

United States Court of Appeals for the Federal Circuit

2009-1001

GEMTRON CORPORATION,

Plaintiff-Appellee,

v.

SAINT-GOBAIN CORPORATION,

Defendant-Appellant.

David L. De Bruin, Michael Best & Friedrich LLP, of Chicago, Illinois, argued for plaintiff-appellee. With him on the brief were Marshall J. Schmitt and Gilberto E. Espinoza.

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Appealed from: United States District Court for the Western District of Michigan

Senior Judge Avern C. Cohn

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GEMTRON CORPORATION,

Plaintiff-Appellee,

v.

SAINT-GOBAIN CORPORATION,

Defendant-Appellant.

Appeal from the United States District Court for the Western District of Michigan in case no. 1:04-CV-0387, Senior Judge Avern C. Cohn.

DECIDED: July 20, 2009

Before MICHEL, Chief Judge, SCHALL and LINN, Circuit Judges.

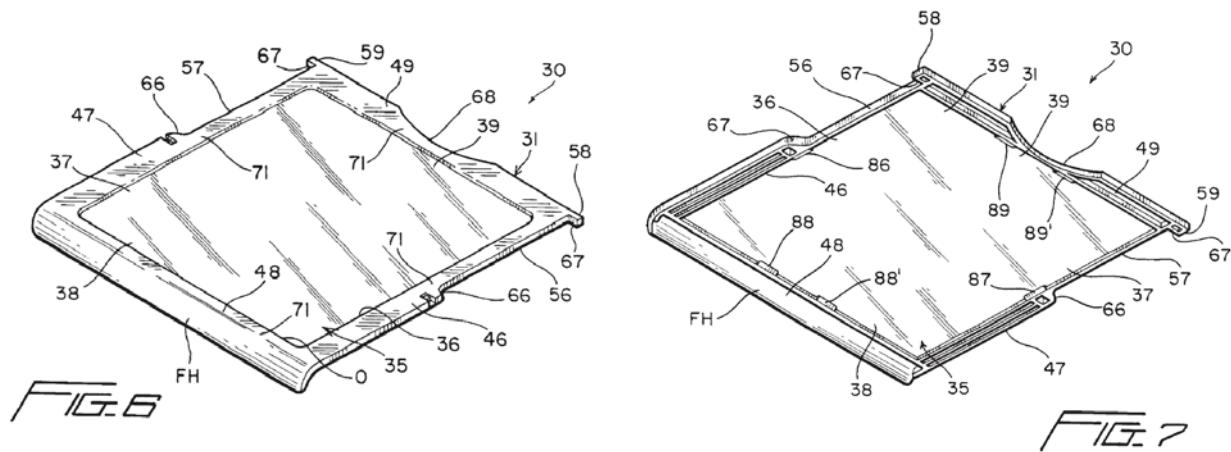
LINN, Circuit Judge.

Refrigerator parts manufacturer Saint-Gobain Corporation (“Saint-Gobain”) appeals from the grant of a permanent injunction following a determination that certain of its refrigerator shelves infringe claim 23 of U.S. Patent No. 6,679,573 (the “573 patent”), owned by Gemtron Corporation (“Gemtron”). Gemtron Corp. v. Saint-Gobain Corp., No. 1:04-387 (W.D. Mich. Sept. 22, 2008); see also Gemtron Corp. v. Saint-Gobain Corp., No. 1:04-0387 (W.D. Mich. Apr. 21, 2008); (“New Trial Op.”); Gemtron Corp. v. Saint-Gobain Corp., No. 1:04-0387 (W.D. Mich. Apr. 21, 2008) (“JMOL Op.”); Saint-Gobain Corp. v. Gemtron Corp., No. 1:04-387 (W.D. Mich. Apr. 17, 2006) (“S.J. Op.”). Because the district court correctly construed the claim term “relatively resilient end edge portion” to require only that the frame of the shelf be flexible at the time of

manufacture, because there was undisputed evidence that the frames of Saint-Gobain's accused shelves were flexible at the time of manufacture, and because the district court did not err in denying Saint-Gobain's motions concerning obviousness, we affirm.

I. BACKGROUND

Gemtron is the assignee of both the '573 patent and U.S. Patent No. 6,422,673 (the "673 patent"). The '573 patent issued from a divisional of the application that issued as the '673 patent, and the two patents share a common specification. See '573 patent, at [62]. The '573 patent is directed to a refrigerator shelf. Id. col.1 l.1. The shelf disclosed in the '573 patent is made up of two pieces—"a one-piece open frame" made of plastic, and a glass panel. Id. col.2 ll.29-33. Top and bottom views of the shelf are depicted below:



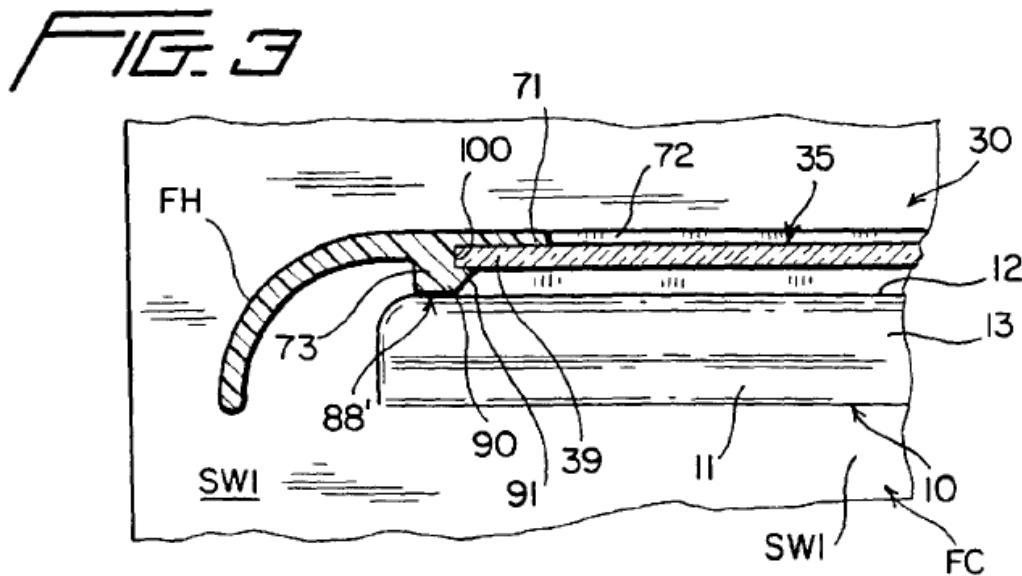
Id. figs. 6-7.

Unlike prior art shelves that were constructed by bonding the edge of the glass panel to the frame using adhesive, the claimed shelf secures the glass panel in the frame using "relatively resilient" fingers so that the glass panel is "snap-secured" into place. Id. col.2 ll.42-47. According to the specification, avoiding adhesive is desirable because using adhesive increases manufacturing costs:

The cost of adhesive adds to the overall cost of such shelves and, of course, additional steps are required during the assembly process to apply the adhesive to the frame and/or to the edges of the glass panel prior to assembling the same. Moreover, if an overabundance of adhesive is utilized, there is a tendency for the edges of the glass panel to squeeze excess adhesive out of the continuous peripherally inwardly opening glass edge-receiving channel, and this in turn creates additional adhesive clean-up problems and the cost associated therewith.

Id. col.1 ll.46-55. By contrast, by using a frame with “relatively resilient” fingers that “snap-secure[]” the glass panel, the shelf of the ’573 patent “is manufactured at a relatively low cost from only two pieces of material (a frame and a glass panel) in the absence of the added costly manufacturing step of applying adhesive and removing excess adhesive.” Id. col.2 ll.43, 45-46, 59-62.

The fingers of the shelf’s frame are illustrated in Figure 3 of the ’573 patent:



Id. fig.3. “In the assembled condition of the frame, [the edges of] the glass panel 35 are each snap-secured to the respective [portions] of the frame.” Id. col.4 ll.38-43. The specification includes a description of the way in which the glass panel is inserted into the frame when the shelf is assembled:

Due to [the] relative dimensioning [of the frame and glass panel] and the relatively flexible nature of the fingers 90 and the finger terminal edge portions 91 thereof, the latter are free to temporarily flex and deform as the glass panel 35 is inserted upwardly, . . . which causes the fingers to temporarily deform, resulting in the edges of the glass panel 35 to essentially pass or snap into the associated channels of each finger whereupon the finger terminal free edge portions 91 rebound to their original position and interlock beneath each glass edge . . . In this manner, each shelf is constructed of only two pieces of material, namely, the one-piece injection molded frame and the tempered glass panel retained in snap-secured relationship to each other . . .

Id. col.5 l.57-col.6 l.4 (citations to reference characters omitted). Put another way, the fingers on the frame bend up as the glass is being inserted, then snap back into their original position to secure the glass.

Saint-Gobain brought suit against Gemtron in 2004, seeking a declaratory judgment of noninfringement and invalidity of the '573 and '673 patents. Gemtron counterclaimed for infringement, and the district court realigned the parties to make Gemtron the plaintiff.

Claim 23 of the '573 patent is the only claim at issue in this appeal. It recites:

23. A refrigerator shelf comprising a one-piece open frame made of substantially homogeneous polymeric/copolymeric molded synthetic material and a piece of glass closing an opening defined by said frame; said open frame having opposite substantially parallel side frame portions and opposite substantially parallel front and rear frame portions; said glass piece having opposite substantially parallel side edges and opposite substantially parallel front and rear edges; said side, front and rear frame portions being substantially contiguous to said respective side, front and rear edges; each of said side frame portions being defined by an upper wall, a side wall depending from each upper wall and a lower wall projecting from its side wall toward an opposite side wall with the opposing lower walls being spaced from each other and each defining with an associated upper wall a glass piece side edge-receiving channel, each upper wall and lower wall having a terminal free edge, said glass piece side edges being spaced a predetermined distance from each other, said upper wall terminal free edges being spaced a predetermined distance from each other, said lower wall terminal free edges being spaced a predetermined distance from each other, the predetermined distance of the glass piece side edges being appreciably greater than the

predetermined distance of said upper wall edges and only slightly greater than the predetermined distance between said lower wall terminal free edges whereby said glass piece side edges are captively retained in said glass piece side edge-receiving channels, and at least one lower wall of at least one of said front and rear frame portions including a relatively resilient end edge portion which temporarily deflects and subsequently rebounds to snap-secure one of said glass piece front and rear edges in the glass piece edge-receiving channel of said at least one front and rear frame portion.

'573 patent col.8 ll.32-65 (emphasis added).

Saint-Gobain does not dispute that its accused refrigerator shelves meet all of the limitations of claim 23 except the limitation requiring that the frame have the claimed "relatively resilient end edge portion." S.J. Op. at 6. The district court construed the claim term "relatively resilient end edge portion which temporarily deflects and subsequently rebounds to snap-secure" to mean that "the end edge portion is sufficiently resilient that it can temporarily deflect and subsequently rebound when glass is being inserted into the frame." Id. at 2-3.

In 2005, the parties filed cross-motions for partial summary judgment concerning infringement by Saint-Gobain model SG1, SG2, and SG3 shelves—which were the only three models of accused shelves at that time. Each party submitted the affidavit of an expert. Gemtron's expert testified that, when the frames of the accused shelves were heated, it was possible to insert the glass panel of the accused shelves into the frame by snap-securing the panel into the receiving channel of the frame. Id. at 7-8. Saint-Gobain's expert testified that he had attempted to insert the glass panel into the frame at room temperature, but that the frame was not sufficiently flexible to allow insertion of the glass. The district court concluded that the conflicting test results did not create a factual dispute, because the testing was performed under different conditions. Id. at 7. Reasoning that "the relevant characteristic ['relatively resilient'] is defined by the patent

in terms of the time of insertion, and not the time of actual use in a refrigerator or freezer compartment," the district court concluded that infringement was established by the undisputed evidence that the glass panel could be snap-secured into the frames of the accused shelves during manufacture, when the shelves were still warm from the molding process. Id. at 8-10. The district court therefore granted partial summary judgment of infringement of claims 23-30 of the '573 patent by the SG1, SG2, and SG3 shelves. Id. at 13.

Following the resolution of a discovery dispute, Gemtron identified additional Saint-Gobain shelves as accused infringing products. Pursuant to an amended scheduling order, the SG16 shelf was selected to be representative of all remaining accused shelves, and trial was set on infringement of claim 23 of the '573 patent as representative of all of the asserted claims. The case proceeded to trial on infringement and validity.

At trial, the jury heard evidence from both parties' experts, including a video showing Gemtron's expert heating the frame of the SG16 shelf and snap-securing the glass panel into it. JMOL Op. at 8. Gemtron also introduced evidence of Saint-Gobain's manufacturing process, including instructions for assembling the SG16 shelf and a video of the manufacture of the SG16 shelf in Saint-Gobain's Mexico plant. Id. at 9. The jury returned a verdict finding that the SG16 shelf infringed claim 23, and that claim 23 was not invalid.

The district court denied Saint-Gobain's post-trial motions for a new trial and judgment as a matter of law, entered judgment in Gemtron's favor, and granted and then stayed a permanent injunction. Gemtron Corp. v. Saint-Gobain Corp., No. 1:04-

0387 (W.D. Mich. Sept. 22, 2008). Saint-Gobain timely appealed. We have jurisdiction pursuant to 28 U.S.C. § 1292(c)(1).

II. DISCUSSION

Saint-Gobain argues that the district court's construction of "relatively resilient" was incorrect, and that the district court erred by granting summary judgment of infringement, by denying Saint-Gobain's motion for judgment as a matter of law on infringement, by denying Saint-Gobain's motion for judgment as a matter of law on obviousness, and by denying Saint-Gobain's motion for a new trial. We review each of these determinations in turn.

A. Claim Construction

Claim construction is an issue of law, Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), that we review de novo, Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed. Cir. 1998) (en banc). We determine the ordinary and customary meaning of undefined claim terms as understood by a person of ordinary skill in the art at the time of the invention, using the methodology in Phillips v. AWH Corp., 415 F.3d 1303, 1312-19 (Fed. Cir. 2005) (en banc). "[T]he court looks to those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean. Those sources include the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." Id. at 1314 (internal quotation marks and citations omitted).

The only disputed claim term is "relatively resilient end edge portion which temporarily deflects and subsequently rebounds to snap-secure." '573 patent col.8

II.61-62. The district court construed this term to mean that “the end edge portion is sufficiently resilient that it can temporarily deflect and subsequently rebound when glass is being inserted into the frame.” S.J. Op. at 3 (emphasis added). Saint-Gobain argues that the term should have been construed to mean that “the end edge portion is sufficiently flexible to permit the glass in the finished product to be pushed out of the frame and pushed back into the frame.” Br. for Defendant-Appellant Saint-Gobain Corp. at 25 (emphasis added). More particularly, Saint-Gobain argues that “relatively resilient” should not mean “temporarily resilient immediately after cooking in an oven and before any opportunity to cool.” Id. at 26. Gemtron argues that the district court’s construction was correct. The parties do not dispute that the “relatively resilient” limitation requires that the frame be flexible at some point in time. The dispute is about precisely when the frame must be flexible to satisfy the “relatively resilient” limitation.

Because neither party has identified any portion of the prosecution history or any extrinsic evidence bearing on the claim construction issues before us, we confine our analysis to the claim language and the specification. Looking first to the claim language, we note that claim 23 has no express temporal or temperature limitation requiring that the end edge portion be relatively resilient “always,” or “at all temperatures,” or “when in use in a refrigerator.” Additionally, the claim does not merely claim a frame with an end edge portion that is “relatively resilient.” The full expression recited in the claim calls for a frame with a “relatively resilient end edge portion which temporarily deflects and subsequently rebounds to snap-secure one of [the] glass piece front and rear edges in the glass piece edge-receiving channel.” ’573 patent col.8 II.61-64 (emphasis added). The use of the phrase “temporarily deflects and subsequently

rebounds to snap-secure” suggests that the claimed resilience of the frame need only be exhibited during assembly. The “snap-secure” interaction of the frame and glass piece, facilitated by the “relatively resilient end edge portion,” is a characteristic of the shelf that is maintained even after assembly in the claimed shelf. While the claim language ties the “relatively resilient” characteristic of the frame’s edge portion to its function in the assembly of the shelf, that characteristic is nonetheless a structural attribute possessed by the claimed frame and is not a process limitation. See, e.g., In re Garnero, 412 F.2d 276, 279 (CCPA 1969) (listing similar examples of claim terms “held capable of construction as structural, rather than process, limitations”).

Like the claims, the specification focuses on the characteristics of the frame that enable snap-secure assembly of the claimed shelf. In the “Background of the Invention” section, the specification describes the structure of prior art shelves by reference to the way in which the shelves are assembled. See, e.g., '573 patent col.1 ll.21-27 (describing assembly of prior art shelf as “[t]he glass [panel] is basically ‘dropped-in’ from above, not snapped-in from below”); id. col.1 ll.28-36 (describing other prior art shelves as “the same type shelf structure” but assembled using different methods, in which “a sheet of glass . . . is slid into opposite channels of a frame and then is locked into position” or “a panel . . . is dropped-in from above and rests upon a flange”). The specification characterizes all of the prior art as disclosing a shelf assembled by “adhesively bonding a peripheral edge of a sheet of glass to [the] frame.” Id. col.1 ll.43-45. The specification goes on to criticize this type of shelf structure, because of the additional cost of the adhesive and the “additional steps [that] are required during the assembly process.” Id. col.1 ll.46-55. Likewise, in the “Brief Summary of the Invention”

section, in discussing the advantages of the disclosed shelf over this prior art, the specification stresses the advantages that the claimed structure has in the manufacturing and assembly process:

In this manner, a sliding shelf is manufactured at a relatively low cost from only two pieces of material (a frame and a glass panel) in the absence of the added costly manufacturing step of applying adhesive and removing excess adhesive, while at the same time increasing conductivity because the fingers cover but minor lower surface areas of the glass panel side, front and rear edges.

Id. col.2 ll.58-65. In fact, every time the structure of the “relatively resilient” edge portions is mentioned in the specification, it is in the context of a discussion of how that structure functions while the shelf is assembled. See id. col.2 ll.42-47 (describing “relatively resilient” ends of fingers “such that the glass panel can be snap-secured”); id. col.5 ll.57-60 (“Due to this relative dimensioning and the relatively flexible nature of the fingers **90** and the finger terminal edge portions **91** thereof, the latter are free to temporarily flex and deform as the glass panel **35** is inserted upwardly . . .”). There is no discussion in the specification of any purpose for or value of the “relatively resilient” structural characteristic of the end edge portions of the frame, other than to facilitate assembly of the shelf. This indicates that the end edge portions of the frame have the claimed structural characteristic—“relatively resilient”—if they are able to deflect at the time the shelf is assembled, to “snap-secure” the glass panel within the frame.

For these reasons, we affirm the district court’s construction of “relatively resilient end edge portion which temporarily deflects and subsequently rebounds to snap-secure” as used in claim 23 to mean that the end edge portion must be sufficiently resilient that it can temporarily deflect and subsequently rebound when glass is being inserted into the frame.

Saint-Gobain argues that a construction requiring only that the frame deflect at the time that glass is being inserted into the frame during assembly transforms the “relatively resilient” limitation of claim 23 into a product-by-process limitation. We disagree. The limitation requires that the glass panel be “snap-secure[d]” in the frame. “Snap-secure[d]” describes the structural relationship between the glass panel and the frame, which is possessed by the claimed shelf because of the structural characteristics of the individual components. See, e.g., 3M Innovative Props. Co. v. Avery Dennison Corp., 350 F.3d 1365, 1371 (Fed. Cir. 2003) (“[E]ven words of limitation that can connote with equal force a structural characteristic of the product or a process of manufacture are commonly and by default interpreted in their structural sense”); Hazani v. U.S. Int’l Trade Comm’n, 126 F.3d 1473, 1479 (Fed. Cir. 1997) (holding that claim is not product-by-process claim if it “describes the product more by its structure than by the process used to obtain it”); see also Garnero, 412 F.2d at 279 (noting that past-tense verbs such as “‘intermixed,’ ‘ground in place,’ ‘press fitted,’ ‘etched,’ and ‘welded,’ all . . . at one time or another have been separately held capable of construction as structural, rather than process, limitations.”); Eric P. Mirabel, Product-By-Process Claims: A Practical Perspective, 68 J. Pat. & Trademark Off. Soc’y 3, 4-7 (1986). Defining a structural component by its functional as well as its physical characteristics is different from defining a structure solely by the process by which it is made. Our construction therefore does not transform the “relatively resilient” limitation of claim 23 into a product-by-process limitation.

B. Infringement

The district court granted summary judgment of infringement as to the SG1, SG2, and SG3 shelves. S.J. Op. at 13. “We review [the] grant of summary judgment de

novo, reapplying the standard that the district court employed. Drawing all reasonable inferences in favor of the nonmovant, summary judgment is appropriate only when there is no genuine issue as to any material fact and the moving party is entitled to a judgment as a matter of law.” Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1365 (Fed. Cir. 2008) (citations and internal quotation marks omitted). Following the jury’s verdict that the representative SG16 shelves infringed, the district court denied Saint-Gobain’s motion for judgment as a matter of law, JMOL Op. at 20, and its motion for a new trial, New Trial Op. at 6. “This court reviews the denial of a motion for JMOL or a new trial under the law of the regional circuit where the district court sits” Voda v. Cordis Corp., 536 F.3d 1311, 1318 (Fed. Cir. 2008). The Sixth Circuit “review[s] de novo a district court’s denial of a motion for judgment as a matter of law.” Imwalle v. Reliance Med. Prods., Inc., 515 F.3d 531, 543 (6th Cir. 2008). The Sixth Circuit “review[s] the denial of a party’s motion for a new trial for abuse of discretion.” Morgan v. N.Y. Life Ins. Co., 559 F.3d 425, 434 (6th Cir. 2009).

Both at summary judgment and at trial, Saint-Gobain did not dispute that, during the manufacturing process for the accused shelves, when the glass is inserted into the frame, the frame is at a temperature such that it can temporarily deflect and subsequently rebound. At summary judgment, the district court concluded that it was undisputed that at the time of insertion, the end edge portion of the frame of the accused shelf can temporarily deflect and subsequently rebound. S.J. Op. at 8. Likewise, at trial, the jury saw a video of Saint-Gobain’s manufacturing process and heard the testimony of an expert that, during the manufacturing process, “the glass panel was snapped into place in the manner called for by Claim 23.” JMOL Op. at 20.

Nowhere in its briefs on appeal did Saint-Gobain dispute that—at the time its shelves are manufactured—the frame is at an elevated temperature, such that the end edge portions of the frame can deflect to accommodate insertion of the glass. At oral argument, Saint-Gobain claimed that its products are actually assembled using a “heat-shrink process,” and it denied that, during manufacture, the frame is “resiliently flexed to snap over the glass.” Oral Arg. at 2:41-4:04, available at <http://oralarguments.cafc.uscourts.gov/mp3/2009-1001.mp3> (Mar. 30, 2009). This argument is directly contradicted by the video evidence of Saint-Gobain’s manufacturing process admitted at trial. The video unambiguously shows that, during Saint-Gobain’s manufacturing process, while the frame is still warm from the molding process, a Saint-Gobain employee pushes on the frame, which temporarily deflects to accommodate the glass, then rebounds to snap-secure the glass piece in a receiving channel in the frame. Saint-Gobain’s unsworn attorney argument to the contrary—made for the first time at oral argument on appeal—is not evidence and cannot rebut the video and other admitted evidence concerning Saint-Gobain’s manufacturing process. See, e.g., Laitram Corp. v. Cambridge Wire Cloth Co., 919 F.2d 1579, 1583 (Fed. Cir. 1990) (criticizing parties’ “reliance on attorney argument and counsel’s unsworn fact statements as ‘evidence’”).

Saint-Gobain’s only remaining argument is that the accused shelves cannot infringe because the manufacturing process occurs in Mexico, and that, by the time that the accused shelves are imported into the United States, the frames have cooled and are no longer flexible. According to Saint-Gobain, the accused shelves as imported and

sold in the United States must be modified—by heating them—to satisfy the “relatively resilient” limitation.

Claim 23 is directed to an apparatus “[a] refrigerator shelf”—not a process. '573 patent col.8 l.32. Under 35 U.S.C. § 271(a), an accused infringer infringes an apparatus claim if it “makes, uses, offers to sell, or sells” the claimed apparatus “within the United States,” or “imports [the apparatus] into the United States.” Critically, it is the infringing act—making, using, offering to sell, selling, or importing—that must be within (or into) the United States. Even if an infringing product is manufactured outside of the United States, a person infringes if he imports the product, or uses, offers to sell, or sells it in the United States. See, e.g., In re N. Pigment Co., 71 F.2d 447, 456 (CCPA 1934) (“It has long been settled that articles patented in the United States cannot be manufactured abroad, imported, and sold in violation of the rights of the patentee.”).

Properly construed, the “relatively resilient” limitation requires no more than that the frame of the claimed shelf has the structural characteristic of having been temporarily deflected and subsequently rebounded to snap-secure the glass at the time of manufacture. In this case, Saint-Gobain does not dispute that it has imported the accused shelves, and that it has used and sold them in the United States. The end portions of the frames of the accused shelves are “relatively resilient,” as that phrase is used in claim 23, in that they were temporarily deflected and subsequently rebounded when glass was being inserted into the frame during assembly. The accused shelves therefore satisfy the “relatively resilient end edge portion which temporarily deflects and subsequently rebounds to snap-secure” limitation of claim 23, as properly construed. Thus, there is no genuine issue as to any material fact as to infringement by the SG1,

SG2, and SG3 shelves, and Gemtron was entitled to a judgment as a matter of law that those shelves infringed. Likewise, substantial evidence—in fact, uncontroverted evidence—supports the jury’s verdict that the representative SG16 shelf infringes claim 23. We therefore affirm the district court’s grant of summary judgment of infringement, its denial of Saint-Gobain’s motion for judgment of noninfringement as a matter of law, and its denial of Saint-Gobain’s motion for a new trial on infringement.

C. Validity

The district court denied Saint-Gobain’s motions for judgment of invalidity as a matter of law and for a new trial on obviousness. JMOL Op. at 21-22. Applying Sixth Circuit law, we review the denial of judgment as a matter of law de novo, and the denial of Saint-Gobain’s motion for a new trial for abuse of discretion. See Voda, 536 F.3d at 1318; Imwalle, 515 F.3d at 543; Morgan, 559 F.3d at 434.

Saint-Gobain’s appeal of both motions boils down to a single argument: Saint-Gobain argues that the only evidence of nonobviousness was the testimony of Gemtron’s expert, Roger Hamilton, who testified that a person of ordinary skill in the art would not have expected that the claimed flexible frame could be used in a shelf that would support food loading. According to Saint-Gobain, this testimony should have been “excluded as contrary to the ’573 specification.” Br. for Defendant-Appellant Saint-Gobain Corp. at 35.

We reject Saint-Gobain’s argument for two reasons. First, Saint-Gobain did not seek to exclude or strike Hamilton’s testimony at trial. The issue is therefore waived. See, e.g., Curcuru v. Peninsular Elec. Light Co., 258 F. 785, 790 (6th Cir. 1919) (holding that objection to admissibility of testimony is waived for purposes of appeal if no motion to strike is made during trial).

Second, a shelf capable of supporting food loading is not “directly contrary to the ’573 patent” as Saint-Gobain argues. Reply Br. for Defendant-Appellant Saint-Gobain Corp. at 25. Saint-Gobain is correct that the specification of the ’573 patent expressly describes the ribs of the refrigerator compartment providing support to the shelf, to prevent the frame from bending and, consequentially, allowing the glass to fall out. See, e.g., ’573 patent col.2 ll.53-58; id. col.6 ll.13-29. Nevertheless, the context of the specification makes clear that the shelf alone can support food loading, and that the ribs are provided as additional support to prevent inadvertent distortion of the frame. See id. col.2 l.56 (describing ribs as resisting “any tendency” that the frame might have to bend); id. col.6 l.15 (noting that each rib “assures” that frame will not distort); id col.6 ll.22 (noting that, without ribs, glass panel “might inadvertently flex” fingers of the frame); id. col.6 ll.25-26 (remarking that frame “might stress” without ribs). The specification therefore does not contradict Hamilton’s testimony that the shelf of the ’573 patent was, unexpectedly, able to support food loading. Hamilton’s testimony thus provided substantial evidence that a person of ordinary skill in the art would not have expected the results of the combination recited in claim 23. The district court did not err by denying Saint-Gobain’s motion for judgment as a matter of law, and the district court did not abuse its discretion by denying Saint-Gobain’s motion for a new trial.

III. CONCLUSION

For the foregoing reasons, we adopt the district court’s construction of the claim term “relatively resilient end edge portion” to mean that the end edge portion is sufficiently resilient that it can temporarily deflect and subsequently rebound when glass is being inserted into the frame. Applying this construction, we affirm the district court’s

grant of summary judgment, its denial of Saint-Gobain's post-trial motions as to both infringement and validity, and its grant of a permanent injunction.

AFFIRMED