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| **Statement  of the Case** | **Color** |
| **What is this case about?** | **This case is about manufacturing fuel tanks for automobiles.** |
| **What is Donghee’s business?** | **Donghee manufactures, sells, and distributes automotive fuel tanks in the United States to Hyundai Motor Manufacturing Alabama. (OB 19).** |
| **Which part of Donghee’s business is at issue in this case?** | **Plastic Omnium accused Donghee of patent infringement based on its manufacture and sale of its LFa tank. (OB 19).** |
| **Where does Donghee manufacture the LFa tank?** | **Donghee manufactures the LFa tank at its facility in Auburn, Alabama using a blow-molding machine and process called the Next Generation Fuel System II (NGFS II). (OB 19).** |
| **When did Donghee begin operating in Alabama?** | **2013. (OB 19).** |
| **What material is used to make fuel tanks?** | **Until the 1980s, fuel tanks generally were made from steel, but since that time, they’ve typically been made from plastic.** |
| **How are plastic fuel tanks made?** | **Plastic tanks are manufactured using a process called “blow molding.”** |
| **What is the blow-molding process?** | **The conventional blow-molding process has two basic stages:**  **(1) *extrusion*, in which a shapeable plastic form is created; and**  **(2) *blow molding*, in which air is blown into the soft plastic form to cause it to expand into the shape of a mold.** |
| **What is extrusion?** | **Extrusion is the process of forming continuous shapes by forcing a molten plastic material through a die that shapes the plastic.** |
| **What is another way of describing extrusion?** | **Extrusion is a process in which a hot or cold semisoft solid material, such as metal or plastic, is forced through the opening of a die to produce a piece in the shape of the desired product.** |
| **What are the initial steps of the conventional excursion process?** | **In conventional extrusion:**  **(1) plastic pellets are melted to form the semisoft plastic material;**  **(2) the softened plastic is forced into an “extruder,” where it flows to the “extruder head,” a cylindrical component that smooths and evenly distributes the plastic in preparation for shaping it; and**  **(3) if the end product requires multiple layers of different types of plastic, then multiple extruders carry different types of plastic to a “coextrusion head.”** |
| **What happens after the softened plastic leaves the extruder or coextrusion head?** | **The plastic is then shaped. This is done with a “die,” which is typically located at the end of the extrusion head.** **The molten plastic that was smoothed in the extruder head is forced through the die, thereby producing a plastic shape.** |
| **Where is the die located?** | **The die is at the end of the circular extrusion head, so the die is what gives the plastic a shape. If you want a square, you put the square piece in front of the presser and you press out a square. The plastic that is extruded out of the die is called a parison.** |
| **What is a parison?** | **The plastic that is extruded out of the die.** |
| **How does Plastic Omnium’s ’812 patent describe an “extruded parison”?** | **An “extruded parison” is “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.”** |
| **In the conventional extrusion process, what shape is the parison?** | **A simple cylinder.** |
| **What happens during blow molding?** | **During blow molding, the parison is formed into the shape of the end product.** |
| **What is the conventional blow-molding process?** | **In conventional blow molding:**  **(1) a single, hollow parison is open at one end;**  **(2) two halves of a mold close around the parison, surrounding it with the hollow mold cavity and pinching the bottom of the parison shut;**  **(3) compressed air is blown into the parison, inflating the parison into the mold cavity; and**  **(4) the halves of the mold open to reveal a hollow plastic body in the shape of the mold.** |
| **What is the problem with conventional blow molding?** | **Modern automotive fuel tanks include accessories attached to the inside of the tanks to improve safety and performance. But it’s tricky to get those accessories on the inside — it’s the “ship in a bottle” problem.** |
| **What kinds of accessories are attached to the inside of automotive fuel tanks?** | **Accessories include “ventilation devices” to manage fumes, and “baffles” to prevent fuel from sloshing around. [Plastic Omnium’s brief also refers to the following accessories: Roll Over Valve; Fill Limiting Venting Valve; and support pillars.] (OB 24-25).** |
| **How can a manufacturer get accessories inside a fuel tank *after* the blow-molding process?** | **One approach is to cut holes in the walls of the tank, insert the accessories, and re-seal the tank.** |
| **What are the pros and cons of cutting the tank, inserting accessories, and resealing the tank?** | **Pro: It can be done after the molding process is complete.**  **Con: It compromises the integrity of the tank walls and can allow pollutants to leak.** |
| **How does conventional blow molding get accessories into the tank?** | **In conventional blow molding, accessories are squeezed into the parison at the outset of the molding process, and then are fused to the walls from the inside as the walls are forming in the mold.** |
| **What are the pros and cons of squeezing accessories into the parison at the start of the molding process?** | **Pro: It avoids cutting the finished walls, which preserves their integrity.**  **Con: Because the parison is typically narrow, only very small accessories can be placed inside it before it expands. Larger accessories must be installed after molding is complete — with the accompanying leakage of pollutants.** |
| **How did fuel-tank manufacturers change the blow-molding process to meet tightened global emissions standards?** | **Fuel- tank manufacturers sought new techniques that would allow accessories to be placed inside the mold and fused to the tank walls as they form. One early approach was the Kasugai process.** |
| **What was the Kasugai process?** | **The Kasugai process (started in 1990):**  **(1) used two separate sets of extrusion equipment to simultaneously extrude two parallel plastic sheets that would hang near each other;**  **(2) larger accessories could be placed between the sheets; &**  **(3) a mold would then close around the sheets and join them into a single fuel tank, with the accessories installed from within.** |
| **What were the pros and cons of the Kasugai process?** | **Pro: The Kasugai technique created more space for accessories.**  **Con: It was difficult to coordinate the two sets of extrusion equipment so that the sheets were uniform. As a result, the process could not be scaled or industrialized to make tanks for automobiles.** |
| **What did manufacturers do to avoid the drawbacks of the Kasugai process?** | **Manufacturers sought to produce parallel plastic sheets without the shortcomings of Kasugai, but they took very different approaches. Some companies, including Plastic Omnium, altered what happens *after* extrusion. Donghee instead changed what happens *during* extrusion.** |
| **How does Plastic Omnium’s patented process work?** | **Plastic Omnium’s patented process:**  **(1) retains the extrusion equipment used in conventional blow molding, which extrudes a tubular parison;**  **(2) after the parison is extruded from the die, it is cut so that it forms two portions; and**  **(3) like the Kasugai process, accessories are positioned between the sheets and then attached to the inside of the fuel tank as it forms.** |
| **How did Plastic Omnium’s patented process improve upon the Kasugai process?** | **Plastic Omnium’s patents purport to avoid the drawbacks of the Kasugai process regarding the uniformity of sheet thickness.** |
| **What does Plastic Omnium say are the benefits of its patented process?** | **According to Plastic Omnium, its patented process of splitting a parison to create two sheets:**  **(1) provides consistency in the material and thickness of the twin shells of the tank; and**  **(2) allows conventional blow-molding equipment to be retrofitted to manufacture a twin-sheet blow-molded plastic fuel tank. (OB 10-12).** |
| **What claims are at issue in this appeal?** | **Two groups of claims are at issue:**  **(1) claims related to creating and cutting a parison — the “Parison Claims”; and**  **(2) claims related to the method of attaching accessories during molding — the “Preassembled Structure Claims.”** |
| **In which patents did Plastic Omnium claim its process for producing and splitting a parison?** | **The ’812, ’921, and ’327 patents.** |
| **What process do Plastic Omnium’s ’812, ’921, and ’327 patents claim?** | **All three patents claim a process for molding plastic containers from a single parison that has been split after extrusion.** |
| **What are the specifications of Plastic Omnium’s ’812 and ’921 patents?** | **The specifications of the ’812 and ’921 patents explain that “the invention relates to a process for manufacturing hollow plastic bodies from an extruded parison of closed cross section.”** |
| **What are the specifications of Plastic Omnium’s ’327 patent?** | **The ’327 patent incorporates by reference the method for splitting a parison described in the ’812 and ’921 patents.** |
| **What is Plastic Omnium’s process for molding plastic containers?** | **There are three steps in Plastic Omnium’s process:**  **(1) extruding a single parison from conventional extrusion equipment;**  **(2) cutting the extruded parison (which forms two sheets of plastic); and**  **(3) molding the two sheets of plastic together to form a single hollow body.** |
| **How does Plastic Omnium’s process allow accessories to be installed into fuel tanks?** | **The inside walls of the tank are openly exposed to permit large components to be directly installed into the inner walls of the tank (eliminating the “ship in a bottle” problem). (OB 12).** |
| **How does Plastic Omnium define an “extruded parison”?** | **Plastic Omnium’s ’812 patent defines an “extruded parison” 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.” In short, once the melted plastic has been smoothed in an extruder head and forced through the die, the result is an extruded parison.** |
| **How are accessories attached to the fuel tank in Plastic Omnium’s process?** | **Before the mold closes, a structure that supports accessories is placed between the two sheets of plastic. Once the mold closes, a nozzle injects air to blow mold the sheets into the shape of the mold.** |
| **In which patents did Plastic Omnium claim its process for** **attaching accessories to a blow-molded plastic body?** | **Plastic Omnium’s ’253 patent claims a process for attaching accessories inside “a hollow plastic” body during the molding process.** |
| **What does Plastic Omnium’s ’253 patent require to support an accessory inside the tank?** | **Plastic Omnium’s ’253 patent process requires a “preassembled structure” to support an accessory inside the tank and anchor it to the tank wall.** |
| **What is the purpose of the preassembled structure in Plastic Omnium’s ’253 patent?** | **The preassembled structure makes it possible to support accessories introduced into the hollow body.** |
| **Why is a preassembled structure necessary to attach accessories to a tank’s inner wall?** | **A preassembled structure allows an accessory to be attached to the inner wall when a direct connection between the accessory and the tank’s wall is either not possible (perhaps because of material compatibility problems), or is not desired (because accessories manufactured by others need to be attached). (OB 17).** |
| **What were some of the shortcomings in Plastic Omnium’s patented process?** | **Cutting a parison with blades as it leaves the extrusion die rather than extruding two different sheets was not the way to manufacture a tank in production. Because the process was so complex, it was not repeatable.** |
| **What was the problem with Plastic Omnium’s patented process?** | **It was challenging to manage the sheets — to position the sheets at the correct place.** |
| **What technology does Donghee use to manufacture its fuel tank assemblies?** | **Donghee licensed technology from Kautex Textron, which invented its own molding process for automotive fuel tanks.** |
| **How did Kautex’s molding process differ from Plastic Omnium’s?** | **Plastic Omnium’s process did not require new extrusion machinery; rather, conventional extrusion equipment could be retrofitted by mounting a die on the extrusion head that would produce a tubular parison. By contrast, Kautex altered the extrusion equipment itself, affixing a new type of flat die directly to a single coextrusion head.** |
| **How is the plastic in the Kautex process formed?** | **(1) The flat die receives molten plastic from the coextrusion head.**  **(2) The flat die then extrudes two sheets of plastic, rather than extruding a tubular parison that must then be cut.**  **(3) Specifically, the die forces the molten plastic flow into two flat channels and then manipulates their thickness before they separately exit the die.** |
| **What is the main difference between Plastic Omnium’s process and Kautex’s process?** | **Plastic Omnium’s process extrudes a tubular parison that must then be cut. The Kautex process does not cut the sheets after they are extruded; instead, it feeds the sheets directly into a mold, where they are formed into a single fuel tank.** |
| **You assert that the Kautex process doesn’t cut the sheets after they’re extruded – but didn’t the district court explain that the “extruded plastic parison is [] cut in a separate ‘flat die’ tool after it leaves Donghee’s coextrusion die”?** | **[Explain.] (OB 23).** |
| **When are accessories attached in Kautex’s process?** | **Accessories are positioned between the sheets during molding and then attached while the tank is forming.** |
| **How are the accessories attached?** | **They are fixed to a mounting bracket that is attached to the tank’s wall with a self-formed plastic rivet. (OB 25).** |
| **How is the plastic rivet used in Donghee’s process formed?** | **The rivet is formed during the tank’s manufacture when a portion of the plastic wall of the tank is forced into and through an appropriately shaped orifice in the accessories’ mounting bracket so that the accessories are permanently fixed to the tank’s wall. (OB 25).** |
| **What is the mounting bracket used in Donghee’s process?** | **The mounting bracket is a pre-designed and pre-manufactured attachment component that acts as an interface between the inner wall and the accessory to hold the accessory to the tank’s wall. (OB 26).** |
| **Why isn’t the mounting bracket used in Donghee’s process a “preassembled structure” in the ʼ253 patent’s claim language?** | **[Explain.] (OB 26).** |
| **Why is Kautex’s process preferable to Plastic Omnium’s?** | **Extruding sheets of plastic has several advantages over Plastic Omnium’s process of cutting a tubular parison as it leaves the die:**  **(1) the process is easy to manage because everything related to creating the sheets is part of the extrusion process itself;**  **(2) the sheets come out nicely and there is no need to manage them by positioning them for post-die cutting; and**  **(3) the process can control and vary the thickness of each plastic sheet.** |
| **When did Plastic Omnium sue Donghee?** | **In 2016.** |
| **What did Plastic Omnium allege in its suit against Donghee?** | **Plastic Omnium alleged that Donghee infringed 103 claims of 8 different patents. Most of those claims have been dismissed — Plastic Omnium dropped its ’604 patent claim before the district court’s *Markman* order, and dropped its ’228 patent claim before the summary judgment hearing. Plastic Omnium has not appealed summary judgment of non-infringement of its ’490 patent.** |
| **Which patents remain in this appeal?** | **Remaining in this appeal are the Parison Claims of the ’812, ’921, and ’327 patents, and the Preassembled Structure Claims of the ’253 patent.** |
| **What processes do the Parison Claims claim?** | **The Parison Claims all claim processes for producing a blow-molded plastic body from an extruded parison.** |
| **What processes do the Preassembled Structure Claims claim?** | **The Preassembled Structure Claims claim a process for attaching accessories to a blow-molded plastic body by using a preassembled structure that attaches to both the accessory and the tank.** |
| **What did each party argue that “parison” means?** | **Donghee argued that a parison is formed *after* plastic passes through the die attached to the extrusion head.**  **Plastic Omnium argued that (1) a parison need not pass through the die, but includes molten plastic that still is located within the extrusion head/die; and (2) even if a parison must pass through a die, the die need not be located at the *end* of the extrusion head, but may instead be located anywhere, including *inside* the extrusion head.** |
| **What supports Donghee’s position that “parison” means the object that forms *after* plastic passes through the die attached to the extrusion head?** | **(1) It is clear from language in the patents indicating that the extruded parison must have passed “through a die.”**  **(2) It is consistent with the ordinary meaning of the term in the blow-molding field.**  **(3) The patents’ description of the parison as “extruded” confirms that the parison must have passed through a die, since that is the culmination of the extrusion process.** |
| **Why does Plastic Omnium disagree with Donghee’s construction of the meaning of “parison”?** | **Plastic Omnium could not agree to Donghee’s construction without admitting that Donghee’s process—which splits plastic *before* it has been extruded through the die—does not literally infringe.** |
| **What did the district court decide regarding the meaning of “parison”?** | **The court agreed with Donghee that the ’812, ’921, and ’327 patents define a “parison” as plastic that has passed through a die.**  **It held that Plastic Omnium had defined the term “parison” as (1) a plastic tube with a closed cross section that is shaped by a die; and (2) is split either immediately upon exiting the die or at some point thereafter.** |
| **What does a “closed cross section” mean?** | **An object has a “closed cross section” if the exterior of its cross section is unbroken — in this context, if it is “tubular.”** |
| **What did the district court’s definition of “parison” mean for Donghee’s process?** | **The district court’s definition means that the term “parison” *excludes* molten plastic (or a tubular preform) present inside the die/extrusion head. Plastic Omnium’s patent specifications do not contemplate the splitting of the tubular preform *before* the tubular structure leaves the die/extrusion head.** |
| **Do any of Plastic Omnium’s asserted patents or their written descriptions specify where the claimed parison must be split?** | **No. [Explain.] (OB 15).** |
| **On what basis did the district court decide that Plastic Omnium’s claims do not cover splitting a parison *inside* of the extrusion equipment?** | **[Explain.] (OB 15).** |
| **Did the district court err in concluding that Plastic Omnium’s patents require the extruded parison to be cut or split *outside* of the extrusion equipment?** | **[Explain.] (OB 15-16).** |
| **Don’t the asserted patents merely claim and describe the process of splitting a parison to form the walls of a fuel tank, rather than specifying where the parison must be cut?** | **[Explain.] (OB 16).** |
| **What did the district court hold regarding the location of the die?** | **The court rejected Plastic Omnium’s argument that the die can be located “anywhere,” and held that the patents expressly require the die to be located at the end of the extrusion head. The court noted that the ’812 patent defines an “extruded parison” as having passed through an “extruder whose head is *terminated* by the die.”** |
| **What did each party argue that “preassembled structure” in the ’253 patent means?** | **Donghee argued that “preassembled structure” means “a set of multiple parts previously joined into a single arrangement.”**  **Plastic Omnium argued that it means “a premade structure.”** |
| **What did the district court decide regarding the meaning of “preassembled structure” in the ’253 patent?** | **The district court agreed with Donghee. It explained that the term “preassembled structure” refers to a structural feature comprising at least two parts, which is initially distinct from the accessories that it supports and can then be joined with the relevant accessories. In other words, “preassembled” does not merely mean “premade,” as Plastic Omnium suggests.** |
| **What does “preassembled structure” mean according to the district court?** | **The term “preassembled structure” means a set of multiple parts previously joined into a single arrangement.** |
| **The ʼ253 patent requires the preassembled structure to comprise “at least one device”—why doesn’t that allow the preassembled structure to encompass a single-component device?** | **[Explain.] (OB 18).** |
| **How does the ʼ253 patent’s specification dictate a multi-piece component? (Doesn’t it merely require that the preassembled structure be produced in a separate process from the fuel tank?)** | **[Explain.] (OB 18).** |
| **What did the district court hold on summary judgment?** | **The district court entered summary judgment of no infringement of five patents asserted by Plastic Omnium, including the ʼ812, ʼ921, ʼ327, and ʼ253 patents involved in this appeal. (OB 26-27).** |
| **What did the district court hold regarding literal infringement of the Parison Claims?** | **The court held that Donghee’s manufacturing process does not literally infringe the Parison Claims. Those claims require the formation and subsequent cutting of a single, tubular parison—which happen *after* the plastic exits the die attached to the extrusion head.**  **By contrast, Donghee’s extrusion equipment culminates in a flat die that extrudes two sheets of plastic rather than a single parison, with no subsequent cutting.** |
| **How did the district court construe the parison terms in its *Markman* order?** | **The district court construed an “extruded parison of closed cross section” to mean “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.” (OB 27).** |
| **Does the district court’s summary judgment opinion differ from its *Markman* order regarding the parison terms?** | **[Explain.] (OB 27-28).** |
| **What did the district court hold regarding infringement of the Parison Claims under the doctrine of equivalents?** | **The district court held that Donghee’s process does not infringe the Parison Claims under the doctrine of equivalents. A reasonable jury could not find cutting the parison while it is extruding *within* extrusion equipment to be *insubstantially different* than cutting the extruded parison *outside* the extrusion equipment.** |
| **What did the district court hold regarding the ’253 patent?** | **The asserted claims of the ’253 patent each require that at least one accessory is supported by a preassembled structure. Under the court’s claim construction, a “preassembled structure” requires multiple parts joined together. Because there was no evidence of the attachment order of the parts in Donghee’s multipart support structures, the court held that no reasonable jury could find infringement.** |
| **Doesn’t the claim language of the ʼ253 patent indicate that a preassembled structure is a single-component article — a “preassembled structure which comprises at least one device”?** | **[Explain.] (OB 29).** |
| **Is there any discussion in the ʼ253 patent’s written description of the preassembled structure being a multi-piece component?** | **[Explain.] (OB 29).** |
| **Is there any discussion in the ʼ253 patent’s written description of the purpose of the preassembled structure being a multi-piece component, or an advantage of the preassembled structure being a multi-piece component?** | **[Explain.] (OB 29).** |
| **If the ʼ253 patent were describing a multi-piece component, wouldn’t there be an explanation of its purpose or why it was an advantage?** | **[Explain.] (OB 29).** |
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| **Parison Claims** | **Color** |
| **Put simply, why doesn’t Donghee’s process literally infringe the Parison Claims?** | **The Parison Claims require (1) extrusion of a tubular parison and (2) subsequent cutting of that parison. Donghee’s process does neither. It extrudes two plastic sheets, not a tubular parison. And those sheets are not subsequently cut.** |
| **Do Plastic Omnium’s claims limit where plastic can be cut into sheets?** | **Yes. Plastic Omnium’s claims require plastic to be cut only after it becomes a parison by passing through the extrusion head and die.** |
| **Does Plastic Omnium dispute that its claims impose some sort of cutting location requirement?** | **It’s unclear. At some points in its briefing, Plastic Omnium contends that there is “no cutting-location requirement.” OB30. But elsewhere, Plastic Omnium acknowledges (correctly) that “[t]he parison must … exit the die that shaped it before being split.” OB37. That’s a cutting location requirement, and it resolves this appeal.** |
| **You argue that in Plastic Omnium’s process, plastic may be cut only after it passes through the extrusion head and die. Broadly speaking, how do the patents impose that limitation?** | **Plastic Omnium’s claims are explicit that it is a “parison” that must be cut. And the patents are equally clear that a parison doesn’t exist—that is, molten plastic doesn’t become a parison—until it passed through the die attached to the extrusion head.** |
| **How do Plastic Omnium’s claims make clear that it is a “parison” that must be cut?** | **Claim 1 of the ’921 patent explains that a shell of a fuel tank “will be produced … by the cutting and opening [of] an extruded parison.”**  **Similarly, the ’812 patent claims the method of (among other steps) “extruding a parison,” and then “cutting through said parison so as to form two portions separated by a cut.”** |
| **Isn’t it true that Plastic Omnium’s claims don’t mention anything about where the parison must be cut?** | **A cutting location inheres in the meaning of the term “parison.” Obviously, something cannot be cut until it exists. And the patents are clear that the parison forms only after plastic passes through the extrusion head and die.** |
| **How do Plastic Omnium’s patents make clear that a parison forms (and may be cut) only after plastic passes through the extrusion head and die?** | **The patents repeatedly define the parison that way:**  ***First*, the ’812 patent expressly defines “extruded parison” 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.”**  ***Second*, the ’812 and ’921 specifications both describe “the invention” as a whole as a process for cutting a “parison” that is “leaving the die mounted on the extrusion head.” The ’921 further specifies that the object cut in “the invention” is an “extruded parison.”**  ***Third*, the patents’ illustrations uniformly depict a parison forming only after passing through the extrusion head and die.** |
| **Where precisely do the ’812 and ’921 specifications describe the invention as a whole?** | **The ’812 patent specifies that “according to the invention, at least one cut is made in the parison leaving the die mounted on the extrusion head.”**  **Similarly, the ’921 patent states that “according to the invention, the sheet is advantageously obtained by cutting and opening a parison … leaving the die mounted on the extrusion head.” It further specifies that “[a]ccording to the invention,” the object that is cut is an “extruded parison.”**  **These statements confirm that a parison forms, and may be cut, only after plastic passes through the extrusion head and die.** |
| **Why should we care about how the ’812 and ’921 specifications describe the invention as a whole? Isn’t it the claim language, not broad pronouncements in the specification, that defines the scope of the claims?** | **As this Court emphasized in *Phillips*, the specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.”**  **In particular, this Court has repeatedly held that statements in the specification that expressly describe the boundaries of “the invention”—not just a particular embodiment—are important in understanding the limits of the claims. Such statements played a critical role in construing claim limitations in *American Piledriving Equip., Inc. v. Geoquip, Inc.* (CAFC 2011) and *Honeywell Int’l, Inc. v. ITT Indus., Inc.* (CAFC 2006), among other cases.** |
| **In *American Piledriving*, how did the specification’s statements describing the invention as a whole impact claim construction? How is that analogous to this case?** | **The claims in *American Piledriving* covered pile driving devices featuring a structure called an “eccentric weight portion.” *Id.* at 1334. To determine how that structure related to other pieces of the device, this Court relied heavily on statements in the specification describing “the invention as a whole.” *Id.* Those statements made clear that the eccentric weight portion “extends forward from the front face of the gear portion.” *Id.***  **In much the same way, the descriptions of “the invention” in the ’812 and ’921 patents make clear that the claimed “die” is distinct from, but “mounted on,” the extrusion head.** |
| **In *Honeywell*, how did the specification’s statements describing the invention as a whole impact claim construction? How is that analogous to this case?** | **The claims in *Honeywell* were for a type of “fuel injection system component.” *Id.* at 1318. To determine what structures that did—and did not—cover, this Court relied on statements in the specification describing “this invention” or “the present invention.” *Id.* Those statements made clear that the invention—and thus the claim term “fuel injection system component”—was limited to a fuel filter. *Id.***  **In much the same way, the descriptions of “the invention” in the ’812 and ’921 patents make clear that the claimed “die” does not include the extrusion head itself, but is limited to a distinct mechanism “mounted on” the head.** |
| **You cite certain statements in Plastic Omnium’s specifications that describe “the invention.” But don’t the specifications elsewhere describe the invention more broadly—as any process for forming two parallel sheets of plastic from a single extrusion head, in order to avoid the drawbacks of using two extruders (OB34)?** | **No. The opening paragraphs of the ’812 specification note that the “object of the invention is to provide a process which avoids the drawbacks” of using two extruders to create parallel sheets. But that is simply a statement of general purpose. When the specification describes what the invention actually is, it clearly requires an “extruded parison” that has passed “through a die” at the end of the extrusion head.** |
| **Let’s say we agree with Plastic Omnium that the purpose of its invention is to overcome the drawbacks of using two extruders to create parallel plastic sheets. Isn’t Plastic Omnium right that nothing about that purpose requires cutting a parison only after it exists outside of the extrusion equipment (OB35)? If so, how can you argue their invention is so limited?** | **That purpose-based argument gets Plastic Omnium nowhere. Plastic Omnium did not patent any means of overcoming the drawbacks of using two extruders (nor could it have). It patented a specific process for accomplishing that goal by cutting an extruded parison. And an extruded parison can be cut only after it forms—afterit passes through the extrusion head and die. Plastic Omnium cannot now claim other methods of achieving its general objective.** |
| **So you disagree with Plastic Omnium’s claim that its invention is cutting a parison into sheets so that those sheets are formed from a single, consistent body of plastic—regardless of where cutting takes place (Reply 12)?** | **Absolutely. Plastic Omnium’s general goal may have been the formation of consistent sheets. But its *invention*—what it actually claimed—is a specific method of creating sheets from an extruded parison. That method requires cutting after plastic has passed through both the extrusion head and the die. Plastic Omnium cannot broaden its patent rights by conflating its actual invention with its general goal.** |
| **Didn’t Plastic Omnium patent the process of retrofitting conventional extrusion equipment to create two sheets of plastic—precisely what Donghee’s process does?** | **That’s doubly wrong. First, Plastic Omnium patented a specific process for splitting an extruded parison into sheets. That process happens to involve retrofitting a conventional extrusion head and die with post-die cutting equipment. But Plastic Omnium did not patent anymethod of retrofitting conventional equipment to create sheets.**  **Second, and in any event, Donghee’s process does not retrofit conventional extrusion equipment. It uses an entirely novel piece of extrusion equipment—the flat die—to fundamentally change the extrusion process.** |
| **You argue that illustrations in the ’812 and ’921 specifications confirm that plastic may be cut only after it passes through the extrusion head and die. Where exactly do the patents show that?** | **Each patent contains one illustration of the patented process. The ’921 illustration depicts a “tubular extrudate” (i.e. a parison) being cut after passing through “the circular die, which is mounted on the extrusion head.” The cutting is performed by a blade “placed at the exit of the circular die.”**  **Similarly, the ’812 illustration depicts a “tubular multilayer extrudate” (i.e. a parison) being cut by blades “at the exit of the circular die mounted on the extrusion head.” Elsewhere, the ’812 patent notes that a “knife blade” may be used to cut “transversely, at regular intervals, the extrudate leaving the die.”** |
| **Plastic Omnium argues that the illustrations in the ’812 and ’921 patents—in which a parison is cut and separated in the open atmosphere using steel blades and rollers—are non-limiting, since the patents lack a clear disclaimer of additional embodiments. Do you disagree?** | **We agree that the illustrations are not the only embodiment of Plastic Omnium’s claimed process. In particular, steel blades and rollers are not the exclusive means of cutting and opening the parison.**  **That said, the illustrations contain—and confirm—certain features that are limitations of the process in any form. Most importantly, plastic may be cut only after it has become an extruded parison by passing through the “die” “mounted on the extrusion head.”** |
| **If the illustrations in the ’812 and ’921 patents are non-limiting embodiments, how can you argue they shed any light on claim construction?** | **This Court has held that statements about “the invention” as a whole may shed light on the boundaries of the claims. And it has emphasized that such boundaries are “especially” clear if they are consistently reiterated in “other statements and illustrations in the patent.” *American Piledriving* at 1334.**  **Here, every illustration in the patents requires a parison to form and be cut after passing through the die connected to the extrusion head. As the district court explained, “[t]here is no disclosure in the patents’ specifications that contemplates the splitting of the tubular preform at any stage earlier than right as the previously tubular structure leaves the die/extrusion head.” Under *American Piledriving*, that makes it “especially” clear that a parison exists, and may be cut, only at that point in the process.** |
| **In *American Piledriving*, how did the specification’s illustrations bolster the significance of statements describing the invention as a whole? How is that analogous to this case?** | **The specification in *American Piledriving* stated repeatedly that “the invention as a whole” required an “eccentric weight portion” that bore a particular structural relationship to the remainder of the claimed device. This Court held that those statements were “especially” significant because they were consistent with all “illustrations” elsewhere in the specification. *Id.* at 1334.**  **Here, the illustrations in Plastic Omnium’s patents likewise confirm the structural limitations of the claimed “die”—namely, that it must be distinct from (but attached to) the extrusion head.** |
| **You seem to concede that the blades and rollers illustrated in the ’812 and ’921 specifications are just one way of cutting and separating a parison in Plastic Omnium’s process. Isn’t your flat die simply one of the alternatives—another type of “post-processing equipment” covered by Plastic Omnium’s claims (OB34)?** | **No. Plastic Omnium’s process may cover a variety of mechanisms for cutting a parison after extrusion. But our process doesn’t cut a parison at all. It splits molten plastic within the flat die, before a parison forms.** |
| **Aside from the patents, your briefing cites additional support for the idea that a parison forms only after exiting the die. What is that evidence?** | **The patents’ definition of “extruded parison” is consistent with the customary use of the term in the blow-molding field. The terms “extrude” and “parison” both denote material that has exited a die, as numerous dictionaries confirm.**  **“Extrusion” is “[t]he process of forming continuous shapes by forcing a molten plastic material through a die.”**  **“Parison,” similarly, is defined in relevant part as the “hollow tube of melt exiting the extruder die.”** |
| **Why should we pay any attention to the customary usage of “extruded parison”? Didn’t the district court hold, and don’t you now concede, that Plastic Omnium acted as its own lexicographer regarding the meaning of “parison”?** | **Plastic Omnium acted as its own lexicographer by expressly defining “extruded parison.” But it’s worth noting that the definition Plastic Omnium chose—plastic that has passed through an “extruder whose head is terminated by the die”—is a familiar one. Technical dictionaries consistently require a parison to have passed through a die. There is no indication whatsoever in the patents that Plastic Omnium altered that fundamental meaning of the term.** |
| **Let’s say we agree that parison forms only after passing through the extrusion head and die. Couldn’t the head and die be a single structure, so that the co-extrusion head is itself a “parison-forming die” (OB20)?** | **No. The patents clearly define the head and die as two different components:**  ***First*, the ’812 patent expressly defines “extruded parison” 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.”**  ***Second*, the ’812 and ’921 specifications both describe “the invention” as a whole as a process for cutting a “parison” that is “leaving the die mounted on the extrusion head.” The ’921 further specifies that the object cut in “the invention” is an “extruded parison.”**  ***Third*, the patents’ illustrations uniformly depict a parison forming only after passing through the die mounted on the extrusion head.** |
| **You point to the ’812 specification’s definition of “extruded parison” as evidence that the extrusion head and die are distinct. But couldn’t that definition—in particular, the phrase “extruder whose head is terminated by the die”—be read to describe the head and die as a single element, with the last portion of the head functioning as a die?** | **That’s not a tenable reading of the patent. This Court presumes that “different terms” in a patent “have different meanings,” absent evidence that they “are used interchangeably.” *Chicago Bd. Options Exch., Inc. v. Int’l Sec. Exch., LLC* (CAFC 2012). Nothing in the ’812 specification overcomes that presumption regarding the different terms “head” and “die.” Quite the contrary: The ’812 goes out of its way to distinguish between them, noting that a parison must pass through a “die” and then explaining that the die is located where the “head” terminates.** |
| **How do the specifications’ descriptions of the invention as a whole support the idea that the extrusion head and die are distinct?** | **The ’812 patent specifies that “according to the invention, at least one cut is made in the parison leaving the die mounted on the extrusion head.”**  **Similarly, the ’921 patent states that “according to the invention, the sheet is advantageously obtained by cutting and opening a parison … leaving the die mounted on the extrusion head.”**  **These statements clearly describe the head and die as discrete components. This Court always presumes that “different terms” in a patent “have different meanings,” absent evidence that they “are used interchangeably.” *Chicago Bd. Options Exch., Inc. v. Int’l Sec. Exch., LLC* (CAFC 2012). Here, the phrase “mounted on” makes it crystal clear that “head” and “die” are not interchangeable.** |
| **You argue that the illustrations in the ’812 and ’921 patents show that the extrusion head and die are distinct. But is that so clear? Don’t the illustrations refer to just a single element (numbered “2”) as both the “extrusion head” and the “die,” suggesting they can be one and the same?** | **Both patents clearly explain that in the illustrated process, plastic passes through “the circular die” that is “mounted on the extrusion head.” That language simply can’t be read to conflate the die and the extrusion head. It unambiguously distinguishes between them.**  **That’s the fundamental difference between element “2” in the illustration and Donghee’s co-extrusion head. Element “2” has a circular die mounted on the head. So the plastic that emerges is an extruded parison.** |
| **If the extrusion head and die are separate, why would Plastic Omnium’s patents illustrate them as a single element?** | **The illustrations are notably simplistic, with generic block shapes representing complex machinery. They also depict a “circular die” that echoes the shape of the circular extrusion head. So it’s no surprise that the simplistic illustrations depict them as a continuous shape. That takes nothing away from the patents’ clear statements that the illustrated process uses a die “mounted on”—not synonymous with—the “extrusion head.”** |
| **Isn’t Plastic Omnium right that the illustrations in the ’812 and ’921 patents show a parison being cut by blades “located at the exit of the coextrusion head” (OB11)? Doesn’t that confirm that the coextrusion head itself can serve as the parison-forming die that Plastic Omnium’s claims require?** | **That portion of Plastic Omnium’s brief rewrites the patents to get rid of the distinct term “die.” The specifications do not say that the blades are located at “the exit of the co-extrusion head,” as Plastic Omnium suggests. They say the blades are located “at the exit of the circular die mounted onthe extrusion head.”** |
| **Even if the extrusion head and die must in some sense be distinct, couldn’t the die be located within the head?** | **No. The patents are clear that the die must be “mounted on” the extrusion head. More specifically, as the district court held—and Plastic Omnium concedes—the die must be “located at the extrusion head’s lowest point” (Reply 19).** |
| **Didn’t the district court recognize that the extrusion head and die don’t have to be distinct components when it held at the *Markman* stage that “the patents specify that the ‘parison’ is cut in two as it leaves the die at the end of the extrusion head,” Appx947?** | **No. The *Markman* order consistently referred to the “head” and “die” separately. This language reflects the same distinction.** |
| **Didn’t the district court recognize that the extrusion head and die don’t have to be distinct components when it held at the summary judgment stage that the “extrusion equipment” could “consist[] of a single combined extrusion head with a die or a more complex extrusion head with a separate attached die” (Appx20)?** | **No. That passage simply recognizes that there are different types of dies. A circular die, like the one in Plastic Omnium’s illustrations, matches the general shape of the extrusion head and so can be “combined” with it particularly seamlessly. A flat die, like Donghee’s, is more “complex” and stands out more as a distinct attachment.**  **The district court’s point was that whichever type of die is chosen, cutting must not occur within it. That is why Donghee’s process does not literally infringe: Cutting indisputably occurs within, not outside, the flat die attached to the coextrusion head.** |
| **Does Donghee’s process form a parison as that term is defined in Plastic Omnium’s claims?** | **No. Plastic Omnium’s parison forms at the exit of the die mounted on the extrusion head and must be tubular. In Donghee’s process, when plastic leaves the die mounted on the extrusion head, it is not tubular—it’s two separate sheets.** |
| **You’re saying we have to read the summary judgment order to hold that Donghee’s process doesn’t create the type of parison required by Plastic Omnium’s claims, even though it repeatedly uses the word “parison” to describe plastic in your process. Where does the district court say there’s no parison?** | **That’s the crux of the summary judgment order. It begins by noting that “Donghee argues that the accused product does not infringe the Parison Claims because it does not extrude a parison.” The order then resolves that dispute in our favor. First, it quotes the *Markman* order for the ruling that “the term” parison “should not include molten plastic (or a tubular preform) present inside the die/extrusion head.” Then, it clarifies that for a parison to form and be cut as Plastic Omnium’s claims require, “the splitting of the molten plastic must not occur inside any of the extrusion head/die equipment.” The order concludes that Donghee’s process does just that—and so doesn’t literally infringe—because it splits plastic within the flat die. All of this is about the absence of a parison.** |
| **Plastic Omnium argues that the district court’s original claim construction correctly “did not limit a parison to something that can exist and must be cut at a certain point, i.e., outside of the extrusion equipment” (OB37). Isn’t that right?** | **No. The *Markman* order took pains to emphasize that “the construction of the ‘extruded parison’ terms should not include molten plastic (or a tubular preform) present inside the die/extrusion head.” That limited a parison to something that exists outside of the head and die.** |
| **Plastic Omnium argues that the district court deviated from its *Markman* order by holding, at the summary judgment stage, that “the splitting of the molten plastic must not occur inside any of the extrusion head/die equipment.” How do you reconcile the two?** | **There is no conflict. The summary judgment decision applied the *Markman* order’s construction without alteration.**  **Under the *Markman* order, “the construction of the ‘extruded parison’ terms should not include molten plastic (or a tubular preform) present inside the die/extrusion head.” Instead, a parison exists (and may be cut) only after the plastic reaches “the exit of the extrusion head/die.” Everyone agrees that under Plastic Omnium’s claims, it is an extruded parison that must be split. So the claims do not cover splitting plastic within the die or extrusion head, before a parison forms.**  **The summary judgment decision said exactly the same thing. It reiterated that “the splitting of the molten plastic must not occur inside any of the extrusion head/die equipment,” since a parison has not yet formed at that point.** |
| **Didn’t the summary judgment order alter the *Markman* order by requiring a parison to be cut outside *any* extrusion “equipment,” Appx20—not simply outside the “die” that shapes it, Appx946?** | **No—Plastic Omnium invented that distinction. At summary judgment, the district court quoted the *Markman* order’s conclusion that “the splitting does not occur ‘at any stage earlier than right as the previously tubular structure leaves the die/extrusion head.’” Applying that conclusion verbatim, the court concluded that “the splitting of the molten plastic must not occur inside any of the extrusion head/die equipment.” There’s no gap. The *Markman* order required splitting after the “die/extrusion head,” and the summary judgment order required splitting after the “extrusion head/die equipment.” They’re identical.** |
| **You’re arguing that the district court’s summary judgment decision did not deviate from its *Markman* order. But did you develop that argument in your briefing? Isn’t Plastic Omnium right that “Donghee relegated its only rebuttal to this aspect of the district court’s decision to a single footnote” (Reply 5)?** | **This is a lead argument in our brief. Section I.A of the argument, titled “The Parison Claims require cutting as or after the plastic exits the die,” explains at length how both the *Markman* order and summary judgment decision correctly required cutting to occur at or after the die’s exit, when a parison first forms. *See* Ans. Br. 42.** |
| **Is it your position that the “die” in Plastic Omnium’s process must be the final piece of extrusion equipment? Or is it possible that the die could feed into more extrusion equipment?** | **The district court did not decide that issue, and this Court doesn’t have to, either. What matters is that the claims require a distinct extrusion head and die, and plastic does not become a parison until it passes through both of them. Donghee’s process splits plastic before that happens. So it does not literally infringe—regardless of what’s permissible after plastic passes through the die.**  **That said, it wouldn’t make sense for the die to feed into additional extrusion equipment. There is no dispute that the die is the component that “imparts” the desired “shape” to plastic during extrusion (Reply 7). It could not dictate the shape if it fed plastic into additional extrusion equipment for further processing.**  **Moreover, the die in Plastic Omnium’s process produces an “extruded parison.” But if a die fed plastic into more extrusion equipment, that plastic would not be “extruded”—it would still be extruding.** |
| **You say there’s no need to decide whether the die in Plastic Omnium’s process can feed into more extrusion equipment. But Plastic Omnium seems to think that was the basis for the summary judgment order. In its view, the district court held that your process feeds a parison into the flat die, and found no infringement only because it decided (departing from its *Markman* order) that the die in Plastic Omnium’s process can’t feed into more extrusion equipment that way. Why is that wrong?** | **Once again, if that’s Plastic Omnium’s position, it’s taking one sentence entirely out of context and disregarding the substance of the summary judgment order. The court did not hold that our process feeds a parison into the flat die. Just the opposite: It concluded that the plastic entering our flat die is not a parison because it hadn’t yet passed through the extrusion head and die.**  **The court never contemplated potential limits on how a parison may be cut once it forms by passing through the extrusion head and die—including whether it could be cut in additional extrusion equipment. That’s simply a non-issue.** |
| **We keep coming back to whether the district court held that your process uses a “coextrusion die” to produce a “parison,” or carelessly imported those terms from Plastic Omnium’s briefing without meaning to endorse them. Is that ultimately what this dispute comes down to?** | **[Explain.].** |
| **Is it your position that the “die” in Plastic Omnium’s process must feed a parison into the open air? Or is it possible that the die could feed the parison directly into another piece of enclosed machinery for cutting, as Plastic Omnium seems to argue?** | **The district court did not decide that issue, and this Court doesn’t have to, either. What matters is that the claims require a distinct extrusion head and die, and plastic does not become a parison until it passes through both of them. Donghee’s process splits plastic before that happens. So it does not literally infringe—regardless of what’s permissible after plastic passes through the die.** |
| **Is it your position that there can be only one “die” in the extrusion process? Isn’t there an unresolved question of fact as to whether there can be multiple dies?** | **The district court did not decide that issue, and this Court doesn’t have to, either. What matters is that Plastic Omnium’s claims require plastic to pass through the extrusion head and a distinct die before it’s cut. Donghee’s process splits plastic before plastic has passed through a single die. So it does not literally infringe—regardless of whether there could theoretically be additional dies later in the extrusion process.**  **That said, it wouldn’t make sense for the die to feed into another die. There is no dispute that the die is the component that “imparts” the desired “shape” to plastic during extrusion (Reply 7). It could not dictate the shape if it fed plastic into a different die that reshaped the plastic.**  **Moreover, the die in Plastic Omnium’s process produces an “extruded parison.” But if a die fed plastic into another die, that plastic would not be “extruded”—it would still be extruding.** |
| **Plastic Omnium argues that cutting an extruded parison into sheets would infringe its patents regardless of how, precisely, that cutting is performed—including cutting performed within some sort of enclosed piece of machinery. Do you dispute that?** | **The district court did not resolve the range of techniques that would count as “cutting” a parison, and this court doesn’t have to, either. What matters is that our process never extrudes a tubular parison for cutting.** |
| **When describing how your flat die works, you wrote: “After the plastic [in Donghee’s extrusion equipment] goes through the coextrusion head, it is first split into two channels, and only then does it go through the die. In short, cutting happens before the die.” Plastic Omnium makes a big deal about this, arguing that you’re mistakenly claiming that plastic is split before, rather than within, the flat die (Reply 13-14). Is that right? Is it a problem for you?** | **Plastic Omnium is misreading our brief. Our position is that plastic is split within the flat die tool—after entering the tool but before exiting it. We’ve never argued that splitting occurs before the entrance of the flat die tool.**  **(It’s worth noting that either way, we would not infringe. Plastic Omnium’s claims require plastic to be split after it completes its passage through the die mounted on the extrusion head. Our process would not do that whether it split plastic before or within the flat die.)** |
| **Plastic Omnium argues that “the claims are not limited to only a tube of plastic that exits the extrusion equipment, but cover a plastic tube that is created inside the extrusion equipment and is subsequently split inside the extrusion equipment as well” (OB38). What’s wrong with that reading of the claims?** | **It defies the fundamental teaching of the patents: Plastic must pass through the extrusion equipment and become an “extruded parison” before it is cut.** |
| **Do Plastic Omnium’s patents expressly define the term “die”?** | **They make clear that the die is an item attached to the extrusion head, through which molten plastic passes to form a parison.** |
| **The experts seem to have a lot to say about the meaning of “die.” Didn’t Plastic Omnium’s expert, Dr. Tim A. Osswald, testify that Donghee’s coextrusion head is a die?** | **Dr. Osswald acknowledged that “[a] conventional extrusion head is typically terminated by an extrusion ‘die.’” But he also asserted, confusingly, that “the terms extrusion head and extrusion die are used interchangeably,” such that the head itself could be called a “die.”** |
| **Why did Dr. Osswald classify Donghee’s coextrusion head as a die?** | **He testified that the coextrusion head is a die because it imparts a shape to the exiting plastic. In particular, Dr. Osswald asserted that the head’s “outer body” and “spiral mandrel” “together define an annular channel” that forces plastic into a “tubular” shape.** |
| **When Dr. Osswald classified Donghee’s coextrusion head as a die, didn’t he have support from internal Kautex documents? What were those?** | **Dr. Osswald cited some illustrations from Kautex manuals translated from German to English. Some of them refer to the extrusion head as a “6-layer parison coextrusion die tool.” Another refers to various sections of the flat die as manipulating a “parison.”** |
| **Plastic Omnium’s reply brief discusses at length how Kautex documents refer to the plastic exiting the coextrusion head as a “parison”—and the head itself as a “die.” Isn’t that a big problem for your argument?** | **The Kautex documents are irrelevant to the dispositive question here, which is how the patents unambiguously define the “die” that produces a parison. That’s a purely legal question of claim construction. And the answer is clear: That die is distinct from (and attached to) the extrusion head.**  **The Kautex documents—like the broader expert disputes over the generic meaning of “die”—don’t bear on this legal question.** |
| **Dr. Osswald cited the definition of “die” from the Concise Encyclopedia of Plastics. What is it?** | **A “device, usually of steel, having an orifice (opening) with a specific shape or design geometry that it imparts to a plastic melt [] pumped from an extruder….”** |
| **Doesn’t your coextrusion head count as a “die” under the Concise Encyclopedia of Plastics definition?** | **We don’t think so, because it doesn’t impart the post-extrusion shape to the plastic passing through it—that’s the function of the flat die.**  **But in any event, this issue is irrelevant to the dispositive question here, which is how the patents unambiguously define the “die” that produces a parison. That die is distinct from (and mounted on) the extrusion head.** |
| **What, if anything, did Dr. Osswald say about how the patents use the terms “head” and “die”?** | **He conceded that the specifications require “a die mounted on the extrusion head.” Recognizing that this language plainly distinguishes between the die and the head, his only response was that it “may just be a poor choice of words” on the part of the inventor.** |
| **Can’t we agree with Dr. Osswald that the patents’ distinction between the “head” and “die” was merely a poor choice of words?** | **No. Claim terms must be “construed with the meaning with which they are presented in the *patent document*”—not the meaning that later serves the patentee’s litigation interests. *Phillips* at 1316. “It is likewise well-settled that courts generally may not re-draft claims; we must construe the claims as written.” *Ecolab* at 1344 (CAFC 2009).** |
| **Does your expert, Dr. Paul Koch, agree with Plastic Omnium’s expert that Donghee’s coextrusion head is a die?** | **No. Dr. Koch testified that the terminus of our coextrusion head is what attaches to a die, but is not itself a die as that term is commonly used. Again, though, that’s not relevant here. The dispositive question is how the patents unambiguously define the “die” that produces a parison. That die is distinct from (and mounted on) the extrusion head.** |
| **There seems to be a battle of experts as to whether the coextrusion head in Donghee’s process is also a die. Plastic Omnium emphasizes this at Reply 16-20. Isn’t Plastic Omnium right that “any underlying disputes” about whether your coextrusion head is or includes a die are “fact questions that must be presented to the jury” (Reply 16)?** | **No, because the expert dispute is irrelevant to the infringement analysis. The district court granted summary judgment because it correctly concluded that the patents unambiguously require plastic to pass through a die distinct from the extrusion head. In other words, the operative “die” in Plastic Omnium’s claims can’t simply be the extrusion head. That’s a purely legal issue of claim construction, distinct from the expert dispute.**  **Plastic Omnium itself acknowledges this. Its reply brief implicitly recognizes that expert testimony would be irrelevant if the patents require the “die” to be “separately mounted to the extrusion head” (Reply 19). Plastic Omnium’s only response is to argue that the patents don’t, in fact, impose that requirement. But that misreads the patents, as the district court correctly held.** |
| **Don’t the patents support Dr. Osswald’s classification of Donghee’s coextrusion head as a die? In particular, doesn’t the terminus of Donghee’s coextrusion head—which has a circular gap between the spiral mandrel and die body—look exactly the same as element “2” in the patent illustrations, which produces a parison?** | **No. Element “2” in Plastic Omnium’s patents depicts both an extrusion “head” and “the circular die, which is mounted on the extrusion head.” That confirms the extrusion head and die are distinct items. Donghee’s coextrusion head is only part of what element “2” depicts.** |
| **Plastic Omnium contends it’s “undisputed” that Donghee’s process uses a “coextrusion die” to produce a “parison” (OB19, 30). Is that wrong?** | **Yes. Donghee absolutely disputes that its coextrusion head qualifies as a “die” or produces a “parison.” Again, Plastic Omnium is misreading that one sentence in the summary judgment order out of context.** |
| **I’m confused. Didn’t the district court hold that your coextrusion head is a die that produces a parison—and that those facts were undisputed? How else can you interpret its conclusion that “it is undisputed that ‘[t]he extruded plastic parison is [] cut in a separate ‘flat die’ tool after it leaves Donghee’s coextrusion die” (Appx 20)? And if your coextrusion head is a die that produces a parison, doesn’t that mean you infringe?** | **The district court did not hold that Donghee’s process feeds an extruded parison into the flat die. Just the opposite. It reiterated its *Markman* holding that the term “parison” “should not include molten plastic (or a tubular preform) present inside the die/extrusion head.” And it held that Donghee’s process does not literally infringe because it splits plastic while it is still inside the die, before it becomes a parison.**  **In so holding, the district court quoted a sentence from Plastic Omnium’s brief for a narrow purpose: to show that the location of splitting in Donghee’s process was undisputed. That sentence acknowledges that cutting occurs in Donghee’s “‘flat die’ tool.” As it happens, the quoted sentence also erroneously refers to Donghee’s coextrusion head as a “die” that produces a “parison.”But the district court certainly did not endorse those erroneous labels—its summary judgment decision squarely *rejected* them.** |
| **The district court said it was “undisputed” that your flat die tool cuts a “parison.” Appx20. So didn’t it necessarily also conclude that parison is previously “forced through a die”—namely, the coextrusion head (Reply 15)?** | **The district court did not hold that Donghee’s process feeds an extruded parison into the flat die. Just the opposite. It reiterated its *Markman* holding that the term “parison” “should not include molten plastic (or a tubular preform) present inside the die/extrusion head.” And it held that Donghee’s process does not literally infringe because it splits plastic while it is still inside the die, before it becomes a parison.**  **In so holding, the district court quoted a sentence from Plastic Omnium’s brief for a narrow purpose: to show that the location of splitting in Donghee’s process was undisputed. That sentence acknowledges that cutting occurs in Donghee’s “‘flat die’ tool.” As it happens, the quoted sentence also erroneously refers to the plastic entering the flat die as a “parison.” But the district court certainly did not endorse that erroneous label—its summary judgment decision squarely *rejected* it.** |
| **At times, Plastic Omnium argues that the district court undisputedly held that your coextrusion head is a die. But in the alternative, it contends that the district court had no occasion to decide whether there’s a “parison-forming die” at “the bottom of its extrusion head” (Reply 15). Isn’t that right—and doesn’t it mean we can’t reach that issue for the first time on appeal?** | **The district court plainly held that Donghee’s extrusion head is not a parison-forming die. Its *Markman* order construed “parison” to exclude plastic “present inside the die/extrusion head.” Applying that construction, the summary judgment order held that Donghee does not cut a parison because it splits plastic within “the extrusion head/die equipment”—namely, “in a separate ‘flat die’ tool.” In so holding, the district court necessarily concluded that the coextrusion head—which feeds plastic into the flat die—does not itself form a parison that may be cut.** |
| **Let’s say you’re right that, at least implicitly, the district court held that Donghee’s coextrusion head is not a parison-forming die. Why should we affirm that holding on this record? Did the district court provide any reason why the end of the coextrusion head isn’t a parison-forming die? Is there one that’s undisputed?** | **The patents compel that conclusion. As explained, they make clear that the extrusion head and the die are separate items attached to each other. Plastic Omnium can’t get around that by redefining the head as the die, or citing its expert’s testimony to that effect.** |
| **Does the term “coextrusion die” appear anywhere in Plastic Omnium’s patents?** | **No.** |
| **If the term “coextrusion die” doesn’t appear in the patents, why does Plastic Omnium use it throughout its briefing?** | **It’s yet another effort to mask the distinction between the extrusion head and die. The patents clearly distinguish those two components. By combining those terms into the phrase “coextrusion die,” Plastic Omnium impermissibly rewrites the patents.** |
| **You object to the graphic that Plastic Omnium created to illustrate Donghee’s process (OB24):**    **But doesn’t it accurately represent how plastic flows through your machinery?** | **The big problem with Plastic Omnium’s graphic is how it uses the term “parison.” It labels the plastic exiting our coextrusion head and entering our flat die as a “parison.” That is flatly incompatible with Plastic Omnium’s patents, which clearly state that a parison forms only after passing through both the extrusion head and the die attached to it.** |
| **Regarding the graphic that Plastic Omnium created to illustrate Donghee’s process (OB24), aside from your objection to its use of the term “parison,” do you concede that it accurately represents how plastic flows through your machinery? If not, why not?** | **We do not. Several aspects of the illustration, including the flow of plastic within the coextrusion head, lack record support.** |
| **What is the legal standard for deciding infringement under the doctrine of equivalents?** | **This Court has endorsed two formulations of the equivalence standard:**   1. **Function-way-result standard: An accused product infringes only if it performs substantially the same function, in the substantially the same way, with substantially the same result as the patented invention.**   **Insubstantiality-of-the-differences standard: An accused product infringes only if any differences between it and the patented invention are insubstantial.** |
| **Is one formulation of the equivalence standard a better fit than the other in this case?** | **We think both formulations are a good fit. This Court noted in *Mylan v. Aurobindo* (CAFC 2017) that the insubstantiality-of-the-differences standard might work better for a case about chemical compounds. But in our case, which involves mechanical devices, the function-way-result standard is just as illuminating.** |
| **Which formulation of the equivalence standard did the district court apply?** | **The district court recited both standards, and it is not clear that it ultimately chose one over the other. The court concluded that no reasonable jury could find Donghee’s process “insubstantially different” from Plastic Omnium’s process. That may sound more like the insubstantiality-of-the-differences standard, but it could reflect the application of either test.** |
| **Which formulation of the equivalence standard did you apply in your appellate brief?** | **We did not choose one over the other. We explained how Donghee’s process differs from Plastic Omnium’s process in both the way it forms plastic sheets and the result of the process. And we explained why those differences are not insubstantial. *See* Ans. Br. 51. That analysis defeats Plastic Omnium’s infringement claims, as a matter of law, under either formulation of the equivalence standard.** |
| **Didn’t your appellate brief incorrectly frame the doctrine of equivalents test by arguing that a complete identity between the accused process and claims—rather than a substantial identity—is required to prove infringement (Reply 21)?** | **No. We consistently applied this Court’s rule that substantial differences—not any differences—defeat a claim of infringement under the doctrine of equivalents. *E.g.* Ans. Br. 51.** |
| **What was Plastic Omnium’s evidentiary burden, if any, regarding its claim that Donghee’s process infringes the parison claims under the doctrine of equivalents?** | **To avoid summary judgment, Plastic Omnium was required to “provide particularized testimony and linking argument as to the ‘insubstantiality of the differences’ between the claimed invention and the accused device or process, or with respect to the function, way, result test.” *AquaTex Industries, Inc. v. Techniche Solutions* (CAFC 2007).** |
| **How, if at all, was Plastic Omnium required to account for each individual claim limitation when presenting evidence that differences between its process and Donghee’s process are insubstantial?** | **Plastic Omnium was required to provide evidence that differences were insubstantial “on a limitation-by-limitation basis.” *Aquatex* at 1328-29.** |
| **If Plastic Omnium’s expert asserted that there is “no substantial difference” between the patented process and Donghee’s process, wouldn’t that constitute the requisite “particularized testimony”?** | **No. This Court has made clear that such “conclusory statements regarding equivalence … do not raise any genuine issues of material fact.” *PC Connector Sols. LLC v. SmartDisk Corp.* (CAFC 2005) at 1324.** |
| **So you agree with Plastic Omnium that “[t]he relevant inquiry instead asks whether an accused process performs substantially the same function, in substantially the same way, to achieve substantiallythe same result” (Reply 21-22)?** | **We agree that is one of the two formulations of the equivalence standard. And we applied it throughout our brief.** |
| **Why does Plastic Omnium bear the burden of showing insubstantiality under the doctrine of equivalents? What danger is that guarding against?** | **Plastic Omnium’s evidentiary burden “assure[s] that the fact-finder does not, ‘under the guise of applying the doctrine of equivalents, erase a plethora of meaningful structural and functional limitations of the claim on which the public is entitled to rely in avoiding infringement.’” *Texas Instruments, Inc. v. Cypress Semiconductor Corp.* (CAFC 1996).** |
| **Plastic Omnium suggests that if we reach the doctrine of equivalents issue, the “question is … when there is a die in the equipment that forms a tubular parison, and that parison is subsequently cut within the equipment, is that process equivalent to cutting a parison as it leaves the equipment?” (Reply 25). Do you agree?** | **No. Plastic Omnium lost on literal infringement because our process does not contain a parison-forming die as required by the claims. The question here is whether our process is nonetheless equivalent despite the absence of, among other things, a parison-forming die.** |
| **What differences, if any, are you claiming in the way Plastic Omnium’s process and Donghee’s process split plastic into sheets?** | **Two critical differences are undisputed.**  **First, Donghee’s process splits plastic by using high pressure to direct it into two extrusion channels. Plastic Omnium’s process instead cuts plastic after extrusion is complete.**  **Second, as a result, Donghee’s process offers independent wall thickness manipulation while splitting plastic. Plastic Omnium’s process doesn’t.** |
| **What is your evidence that Donghee’s process splits plastic by using high pressure to direct it into two extrusion channels?** | **Our expert, Dr. Koch, testified that Donghee’s process splits plastic by using “high pressure” to force a “melt flow” into channels “inside of the [extrusion] machinery.” He then explained that Plastic Omnium’s process instead splits plastic after extrusion, when it “exists at normal atmospheric pressure” and is no longer confined to “the shape of the channel.” Plastic Omnium does not dispute that this distinction is accurate under the district court’s claim construction.** |
| **What is your evidence that Donghee’s process offers independent wall thickness manipulation, while Plastic Omnium’s process doesn’t?** | **Dr. Koch explained that the size of the channels into which Donghee’s process splits plastic can be independently varied, altering the thickness of each sheet (and the resulting tank walls).**  **Dr. Osswald calls that “independent wall thickness manipulation.” And he conceded that Plastic Omnium’s process cannot offer it, absent a distinct “invention.” That is because in Plastic Omnium’s process, any changes to thickness during extrusion necessarily affect the entire, tubular parison. As Plastic Omnium itself emphasizes, this “results in consistent and uniformly thick tank walls.” OB12.** |
| **What differences, if any, are you claiming in the results of splitting plastic in Plastic Omnium’s process and Donghee’s process?** | **Three differences are undisputed.**  **First, Donghee’s process is more consistent. It produces sheets with fewer quality control problems.**  **Second, Donghee’s process produces higher-quality sheets. In particular, independent wall thickness manipulation means sheets can be shaped more precisely, yielding better fuel tanks.**  **Third, Donghee’s process is easier to start and stop, improving the manufacturing process.** |
| **What is your evidence that Donghee’s process is more consistent, producing sheets with fewer quality control problems?** | **Plastic Omnium’s lead engineer, Bjorn Criel, said so. He testified that Plastic Omnium was “aware … from the beginning” that the post-extrusion cutting process in its patents “would not be the way to manufacture a tank in production.” That was because “cutting … at the exit of the die” created a “[p]roblem”—the “need to manage the sheets, to position the sheets at the correct place.” *Id.* The “complexity” of that process meant that it “was not repeatable.” (Our expert. Dr. Koch, confirmed these “quality control” problems.”)**  **Criel then explained the improved consistency of Donghee’s approach. He testified that when the splitting process is “extrusion related,” the plastic “comes out nicely,” without the “need to manage the[] sheets” that arises when the plastic is cut after extrusion from the die. Splitting the plastic within the die was a significant “advantage” in the “industrial aspect of the invention.”** |
| **What is your evidence that Donghee’s process produces higher-quality sheets?** | **Criel testified that the plastic sheets “come[] out nicely” when they are formed during the extrusion process.**  **Further, Dr. Koch explained that independent wall thickness adjustment—a unique feature of Donghee’s process—facilitates “small adjustments of the sheet thickness” over “each incremental width of the sheet.” That means Donghee’s process can alter the thickness of each sheet to “put” plastic “into specific areas of the final product” or compensate for “variations in the viscosity” of the plastic, creating a unique type of fuel tank. Criel confirmed that splitting plastic within the extrusion equipment “increased” the “quality … of the thicknesses” compared to the post-die cutting illustrated in Plastic Omnium’s patents.** |
| **What is your evidence that Donghee’s process is easier to start and stop?** | **Criel testified that relative to post-extrusion cutting, splitting plastic within the extrusion equipment made it “easy … to start up and end … the manufacturing or prototyping.”**  **Dr. Koch echoed Criel’s testimony, explaining that “[c]utting an extruded parison introduces a number of uncontrolled variables, including temperature variations, wind currents, and process parameters,” “negatively affecting productivity.”** |
| **You cite Bjorn Criel’s testimony about splitting plastic during the extrusion process. Was he talking about Donghee’s process or something else?** | **He was talking about the equivalent of Donghee’s process. Years after filing for the patents at issue here, Plastic Omnium developed a component it called the Head Tooling Adapter, which operates similarly to Donghee’s flat die. Criel was describing the advantages of that tool, but his analysis applies equally to Donghee’s process.** |
| **If Bjorn Criel wasn’t talking about Donghee’s flat die, why should we give his testimony any weight?** | **Plastic Omnium has never disputed that his analysis of splitting plastic during extrusion applies to Donghee’s process. Indeed, Plastic Omnium acknowledges that Criel’s testimony shows “there may be advantages to cutting inside of the extrusion equipment.”** |
| **You claim to identify undisputed differences in the way each process works, and the corresponding results. But didn’t Dr. Osswald dispute that by testifying that the processes are “no different” from each other, Appx265?** | **Plastic Omnium cites two paragraphs to that effect from Dr. Osswald’s initial expert report. OB42. They’re entirely conclusory and fail to raise a triable issue of fact regarding equivalence. *PC Connector* at 1364.**  **The first paragraph simply asserts that when plastic is forced “into Donghee’s ‘flat die tool’ so that it can be split,” “[t]his is no different than what is depicted/described in the ’921 patent, which shows a coextrusion die forcing an extruded parison onto a blade at the exit of the coextrusion die so that the parison can be split.”**  **The second paragraph simply asserts that “the flat die tool” works by “splitting the parison, just as shown in Fig. 1 of the ’921 patent.”** |
| **Why exactly should we deem conclusory Dr. Osswald’s testimony that the two processes are “no different” from each other, Appx265?** | **Dr. Osswald did not analyze the specific wayplastic is split in each process or the specific result. He simply described the processes in general terms and said they were the same, without explaining whether or how any differences matter. He did not mention consistency, sheet quality, or ease of starting and stopping. The Court has consistently disregarded such remarks as conclusory when affirming summary judgment under the doctrine of equivalents.** |
| **Have we rejected testimony like Dr. Osswald’s as conclusory in other cases?** | **Yes, many times. Recent examples include *Augme v. Yahoo!* (CAFC 2014) and *Cambrian Science v. Cox* (CAFC 2015).**  ***Augme* rejected testimony “stating only that the product would ‘operate the same,’ ‘perform [the functions described in the patent] in essentially the same way,’ and ‘would [produce] the same result.’” *Id.* at 1336.**  ***Cambrian Science* rejected testimony asserting that “any differences between the structure and the claim limitations are insubstantial,” without further “particularized testimony or linking arguments.” *Id.* at 994.**  **Dr. Osswald’s assertion that Donghee’s and Plastic Omnium’s processes are “no different” from each other is even more conclusory than those examples.** |
| **You criticize the equivalence analysis in Dr. Osswald’s initial expert report as conclusory. Did he offer more particularized evidence of equivalence in his reply report?** | **Just the opposite: Dr. Osswald’s reply report conceded for the first time that Donghee’s process offers “improvements” over Plastic Omnium’s process. He never disputed that those improvements include independent wall thickness manipulation, better consistency, higher-quality sheets, and easier starting and stopping. So hid reply report confirms that summary judgment of noninfringement was warranted here.**  **Thus, as the district court recognized, “Plastic [Omnium]’s expert, Dr. Osswald, acknowledge[d] differences between Donghee’s flat die tool and the patented invention.” Plastic Omnium has not challenged that holding on appeal.** |
| **How does Plastic Omnium’s appellate briefing explain what Dr. Osswald meant when he conceded that your process offers “improvements,” Appx387?** | **It doesn’t. Plastic Omnium’s briefing never mentions, let alone explains, that concession.** |
| **Even if Plastic Omnium acknowledges that Donghee’s process offers improvements over post-extrusion cutting, doesn’t it dispute that those improvements are substantial, which is what matters under the doctrine of equivalents?** | **Plastic Omnium doesn’t dispute that, either. It offers no particularized evidence that the improvements (independent wall thickness manipulation, better consistency, higher-quality sheets, and easier starting and stopping) are not substantial, as would be required to avoid summary judgment.** |
| **You claim to identify undisputed differences in the way each process works, and the corresponding results. But didn’t Dr. Osswald dispute that by testifying that “a plastic parison can be cut, just as the claims require, whether that parison is inside a flow channel within the extrusion equipment or has already exited the equipment” (Reply 23)?** | **That’s just more conclusory testimony. All it shows is that Donghee’s process and Plastic Omnium’s process both split plastic. It does not establish that the differences between them are merely insubstantial. That’s the evidentiary gap that justifies summary judgment of noninfringement.** |
| **You claim to identify undisputed differences in the way each process works, and the corresponding results. But didn’t Dr. Osswald dispute that by testifying that the viscoelastic properties of plastic are identical inside and outside the extrusion equipment (Reply 22-23)?** | **No. All Dr. Osswald said is that the “viscoelastic properties” of plastic are not significantly different within and outside extrusion equipment (Reply 22). But even if that’s true, the differences we identify remain undisputed. Our process still uses high pressure to force plastic apart into two channels that can be independently varied. That yields higher-quality sheets and a more consistent and controllable manufacturing process. Dr. Osswald never suggested that his testimony about viscoelasticity called any of those differences into question.** |
| **You claim that independent wall thickness manipulation is an undisputed difference in the way your process works, compared to Plastic Omnium’s process. But isn’t Plastic Omnium right that its claims “simply require ‘cutting and opening an extruded parison’” and “do not exclude further processing of the plastic” (Reply 22)? Doesn’t that show that its process can also perform independent wall thickness manipulation?** | **Plastic Omnium has offered no evidence that its process offers any form of independent wall thickness manipulation—let alone a form that differs only insubstantially from Donghee’s process. To the contrary: Dr. Osswald conceded that Plastic Omnium’s process cannot offer independent wall thickness manipulation absent a distinct “invention.”**  **Plastic Omnium can’t fill this evidentiary gap by speculating that its claims would not “exclude” some unidentified method of performing independent wall thickness manipulation after cutting an extruded parison. Plastic Omnium was required to submit evidence that such a method exists and is not substantially different from Donghee’s method of varying wall thickness during extrusion. It did neither.** |
| **You note in your brief that Dr. Osswald “grudgingly acknowledged that Donghee’s flat die ‘may offer improvements (e.g., independent wall thickness manipulation) over the blade and roller cutting system of the Asserted Patents’” (Ans. Br. 52-53). But that wasn’t a concession that Plastic Omnium’s claimed process doesn’t offer independent wall thickness manipulation, was it? Didn’t Dr. Osswald say merely that one particular embodiment, using blades and rollers, doesn’t offer it?** | **Dr. Osswald eventually testified that Plastic Omnium’s process cannot offer independent wall thickness manipulation absent a distinct “invention.” That’s a concession about the claims as a whole, not merely one embodiment. And Dr. Osswald certainly did not offer evidence that any embodiment of Plastic Omnium’s process can offer independent wall thickness manipulation, as was required to avoid summary judgment of noninfringement.** |
| **Plastic Omnium argues that your process’s capacity for independent wall thickness manipulation is “irrelevant” to the equivalence analysis because it “occur[s] post-cutting of the parison” (Reply 22). Isn’t that right?** | **No. First of all, our process does not involve cutting “of the parison.” It splits plastic during extrusion, before a parison forms. That’s a fundamental difference between our process and Plastic Omnium’s process.**  **Second, independent wall thickness manipulation is not a “post-cutting” feature of our process. It is part of the way cutting occurs. Rather than slice apart an extruded parison, our process splits plastic into two channels within the extrusion equipment. That type of splitting facilitates independent wall thickness manipulation because the channels can be varying sizes.**  **Again, Plastic Omnium has offered no evidence that cutting an extruded parison facilitates independent wall thickness manipulation. Instead, Dr. Osswald conceded that Plastic Omnium’s process cannot offer that feature absent a distinct “invention.”** |
| **Does Plastic Omnium concede any shortcomings in Dr. Osswald’s equivalence testimony that we should take into account?** | **Plastic Omnium’s reply brief concedes that Dr. Osswald never “provided” a “direct *ipsis verbis* conclusion on whether cutting inside the ‘extrusion head/die equipment’ is equivalent to cutting outside the equipment” (Reply 23). That confirms that Dr. Osswald did not provide the particularized testimony required to avoid summary judgment of noninfringement.** |
| **You note that Plastic Omnium concedes that Dr. Osswald did not expressly opine on “whether cutting inside the ‘extrusion head/die equipment’ is equivalent to cutting outside the equipment” (Reply 23). But doesn’t Plastic Omnium explain that Dr. Osswald omitted such an opinion only because he was relying on the claim construction in the district court’s *Markman* order, which the court “redrafted” at the summary judgment stage? Shouldn’t we reopen discovery so that Dr. Osswald can address the new claim construction?** | **That explanation makes no sense. The *Markman* order emphasized that “the construction of the ‘extruded parison’ terms should not include molten plastic (or a tubular preform) present inside the die/extrusion head.” The summary judgment order said the same thing. So at every stage, Dr. Osswald knew to evaluate whether cutting inside the die/extrusion head (Donghee’s process) was equivalent to cutting outside that equipment (Plastic Omnium’s process). He simply did not opine, with the requisite particularity, that those methods are equivalent.** |
| **Plastic Omnium argues that Donghee’s process and Plastic Omnium’s process are equivalent even if “the use of Donghee’s flat die tool may be a more refined implementation of the patented process, at least as compared to exactly what is depicted in the ’921 and ’812 patent’s Figure 1” (Reply 23-24). Why isn’t that right?** | **The premise of Plastic Omnium’s doctrine of equivalents claim is that Donghee’s process is not an implementation of the patent process. To establish that Donghee’s process is nonetheless equivalent, Plastic Omnium has to show that the two processes differ only insubstantially, if at all. The fact that Donghee’s process is “more refined,” as Plastic Omnium put it, shows it’s not equivalent.** |
| **What is the claim vitiation doctrine?** | **It’s a guide for evaluating equivalence. This Court has long held that “the doctrine of equivalents does not apply if applying the doctrine would vitiate an entire claim limitation.” *Panduit v. HellermannTyton* (CAFC 2006) at 830.** |
| **How does the claim vitiation doctrine map onto claims with structural limitations?** | **As a matter of law, the doctrine of equivalents isn’t satisfied “where the patentee seeks to encompass a structural feature that is the opposite of, or inconsistent with, the recited limitation.” *Augme* at 1335. You can’t say “the very antithesis” of a limitation is its equivalent. *Moore U.S.A. v. Standard Register* (CAFC 2000) at 1095. That’s because “the concept of equivalency cannot embrace a structure that is specifically excluded from the scope of the claims.” *Dolly v. Spalding & Evenflo* (CAFC 1994) at 400.** |
| **How have we previously applied the claim vitiation doctrine to prevent the doctrine of equivalents from encompassing the opposite of a limitation?** | ***Planet Bingo v. GameTech* (CAFC 2006): Determining the winning bingo call “before” a game begins isn’t equivalent to doing so “after.”**  ***Moore*: A “majority” of certain things isn’t equivalent to a “minority.”**  ***Eastman Kodak v. Goodyear* (CAFC 1997): A process for crystallizing a substance “under an inert gas atmosphere” isn’t equivalent to doing so using a gas that is reactive rather than inert.** |
| **How does the claim vitiation doctrine reflect public notice concerns?** | **When a patentee’s invention contains a particular structure, it makes “a clear and binding statement to the public” that inconsistent structures “are excluded from the protection of the patent.” *SciMed v. Advanced Cardiovascular* (CAFC 2001) at 1347. The patentee cannot later invoke the doctrine of equivalents to escape the consequences of such a statement. “[A]s between the patentee who had a clear opportunity to negotiate broader claims but did not do so, and the public at large, it is the patentee who must bear the cost of its failure to seek protection for [a] foreseeable alteration of its claimed structure.” *Sage Prods v. Devon Indus.* (CAFC 1997) at 1425.** |
| **How does the claim vitiation doctrine apply here?** | **It forecloses Plastic Omnium’s theory of equivalence. As the district court correctly held, Plastic Omnium’s patents require splitting plastic afterextrusion is complete. Plastic Omnium wants to use the doctrine of equivalents to cover the structural opposite of that limitation: Donghee’s process of splitting plastic beforeextrusion is complete. That would improperly vitiate Plastic Omnium’s claims by making the term “extruded” in Plastic Omnium’s patents a dead letter.** |
| **Shouldn’t it be up to a jury to decide claim vitiation?** | **No. This Court has repeatedly held that a theory of equivalence would improperly vitiate a claim as a matter of law because “no reasonable juror could find otherwise.” *Moore* at 1106. Examples include *Moore*, *Augme*, and *Eastman Kodak*. The same is true here.** |
| **How does the claim vitiation doctrine intersect with failed claim construction arguments—both generally and in this case?** | **The claim vitiation doctrine ensures that a party cannot use the doctrine of equivalents to recycle its unsuccessful “claim construction arguments,” hoping to “encompass a structural feature that is the opposite of, or inconsistent with, the recited limitation.” *Augme* at 1335.**  **Here, Plastic Omnium argued for a broad claim construction that would encompass splitting plastic both before and after extrusion was complete. It lost. Plastic Omnium cannot recapture its preferred claim construction through the doctrine of equivalents.** |
| **In contesting your claim vitiation argument, Plastic Omnium relies on *Cadence Pharmaceuticals v. Exela PharmSci* (CAFC 2015). What did that decision hold regarding claim vitiation?** | **The claims in *Cadence Pharmaceuticals* covered a process of deoxygenating a solution that contains an active ingredient, in order to prevent decomposition of the active ingredient. The accused process deoxygenated a solution to which an active ingredient was later added, to the same end.**  **The district court concluded that the accused process infringed under the doctrine of equivalents because the timing of adding the active ingredient did not change the way the process prevents decomposition (deoxygenation of the solution) or the results of that process.**  **This Court, reviewing only for clear error, affirmed.** |
| **Doesn’t *Cadence Pharmaceuticals* say that claim vitiation really comes down to “the factual analysis required to establish whether the differences between a claimed limitation and an accused structure or step are substantial”? And doesn’t that show that your claim vitiation argument isn’t doing any independent work here?** | **That language from *Cadence Pharmaceuticals* is fatal for Plastic Omnium. As explained, there are several substantial, undisputed differences in the Donghee and Plastic Omnium processes. The claim vitiation doctrine underscores the problem—Donghee’s process is different because it takes the opposite approach to Plastic Omnium, splitting plastic before it is done extruding rather than after.** |
|  |  |
| **Preassembled Structure Claims** | **Color** |
| **What is the preassembled structure limitation?** | **The limitation requires that “at least one of said accessory or said duct is supported by a preassembled structure which comprises at least one device configured to anchor said preassembled structure to an internal wall of the hollow body.”** |
| **Which patents and claims include a preassembled structure limitation?** | **Claim 41 of the 812 patent.**  **Several claims of the 253 patent, which have been cancelled following an IPR.** |
| **How did the court construe preassembled structure?** | **Applying the word’s ordinary meaning the court held that a “preassembled structure” requires “a set of multiple parts previously joined into a single arrangement that is capable of attachment to at least one accessory.”** |
| **At the claim construction stage, how did Plastic Omnium construe “preassembled structure”?** | **Plastic Omnium argued that it means “a premade structure.”** |
| **In what two ways does Plastic Omnium contend the district court got the meaning of preassembled structure wrong?** | **It says the court erred by (1) requiring “multiple parts,” and (2) requiring those parts to be “previously joined into a single arrangement” before the structure is connected to a fuel tank.** |
| **Why is Plastic Omnium wrong that a preassembled structure does not require multiple parts?** | **Because it is plain from the widely understood meaning of “preassemble” that multiple parts are required. Preassembled means “to fit together the parts of” “in advance.” And the only way parts can be fit together is if there are multiple parts.** |
| **Why is Plastic Omnium wrong that the claim’s reference to a preassembled structure “comprising at least one device configured to anchor said preassembled structure” indicates such a structure may have only one component. Doesn’t “at least one” include one?** | **Because the “at least one” language does not refer to the number of pieces that comprise the preassembled structure. That language simply refers to one required component of such a structure—a preassembled structure must include at least one anchor. Nowhere does the claim say the preassembled structure itself need be comprised of only one piece.**  **Moreover, the claim refers to the “at least one” anchoring device anchoring the preassembled structure. So the anchor itself cannot be the entirety of the structure. That is like saying a boat comprising an anchor may include an anchor lying untethered at the bottom of the ocean.** |
| **Is there anything in the specification that suggests a preassembled structure must have multiple parts?** | **The ordinary meaning makes that plain and where the ordinary meaning is plain it controls absent disclaimer or lexicography. Plastic Omnium has pointed to nothing in the specification that suggests a preassembled structure does not require multiple parts that have been assembled.** |
| **Why is Plastic Omnium wrong that a preassembled structure need not be previously joined into a single arrangement?** | **Because that is the very definition of what it means to be preassembled—previously put together or previous joined.** |
| **Is there any advantage to a preassembled structure that contains multiple parts as opposed to a single part structure? If not, why should we read the term to be so limited?** | **I don’t know whether there is such an advantage, but it’s also not our patent. The dominant rule of claim construction is you construe claims terms according to their ordinary meaning. So when Plastic Omnium chose to require a preassembled structure knowingly that the ordinary meaning of that term includes multiple pieces joined together, it defined its claim to require multiple parts. No rule of claim construction requires each element or limitation to have an advantage over an alternative approach.** |
| **Plastic Omnium argues that the relevance of the “preassembled” portion of preassembled structure is that the structure is inserted into the fuel tank during manufacture rather than being made from the molten tank plastic itself. If that’s right, then it seems perfectly reasonable to read preassembled to simply rule out a structure that is created from the tank.** | **If that were the case, Plastic Omnium could have conveyed that meaning by specifying a premade structure rather than a preassembled one. No one would refer to a pile of Legos on the floor as preassembled.** |
| **I get that preassembled requires one thing to be assembled before another, but why can’t the preassembly occur before the preassembled structure is attached to the wall of the tank rather than before it’s joined with an accessory, as Plastic Omnium argues?** | **Because the claim language forecloses that construction. It says the accessory “must be supported by a preassembled structure.” The only way a *pre*assembled structure can support an accessory is if it’s assembled before it is joined with the accessory. Otherwise, the accessory would simply be supported by “a structure.”** |
| **Does your position that a preassembled structure must be assembled before it is attached to an accessory have any support in the specification?** | **Yes, the specification describes a preassembled structure that is produced “in a separate” process from an accessory. It also refers to a preassembled structure that is created and “used only later for fastening an accessory.” Both of those descriptions contemplate a structure that is created and assembled before it is joined with an accessory.** |
| **Plastic Omnium argues that the relevant point in time for the preassembled structure to be assembled is before it is attached to the tank rather than before it is attached to an accessory. It says the specification supports that reading because it explains that a preassembled structure is made “in a separate process prior to introduction into the hollow body.” Why doesn’t that support its argument?** | **Because that’s not what the specification says. The portion of the specification it cites refers to producing the preassembled structure and the accessories prior to “their introduction into the hollow body.” So it simply contemplates that the preassembled structure and accessories will be created ahead of time, which supports our argument that the preassembled structure is created before it is attached to an accessory.** |
| **Your argument that assembly must occur before attachment to an accessory seems to create absurd results. In your view, the difference between infringement and noninfringement could simply be the order in which three pieces—the two parts of a preassembled structure and an accessory—are joined together. How does that make any sense when the end result is the same?** | **The patentee wrote its claims to require an accessory to be attached to a preassembled structure. It could not have been clearer about that. And that is the invention it provided notice to the world of. That the patentee could have easily written a broader claim, but not did, is no reason to construe the patent contrary to its clear language. Indeed, Plastic Omnium attempted to distinguish prior art in an inter partes review involving the same claims on the ground that the prior art did not contain the limitation it now argues is trivial.** |
| **Why does prosecution disclaimer foreclose Plastic Omnium’s challenge to the district court’s preassembled structure construction?** | **Plastic Omnium is foreclosed from challenging the district court’s construction of preassembled structure because it urged the PTAB to adopt that same construction to save its patents from a validity challenge in an inter partes review proceeding.** |
| **How exactly did Plastic Omnium disclaim its preferred construction of preassembled structure during the ’253 IPR?** | **It argued to the PTAB that “the district court’s … construction should be controlling.”** |
| **Did Plastic Omnium also disclaim its preferred construction of preassembled structure during the ’812 IPR?** | **Yes. There too it argued to the PTAB that the “district court’s … construction should be controlling.”** |
| **Do you have any authority that prosecution disclaimer applies to positions taken during inter partes reviews?** | **Yes. In *Aylus Networks* this Court found prosecution disclaimer on very similar facts to these. There it found prosecution disclaimer barred a patentee from urging a broader construction in litigation after it urged a narrower construction in an inter partes review to save its patent from an invalidity challenge.** |
| **Prosecution disclaimer requires an unequivocal and unambiguous disclaimer. But here Plastic Omnium only urged the PTAB to adopt a construction for the purposes of Donghee’s IPR. So how is that a clear disclaimer?** | **There is no ambiguity or uncertainty that Plastic Omnium urged the PTAB to adopt the same construction the district court adopted for purposes of the IPR and that it did so for the express purpose of overcoming prior art. That is the very thing prosecution disclaimer seeks to prevent—ensuring that claims are not argued one way in order to maintain their patentability and in a different way against accused infringers.**  **Moreover, IPRs are not simply a proceeding between two companies such that positions a patentee takes during an IPR have no broader significance. Those reviews serve the public interest as well by ensuring that invalid patents are invalidated.** |
| **What prior art did Plastic Omnium attempt to overcome by disclaiming the construction of preassembled structure it now urges?** | **It tried to overcome Linden arguing that “there is nothing in Linden that demands its holding means to be made of multiple parts, instead of, for example a single … piece” or to be preassembled before attachment to an accessory.** |
| **You argue it wasn’t inconsistent for you to argue a broader construction of preassembled structure before the Board than to the district court. But the Board no longer applies the different BRI standard.** | **That’s true, but at the time of the related IPR the Board still applied the BRI standard. And when the PTO promulgated regulations to replace the BRI with the *Phillips* standard it did not make those regulations retroactive. So the Board appropriately applied the BRI standard in the related IPR.** |
| **The PTAB rejected Plastic Omnium’s argument that it should construe preassembled structure in the same manner as the district court. So how can disclaimer apply when the supposedly disclaimed construction was never adopted?** | **It makes no difference whether the disclaimer is adopted. The patentee bears a special obligation to be clear, honest, and consistent. Accordingly, this court has held in cases like *American Piledriving* that disclaimer applies “regardless whether the examiner agreed.”** |
| **The district court’s construction of preassembled structure and the one you argue for on appeal is inconsistent with the construction you advocated for during a related IPR, right? Why shouldn’t we adopt that construction?** | **Because there’s nothing inconsistent about arguing for a broader construction before the Board when claim construction is governed by the broader BRI standard. And just to be absolutely clear. Plastic Omnium is not arguing for a consistent construction either. It seeks to have a broader construction apply in this litigation and a narrow construction to apply before the Board. That is the very thing prosecution disclaimer forbids.** |
| **Does Plastic Omnium concede that under the district court’s construction of preassembled structure there’s no infringement?** | **Yes. Plastic Omnium has made no argument that it can prevail under the district court’s construction.** |
| **Why did the district court conclude Donghee’s fuel tanks don’t include a preassembled structure?** | **Plastic Omnium identified two structures that it contended satisfied the preassembled structure limitation. One was a single part component that required no assembly whatsoever. And for the other the district court found there was no evidence that it was assembled before an accessory is attached to it, as the claim construction requires.** |
| **Do we need to resolve the preassembled structure issue?** | **Not only do you not have to, it would be inappropriate to do so. That issue is no longer in the case. Plastic Omnium only raised that issue with respect to the ’253 patent, which has been dismissed from this appeal. Nowhere in its opening brief or its reply did Plastic Omnium make any argument about the ’812 patent’s preassembled structure limitation.** |
| **In what two ways did Plastic Omnium waive its preassembled structure argument?** | **First it waived the argument when it failed to make any argument about the ’812 patent and the preassembled structure limitation in its opening brief. The district court had awarded summary judgment to Donghee because its accused product contained no preassembled structure and Plastic Omnium failed to appeal that ruling with respect to claim 41 of the 812 patent.**  **Second, Plastic Omnium waived the argument a second time when it failed to respond after we pointed out the waiver in its response brief. And this is no mere technicality. As we explained in our reply, Donghee would have made additional arguments specific to the ’812 patent’s preassembled structure limitation had it known Plastic Omnium was raising that argument.** |
| **Did you argue waiver in your opening brief?** | **Yes. We argued that “Claim 41 of the ’812 patent includes the same ‘preassembled structure’ limitation, but Plastic Omnium on appeal has not challenged the court’s order granting summary judgment of non-infringement on that claim.”** |
| **Why do you say Plastic Omnium failed to challenge the grant of summary judgment on the ’812 patent with respect to the preassembled structure limitation in its opening brief?** | **Because it nowhere mentions that limitation in its brief. Not in its statement of the case, not in its statement of issues, and not in its argument section. The only thing related to the preassembled structure limitation Plastic Omnium asks for review of it whether the district court’s construction “of the ’253 patent’s preassembled structure term” was correct in light of “the ’253 patent’s claim language and written description.”** |
| **Do you have any authority that a party waives an argument by failing to respond when the other side points out the waiver?** | **Yes. In both *Cognex* and *SmithKline*, which we cite in our motion, this Court held that waiver occurs where “in response to Appellee’s waiver argument, Appellant fails to point out where it presented the issue in its opening brief.”** |
| **I’m confused, did the district court grant you summary judgment on claim 41 based on the preassembled structure limitation?** | **Yes.** |
| **Where did the court say that it believed you were entitled to summary judgment on claim 41 because your product did not include a preassembled structure?** | **That is the most logical reading of the court’s summary judgment order. Donghee argued it was entitled to summary judgment with respect to the preassembled structure claims in both the 253 and 812 patents because the limitation is identical in both patents and its accused product contains no preassembled structure. In granting Donghee summary judgment, the district court agreed that Donghee’s accused product contained no preassembled structure and granted Donghee’s motion. So even though the court’s opinion doesn’t discuss the ‘812 patent and the preassembled structure limitation, there is no reason to believe the court’s judgement does not rest on that basis.** |
| **You argue that it doesn’t matter that the district court’s opinion says nothing about claim 41 and the preassembled structure limitation because we review judgments not opinions? But isn’t the opinion the best way to understand the basis for the court’s judgment?** | **Generally yes. And I do think the opinion gets you to the same place when considered in the context of what the parties argued. Everyone agreed that the preassembled structure analysis was the same for the 253 patent claims as for the 812 claim, so when the court discussed that issue in the context of the 253 claims its analysis applied equally to the 812 claim.** |
| **How could Plastic Omnium have raised the proper construction of the preassembled structure limitation when it could not have appealed that issue with respect to the ’812 patent?** | **Just to be clear at the outset, the argument is waived because if Plastic Omnium wanted to make that argument, it was required to do so in its reply brief after Donghee pointed out its waiver rather than burden the parties and the court with motion practice on the preservation point.**  **And Plastic Omnium plainly could have raised the argument on appeal because the district court granted Donghee summary judgment on claim 41 in part because Donghee’s accused product does not practice the preassembled structure limitation.** |
| **If your waiver argument is correct, then it would have made no sense for Plastic Omnium to appeal the invalidation of the ’812 patent at all since it could not get relief. What do you say to that?** | **I don’t know why they didn’t appeal it. But that doesn’t change the fact that they didn’t, and that we accordingly relied on that and responded only to the arguments they did make in their brief. Nor does it change the fact that they failed to plead inadvertence, or offer any explanation in their reply brief after we noted their failure in our brief. The time to make that argument was in their reply not in post-briefing motion practice.** |
| **Why didn’t you argue in the opening brief that preassembled structure was an alternative ground of affirmance for the ’812 claim?** | **We did. We pointed out that they failed to appeal that aspect of the district court’s summary judgment.** |
| **What’s the harm to you if we consider the preassembled structure argument? This is an issue that the parties dispute, that may be relevant on remand, and that has been fully briefed.** | **Beyond the harm from disregarding the procedural rules that ensure orderly litigation and the cost of having to file additional briefing in the preservation point, we would be prejudiced because we could have made additional arguments with respect to claim 41 in our brief. Specifically, we would have argued that Plastic Omnium disclaimed the construction of claim 41 that it now seeks.** |
| **Is there any difference between the language of the preassembled structure limitation in the 812 and 253 patents?** | **No, there is no difference, and Plastic Omnium concedes as much. That’s why it’s argument that the district court did not grant Donghee summary judgment of noninfringement with respect to claim 41 because Donghee’s accused product has no preassembled structure makes no sense.** |
| **Don’t we often address claim constructions on appeal simply because doing so might simplify litigation? Why shouldn’t we do so here.** | **Of course, but none of those cases involved waiver. Where there is waiver, efficiency is promoted by not reviving a waived argument.** |
| **Let’s say we agree with Plastic Omnium that the district court did not grant summary judgment of noninfringement as to the “preassembled structure” limitation of the ’812 patent. Shouldn’t we resolve the meaning of “preassembled structure” now in the interest of judicial economy?** | **No. That wouldn’t change the fact that Plastic Omnium waived the argument by failing to raise it in either of its briefs or the prejudice to Donghee.** |