

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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**DONGHEE AMERICA, INC., DONGHEE ALABAMA,  
LLC,**  
*Appellants*

v.

**PLASTIC OMNIUM ADVANCED INNOVATION AND  
RESEARCH,**  
*Appellee*

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2019-1733

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Appeal from the United States Patent and Trademark  
Office, Patent Trial and Appeal Board in No. IPR2017-  
01945.

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Decided: May 7, 2020

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by ALEXANDER HADJIS, CHRISTOPHER RICCIUTI, VINCENT SHIER.

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Before MOORE, O'MALLEY, and TARANTO, *Circuit Judges*.  
TARANTO, *Circuit Judge*.

Plastic Omnium Advanced Innovation and Research owns U.S. Patent No. 9,399,326, which describes and claims a process for fastening certain accessories to the inside of a plastic fuel tank during manufacturing. Donghee America, Inc., and Donghee Alabama, LLC (together, Donghee) successfully sought from the Patent and Trademark Office (PTO) an inter partes review of several claims of the '326 patent under 35 U.S.C. §§ 311–319. In that review, the PTO's Patent Trial and Appeal Board concluded that Donghee had proven claims 25–27, 33–34, and 44 unpatentable but had not proven claims 1 and 13 unpatentable. Donghee appeals the Board's ruling on claims 1 and 13. We affirm.

## I

The '326 patent describes and claims a method of attaching accessories to the inside of a plastic fuel tank by stake-fastening during manufacture. Stake-fastening involves attaching the accessory at issue directly to the inside of a fuel tank by inserting a protrusion formed from the plastic of the tank wall. The claimed attachment method involves neither piercing the outer wall of the tank (which might cause leaks) nor reheating the wall once the tank is sealed (which presents problems, at least problems of manufacturing efficiency). '326 patent, col. 1, lines 21–28; *id.*, col. 1, line 66, through col. 2, line 14.

Stake-fastening itself, even without a wall-piercing step, is not a novel concept. *Id.*, col. 1, line 62, through col. 2, line 3. In a prior-art version of stake-fastening described in the '326 patent, molten plastic is extruded and split into

two sheets. *See id.*, col. 1, lines 62–66. Each molten-plastic sheet is molded to form one half of a fuel tank, and the fuel tank is formed by joining the halves into a single body. *See id.*; *id.*, col. 1, lines 29–38. Part of the tank wall is then locally reheated to melt the plastic and form the stake on the inside of the tank wall that holds the accessory. *Id.*, col. 1, line 62, through col. 2, line 14. The molten plastic of the tank wall is forced into an orifice in the accessory and deformed so that when the plastic cools and hardens, the accessory is fastened to the inside of the tank wall without any break in the inner wall material. *See id.*, col. 2, lines 21–26. The '326 patent improves this process by forming the stake during the molding step using the already-molten plastic, thus avoiding the reheating step. *Id.*, col. 2, lines 15–32; *see also id.*, col. 3, lines 33–42; *id.*, col. 4, lines 39–53.

The parties agree that claim 1 of the '326 patent is illustrative of the issue on appeal:

1. A method for stake-fastening an accessory into a multilayer plastic fuel tank comprising a thermoplastic outer layer and either a fuel-impermeable inner layer or fuel-impermeable inner surface treatment,

wherein the accessory has a wall portion which is equipped with at least one orifice which passes through the wall portion of the accessory, and

said at least one orifice has a variation along a plane perpendicular to the wall of the accessory that is tailored to make it easier to force molten plastic through the orifice,

said method comprising:

melting at least some of the plastic of which the wall of the tank is made to form molten plastic;

forcing some of the molten plastic through the orifice of the accessory without becoming detached from the remainder of the molten plastic and without rupturing the fuel-impermeable inner layer or fuel-impermeable inner surface treatment of the multilayer plastic fuel tank wall, thereby forming molten plastic protruding through the orifice of the accessory;

shaping the protruding molten plastic to provide a self-formed plastic rivet, and allowing the molten plastic to solidify; and

closing the multilayer plastic fuel tank with the stake-fastened accessory therein; whereby the size and shape of the orifice and/or of the solidified multilayer plastic are such that the accessory is mechanically fastened to the inside wall of the multilayer plastic fuel tank by at least some of the solidified plastic.

*Id.*, col. 7, lines 2–31. Claim 13 limits the accessory to a “ventilation device.” *Id.*, col. 8, lines 1–2.

Donghee filed a petition seeking an inter partes review of claims 1, 13, 25–27, 33–34, and 44 of the ’326 patent. The Board, acting as delegee of the PTO’s Director, 37 C.F.R. §§ 42.4(a), 42.108, instituted the requested review. In its final written decision, the Board construed part of claim 1’s final limitation—“closing the multilayer plastic fuel tank with the stake-fastened accessory therein”—to require that the accessory be stake-fastened to the fuel tank wall before the tank is closed. *Donghee America, Inc. v. Plastic Omnium Advanced Innovation and Research*, No. IPR2017-01945, 2019 WL 339985, \*5–6 (P.T.A.B. Jan. 25,

2019); J.A. 11–12. Based on that construction, the Board concluded that the prior art relevant to this claim element does not teach the “closing” limitation because it teaches fastening the accessory simultaneously with or just after closing the fuel tank. *Donghee*, 2019 WL 339985, at \*6; J.A. 13. The Board concluded that the remaining challenged claims, besides claim 13, are unpatentable for obviousness. *Donghee*, 2019 WL 339985, at \*25; J.A. 62.

Donghee timely appealed the Board’s construction of the ’326 patent’s “closing” limitation and the resulting conclusion that claims 1 and 13 were not proven unpatentable. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

## II

“We review the Board’s claim construction de novo and any underlying factual findings for substantial evidence.” *Kaken Pharm. Co. v. Iancu*, 952 F.3d 1346, 1350 (Fed. Cir. 2020). The parties agree that in this case, the claims must be given their broadest reasonable interpretation. We hold that the Board’s understanding of the “closing” limitation—that the accessory must be fastened before the tank is closed—is the broadest reasonable interpretation. Because Donghee’s opening brief presents no argument for disturbing the Board’s decision if we agree with the Board’s claim construction, we affirm the Board’s conclusion that claims 1 and 13 were not proven unpatentable.

Donghee argues that, under the broadest reasonable interpretation, the “closing” limitation “requires only that (1) the tank is closed and (2) there is an accessory inside the closed tank that will attach to the finished tank wall via stake-fastening,” not that the accessory actually be attached to the wall before tank closure. Appellants’ Br. 25. In other words, under Donghee’s proposed construction, the limitation is met if, when the tank is being closed and even when it is fully closed, it contains an accessory that is capable of being stake-fastened and will later be stake-

fastened. We conclude, as did the Board, that Donghee's reading is unreasonably broad.

Donghee reads the modifier "stake-fastened" in "stake-fastened accessory" as simply describing the strategy used to attach the accessory to the tank wall, whenever that attachment process occurs in relation to the tank closing. Donghee invokes as an analogy one informal usage of the modifier "hard-wired" to characterize a smoke alarm that is capable of being hard-wired or will ultimately be hard-wired when installed. We need not question that sometimes "hard-wired smoke alarm" might be used in that way, but the analogy does not bear the weight Donghee puts on it. The present context is one in which one expects more technically precise, not informal, usage. And the phrase does not stand alone. The claim limitation provides a context that ties "stake-fastened" to a particular temporal event—the "closing" of the tank. That context strongly suggests that the phrase is best read, based on the past-tense form of "fasten" in the phrase, to refer to what has already occurred at that time. The Board's reading accounts for that context; Donghee's does not.

The Board's reading is reinforced by the remainder of the claim's language. Every other recitation of "accessory" in claim 1 is without any descriptive modifier. '326 patent, col. 7, lines 2–31. The addition of the term "stake-fastened" in this particular limitation, itself a limitation about the temporally defined step of "closing," points to understanding the phrase as using the past participle of "stake-fasten"—it describes an accessory that has already been fastened to the tank wall. *Cf. Tuna Processors, Inc. v. Hawaii Int'l Seafood, Inc.*, 327 F. App'x 204, 209 (Fed. Cir. 2009) (holding that "the produced smoke" refers to smoke that has already been produced).

Nothing in the specification shows that Donghee's proposed construction is reasonable despite the foregoing claim-language considerations. Indeed, the specification

specifically distinguishes its claimed invention from stake-fastening methods in which the stake-fastening occurs “in an existing (already manufactured) fuel tank.” ’326 patent, col. 1, line 62, through col. 2, line 14. Donghee’s interpretation, covering accessories that are capable of being or will be stake-fastened after closure, requires the technique that the specification distinguishes from the claimed invention.

Donghee points to a passage in the specification that refers to an “advantageous” embodiment. The specification states that, “advantageously, the stake-fastening occurs at the time of moulding of the tank by: thermoforming sheets; compressing/blow-moulding sheets (as described in [an incorporated reference]); blow-moulding a parison [a hollow tube] comprising at least one cut-out (as described in [European] Patent Application EP 1110697, the content of which for this purpose is incorporated by reference into this application).” ’326 patent, col. 4, lines 43–53; *see* J.A. 1072–76. The ’697 application identified in the last phrase describes a method for welding accessories to a tank wall “during closure of the mold.” J.A. 1075. Donghee argues that incorporating the ’697 application’s disclosure into the ’326 patent’s description results in an embodiment in which stake-fastening occurs at least simultaneously with tank closure.

This passage does not show an embodiment of the claim at issue in which stake-fastening has not occurred upon closing the tank. Notably, while the Board agreed that the ’697 application discloses attaching accessories during *mold* closure, *Donghee*, 2019 WL 339985, at \*5; J.A. 11, it is *tank* closure that defines the event of the claim limitation at issue. And mold closure is not the same as tank closure, as the ’326 patent specification confirms. In one embodiment, the mold-closure step shapes the tank walls, but the mold opens to allow for the performance of additional steps before the tank halves are finally joined into one cohesive tank body. ’326 patent, col. 4, line 62, through col. 5, line 19.

The '326 patent specification does not treat the '697 application's mold-closing process as a process of tank closure, as claimed, but instead modifies the '697 application's process to ensure that the tank has a stake-fastened accessory before tank closure. The '326 patent describes a process in which a hydraulic ram performs the accessory-staking step during the blow-molding step, and the mold is subsequently opened to allow "retraction of the hydraulic ram." *Id.*, col. 5, lines 3–22. The embodiment specifically includes "a device preventing the slot or the edges of the [plastic] from welding together during the initial closing of the mould." *Id.*, col. 5, lines 22–25. Stake-fastening occurs during the molding step, and the mold is subsequently opened—with the stake-fastened accessory attached to the tank wall—before the tank is finally closed. *Id.*, col. 5, lines 3–25. The specification passage on which Donghee relies therefore does not supply an embodiment that must be covered by the claim language and yet is outside the Board's construction.<sup>1</sup>

In its reply brief, Donghee appears to argue that claims 1 and 13 are unpatentable even under the Board's construction of the "closing" limitation. Appellants' Reply Br. 19–20. Because there is no such argument in Donghee's opening brief, we deem the argument forfeited and do not address it on the merits. See *Bannum, Inc. v. United States*, 779 F.3d 1376, 1382 (Fed. Cir. 2015); Appellants' Br. 40–45 (arguing unpatentability of claims 1 and 13 under only Donghee's proposed construction). Having

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<sup>1</sup> Donghee argues that in the process described by the '697 application, the molding step occurs simultaneously with the final tank-closure step. Appellants' Reply Br. 9–10 (citing J.A. 1076). Even if that were the case, the modification disclosed in the '326 patent specification describes stake-fastening after mold closure, but before final tank closure.



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concluded that the Board properly construed the “closing” limitation, we therefore affirm the Board’s conclusion that Donghee did not prove claims 1 and 13 of the ’326 patent unpatentable.

III

For the foregoing reasons, we affirm the decision of the Board.

**AFFIRMED**