United States Court of Appeals for the Federal Circuit

PLASTIC OMNIUM ADVANCED INNOVATION AND RESEARCH,
Plaintiff-Appellant

v.

DONGHEE AMERICA, INC., DONGHEE ALABAMA, LLC,
Defendants-Appellees

2018-2087

Appeal from the United States District Court for the District of Delaware in No. 1:16-cv-00187-LPS, Chief Judge Leonard P. Stark.

SEALED OPINION ISSUED: November 21, 2019
PUBLIC OPINION ISSUED: December 3, 2019*

ALEXANDER HADJIS, Oblon, McClelland, Maier and Neustadt, LLP, Alexandria, VA, argued for plaintiff-appellant. Also represented by ROBERT CARTER MATTSON, CHRISTOPHER RICCIUTI.

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* This opinion was originally filed under seal and has been unsealed in full.

ERIC SHUMSKY, Orrick, Herrington & Sutcliffe LLP, Washington, DC, argued for defendants-appellees. Also represented by MELANIE L. BOSTWICK, JEREMY PETERMAN; ALYSSA MARGARET CARIDIS, Los Angeles, CA; EDMUND HIRSCHFELD, New York, NY.

Before NEWMAN, CLEVENGER, and REYNA, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge* REYNA.

Dissenting opinion filed by *Circuit Judge* CLEVENGER.

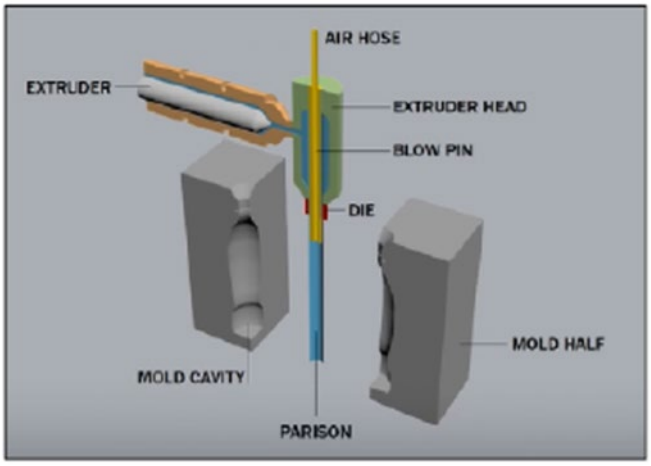
REYNA, *Circuit Judge*.

Plastic Omnium Advanced Innovation and Research appeals from a grant of summary judgment of noninfringement by the U.S. District Court for the District of Delaware. The district court's determinations on summary judgment are consistent with its claim construction and supported by undisputed facts in the record. We affirm.

BACKGROUND

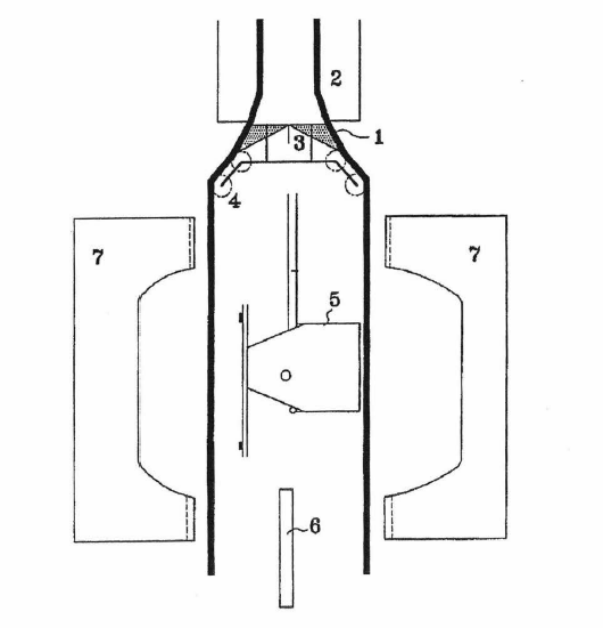
A. The Asserted Patents

Plastic Omnium Advanced Innovation and Research ("Plastic Omnium") owns U.S. Patent Nos. 6,814,921 ("the '921 patent") and 6,866,812 ("the '812 patent"). The patents generally relate to manufacturing plastic fuel tanks formed by blow molding. The fuel tanks are formed in a way that allows accessory components to be installed inside the fuel tank without cutting holes in the tank wall, which could compromise the structural integrity of the wall. A conventional blow molding system is depicted below:



J.A. 3482 (Appellee's Technology Tutorial). The image shows the general placement and geometry of the extruder head, die, parison, and molding cavity in a conventional blow molding process.

The sole figure (shown below) of the '812 patent is representative of the disclosed system and depicts a tubular "parison" that is formed using an extrusion head (component 2) and circular die mounted on the extrusion head. As the parison exits the extrusion head, a blade (component 3) located at the exit of the die splits the parison.



'812 patent Fig. 1, col. 5 ll. 28–30; *see also* '921 patent col. 5 l. 25.

Claim 1 of the '921 patent recites the following, including the disputed "extruded parison" limitation:

> 1. A process for manufacturing plastic hollow bodies from two shells formed by molding, which are joined together, at least one shell being produced by compression-molding a portion of a plastic sheet between a mold and a punch and by the remaining portion of the sheet being blow-molded in the region not compression-molded, characterized in that it is applied to the manufacture of a fuel tank and in the sheet is obtained in the same manufacturing line as the shell which will be produced from this sheet, by the *cutting and opening an extruded parison of closed cross section.*

'921 patent col. 5 l. 44–col. 6 l. 6 (emphasis added to disputed term). Claim 32 of the '812 patent includes a similar disputed term: "extruding a parison."

B. District Court Proceedings

On March 23, 2016, Plastic Omnium filed suit against Donghee America, Inc., and Donghee Alabama, LLC (collectively "Donghee") in the District of Delaware, asserting infringement of several patents. The '921 and '812 patents were among the eight patents in Plastic Omnium's amended complaint. After claim construction, Donghee moved for summary judgment of noninfringement as to the asserted claims of the '921 and '812 patents and on other bases not at issue in this appeal. On May 22, 2018, the district court granted Donghee's summary judgment motion. The district court entered final judgment on June 11, 2018.

1. Claim Construction

During claim construction, the parties disputed the meaning of the term "parison." *Plastic Omnium Advanced Innovation & Research v. Donghee Am., Inc.*, No. 16-CV-187, 2017 WL 5125725, at *3–4 (D. Del. Nov. 6, 2017) ("*Claim Construction Order*"). Donghee argued that it should be given its plain and ordinary meaning of "hollow plastic tube exiting the die of an extrusion head." *Id.* at *3. Plastic Omnium argued that the patentee had acted as its own lexicographer and that "the '921 and '812 patents do not use the term 'parison' [in] its conventional, plain and ordinary meaning." *Id.* The district court agreed with Plastic Omnium and reasoned that "the patents specify that the 'parison' is cut in two as it leaves the die at the end of the extrusion head" and so "this 'parison' cannot be strictly limited to a fully-formed tubular structure existing in its entirety outside the extrusion head/die." *Id.* at *4. It recognized that "the principal disagreements between the parties [were] identifying the point at which the molten plastic within the extrusion head becomes a 'parison,' and

identifying the location of the die." *Id.* The district court rejected Plastic Omnium's contention that the "claimed process includes the splitting of molten plastic within the extrusion head/die" based on its determination that neither specification discloses "splitting of the tubular preform at any stage earlier than right as the previously tubular structure leaves the die/extrusion head." *Id.* (internal quotations omitted). The district court also clarified that "the 'extruded parison' terms should not include molten plastic (or a tubular preform) present inside the die/extrusion head and that the '"die' is located at the 'extrusion head['s]' 'lowest point,'" rejecting Plastic Omnium's contention that the "die" could be located anywhere. *Id.* at *4, *4 n.4 (quoting '921 patent col. 3 ll. 4–5; '812 patent col. 2 ll. 37–38). Accordingly, the district court construed "parison" as "referring to a plastic tube with a closed cross section that is shaped by—and has reached the end of—a die and is split either immediately upon exiting the die or at some point thereafter." *Id.* at *4. Building upon that construction, the district court construed "extruded parison of closed cross section" and "extruding a [multilayered] parison" as "a tubular preform with a closed cross-section that has been forced through a die and is cut or split as it exits the die or at some time thereafter" and "a [multilayered] tubular preform with a closed cross-section that has been forced through a die and is cut or split as it exits the die or at some time thereafter," respectively. *Id.* at *8 (alterations in original).

2. Summary Judgment

Donghee moved for summary judgment of noninfringement of five asserted patents, including the '921 and '812 patents involved in this appeal.[1] Donghee argued that its

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[1] This appeal also included U.S. Patent Nos. 7,166,253 and 9,399,327. Plastic Omnium filed a Motion to Withdraw those patents from this appeal which we grant

accused product does not infringe the asserted claims of the '921 and '812 patents because it "does not extrude a parison." *Plastic Omnium Advanced Innovation & Research v. Donghee Am., Inc.*, 387 F. Supp. 3d 404, 416–17 (D. Del. 2018) ("*Summary Judgment Order*"). Relying on its claim construction of the "parison" terms, the district court granted summary judgment of noninfringement. *Id.*

As to literal infringement, the district court recognized that there was no dispute that Donghee's "'manufacturing process begins by forcing plastic through a circular coextrusion head, and then feeding the plastic that exits the coextrusion head into a separate piece of equipment, referred to as a flat die tool,' and that once inside 'the flat die, the molten plastic is cut into two streams of plastic which are extruded as two sheets.'" *Id.* at 416 (citing Donghee's brief in support of its motion for summary judgment and Plastic Omnium's brief in opposition). Turning to its claim construction holdings, the district court reiterated its determinations that (1) "parison" was not limited to a fully formed tubular structure that exists entirely outside of the extrusion head/die, i.e., the "parison" may be cut as it exits the die at the end of the extrusion head; (2) the tubular preform cannot be split at any stage prior to its exit of the extrusion head/die such that molten plastic or a tubular preform present inside the extrusion head/die is excluded from the claim scope; and (3) the die must be located at the extrusion head's lowest point. *Id.* (citing *Claim Construction Order*, 2017 WL 5125725, at *4).

According to the district court, "[b]ecause the *splitting does not occur 'at any stage earlier than right as the previously tubular structure leaves the die/extrusion head*,' the claim construction makes clear that whether the extrusion equipment consists of a single combined extrusion head

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(*see* Conclusion) and therefore do not address those patents in the Background.

with a die or a more complex extrusion head with a separate attached die, the *splitting of the molten plastic must not occur inside any of the extrusion head/die equipment*." *Id.* (internal citation omitted and emphases added). Quoting Plastic Omnium's brief in opposition of summary judgment, the district court found that there was no genuine dispute of material fact that Donghee's accused product does not literally infringe because "for the accused product, it is undisputed that '[t]he extruded plastic parison is [ ] cut in a separate "flat die" tool after it leaves Donghee's coextrusion die.'" *Id.* (omissions and alterations in original).

The district court also concluded that Donghee's accused product did not infringe under the doctrine of equivalents. According to the district court, "a reasonable jury could not find [that the] cutting [of] the parison while it is extruding within extrusion equipment is insubstantially different than [the] cutting [of] the extruded parison outside the extrusion equipment." *Id.* at 417. The district court also pointed to statements by Dr. Osswald, Plastic Omnium's expert, where he acknowledged differences between Donghee's "flat die tool" and the claimed invention. *Id.* (citing J.A. 387; 431).

Plastic Omnium appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

DISCUSSION

We review a grant of summary judgment under the law of the applicable regional circuit, here the Third Circuit. *ArcelorMittal Atlantique et Lorraine v. AK Steel Corp.*, 908 F.3d 1267, 1273 (Fed. Cir. 2018). The Third Circuit reviews a grant of summary judgment de novo. *Gonzalez v. Sec'y of Dep't of Homeland Sec.*, 678 F.3d 254, 257 (3d Cir. 2012).

Plastic Omnium challenges the district court's grant of summary judgment of no literal infringement and no

infringement under the doctrine of equivalents as to the '921 and '812 patents. We address each argument in turn.

A. Literal Infringement

Plastic Omnium argues that the court granted summary judgment based on an erroneous claim construction. Appellant Br. 32. According to Plastic Omnium, the district court's summary judgment improperly imposed a "cutting location requirement." *Id.* at 35. We disagree.

We first note that despite its argument that summary judgment was based on an erroneous claim construction, Plastic Omnium does not dispute the district court's construction of "extruded parison of closed cross section" as "a tubular preform with a closed cross-section that has been forced through a die and is cut or split as it exits the die or at some time thereafter." Nor does it dispute the construction of "extruding a [multilayered] parison" as "a [multilayered] tubular preform with a closed cross-section that has been forced through a die and is cut or split as it exits the die or at some time thereafter." Rather, Plastic Omnium argues that the district court erred by deviating from its claim construction order and requiring "the claimed parison to be cut or split outside of the extrusion equipment." *Id.* We therefore determine whether the correct application of the district court's claim construction excludes the accused Donghee product based on the undisputed facts. We conclude that it does.

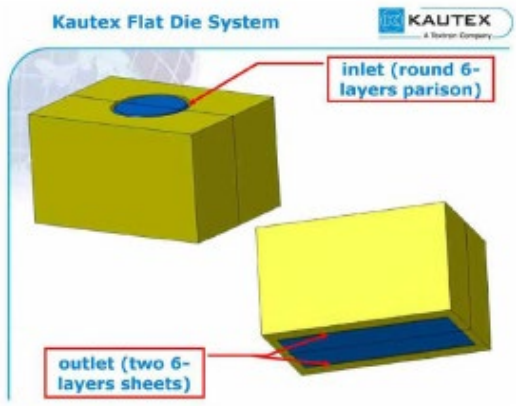
Claim 1 of the '921 patent requires "cutting and opening of an *extruded* parison of closed cross section." '921 patent col. 5 l. 44–col. 6 l. 5 (emphasis added). Claim 32 of the '812 patent requires "*extruding* a parison" and then "cutting through said parison so as to form two portions separated by a cut . . . ." '812 patent col. 7 ll. 14–18 (emphasis added). In construing the "parison" terms, the district court made clear that "extruded parison [] should not include molten plastic (or a tubular preform) [] inside the die [or] extrusion head" and that the "'die' is located at the

'extrusion head['s]' 'lowest point.'" *Claim Construction Order*, 2017 WL 5125725 at *4, *4 n.4. Thus, no "*extruded* parison" is formed until a plastic tube, which implies some depth, of a closed cross section passes through and exits the die located at the lowest point of the extrusion head. The district court rejected Plastic Omnium's contention that the claims included splitting plastic inside the extrusion head or die and its contention that the die could be located anywhere in the extrusion equipment. *See id.* at *4.

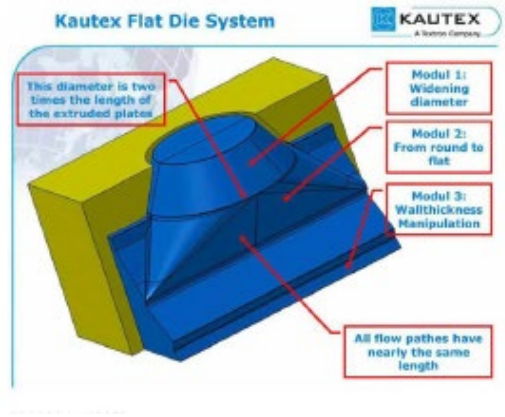
The district court's determination on summary judgment is consistent with its Claim Construction Order. The district court first recognized two undisputed facts about Donghee's process: (1) the process begins with forcing plastic into a "coextrusion head" and then feeding the plastic into a separate "flat extrusion die;" and (2) "once inside the flat die, the molten plastic is cut into two streams of plastic which are extruded as two sheets." *Summary Judgment Order*, 387 F. Supp. 3d at 416–17 (internal quotations omitted). In view of its Claim Construction Order, the district court determined that regardless of Plastic Omnium's argument that the "coextrusion head" was itself a "die," the claim construction "makes clear" that "the *splitting of the molten plastic must not occur inside any* of the extrusion head/die equipment." *Id.* (emphasis added). In other words, the claims require that the extruded parison is split after passing through the extrusion head and die.

It is undisputed that Donghee's accused product is manufactured by a process where two separate plastic sheets are extruded from the die located at the lowest point of the extrusion head using what is referred to as a "flat die system." Appellant Br. 40 (citing J.A. 710–11, 736–38, 784); *see also id.* at 19–20. The flat die does not produce an extruded parison as required by the claims, but two separate plastic sheets, which are not cut at the point of exiting the die or thereafter. Instead, in the accused system, molten plastic is injected directly from the extrusion head into the die mounted directly on the

extrusion head where it is split into two sheets and formed in the die as shown in the images below.



iHEE_0010804 at 806)



J.A. 451.

As seen in the images, Donghee's own product literature refers to the plastic entering the flat die tool as a "parison." But the district court correctly determined in its claim construction—accepting Plastic Omnium's arguments—that the patentee gave the term "parison" a special definition, and the patents "do not use the term 'parison' [in] its conventional, plain and ordinary meaning." *Claim Construction Order*, 2017 WL 5125725, at *4. Thus, the patentee's definition of "parison" in the specification and as construed by the court—not Donghee's

product literature—controls whether the accused product falls withing the scope of the claim. *See Martek Biosciences Corp. v. Nutrinova, Inc.*, 579 F.3d 1363, 1380 (Fed. Cir. 2009); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) ("[O]ur cases recognize that the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs."). Thus, despite the fact that Donghee's product literature uses the term "parison" to refer to plastic at the inlet of the flat die, it does not depict that an "extruded parison" as defined by the patentee acting as its own lexicographer and construed by the district court has formed at that point. Donghee's product literature does not show a tubular structure as required by the Claim Construction Order. And as noted above, it is undisputed that the plastic passing into the flat die is molten, which the Claim Construction Order specifically excludes.

Plastic Omnium argues that the district court's quotation of its brief in opposition to summary judgment shows that the district court concluded that there was no dispute that an "extruded plastic parison" exits Donghee's "coextrusion die." *See, e.g.*, Appellant Br. 38; Oral Argument at 3:55–4:31, available at http://www.cafc.uscourts.gov/oral-argument-recordings (citing J.A. 20). This argument is contrary to the record because, at oral argument, Donghee disputed Plastic Omnium's contention. *See* Oral Argument at 45:56–47:09. The district court recognized that the heart of the dispute was whether a parison is extruded at all: "Donghee argues that the accused product does not infringe the Parison Claims because it *does not extrude a parison*." *Summary Judgment Order*, 387 F. Supp. 3d at 416 (footnote removed) (emphasis added). The district court further characterized "the parties' dispute [as] center[ing] on whether (1) the first piece of equipment, the 'coextrusion head,' is or has a die,

and (2) the extruded parison may continue to be located in the second piece of equipement, the 'flat die,' and still be held to infringe." *Id.* (internal citations removed). Further, the district court's Claim Construction Order also recognized that "the principal disagreements between the parties seem to be identifying the point at which the molten plastic within the extrusion head becomes a 'parison,' and identifying the location of the die." *Claim Construction Order*, 2017 WL 5125725, at *4.

We are thus not persuaded by Plastic Omnium's contention that the district court's citation and quoation of Plastic Omnium's opposition brief shows that the district court determined that it was undisputed that an "extruded parison" leaves the "coextrusion die." The district court understood that the claims require a parison to be extruded from a die located at the lowest point of the extrusion equipment and that the splitting of the plastic must not occur inside the die. *See Summary Judgment Order*, 387 F. Supp. 3d at 416 ("[T]he claim construction makes clear that whether the extrusion equipment consists of a single combined extrusion head with a die or a more complex extrusion head with a separate attached die, the splitting of the molten plastic must not occur inside *any* of the extrusion head/die equipment." (emphasis added)).

Plastic Omnium's arguments rely heavily on recasting the "coextrusion head" in the accused system as a "coextrusion die," and Plastic Omnium contends that the plastic melt flowing from the extrusion head and directly into the flat die satisfies the extruded parison limitation. Appellant Br. 40. But "extrusion head" and "die" as used in the asserted patents are distinct terms. *E.g.*, '812 patent col. 2 ll. 35–38 (stating "an extruder whose head is terminated by the die"); *id* at col. 2 ll. 46–48 ("In accordance with the process according to the invention, at least one cut is made in the parison leaving the die mounted on the extrusion head."); *id.* col. 5 ll. 23–30 ("The tubular multilayer extrudate (1) . . . leaves the extrusion head (2) and is separated

into two sheets (1), using two steel blades (3) placed at 180° to each other, at the exit of the circular die mounted on the extrusion head (2)."); '921 patent col. 3 ll. 2–5 ("One example is that of a sheet produced by extrusion, in an extruder placed vertically, the extrusion head which includes the die being located at the lowest point."). The court's claim construction order similarly uses "extrusion head" and "die" as distinct terms. *Claim Construction Order*, 2017 WL 5125725, at *3–4 ("[T]he patents specify that the 'parison' is cut in two as it leaves the die at the end of the extrusion head."). Thus, the claims require that the extrusion head and die are distinct components that the "parison" must pass through before it is split.

Dr. Osswald admitted that the patents disclose that there is "a die mounted on the extrusion head" but still took the position that there is actually no die mounted on "an extrusion head or a co-extrusion die or a co-extrusion head, whatever you want to call it." J.A. 1926 (Osswald Dep. Tr. 151:11–152:15.). He justified the apparent contradiction of his position by asserting that the language of the patents "may just be a poor choice of words." *Id.* He thus cited no contrary evidence and merely speculated that the die is not a separate part mounted on the extrusion head in the patents.

Dr. Osswald also asserted that "*if there's nothing that comes after* [the extrusion head in Donghee's accused product], you extrude a tube or tubular parison." J.A. 1926 (Osswald Dep. Tr. 151:18–20) (emphasis added). Plastic Omnium argues that this testimony demonstrates that the accused product satisfies the extruded parison limitation. It is undisputed, however, that in Donghee's accused product, the "flat die" comes after the extrusion head. *See* J.A. 262 ("Donghee's process utilizes a separate 'flat die tool' that forms two sheets of plastic . . . ."). The flat die is mounted directly on the extrusion head, and thus no tube or tubular parison is extruded from the extrusion head. That molten plastic may pass through a "spiral mandrel"

in the bottom of the extrusion head as it passes directly into and is split within the flat die is not sufficient. Donghee's system thus does not satisfy the "extruded parison" limitation under the district court's claim construction.

In summary, Donghee's accused product is different from the claimed system. The asserted claims require that a tubular parison is first extruded and cut at the point of extrusion or sometime thereafter. In the accused system, the plastic is split and formed within the die, and what is extruded is two formed plastic sheets, not a parison. Accordingly, we affirm the district court's grant of summary judgment of no literal infringement.

B. Infringement Under the Doctrine of Equivalents

Plastic Omnium argues that the district court erred in granting summary judgment of noninfringement under the doctrine of equivalents by improperly reading in a cutting location requirement and ignoring that the steps in the claimed process and in the accused product are the same no matter where the splitting of the parison occurs. Appellant Br. 41–42.

"A finding of infringement under the doctrine of equivalents requires a showing that the difference between the claimed invention and the accused product or method was insubstantial or that the accused product or method performs the substantially same function in substantially the same way with substantially the same result as each claim limitation of the patented product or method." *AquaTex Indus., Inc. v. Techniche Sols.*, 479 F.3d 1320, 1326 (Fed. Cir. 2007). "The function, way, result inquiry focuses on an examination of the claim and the explanation of it found in the written description of the patent." *Id.* (internal quotations omitted).

While the district court provided little analysis or support as to its determination of no infringement under the doctrine of equivalents, "we review judgments, not

opinions." *Bruno Indep. Living Aids, Inc. v. Acorn Mobility Servs., Ltd.*, 394 F.3d 1348, 1354 (Fed. Cir. 2005) (citing *Black v. Cutter Labs.,* 351 U.S. 292, 297 (1956)). We must therefore determine whether the record supports the district court's determination that no reasonable jury could find that Donghee's accused product infringes under the doctrine of equivalents.

The district court's limited citations to the record include a report and testimony from Dr. Osswald admitting that "Donghee's flat die tool may offer improvements (e.g., independent wall thickness manipulation) over the blade and roller cutting system of the Asserted Patents." J.A. 387 ¶ 36; *see also* J.A. 430–31 ("Q: So I believe in your reply report you believe that Donghee's flat die would offer some improvements over cutting -- over other methods of cutting where you maybe have a knife . . . A: Well, I mean, I say it right there. Like, independent wall thickness manipulation. That's one."). Further, Dr. Osswald referred to this ability to control the wall thickness as "an invention" distinct from the asserted patents. J.A. 431.

As such, Dr. Osswald conceded that Donghee's products differed from the patented invention because Donghee's process allowed for the advantageous capability of independent wall thickness manipulation resulting from the way plastic is split. The question is whether Plastic Omnium presented evidence that this conceded advantage is an "insubstantial difference." *AquaTex Indus.,* 479 F.3d at 1328 (quoting *Texas Instruments, Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1567 (Fed. Cir. 1996)).

Plastic Omnium's arguments and the patents' written descriptions tout uniform wall thickness as a feature of the patents. In its opening brief, Plastic Omnium states that its inventions "avoid[] the prior 'drawback of having to position two extrusion heads and/or extruders capable of simultaneously producing two flat sheets, the *thickness uniformity and the production uniformity of which are*

[required to be] constant from one sheet to another and at any point on each of the sheets.'" Appellant Br. 11 (quoting the '812 patent col. 1 ll. 42–46) (emphasis added). Dr. Osswald conceded that, in contrast, independent wall thickness manipulation is an advantage of the Donghee system. Plastic Omnium failed to present evidence as to why the differences between the touted advantage of uniform wall thickness in the '812 and '921 patents and the capability of independent wall thickness manipulation in the accused product were insubstantial. *See* Appellant Br. 41–42; Appellant Reply Br. 22–23. Plastic Omnium therefore failed to demonstrate a genuine dispute of material fact that would prevent the grant of summary judgment as to the doctrine of equivalents.

CONCLUSION

The district court's grant of summary judgment of no literal infringement was consistent with its Claim Construction Order based on undisputed differences between the asserted patents and the accused product. The district court's grant of summary judgment of no infringement under the doctrine of equivalents was correct in light of the conceded differences between the claimed process in the asserted patents and process of the accused product. Because we affirm based on the "parison" limitations, we need not reach the issue of whether Plastic Omnium preserved the "preassembled structure" claim construction issue concerning the '812 patent. We grant Plastic Omnium's pending Motion to Withdraw U.S. Patent Nos. 7,166,253 and 9,399,327 (ECF No. 47).

AFFIRMED

COSTS

Each party shall bear its own costs.

United States Court of Appeals for the Federal Circuit

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CLEVENGER, *Circuit Judge,* dissenting.

The majority frames the parties' dispute as one focused on the meaning of the term "extruded parison." The majority concludes, as the district court did, that such a dispute cannot preclude summary judgment because the patentee acted as his own lexicographer when he defined the term "extruded parison" in one of the asserted patent specifications. According to the majority, the district court correctly construed the term in accordance with the patentee's definition, and then simply applied that construction to the accused device, which did not include the claimed parison. To both the district court and the majority, the claimed extruded parison cannot exist in Donghee's process because

the plastic is cut inside of a "die," contravening the district court's construction. But by blessing the district court's analysis, the majority commits the same error. Both rely on Donghee's nomenclature—the fact that its cutting structure is called a "die"—to find no infringement. That analysis elides the key factual dispute: Does Donghee's accused process have more than one die? The real dispute therefore is not over an extruded parison and what it takes to create one—in fact, the parties agree on that front—but is instead over the term "die" and whether Donghee's extrusion head contains one. Plastic Omnium presented sufficient evidence to create a material factual dispute over the structure of Donghee's extrusion head, and I therefore respectfully dissent from the majority's decision.

I

The patents at issue in this case claim an improvement on the standard manufacturing process used to create plastic motor-vehicle fuel tanks. U.S. Patent No. 6,866,812 ("the '812 patent"), Abstract ("Process for manufacturing hollow plastic bodies, especially motor-vehicle fuel tanks."); U.S. Patent No. 6,814,921 ("the '921 patent), Abstract ("Process for manufacturing a plastic fuel tank."). Specifically, claim 1 of the '812 patent discloses in relevant part "[a] process of manufacturing a hollow body for receiving a liquid, comprising the steps of: extruding a parison; cutting through said parison so as to form two portions separated by a cut . . . ." '812 patent, col. 5, ll. 43–47. Claim 1 of the '921 patent similarly recites in relevant part:

> A process for manufacturing plastic hollow bodies from two shells formed by molding, which are joined together, at least one shell being produced by compression-molding a portion of a plastic sheet . . . characterized in that it is applied to the manufacture of a fuel tank and in the sheet is obtained in the same manufacturing line as the shell which

> will be produced from this sheet, by the cutting and opening an extruded parison of closed cross section.

'921 patent, col. 5 ll. 44–col. 6 ll. 5.

The patentee defined the term "extruded parison" in the '812 patent as "the product obtained by passing, through a die, a composition of at least one thermoplastic melt homogenized in an extruder whose head is terminated by the die." '812 patent, col. 2, ll. 35–40. In its *Markman* order, the district court construed "extruded parison" consistent with the '812 patent's definition as "a tubular preform with a closed cross-section that has been forced through a die, and is cut or split as it exits the die or at some time thereafter." J.A. 946. The district court explained further that, while the claimed process could not "include[] the splitting of molten plastic within the extrusion head/die," splitting could occur "right as the previously tubular structure leaves the die/extrusion head." J.A. 948. The district court was never asked to construe the "die" term, but in its *Markman* order, the district court disagreed with Plastic Omnium's argument that the parison-creating die could be located anywhere within the extrusion head because "[b]oth patents specify that the 'die' is located at the 'extrusion head['s] lowest point." J.A. 948 n.4 (quoting '921 patent, col. 3, ll. 4–5).

Besides the location of the die as either "mounted on the extrusion head," "located at the lowest point" of "the extrusion head," '921 patent, col. 3, ll. 4–5, or being what "terminate[s]" the head of the extruder, '812 patent, col. 2, ll. 37–38, the specification is mostly silent on its structure and function. The specifications of both the '921 and '812 patents do, however, describe the die as "circular." '921 patent, col. 3, ll. 4–5.

II

By the *Markman* hearing, Plastic Omnium was already teeing up its argument that, in addition to Donghee's flat

die tool, Donghee's process involved another die at the bottom of its extrusion head, or "coextrusion die tool," as Donghee refers to it in its literature. J.A. 711. During the hearing, Plastic Omnium told the district court judge "[i]t probably bears mentioning, I don't know if it was apparent in the briefing what the real dispute is between the parties here, and I think what Donghee may say is they don't have a circular die. I think that's where the dispute is going to be." J.A. 1523.

Then, in its summary judgment briefing, Plastic Omnium supported its argument with its expert report that identified the relevant die at the bottom of Donghee's coextrusion die tool:

> The coextrusion die's bottom includes the spiral mandrel and an outer body that surrounds the spiral mandrel, which together define an annular channel through which the extruded materials are forced to obtain the tubular preform. The structure that forms this annular channel, through which the molten material is forced before exiting the bottom of the coextrusion die, is a "die" as that term is used in general and as it is used in the asserted Patents.

J.A. 264. Plastic Omnium's expert made clear that he was not "argu[ing] that some amorphous melt inside of Donghee's extrusion equipment is a parison." J.A. 383. Instead, he was arguing that a parison is the tubular preform created by the die at the bottom of Donghee's coextrusion die tool, which is fed into Donghee's flat die tool, where the extruded parison is cut. *Id.*

Plastic Omnium also pointed the district court to Donghee's own documentation, which stated that the "inlet" to its flat die tool is a "round 6-layers [sic] parison," and that the flat die tool functions to "cut[] . . . the parison in two halves." J.A. 738. Thus, Plastic Omnium's argument all along was that Donghee's flat die tool is essentially

irrelevant to the infringement analysis. What mattered, Plastic Omnium explained, was that Donghee's extrusion head included a parison-creating die at its terminus, and therefore "the plastic exiting Donghee's coextrusion die (with the spiral mandrel), and which is fed into the flat die tool, is the claimed parison." J.A. 383. Because the claimed parison is formed in Donghee's process and cut thereafter, Plastic Omnium argued that Donghee clearly infringed the claims of the '812 and '921 patents, as construed by the district court.

In its summary judgment opinion, the district court clearly recognized that there was a dispute over whether Donghee's coextrusion head "is or has a die." J.A. 19. Yet, it granted summary judgment of noninfringement without ever considering Plastic Omnium's double-die argument. It reasoned that there can be no literal infringement because "the splitting of the molten plastic must not occur inside any of the extrusion head/die equipment," and it was "undisputed that the extruded plastic parison is [] cut in a separate flat die tool after it leaves Donghee's coextrusion die." J.A. 20 (internal quotation marks omitted).

The error that the district court committed, and that the majority approves, stems from the assumption that the relevant die for purposes of infringement is Donghee's flat die tool. Both rely on Donghee's chosen nomenclature for its cutting tool, i.e., "flat die tool," to find that Donghee's process involves cutting molten plastic inside of a "die," instead of upon or after extrusion from the "die." Because the claims require cutting a parison, and a parison cannot be cut before it is formed by being forced through a die, the district court and the majority believe that there cannot exist the claimed parison in Donghee's process. But just because Donghee calls its cutting tool a "die" does not mean it is the relevant die for purposes of the infringement analysis.

The only die that matters under the district court's construction of "extruded parison" is the die through which the plastic is forced to form a parison. The district court's construction never required that such a die be the only die in the process or the last die in the process. The fact that the district court's construction does not contemplate splitting the tubular preform before it is at least partially extruded from a die at the end of an extrusion head does not support the broader conclusion, adopted by the majority, that the patents require the tubular preform to be partially extruded outside of *all* of the extrusion equipment, including Donghee's flat die tool, before being cut. Thus, if Plastic Omnium is correct that Donghee's accused process includes an extrusion head that is terminated by a die, then such a structure, under the court's construction, would be sufficient to create the claimed parison. Further, that parison would be split by the flat die tool, which is outside of the relevant extrusion head/die equipment, in keeping with the district court's construction.

The majority discredits the evidence in support of Plastic Omnium's double die theory by relying on the fact that the patentee acted as his own lexicographer when using the "parison" term. According to the majority, the fact that Donghee's documentation refers to the plastic extruded from Donghee's extrusion head as a "parison" does not mean that Donghee intended to use that word as it is used in the patents. But the majority misunderstands how the patentee changed the meaning of "parison" by defining it in the '812 specification.

There was no disagreement between the parties here that the "ordinary and customary" meaning of "parison" is "a hollow plastic tube exiting the die of an extrusion head." J.A. 946. The district court determined, however, that the '921 and '812 patents do not use "parison" in the ordinary sense. The district court found convincing Plastic Omnium's argument that, while traditionally a parison is a "plastic test-tube like structure" "formed outside of the

extrusion head/die," the parison described in the '921 and '812 patents cannot be formed entirely outside of the extrusion head/die because the parison described in the patents is split or cut into two sheets of plastic *as it is being extruded*. J.A. 947. Thus, the district court's construction did nothing to undermine the plain and ordinary meaning of the term "parison" insofar as the term refers to something that is formed by exiting the die of an extrusion head. Instead, the construction clarified that the term in the context of the patent could refer to a tubular preform structure that exists only momentarily after exiting the die at the bottom of the extrusion head, but before being split in two sheets by the blades placed at the exit of the die. The majority is therefore wrong to discount the Donghee's documentation supporting Plastic Omnium's argument because both the patent and a person of ordinary skill in the art use the term to refer to a structure that is created when molten plastic exits a die at the end of an extrusion head.

Moreover, the fact that the patentee acted as his own lexicographer does nothing to undermine Plastic Omnium's double die argument. In defining "extruded parison," the patentee never limited the mechanisms by which the claimed parison can be cut. Further, in construing "extruded parison," the court put no restrictions on where or how the parison must be cut, only that it occur "as [the parison] exits the die or at sometime thereafter." J.A. 946. Nothing prevents the claimed parison, under the district court's construction and the patent's definition, from being cut within a structure such as Donghee's flat die tool, so long as it is created by a die before it is cut. Under Plastic Omnium's double die argument, a parison would be created by the die at the bottom of Donghee's coextrusion die tool, satisfying that requirement.

III

The district court took its eye off the ball. It knew for sure that the big question in this case is whether Donghee's

accused structure includes a separate die that creates an extruded parison which is cut after it emerges from the extrusion die. And we have to assume it knew about the evidence from Plastic Omnium's expert (Dr. Osswald), whose credibility and credentials are unchallenged. Dr. Osswald pointed to the spiral mandrel at the bottom of Donghee's extrusion head as the die that creates the extruded parison which is cut in Donghee's flat tie tool. Donghee may disagree with Dr. Osswald, but by any count, the district court left unresolved a material factual dispute over the structure of Donghee's accused device, a material factual dispute the majority is unwilling to confront. The district court deprived Plastic Omnium of its day in court, and the majority perpetuates that error.

A material factual dispute prevents summary judgment. *See Dorel Juvenile Grp., Inc. v. Graco Children's Prod., Inc.*, 429 F.3d 1043, 1047 (Fed. Cir. 2005) (vacating grant of summary judgment of noninfringement because a material factual dispute existed over how the accused product functioned); *Hilgraeve Corp. v. McAfee Assocs., Inc.*, 224 F.3d 1349, 1353 (Fed. Cir. 2000) ("These differences in the experts' descriptions of [the allegedly infringing process's] operation raise a genuine issue of material fact."). This court should vacate the district court's summary judgment of noninfringement, and remand the case for resolution of the dispositive material factual dispute.