 at 2; D.I. 531 at 7. It is, of course, impossible to add something continuously in a non-continuous manner. Thus, unlike in *Epos Technologies*, in this case there is a binary choice between "intermittently" and "continuously."

Accordingly, I will enter judgment of noninfringement of the asserted claims of the #985 patent as a matter of law.

2. Noninfringement of the #188 Patent

Asserted claim 22 of the #188 patent depends from asserted claim 19, which has two claim limitations written in means-plus-function form. The first limitation requires a "means for providing a plurality of bottles," PTX-199 at claim 19 (16:65); the second requires a "means for filling the aseptically disinfected plurality of bottles at a rate greater than 100 bottles per minute," PTX-199 at claim 19 (17:5–6).

A claim limitation that recites a function to be performed rather than a definite structure, is subject to the requirements of 35 U.S.C. § 112, ¶ 6 (1994). *Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1266 (Fed. Cir. 1999). Such limitations "must be construed 'to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.'" *Id.* at 1266–67 (citing 35 U.S.C. § 112, ¶ 6; *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997)). "Literal infringement of a § 112, ¶ 6 limitation requires that the

relevant structure in the accused device perform the identical function recited in the claim *and* be identical or equivalent to the corresponding structure in the specification." *Id.* (emphasis added). If the relevant structure in the accused device is not identical to the corresponding structure in the patent's written description, then the test for § 112, ¶ 6 equivalence is whether the two structures "perform the identical function, in substantially the same way, with substantially the same result." *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 1364 (Fed. Cir. 2000). Because "[f]unctional identity *and* either structural identity or equivalence *are both necessary*," *Odetics,* 185 F.3d at 1267 (some emphasis added), a court is required "to give *independent meaning to both* the 'function' and 'way' prongs of the equivalency test." *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 312 F. App'x 326, 332 n.3 (Fed. Cir. 2009) (emphasis added).

I construed the corresponding structure for the "means for providing a plurality of bottles" limitation to be "a pushing element, and equivalents." D.I. 531 at 2. I construed the corresponding structure for the "means for filling the aseptically disinfected bottles at a rate greater than 100 bottles per minute" limitation to be, among other things, a conveyor and a conveyor plate and equivalents. D.I. 531 at 5–6.

Steuben alleged at trial that the accused machines have an infeed screw, rotary wheels, and neck grippers that are the structural equivalents respectively of a

pushing element, conveyor, and conveyor plate. Tr. 365:3–12, 405:7–10, 409:1–6 (Sharon). Shibuya argues that no reasonable juror could conclude based on the record evidence that the three alleged equivalents operate in substantially the same way as their corresponding structures, and therefore a judgment of noninfringement of the #188 patent is warranted.

With respect to the infeed screw, Dr. Sharon testified:

> [T]he way the infeed screw works is that as it rotates, you can see that it pushes the bottles forward along the axis of the screw. Okay.
>
> So this thread that is on a screw is actually no different than the thread on a bolt, only that it's bigger, and basically, it, as it's turning, it's kind of wedging the bottle and pushing it along. The thread is like a helix. It kind of does that as I rotate here, you know, it pushes it along.
>
> * * * *
>
> [T]he only way the screw can move the bottles is by pushing on their side, you know, through the wedging action.

Tr. 369:1–370:10 (Sharon). A reasonable juror could conclude from this testimony that the infeed screw operates in substantially the same way as a pushing element—i.e., by pushing. Indeed, a rational juror could conclude from this testimony that an infeed screw *is* a pushing element.

I agree with Shibuya, however, that Steuben did not adduce at trial sufficient evidence for a reasonable juror to conclude that the way the accused machines' rotary wheels and neck grippers operate is substantially the same as the way a

conveyor and conveyor plate operate. Rotary wheels move rotationally, not linearly like a conveyor. Tr. 410:21–411:2, 477:19–22 (Sharon). And rotary wheels operate continuously, not intermittently like a conveyor. Tr. 411:3–8, 477:15–18 (Sharon). The neck grippers of the accused machines each hold one bottle at a time, Tr. 676:6–8 (Larrick), whereas the conveyor plates described in the patent move six or 12 bottles at a time, PTX-199 at Fig. 8; PTX-199 at 7:38–47; Tr. 476:16–477:14 (Sharon). Neck grippers pinch the bottles at the neck, whereas a conveyor plate surrounds the bottom of the bottles. Tr. 406:16–25 (Sharon). Neck grippers can hold different bottle sizes, Tr. 676:25–677:2 (Larrick); Tr. 854:5–10 (Glancey), whereas conveyor plates can accommodate only bottles with bases barely smaller than the size of the plates' holes, Tr. 849:24–850:3 (Glancey). These differences are undisputed and so substantial that no reasonable juror could conclude that the accused machines had the structural equivalents of a conveyor and conveyor plate. *See Toro Co. v. Deere & Co.*, 355 F.3d 1313, 1324 (Fed. Cir. 2004) (affirming grant of summary judgment because "the two systems accomplish [the claimed] function in fundamentally different ways"); *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1309, 1311 (Fed. Cir. 1998) (finding no infringement under either § 112, ¶ 6

or the doctrine of equivalents because the accused device operated in a "substantially different way").[1]

Steuben insists that it adduced at trial sufficient evidence to support the jury's finding of equivalency of the accused machines' components with the patent's corresponding structures. But in the testimony it cites in support of its position, Dr. Sharon merely opined that the neck grippers and rotary wheels were insubstantially different from a conveyor and conveyor plate because they fulfill the claimed function of filling aseptically disinfected bottles at a rate greater than 100 bottles per minute. *See* Tr. 406:4–9 (Sharon testifying that the differences between neck grippers and conveyor plates are "insubstantial . . . because, again, . . . the function of the claim is filling bottles at a rate greater than a hundred bottles per minute. How you hold the bottles is not important."); Tr. 411:9–15 (Sharon testifying that the differences between rotary wheels and a conveyor are

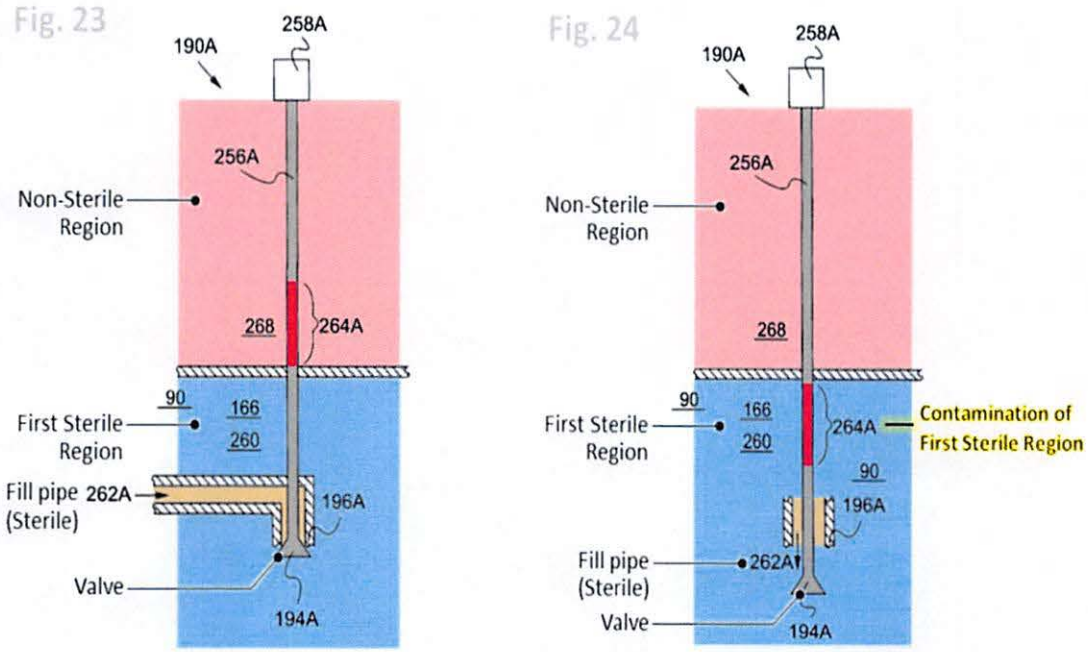
[1] Before trial, I had denied Shibuya's motion for summary judgment of noninfringement of the #188 patent based on Steuben's denial of Shibuya's factual assertion that the accused machines do not use a linear conveyor. *See* D.I. 751 at 1. In support of its denial of that assertion, Steuben cited record evidence of a linear conveyor. *See* D.I. 751 at 1. I learned at trial—from Steuben's own expert—that that linear conveyor moves the bottles *after* they have been sterilized by the accused machines to a labeling and packaging station. *See* Tr. 477:19–478:16 (Sharon testifying that the linear conveyor "is not part of the sterilization" and is "not part of the filling the bottles."). In other words, the linear conveyor plate Steuben referred me to in its summary judgment briefing is irrelevant to the question of infringement.

insubstantial because "you can use either strategy and still achieve 100 bottles per minute. It's not like using one or the other is going to allow you to do that and the other one isn't. So it's an insubstantial difference."); Tr. 410:15–20 (Sharon testifying that "if the claim was directed towards novel new ways of transporting bottles, then maybe those differences [between rotary wheels and a conveyor] would be substantial, but in terms of filling at a rate of 100 bottles per minute, you can do it with a linear conveyor [or] rotary dial. It's not – it's not a substantial difference."). "Function" and "way," however, are independent considerations in determining structural equivalence under § 112, ¶ 6. *Odetics,* 185 F.3d at 1267; *Applied Med. Res.*, 312 F. App'x at 332. And because Steuben adduced no other evidence to show that the accused machines' rotary wheels and neck grippers operate in substantially the same way as a conveyor and conveyor plate, I will grant judgment of noninfringement of the asserted claims of the #188 patent as a matter of law.

3. Noninfringement of the #591 Patent

Steuben accused Shibuya's P7 filling machine of infringing claim 26 of the #591 patent. Claim 26 covers an apparatus that has, among other things, "a first sterile region surrounding a region where the [food] product exits the valve" of a fill pipe into a bottle and "a second sterile region positioned proximate [to] said first sterile region." PTX-212 at reexamined claim 26 (2:59–62).

As the patent explains, the second sterile region solved a contamination problem traceable to the design of existing bottle fillers' valves used to stop and start the flow of sterile food product into the bottles. PTX-212 at 14:1–23. In that design, illustrated in Figures 23 and 24 of the patent and reproduced below, "the valve stem 256A may carry contaminants from the non-sterile region 268 into the first sterile region 260" as it moves up (into the non-sterile region) to stop and down (into the sterile region containing food product) to start the flow of food product into the bottles. PTX-212 at 14:18–21.



DDTX-3.92 (annotated). The patent purports to solve this contamination problem by adding a "second sterile region" into which a sterilant is introduced to clean the portion of the valve stem that is exposed to the non-sterile region during the valve's operation. *See* PTX-212 at 14:21–30.

According to the patent's written description and as illustrated in Figures 25 and 26 of the patent, which are reproduced below: "In the present invention, the first portion 264A of the valve stem 256A has not introduced contaminants into the first sterile region 260 because the first portion 264A of the valve stem 256A was pre-sterilized in the second sterile region 270A before entering the first sterile region 260." PTX-212 at 14:49–53.

Fig. 25

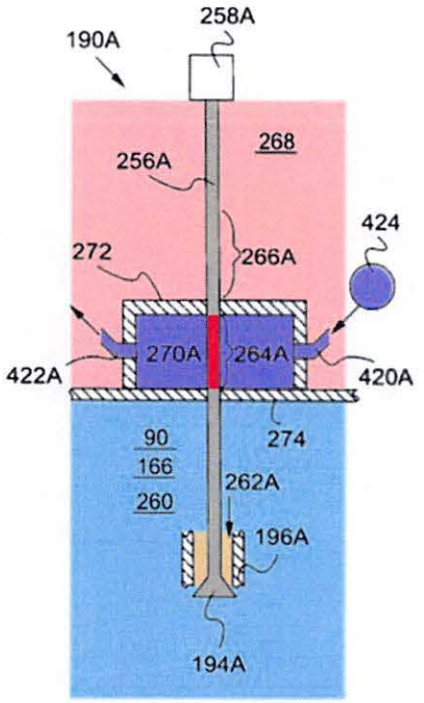
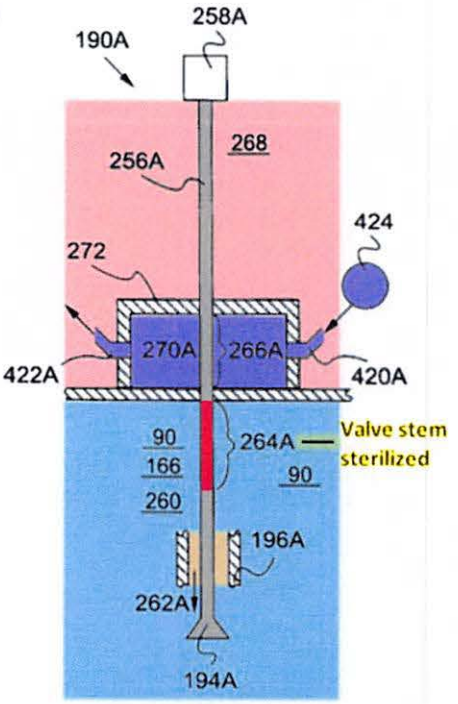


Fig. 26



DDTX-3.96 (annotated). Region 270A (highlighted in purple) is the patent's only depiction of a second sterile region. Tr. 468:12–469:20 (Sharon).

At the *Markman* hearing, I agreed with Steuben that the "second sterile region positioned proximate [to] said first sterile region" limitation (i.e., the "second sterile region" limitation) did not require a construction and should be given its plain and ordinary meaning. D.I. 531 at 6; D.I. 755 at 3 (quoting oral

ruling made at *Markman* hearing). Steuben later moved for summary judgment of infringement of claim 26 by the P7. D.I. 614. Shibuya argued that I should deny the motion because the P7 does not meet the "second sterile region" limitation and because Shibuya's so-called "reverse doctrine of equivalents" defense raised a factual dispute. D.I. 707 at 7–12.[2]

The P7 uses a flexible, impenetrable barrier called a bellows that surrounds the portion of the valve stem that is exposed to a non-sterile region and thereby prevents that portion of the valve stem from entering (and thus from contaminating) the sterile zone (i.e., the first sterile region). Tr. 469:4–17

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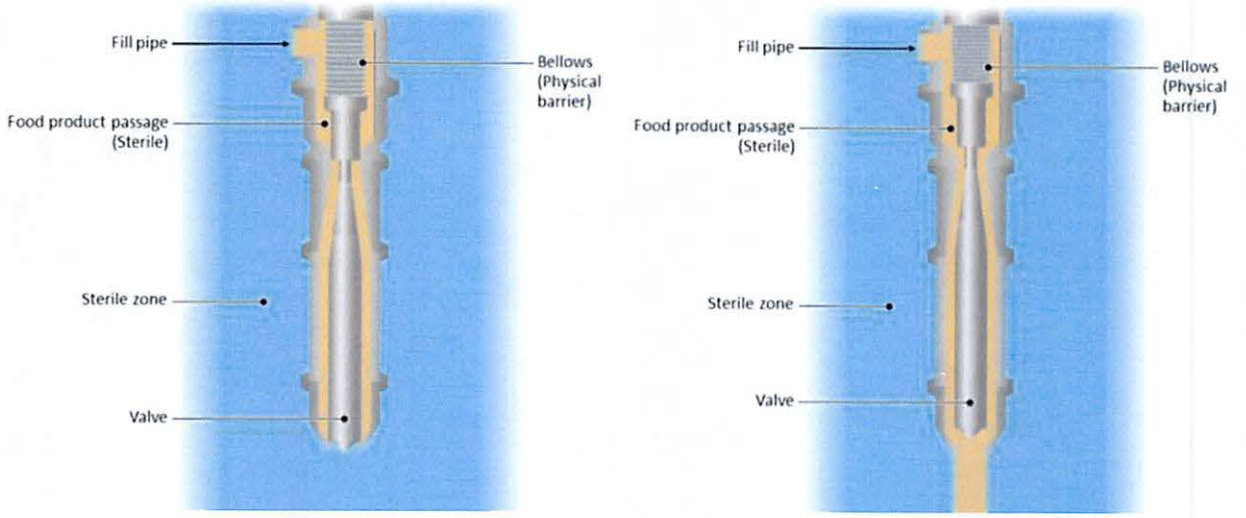
[2] Courts, including the Federal Circuit, have used the phrase "reverse doctrine of equivalents" when a defendant invokes the doctrine of equivalents; and the parties used that phrase here to describe Shibuya's doctrine of equivalents defense. The Supreme Court made clear in *Graver Tank & Manufacturing Co. v. Linde Air Products Co.*, that the doctrine of equivalents applies *equally* to plaintiffs and defendants in a patent infringement case:

> The wholesome realism of th[e] doctrine [of equivalents] is not always applied in favor of a patentee but is sometimes used against him. Thus, where a device is so far changed in principle from a patented article that it performs the same or a similar function in a substantially different way, but nevertheless falls within the literal words of the claim, the doctrine of equivalents may be used to restrict the claim and defeat the patentee's action for infringement.

339 U.S. 605, 608–09 (1950). For ease of reference, I will follow the parties' lead and refer to Shibuya's doctrine of equivalents defense as a reverse doctrine of equivalents defense.

(Sharon); Tr. 688:4–689:17 (Larrick); Tr. 905:18–906:14, 908:2–10 (Glancey). The following images depict the P7's fill-pipe valve in its closed (left image) and open (right image) positions:



DDTX-3.99–100.

Because it was undisputed that the inside of the P7's fill pipe (i.e., the "Food product passage" in the above images) is both sterile and proximate to the P7's first sterile region (i.e., the "Sterile zone" in the above images), I found that the P7 meets the "second sterile region" limitation and literally infringes claim 26. D.I. 755 at 5. But I denied Steuben's motion for summary judgment because of Shibuya's invocation of the reverse doctrine of equivalents defense and the fact that Shibuya had adduced on the record an expert's opinion that the P7's fill pipe (which carries food and does not carry a sterilant) does not clean the valve stem.

That opinion evidence, I held, gave rise to a fact question—namely, whether the P7 performed the second sterile region's claimed function in a substantially different way—and thus precluded summary judgment of infringement. *See* D.I. 755 at 7.

At trial, Steuben maintained its position that the P7 met the "second sterile region" limitation solely by virtue of the sterile region inside of the P7's fill pipe. Steuben did not allege that any other area or component of the P7 constitutes a "second sterile region." Steuben also did not dispute that the P7's fill pipe does not clean the valve stem. Thus, not surprisingly, Dr. Sharon conceded during his cross-examination that the P7 "doesn't have a sterile region that cleans the valve stem while the machine is in operation." Tr. 469:18–20 (Sharon); *see also* Tr. 468:22–469:20 (Sharon).

At the close of Steuben's infringement case and again at the conclusion of the presentation of evidence, Shibuya moved for judgment of noninfringement of the #591 patent as a matter of law. Tr. 629:8–17; Tr. 1064:7–12. Shibuya argued that Steuben had "admitted that what has been called the second sterile region in the accused device . . . does not solve the problem . . . the patent purports to solve, and therefore under the reverse doctrine of equivalents, the accused invention is so far changed in principle that it's just not doing what the patented claim is about." Tr. 629:11–17. Although I stated that this was a "really, really good argument[]," I denied the motion and told counsel I would revisit the argument during posttrial

motion practice. Tr. 629:18–22. In retrospect, I should have granted the motion, as no reasonable juror could have concluded that Steuben rebutted Shibuya's *prima facie* showing of noninfringement under the reverse doctrine of equivalents.

"When a patentee establishes literal infringement, the accused infringer may undertake the burden of going forward to establish the fact of non-infringement under the reverse doctrine of equivalents. If the accused infringer makes a *prima facie* case, the patentee, who retains the burden of persuasion on infringement, must rebut that *prima facie* case." *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1123–24 (Fed. Cir. 1985).

To make a *prima facie* showing of noninfringement under the reverse doctrine of equivalents, the defendant must adduce evidence from which a rational juror could conclude that the accused "device is so far changed in principle from [the] patented article that it performs the same or a similar function in a substantially different way." *Graver Tank*, 339 U.S. at 608–09; *see also Autogiro Co. of Am. v. United States*, 384 F.2d 391, 399–400 (Ct. Cl. 1967) ("[S]ince the law is to benefit the inventor's genius and not the scrivener's talents, claims must not only read literally on the accused structures, but also the structures must 'do the same work, in substantially the same way, and accomplish substantially the same result.'" (internal citation omitted)). Shibuya easily met this burden of production at trial. Its expert, Dr. Glancey, testified: (1) consistent with the patent's

specification, that the principle of operation of the second sterile region in the claimed invention is to "appl[y] a sterilant to [the potentially contaminated] portion of the valve stem, thus cleaning that part of the valve stem," Tr. 905:16–17 (Glancey); (2) based on engineering drawings, documents, and a site visit to Shibuya's facility, Tr. 904:2–7 (Glancey), that the P7's principle of operation is the use of a "flexible" bellows that "stretches or contracts" and "provide[s] an impervious barrier to prevent th[e] internal contaminants inside the bellows from migrating out and contacting the food" as the valve stem "moves up or down," Tr. 906:6–12 (Glancey); (3) that there is therefore "no need for sterilant" in the P7's fill pipe (i.e., the alleged second sterile region), Tr. 907:16–18 (Glancey); and (4) that these differences between the principles of operation of the claimed invention and the P7 are substantial and therefore under the reverse doctrine of equivalents, the P7 does not infringe claim 26, Tr. 908:11–19 (Glancey).

Steuben argues that it rebutted Dr. Glancey's testimony with Dr. Sharon's testimony. D.I. 798 at 9. Although Dr. Sharon never expressly stated that the principles of operation of the P7 and of the patented invention are not substantially different, he did testify that the P7 "embod[ies] the principles of operation of claim 26," including "the principles of operation of the first and second sterile regions." Tr. 361:17–22 (Sharon). But, according to Dr. Sharon, "the whole principle of operation" of claim 26 is "basically filling more than 350 bottles per minute

aseptically and doing that with, *by having these two sterile regions that the valve is sort of constrained to so that as it opens and closes, it only stays within those two regions and it does not go into any non-sterile region* and therefore [reduces the] risk [of] the possibility of bringing in contaminants, pathogens, into the food." Tr. 355:6–13 (Sharon) (emphasis added). This characterization of the patented invention, however, is wrong as a matter of law because it is inconsistent with the patent's specification. It therefore was entitled to no weight by the jury. *See Roche Palo Alto LLC v. Apotex, Inc.*, 531 F.3d 1372, 1378–79 (Fed. Cir. 2008) (affirming grant of summary judgment of infringement and district court's ruling that expert's declaration did not establish *prima facie* case of reverse doctrine of equivalents where declaration was contrary to the patent's claims and specification and therefore "d[id] not properly establish the principle of the [asserted] patent"); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584 (Fed. Cir. 1996) ("[T]he expert testimony, which was inconsistent with the specification and file history, should have been accorded no weight.").

The valve stem in the patented invention does *not* stay in the two sterile regions. On the contrary, the whole purpose of the second sterile region in the patented invention is to sterilize the portion of the valve stem that is *exposed to a non-sterile region*. As the patent's written description explains and Figures 25 and 26 illustrate, "[t]he first portion 264A of the valve stem 256A is surrounded by the

second sterile region 270A," PTX-212 at 14:40–41, and "[*a*] *second portion 266A of the valve stem lies in the non-sterile region* 268" when the invention's valve is in the closed position, PTX-212 at 14:35–36 (emphasis added). To open the valve, an actuator "displace[s] the valve stem 256A in a downward direction . . . . allowing [food] product 262A to flow into a bottle." PTX-212 at 14:44–47. At this point, "[t]he first portion 264A of the valve stem 256A has entered the first sterile region 260," PTX-212 at 14:47–49, and "[*t*]*he second portion 266A of the valve stem 256A has entered the second sterile region 270A from the non-sterile region 268*," PTX-212 at 14:53–55 (emphasis added). The second portion of the valve stem is then "sterilized in the second sterile region 270A removing any contaminants." PTX-212 at 14:56–57. This principle of operation in "the second sterile region 270A removes any contaminants from the valve stem 256A before any portion of the valve stem 256A enters the first sterile region." PTX-212 at 14:58–60. When the valve is closed, the actuator displaces the valve stem in an upward direction, returning the first portion of the valve stem to the second sterile region and the second portion of the valve stem to the non-sterile region. *See* PTX-212 at 13:63–65; PTX-212 at Fig. 23–26.

Steuben cites in its posttrial briefing and Dr. Sharon identified at trial nothing in claim 26 or the #591 patent's specification that requires, discloses, or suggests in any way that a principle of operation of the claimed invention is (in Dr.

Sharon's words) to "constrain[ ]" the valve "so that as it opens and closes, it only stays within [the first and second sterile] regions and it does not go into any non-sterile region and therefore [reduces the] risk [of] the possibility of bringing in contaminants, pathogens, into the food." Tr. 355:10–13 (Sharon). At trial, Dr. Sharon relied solely on the P7 to establish the principle of operation of the patent. Using a valve taken from a P7, design documents for the P7, and demonstrative exhibits, Dr. Sharon explained to the jury how the P7 worked, Tr. 356:14–361:3 (Sharon), and then offered his opinion that the P7 "embod[ies] the principles of operation of claim 26" and "the principles of operation of the first and second sterile region[s]," Tr. 361:17–22 (Sharon).

Steuben's position at trial was that it did not have to rely on claim 26 or the patent's specification to establish claim 26's or the second sterile region's principles of operation because I had found that the P7 literally infringed claim 26. It made this point unequivocally in the following exchange between Steuben's counsel and Dr. Sharon:

> Q. So just to be clear, what we were talking about was, you know, how the patent claim works and you're using [the P7] as an example?
>
> A. That is correct.
>
> Q. Do you think it's fair to use that valve as an example of the patent claim?
>
> A. I do.

Q. Why?

A. Because the—because the accused machine was found to literally infringe, so, you know, if we know that it has that element.

Q. Thank you.

Tr. 357:23–358:9 (Sharon).

But this approach turns the reverse doctrine of equivalents on its head. The doctrine *rescues* from infringement devices that literally satisfy the elements of a claim but perform the same function of the invention in a substantially different way. It makes no sense, then, to look to the accused device that literally infringes to determine how the patented invention performs. But that is what Dr. Sharon did here. He based his description of the *patented invention's* principle of operation on *the P7's* principle of operation. This logic nullifies the reverse doctrine of equivalents.

Because Dr. Sharon's testimony about the principles of operation of claim 26 and the second sterile region was contrary to the patent's specification, it was wrong as a matter of law and entitled to no weight at trial. And because Steuben adduced no other evidence to rebut Dr. Glancey's testimony, Shibuya is entitled to a judgment of noninfringement of the #591 patent under the reverse doctrine of equivalents as a matter of law.

4. Invalidity of the #188, #591, and #985 Patents

Shibuya also argues that it is entitled to judgment as a matter of law of invalidity of the #591 and #188 patents for lack of adequate written description and enablement and of the #985 and #591 patents for obviousness. But as Steuben points out, Shibuya did not present these arguments in its Rule 50(a) motion at trial and therefore it has waived them.

"A motion under Rule 50(b) is not allowed unless the movant sought relief on similar grounds under Rule 50(a) before the case was submitted to the jury." *Exxon Shipping Co. v. Baker*, 554 U.S. 471, 486 n.5 (2008); *see also Kars 4 Kids Inc. v. Am. Can!*, 8 F.4th 209, 220 (3d Cir. 2021) ("[P]ost-trial Rule 50 motion can only be made on grounds specifically advanced in a motion for a directed verdict at the end of plaintiff's case." (internal quotation marks and citation omitted)); 9B Charles Alan Wright & Arthur R. Miller, *Federal Practice & Procedure* §2537 (3d ed.) ("[T]he district court only can grant the Rule 50(b) motion on the grounds advanced in the preverdict [Rule 50(a)] motion, because the former is conceived of as only a renewal of the latter.").

Shibuya does not dispute that it failed to raise in a Rule 50(a) motion the invalidity arguments it makes now in its pending motion. Instead, it argues that it raised these arguments in its summary judgment motions and that "[a] party preserves a legal issue by moving for summary judgment" on that issue. D.I. 800

at 12. But as the authorities it cites in support of that assertion make clear, a motion for summary judgment on an issue preserves that issue for an appeal, not for a Rule 50(b) motion. *See ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517–18 (Fed. Cir. 2012) (denial for motion of summary judgment on indefiniteness preserved that issue for appellate review); *Ericsson Inc. v. TCL Commc'n Tech. Holdings Ltd.*, 955 F.3d 1317, 1321 (Fed. Cir. 2020) ("Ericsson argues as a threshold matter that TCL has waived any right to appeal the issue of ineligibility under § 101 by failing to raise it in a motion for judgment as a matter of law."); *SRI Int'l, Inc. v. Cisco Sys., Inc.*, 930 F.3d 1295, 1302 (Fed. Cir. 2019) ("We may review this denial of summary judgment."); 9B Charles Alan Wright & Arthur R. Miller, *Federal Practice & Procedure* §2537 (3d ed.) ("[W]hen a party has been denied summary judgment, the failure to move for judgment as a matter of law will not preclude that party from seeking appellate review of the denial of summary judgment.").

Accordingly, I will deny Shibuya's motion insofar as it seeks judgment of invalidity of the asserted patents as a matter of law.

II. MOTION FOR A NEW TRIAL AND VACATUR OF DAMAGES AWARD

Because I will enter judgment of noninfringement of the asserted patents, I need not and do not address Shibuya's request to vacate the damages award and grant a new trial.

Under Rule 50(c)(1), "[i]f the court grants a renewed motion for judgment as a matter of law, it must also conditionally rule on any motion for a new trial by determining whether a new trial should be granted if the judgment is later vacated or reversed." Fed. R. Civ. P. 50(c)(1). In this case, were the Federal Circuit to vacate the judgment of noninfringement, I believe a new trial would be warranted because, as explained above, the jury's verdicts with respect to infringement of the asserted claims of the #985, #188, and #591 patents are contrary to the evidence.

III. CONCLUSION

For the reasons stated above, I will enter a judgment of noninfringement of the asserted patents as a matter of law. I will also conditionally grant Shibuya's motion for a new trial under Federal Rule of Civil Procedure 50(c)(1).

The Court will issue an Order consistent with this Memorandum Opinion.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

STEUBEN FOODS, INC., Plaintiff, v. SHIBUYA HOPPMANN CORP., SHIBUYA KOGYO CO., LTD., and HP HOOD LLC, Defendants.	C.A. No. 19-2181-CFC

ORDER

At Wilmington on this Fourteenth day of March in 2023:

For the reasons set forth in the Memorandum Opinion issued this day, IT IS HEREBY ORDERED that Defendants' Motion for Judgment as a Matter of Law or, Alternatively, for a New Trial (D.I. 795) is GRANTED IN PART and DENIED IN PART:

1. The motion is GRANTED insofar as it seeks a judgment of noninfringement of the asserted patents;

2. The motion is DENIED insofar as it seeks a judgment of invalidity of the asserted patents;

3. The motion is CONDITIONALLY GRANTED insofar as it seeks a new trial.

It is FURTHER ORDERED that the parties shall file no later than March 21, 2023 a proposed judgment for the Court to enter.

COLM F. CONNOLLY
CHIEF DISTRICT JUDGE