

# United States Court of Appeals for the Federal Circuit

04-1306, -1307

NORTH AMERICAN CONTAINER, INC.,

Plaintiff-Appellant,

v.

PLASTIPAK PACKAGING, INC.,  
AMERICAN BOTTLING COMPANY, INC.,  
CNC CONTAINER, KRAFT FOODS, INC., SHASTA BEVERAGES, INC.,  
THE KROGER COMPANY, and WIS-PAK PLASTICS, INC.,  
and  
SILGAN PLASTICS CORPORATION,  
and  
THE CLOROX COMPANY,  
and  
RECKITT BENCKISER INC.,  
and  
BARTON BRANDS, LTD.,  
and  
AMERICAN NATIONAL CAN GROUP, INC.,  
and  
SUIZA FOODS CORPORATION,  
and  
COCA-COLA BOTTLING, CO. CONSOLIDATED,  
COCA-COLA ENTERPRISES, CONTINENTAL PET TECHNOLOGIES, INC.,  
OWENS-ILLINOIS, INC., OWENS-BROCKWAY PLASTIC PRODUCTS, INC.,  
SOUTHEASTERN CONTAINER, INC., and WESTERN CONTAINER CORPORATION,  
and  
CONSTAR, INC., AB-TEX BEVERAGE CORPORATION,  
and DR. PEPPER BOTTLING COMPANY OF TEXAS,  
and  
ALBERTSON'S INC.,  
and

SAFEWAY, INC., SCHMALBACH-LUBECA  
PLASTIC CONTAINERS USA, INC., THE CAMPBELL SOUP COMPANY,  
KNOUSE FOODS COOPERATIVE, INC., and THE J.M. SMUCKER COMPANY,  
and  
UDV NORTH AMERICA, INC.,  
and  
BCB USA CORP. (now known as Cott Beverages, Inc.),  
and  
TROPICANA PRODUCTS, INC.,  
and  
HEINZ USA,  
and  
COLGATE-PALMOLIVE COMPANY,  
and  
THE PERRIER GROUP OF AMERICA, INC.,  
and  
QUAKER OATS COMPANY,  
and  
DANONE INTERNATIONAL BRANDS, INC.  
and GREAT BRANDS OF EUROPE, INC.,

Defendants-Cross Appellants.

Martin B. McNamara, Gibson, Dunn & Crutcher LLP, of Dallas, Texas, argued for appellant. With him on the brief were Thomas C. McGraw and Robert S. Case, of Dallas, Texas, and Glenn K. Beaton, of Denver, Colorado.

Douglas A. Freedman, Latham & Watkins LLP, of Chicago, Illinois, and Ernie L. Brooks, Brooks Kushman P.C., of Southfield, Michigan, argued for defendants-cross appellants.

With Douglas A. Freedman on the brief for Owens-Illinois, Inc., et al., was Peter N. Witty; Robert P. Latham, Jackson Walker L.L.P., of Dallas, Texas, for defendant cross-appellant Reckitt Benckiser Inc. Of counsel on the brief were Brian A. Kilpatrick, Stephen A. Kennedy, and Robert C. Klinger; Phillip B. Philbin, Haynes & Boone LLP, of Dallas, Texas, for defendant-cross appellant Barton Brands, Ltd.; Dale M. Heist, Woodcock Washburn LLP, of Philadelphia, Pennsylvania, for defendants-cross appellants Constar, Inc., et al. With him on the brief were Kathleen A. Milsark and Steven D. Maslowski; Dan D. Davison, Fulbright & Jaworski L.L.P., of Dallas, Texas, for defendant-cross appellant Albertson's Inc. Of counsel was Michael J. Fogarty, III; George D. Moustakas, Harness, Dickey, Pierce, PLC, of Troy, Michigan, for defendants-cross appellants The Campbell Soup Company, et al. With him on the brief was

Stanley M. Erjavac; David Lesht, Cook, Alex, McFarron, Manzo, Cummings & Mehler, Ltd., of Chicago, Illinois, for defendant-cross appellant Tropicana Products, Inc. With him on the brief was Raymond M. Mehler; Regis E. Slutter, Burns, Doane, Swecker & Mathis, LLP, of Alexandria, Virginia, for defendant-cross appellant Heinz USA; Bryan S. Hales, Kirkland & Ellis LLP, of Chicago, Illinois, for defendant-cross appellant Colgate-Palmolive Company. With him on the brief was Christopher R. Liro; Bruce S. Sostek, Thompson & Knight, of Dallas, Texas, for defendant-cross appellant The Perrier Group of America, Inc. With him on the brief were Max Ciccarelli and Richard L. Wynne, Jr.; Charles S. Cotropia, Sidley Austin Brown & Wood LLP, of Dallas, Texas, for defendants-cross appellants Danone International Brands, Inc., et al. Of counsel was Kelly J. Kubasta.

With Ernie L. Brooks on the brief for defendants-cross appellants Plastipak, et al. was Earl J. LaFontaine; Peter L. Costas, Pepe & Hazard LLP, of Hartford, Connecticut, for defendant-cross appellant Silgan Plastics Corporation; Warren J. Krauss, Sedgwick, Detert, Moran & Arnold LLP, of San Francisco, California, for defendant-cross appellant The Clorox Company. With him on the brief was Frederick D. Baker. Of counsel was Kirk C. Jenkins; Steven H. Hoeft, McDermott, Will, & Emery, of Chicago, Illinois, for defendant-cross appellant American National Can Group, Inc.; Theodore Stevenson, III, McKool Smith, P.C., of Dallas, Texas, for defendant-cross appellant Suiza Foods Corporation; and David L. Joers, Crutsinger & Booth, of Dallas, Texas, for defendant-cross appellant Quaker Oats Company.

Appealed from: United States District Court for the Northern District of Texas

Judge Sam A. Lindsay

# United States Court of Appeals for the Federal Circuit

04-1306,-1307

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TROPICANA PRODUCTS, INC.,  
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COLGATE-PALMOLIVE COMPANY,  
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THE PERRIER GROUP OF AMERICA, INC.,  
and  
QUAKER OATS COMPANY,  
and  
DANONE INTERNATIONAL BRANDS, INC.,  
and GREAT BRANDS OF EUROPE, INC.,

Defendants-Cross Appellants.

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DECIDED: July 14, 2005

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Before LOURIE, BRYSON, and LINN, Circuit Judges.

LOURIE, Circuit Judge.

North American Container, Inc. (“NAC”) appeals from the decision of the United States District Court for the Northern District of Texas granting summary judgment of noninfringement in favor of Plastipak Packaging, Inc. and other similarly situated manufacturers and distributors of blow-molded plastic bottles (collectively “Plastipak”) of United States Reissue Patent 36,639 (“the ’639 patent”). N. Am. Container, Inc. v. Plastipak Packing Inc., No. 3:99-CV-1749-L (N.D. Tex. Nov. 28, 2003) (“Summary Judgment”). NAC also appeals from the district court’s decision granting summary judgment that reissue claims 29-42 of the ’639 patent are invalid for violating the rule against recapture of previously surrendered subject matter. Plastipak cross-appeals from the district court’s decision granting summary judgment that the ’639 patent is not invalid for anticipation by U.S. Patent 4,335,821 to Collette. Because we agree with the

district court's construction of the claim limitation "generally convex," we affirm the summary judgment of noninfringement for all accused bottles found not to meet that limitation. We further affirm the summary judgment of invalidity of reissue claims 29-42. Because we modify, however, the district court's construction of the claim limitation "re-entrant portion," we vacate the summary judgment of noninfringement for all accused bottles found not to meet only that limitation, and remand for the court to determine whether the limitation is met based on our modified claim construction. The cross-appeal is dismissed.

## BACKGROUND

### I. The '639 Patent

The '639 patent, entitled "Plastic Container," was reissued on April 4, 2000, in the name of Aziz A. Okhai as inventor, and appellant NAC as assignee. The patent specification discloses a one-piece plastic bottle which improves resistance to creep and other forms of deformation by controlling (1) the presence of unoriented polymer chains in the base portion of the bottle and (2) the thickness of the walls of the re-entrant portion. '639 Patent, col. 7, ll. 34-40. These improvements also allow the patented bottle to be manufactured with less material than otherwise, thus lowering its production costs. Id.

The one-piece bottles disclosed in the specification are manufactured by blow molding. Blow molding is a process whereby an injection-molded preform is placed in a mold of the desired finished bottle shape. The preform, which is much smaller than the finished bottle, is shaped like a laboratory test tube. The preform is heated and stretched with a stretch-rod until the bottom surface of the preform touches the bottom

surface of the mold. Pressurized gas is then injected into the hot preform so that it expands and takes the shape of the mold when it cools.

A shortcoming of pre-existing blow-molded bottles is that a carbonated beverage contained within the bottle can create sufficient internal pressure to distort, or even fracture, the base portion. Id., col. 1, ll. 52-59. The susceptibility to failure in the base portion of these bottles is inherent in blow molding, where the bottom surface of the preform is stretched and comes into contact with the bottom surface of the mold. Id. Once the bottom surface of the preform comes into contact with the mold, the polymer chains in that portion become “frozen” in an unoriented state. Id. Unoriented polymer chains are generally weaker than oriented chains. Id. Moreover, the transition from portions of the bottle having unoriented material to portions having oriented material is relatively abrupt in pre-existing bottles, further creating weak points and making the base portion susceptible to stress cracking. Id., col. 1, ll. 59-62.

The invention addresses these shortcomings by controlling the distribution of unoriented material in the base portion and by introducing more material into the re-entrant portion. Id., col. 4, ll. 29-31. Shown in figure 2, in its most basic form, the patented bottle is composed of a cylindrical side wall (11), an upper neck portion, and a base portion (12). Id., col. 3, ll. 5-9. The base portion is further composed of convex semicircular portions (14, 16) extending downwardly from the side wall and converging at the mid-point of the base to form a cusp (18). Id., col. 3, ll. 9-14. The embodiment in figure 2 improves upon pre-existing bottles by limiting the amount of unoriented material in the base portion to only that at the point of the cusp (18). Id., col. 3, ll. 21-25.

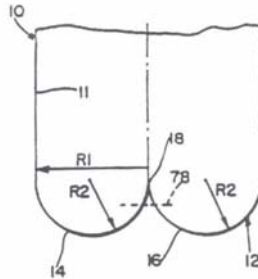


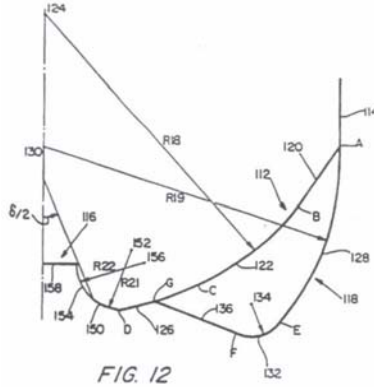
FIG. 2

The specification further teaches that the base portion can be strengthened by truncating the cusp (18), as shown by the dotted line (78). By truncating the cusp, the sides of the re-entrant portion diverge at a relatively large angle and improve the bottle's resistance to deformation. Id., col. 4, 31-34. Moreover, truncating the cusp strengthens the bottle by making the walls of the re-entrant portion thicker.<sup>1</sup> Id., col. 4, ll. 15-20. Finally, molding the bottle to have a truncated re-entrant portion creates an area of unoriented, relatively thick material that provides a gradual transition between unoriented and oriented material. Id., col. 4, l. 66 to col. 5, l. 2. This, in turn, improves the base portion's resistance to stress cracking. Id., col. 5, ll. 2-9.

A "particularly preferred embodiment" of the invention is shown in figure 12 below. Id., col. 5, ll. 11-12. Key features of that embodiment include a side wall (114) and a base portion that is divided into segments by radial webs (112) extending from the side wall to the bottom of the re-entrant portion (116), which also separate the plurality of stabilizing feet (132). Id., col. 5, ll. 11-30. "The central re-entrant portion 116 is radiused into the web 112 at point D by an arcuate portion 150, radius R21 and centre portion 152, and the side walls thereof are defined by a further arcuate portion 154, radius R22 and centre portion 156." Id., col. 5, ll. 31-36.

<sup>1</sup> The parties dispute the meaning of the term "re-entrant portion." We address the construction of that term infra, Discussion, I.B.





## II. The Prosecution History

The '639 patent issued from Reissue Application 08/649,918, a continuation of Reissue Application 08/166,744 ("the '744 application"). The '639 patent is a reissue of U.S. Patent 5,072,841 ("the '841 patent"), which issued from Application 07/577,799, a continuation of Application 07/112,607 ("the '607 application"). The '607 application claims priority from PCT Application GB87/00102, filed February 12, 1987.

During prosecution of the '607 application, the originally-filed claims were rejected as obvious over U.S. Patent 4,231,483 to Dechenne in view of U.S. Patent 4,467,929 to Jakobsen. According to the examiner, as shown in figure 1 below, the Dechenne patent teaches a container having a base portion which comprises a generally convex, annular surface having a central re-entrant portion. In response to the rejection, the applicant amended his claims by specifying that the shape of the inner walls in his invention was "generally convex."

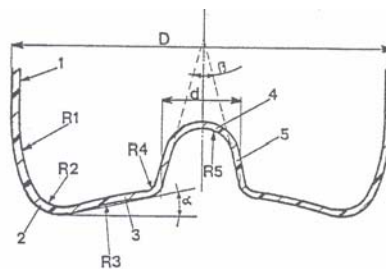


Figure 1 from the Dechenne Patent

The applicant also distinguished the claimed invention from the prior art by making the following argument:

The independent Claims 15, 24 and 33 have been amended to refer to the convex nature of the inner wall portions of the central re-entrant portion (i.e. those wall portions disposed inwardly of the lowermost points of the base upon which the container rests) . . . . The shape of the base as now defined in the claims differs from those of both the Dechenne patent, wherein the corresponding wall portions 3 are slightly concave . . . and the Jakobsen patent, wherein the entire re-entrant portion is clearly concave in its entirety. This is also generally true of all of the prior art known to the applicant and/or referred to by the examiner.

'607 Application, Paper No. 6, at 10-11 (emphases added). The claims, containing the “generally convex” limitation, were subsequently allowed and issued from a continuation application as the '841 patent.

On December 14, 1993, within the two-year period provided for by 35 U.S.C. § 251, the patentee filed a broadening reissue application. The patentee retained all 18 of the originally-allowed claims, and added 14 new, broader claims. Of particular relevance to this appeal, the newly added claims deleted the claim language “inner wall portions are generally convex” because, according to the patentee, “the invention is not limited to such a structure.”

Protests were filed under 37 C.F.R. § 1.291(a) by manufacturers and distributors of bottles against the newly added claims, alleging violation of the recapture rule on the ground that “subject matter which the reissue applicant has intentionally removed from the reissue claims . . . is the same subject matter that was introduced during prosecution of the original patent in order to distinguish over the prior art.” The examiner rejected the protests, stating that the reissue claims “are considered to be of

intermediate scope and the deleted language such as that directed to the convexity of the inner wall . . . are not considered to be critical limitations.” ’918 Application, Paper No. 29, at 4. The examiner allowed the newly added claims and the ’841 patent was reissued as the ’639 patent.

### III. The District Court Proceedings

On August 3, 1999, NAC filed suit for infringement of the ’639 patent (originally the ’841 patent) against thirty-seven defendants consisting of manufacturers of blow-molded plastic bottles and distributors of products sold in those bottles. Defendants are either manufacturers or distributors of footed or non-footed bottles. As exemplified by figure 12, supra, footed bottles have appendages extending from the base portion. Non-footed bottles, as exemplified by figure 2, supra, do not have appendages and stand on the base portion. In total, NAC accused 177 footed bottles and 653 non-footed bottles of infringing the ’639 patent.

Independent claims 1 and 29 are representative of the claims asserted by NAC.

Claim 1 reads as follows:

A container of blow-moulded oriented thermoplastic material of the type formed by enclosing a moulded preform in a mould corresponding to the shape of the container, heating the preform and stretching it to the full length of the mould so that its bottom surface impinges upon the bottom surface of the mould prior to blow-moulding; said container comprising a generally cylindrical body portion with a central longitudinal axis, said body portion having a side wall, a radius and a base portion closing the bottom end of said side wall, wherein said base portion is defined by a figure of rotation formed by rotating a generally convex curve, extending from the bottom end of said side wall to the central longitudinal axis of the body portion, about said axis so as to define an annular, convex surface having a central re-entrant portion, the material in the vicinity of the center of said re-entrant portion being unoriented and relatively thick in comparison

with the oriented material of the remainder of the base portion and wherein said annular, convex surface comprises, in transverse cross-section, first and second downwardly convex portions each comprising an outer, convex wall portion extending downwardly from said side wall to a lowermost point and an inner wall portion extending upwardly from said lowermost portion towards the center of the base portion; and wherein said inner wall portions are generally convex, and said unoriented, relatively thick material is confined substantially to the uppermost regions of said convex, inner wall portions; and wherein said convex, inner wall portions converge to form a cusp at the center of said base portion, and said unoriented, relatively thick material is confined substantially to the point of said cusp.

'639 Patent, col. 7, l. 52 to col. 8, l. 15 (emphasis added).

Reissue claim 29 reads as follows:

A container of blow-moulded oriented thermoplastic material, said container comprising a generally cylindrical body portion with a central longitudinal axis, said body portion having a side wall, a radius and a base portion closing the bottom end of said side wall, wherein said base portion is defined by a figure of rotation, formed by rotating a generally convex curve extending from the bottom end of said side wall to the central longitudinal axis of the body portion, about said axis so as to define a bottom surface having a central re-entrant portion; the material in the vicinity of the center of said re-entrant portion being unoriented and relatively thick in comparison with the oriented material of the remainder of the base portion; and wherein said bottom surface comprises, in transverse cross-section, first and second downwardly convex portions each comprising an outer, convex wall portion extending downwardly from said outer, convex wall portion towards the center of the base portion; wherein said unoriented, relatively thick material is confined substantially to said re-entrant portion and wherein the diameter of said re-entrant portion is in the range of 5% to 30% of the overall diameter of said side wall.

Id., col. 14, l. 64 to col. 15, l. 18 (emphasis added). Pertinent to this appeal, the claim limitation “wherein said inner wall portions are generally convex” appears in each of the originally-issued claims 1-28, but does not appear in reissue claims 29-42. Moreover,

the claim limitation restricting the diameter of the re-entrant portion to a percentage of the overall diameter of the bottle's base appears in claims 2-9, 11-15, and 17-31.

The Magistrate Judge appointed a special master, Paul M. Janicke, to provide recommendations to the district court on claim construction issues. The special master, in turn, made recommendations regarding the construction of numerous claim limitations, including "re-entrant portion" and "generally convex." The district court eventually adopted the special master's recommendations on the construction of the claim limitations "re-entrant portion" and "generally convex" in their entirety.

The special master construed "re-entrant portion" for non-footed bottles to mean the wall portions of the base that in cross-section begin at the lowermost point on which the bottle rests, and then rise towards the center. For footed bottles, "re-entrant portion" was construed to mean the wall portions of the base that in cross-section begin at the lowermost point on which the bottle would rest if the feet were removed, i.e., the lowermost point on the web bottom, and then rise towards the center.

To support his construction, the special master determined that the term "re-entrant" connotes a region where the bottom of the bottle turns upward, thereby "re-entering" the interior volume of the bottle. The special master also considered the specification's description of the re-entrant portion in figure 10 as "a truncated cone 84 having relatively steep sides 86, 88 and closed by a substantially flat top 90." Finally, the special master relied on the applicant's statement during prosecution describing the re-entrant portion as "those wall portions disposed inwardly of the lowermost points of the base upon which the container rests."

The special master further construed “re-entrant portion” as a hollow extending into the bottle at a depth of 3.75 times the maximum thickness of the re-entrant portion. To arrive at the inward depth-to-thickness ratio of 3.75, the special master divided the recommended depth for the re-entrant portion in figure 12 (7.5 millimeters) by the maximum thickness of the re-entrant portions shown in figures 14 and 15 (2 millimeters). Moreover, the special master concluded that an “up-turn only equal to about the thickness of the material” does not fall within the scope of the limitation.

The special master also construed the claim limitation “generally convex.” The special master first construed the term “generally” according to a definition found in the Oxford English Dictionary Online: “with respect to the majority or larger part.” The special master chose this definition over NAC’s proffered definition of “on the whole.” The “generally convex” limitation was construed to mean “mostly convex.” The special master’s construction of “generally convex” allowed the outer walls of the base portion to have straight and concave points, as long as the majority of points along the walls were convex.

Based on the prosecution history, however, the special master imposed an additional restriction on the inner walls of the base portion. In distinguishing his invention over the prior art Dechenne patent, the applicant argued that his invention “differs from . . . the Dechenne patent, wherein the corresponding walls portions 3 are slightly concave.” The special master interpreted that distinction over the prior art as a disclaimer of inner walls with any concavity. Thus, for the inner walls of the base portion, the special master construed “generally convex” to require a majority of convex points along the inner wall and no concave points.

In addition to claim construction recommendations, the Magistrate Judge also requested that the special master provide recommendations regarding defendants' motions for summary judgment of noninfringement and invalidity. In recommending summary judgment of noninfringement, the special master accepted NAC's concession that, based on the special master's earlier construction of "re-entrant portion," none of the accused non-footed bottles infringe claims 2-9, 11-15, and 17-31, which contain a limitation that specifies the diameter of the re-entrant portion as a percentage of the overall diameter of the base portion. Pursuant to Celotex Corp. v. Catrett, the special master also recommended grant of summary judgment of noninfringement of claims 1-28 for 606 non-footed bottles because NAC failed to produce prima facie evidence demonstrating that the accused bottles have inner walls that meet the "generally convex" limitation. Id., 477 U.S. 317 (1986). The district court fully adopted the special master's recommendation and granted summary judgment of noninfringement for all non-footed bottles of claims containing the "re-entrant portion" limitation and 606 non-footed bottles of claims containing the "generally convex" limitation.

For the footed bottles, the special master recommended granting summary judgment of noninfringement on some of the footed bottles, but also concluded that genuine issues of material fact existed as to whether other footed bottles (categorized as Exhibit 7 bottles) met the "re-entrant portion" and "generally convex" limitations. In recommending denial of summary judgment of noninfringement for the Exhibit 7 bottles, the special master noted conflicting expert witness testimony and found that some bottles had a re-entrant portion depth-to-thickness ratio that was close to, but lower than, 3.75. In partially adopting the special master's recommendation, the district court

granted summary judgment of noninfringement for all footed bottles of claims containing the “re-entrant portion” limitation and 151 footed bottles of claims containing the “generally convex” limitation. As with the non-footed defendants, the court determined that NAC failed to meet its burden under Celotex to come forward with affirmative evidence of infringement by the footed-bottle defendants.

In recommending that the district court grant summary judgment of invalidity of claims 29-42 for violating the recapture rule, the special master determined that the patentee was attempting to recapture subject matter by reissue that he had surrendered during prosecution of the original application. Specifically, the special master found that the patentee amended his originally-filed claims by limiting the “inner wall portions” to a “generally convex” shape to avoid an obviousness rejection over the Dechenne patent. In later prosecuting claims that did not require the inner walls to be generally convex, in the special master’s view, the patentee was attempting to recapture subject matter that he had previously surrendered. The district court fully adopted the special master’s recommendation and found reissue claims 29-42 to be invalid for violating the rule against recapture.

On February 24, 2004, the district court entered final judgment under Fed. R. Civ. P. 54(b) of noninfringement of claims 1-28 of the '639 patent for all defendants and all accused bottles, and of invalidity of reissue claims 29-42. NAC appealed and Plastipak cross-appealed to this court. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).



## DISCUSSION

We review a district court's grant of summary judgment de novo, reapplying the same standard used by the district court. Ethicon Endo-Surgery, Inc. v. U.S. Surgical Corp., 149 F.3d 1309, 1315 (Fed. Cir. 1998). Summary judgment is appropriate if there is no genuine issue as to any material fact and the moving party is entitled to JMOL. Fed. R. Civ. P. 56(c). "The evidence of the non-movant is to be believed, and all justifiable inferences are to be drawn in his favor." Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 255 (1986).

### I. Claim Construction and Infringement

Infringement analysis is a two-step process: "First, the court determines the scope and meaning of the patent claims asserted . . . [and secondly,] the properly construed claims are compared to the allegedly infringing device." Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc) (citations omitted). Step one, claim construction, is a question of law, Markman, 52 F.3d at 970-71, that we review de novo, Cybor, 138 F.3d at 1456. Step two, comparison of the claims to the accused device, is a question of fact, Bai v. L & L Wings Inc., 160 F.3d 1350, 1353 (Fed. Cir. 1998), and requires a determination that every claim limitation or its equivalent be found in the accused device. Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997).

On appeal, NAC contests the district court's construction of the claim limitations "generally convex" and "re-entrant portion." NAC asserts that under the proper claim construction, the accused bottles meet both of these limitations, and requests that we vacate the grant of summary judgment of noninfringement. NAC further requests that

we remand the case to the district court to allow it to demonstrate that the accused containers meet these limitations under the correct claim construction.

A. “Generally Convex”

NAC assigns error to the district court’s construction of the claim limitation “generally convex,” which precludes any concavity in the inner walls of the base portion. NAC argues that, contrary to the court’s finding, the applicant did not disclaim inner walls with any concavity during prosecution. According to NAC, the statement in the prosecution history relied upon by the court<sup>2</sup> to support a disclaimer merely reflected the applicant’s distinction of the generally convex inner walls of the claimed invention from the inner walls of the prior art, which were “concave in [their] entirety.”

NAC also contends that the district court’s construction, which defines the “generally convex” limitation differently for the outer and inner walls of the base portion, is prohibited. CVI/Beta Ventures, Inc. v. Tura LP, 112 F.3d 1146, 1159 (Fed. Cir. 1997) (instructing that terms should be construed consistently throughout the claims). Moreover, NAC asserts that under the court’s construction, the claims do not read on the patent’s preferred embodiments, shown in figures 14 and 15, which show base portions with concave inner walls. See Nat’l Steel Car, Ltd. v. Canadian Pac. Ry., Ltd., 357 F.3d 1319, 1337 (Fed. Cir. 2004) (stating that claim interpretations “that do not read on the preferred embodiments are rarely, if ever, correct and would require highly persuasive evidentiary support.”).

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<sup>2</sup> The relevant prosecution statement is: “The shape of the base as now defined in the claims differs from those of both the Dechenne patent, wherein the corresponding wall portions 3 are slightly concave . . . and the Jakobsen patent, wherein the entire re-entrant portion is clearly concave in its entirety.” ’607 Application, Paper No. 6, at 10-11.

Finally, NAC finds error in the district court's construction which requires a majority of points on the inner wall to be convex. According to NAC, the term "generally" is a word of approximation that should not be limited to a strict numerical boundary such as a majority of points. Instead, NAC contends that, applying "ordinary English," the court should have construed the term "generally" as "on the whole," or "in a general manner."

Plastipak responds to NAC's points by arguing that the district court's construction of the "generally convex" limitation, excluding any concavity in the inner walls of the base portion, was required by the applicant's disclaimer during prosecution. Like the district court, appellees read the applicant's prosecution statement as distinguishing the inner walls of the claimed invention from the corresponding structure in the Dechenne patent on the basis of not even being "slightly concave," instead of being entirely concave.

Regarding NAC's argument that the "generally convex" limitation should not be construed inconsistently, Plastipak again contends that the applicant's argument during prosecution required that result. Plastipak also disputes NAC's assertion that the district court's construction reads out preferred embodiments. According to Plastipak, the specification only discloses one "particularly preferred embodiment," shown in figure 12, and the inner walls of that embodiment are within the court's construction of "generally convex." Nonetheless, Plastipak cites case law supporting the proposition that claim construction does not always include all of the embodiments disclosed in a specification. See *Elekta Instruments S.A. v. O.U.R. Scientific Int'l, Inc.*, 214 F.3d 1302, 1308 (Fed. Cir. 2000).

Finally, Plastipak defends the district court's construction of the term "generally" to require a majority of points. Plastipak argues that that construction was supported by the Oxford English Dictionary Online. Moreover, Plastipak asserts that construing "generally" to require a majority of points is not inconsistent with NAC's proposed construction of the term, "on the whole."

We agree with the district court's conclusion that the applicant, through argument during the prosecution, disclaimed inner walls of the base portion having any concavity. Cognizant of the high standard required in order to show a prosecution disclaimer, e.g., Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1325-26 (Fed. Cir. 2003), we conclude that that standard has been met here. To overcome an obviousness rejection, the applicant distinguished his invention from the Dechenne patent on the basis of the latter disclosing inner walls that are "slightly concave." The inescapable consequence of such an argument is that the scope of applicant's claims cannot cover inner walls that are "slightly concave." Moreover, it logically follows, as the district court also concluded, that the scope of applicant's claims is also limited to inner walls of the base portion with no concavity.

We are not persuaded by NAC's argument that the applicant intended only to distinguish his invention from the prior art on the basis that the inner walls in the prior art bottles are entirely concave. Although the inner walls disclosed in the Dechenne and Jakobsen patents may be viewed as entirely concave,<sup>3</sup> that is not what the applicant argued during prosecution to gain allowance for his claims. The applicant stressed the

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<sup>3</sup> With respect to the Dechenne patent, although inner wall portion 3, shown in Dechenne figure 1, supra, appears to be entirely concave, we also note that inner wall portion 5 is not concave, but straight.

difference in the extent of the concavity between the Dechenne and Jakobsen patents, noting that Dechenne is “slightly concave,” whereas Jakobsen is “clearly concave in its entirety.” Such a distinction would have been unnecessary if the only point that the applicant intended to make was that both prior art patents disclosed inner walls that are entirely concave.

We also reject NAC’s argument that the district court erred in its construction of the “generally convex” limitation because the limitation is construed differently as it relates to the inner and outer walls of the base portion. Although the same limitation, i.e., “generally convex,” appearing in different parts of the same claim is typically given the same construction, the applicant’s argument during prosecution has warranted a departure from that general rule. As explained above, the “generally convex” limitation normally allows for some concave points on the walls of the base portion as long as the majority of points are convex, and, indeed that is how the court construed the limitation for the outer walls of the base portion. As we have also explained above, however, the “generally convex” limitation for the inner walls of the base portion cannot be given the same construction as the outer walls because the applicant disclaimed any concavity for the inner walls, but not the outer walls.

We find even less persuasive NAC’s argument that the district court’s construction would read out of the claims the preferred embodiments shown in figures 14 and 15. First, figures 14 and 15 show bottles with inner walls in the base portion that appear to have no convex points. Regardless how the term “generally” is construed, it requires that there be at least some convex points in the inner wall. Thus, even if some concavity in the inner walls is permitted, figures 14 and 15 would still not fall within the

scope of the claims. Secondly, as appellees note, we have previously explained that limitations may be construed to exclude a preferred embodiment if the prosecution history compels such a result. Elekta Instruments S.A., 214 F.3d at 1308. For the reasons explained above, in this case, it does. As the district court recognized, the fact that claims do not cover certain embodiments disclosed in the patent is compelled when narrowing amendments are made in order to gain allowance over prior art.

Finally, the district court did not err in construing the term “generally” to mean a majority of points. As NAC properly recognizes, terms of approximation such as “generally” need not be construed with mathematical precision. See, e.g., Anchor Wall Sys. v. Rockwood Retaining Walls, Inc., 340 F.3d 1298, 1311 (Fed. Cir. 2003). We do not believe, however, that the district court’s construction imposes any “mathematical precision,” as NAC asserts. In merely requiring a majority of points to be convex, the court articulated a common-sense understanding of the term confirmed by a dictionary. Moreover, we find the court’s construction more fitting to the technology at issue here than NAC’s proposed construction of “on the whole.”

B. “Re-Entrant Portion”

NAC argues that the district court erroneously construed the “re-entrant portion” limitation by including the lowermost points of the inner walls. According to NAC, the court also erred by imposing a re-entrant portion depth-to-thickness ratio of 3.75. Contrary to the court’s construction, NAC asserts that the proper construction of “re-entrant portion” is “the area ‘corresponding’ to the point of the cusp or truncated cusp shown in Figure 2, where the projection from the mold-bottom first pushes into the

preform.” NAC also notes that thick plastic material may be seen in the vicinity of the re-entrant portion.

To support its proposed construction, NAC relies heavily on the specification’s description of figure 2. According to NAC, the specification expressly defined the re-entrant portion: “the area where the preform impinges upon the cusp projection from the mold bottom ‘correspond[s]’ to the ‘re-entrant portion.’” NAC also relies on the specification’s disclosure that the base portion can be strengthened “by thickening the wall of the re-entrant portion, which may be accomplished by reintroducing an amount of unoriented material into the re-entrant portion,” to correlate the re-entrant portion to an area of thickened material.

In asserting error, NAC argues that the district court’s construction is inconsistent with figures 10-12. In those figures, NAC asserts that the specification does not support the court’s finding that the re-entrant portion extends from the lowermost points of the inner walls, but, rather, the re-entrant portion extends from some point above the lowermost point. NAC also contends that the court erred in concluding that the applicant defined the “re-entrant portion” limitation as extending from the lowermost points of the inner wall during prosecution. According to NAC, the applicant during prosecution only distinguished the generally convex walls of his invention from the entirely concave walls of the prior art.

NAC also challenges the district court’s construction requiring the re-entrant portion to have an inward depth-to-thickness ratio of approximately 3.75. In doing so, NAC argues that the court imported a limitation from the specification into the claims.

Under the correct construction, NAC asserts that the “re-entrant portion” limitation does not require any threshold depth for the hollow in the base portion.

Plastipak responds by arguing that the specification and prosecution history support the district court’s construction of “re-entrant portion.” Plastipak cites figure 10, where the re-entrant portion is described as “a truncated cone 84 having relatively steep sides 86, 88 and closed by a substantially flat top surface 90.” During prosecution, Plastipak argues that the applicant defined the re-entrant portion as “those wall portions disposed inwardly of the lowermost points of the base upon which the container rests.”

Plastipak also supports the district court’s imposition of a re-entrant portion depth-to-thickness ratio by arguing that the hollow of the base portion must be deeper than the thickest point on the re-entrant portion. According to Plastipak, if the re-entrant portion is not as deep as its thickness at its thickest point, the re-entrant portion cannot be considered a hollow that has “re-entered” anything. Appellees also rely on the specification’s assignment of physical dimensions to figure 12, and its recommendation that other containers be “scaled accordingly.” Finally, Plastipak notes that the re-entrant portion shown in figures 14 and 15 appear to be “significantly deeper” than the re-entrant portion shown in the prior art bottle, figure 16.

We agree with the district court’s construction of the term “re-entrant portion” to the extent that it includes the lowermost points of the inner walls. Embodiments in the specification, including the “particularly preferred embodiment” shown in figure 12, support that construction. For example, the specification states that “the central re-entrant portion 116 [of figure 12] is radiused into the web at point D [the lowermost point].” ’639 Patent, col. 5, ll. 31-36. In the footed bottle shown in figure 11, the



specification again informs us that the “central re-entrant portion [has been] modified . . . so as to define a flat-topped, truncated cone 102 extending upwardly from the points 104, 106 [the lowermost points if the feet are excluded].” Id., col. 4, ll. 47-52. With respect to NAC’s position regarding figure 10, while the specification does not expressly identify the re-entrant portion as extending from the lowermost point on arcuate portion 92, neither does it preclude the lowermost point on arcuate portion 92 from being part of the re-entrant portion.

We further note that the district court construction of “re-entrant portion” is consistent with the prior art’s usage of that term. The Dechenne patent uses the term “re-entrant” interchangeably with the term “recessed.” ’438 Patent, col. 1, l. 24. Moreover, the Dechenne patent defines the “recessed” portion as extending from the lowermost point of the inner wall to the central region. Id., col. 2, ll. 48-58. Similarly, in the ’639 patent, all of the disclosed embodiments are “recessed” from the lowermost point of the base portion (or the web bottom, for footed bottles) to the central portion.

The strongest confirmation of the district court’s construction of “re-entrant portion,” however, comes from the applicant’s own statement in the prosecution history. During prosecution, the applicant argued that “[t]he independent [c]laims . . . have been amended to refer to the convex nature of the inner wall portions of the central re-entrant portion (i.e. those wall portions disposed inwardly of the lowermost points of the base upon which the container rests).” ’607 Application, Paper No. 6, at 10 (emphasis added). We are not persuaded by NAC’s contention that the statement was made to distinguish the generally convex inner walls of its invention from the prior art. Indeed,

NAC's argument does not adequately account for the statement contained in parentheses.

We do, however, modify the district court's construction of "re-entrant portion" as requiring an inward depth-to-thickness ratio of 3.75. As we have stated previously, unless required by the specification, limitations that do not otherwise appear in the claims should not be imported into the claims. See, e.g., E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.3d 1430, 1433 (Fed. Cir. 1988) ("Where a specification does not require a[n extraneous] limitation, that limitation should not be read from the specification into the claims."). The court erroneously imported the specification's recommended dimensions for a commercial embodiment of the bottle shown in figure 12 into the claims. '639 Patent, col. 5, ll. 41-48; Table 1. While we appreciate the court's effort to distinguish the present invention from the prior art shown in figure 16, which shows a re-entrant portion with a smaller inward depth, it was improper for the court to make that distinction by importing the preferred embodiment's physical dimensions into the claims. Also unconvincing is appellees' conclusory remark that, if the re-entrant portion is not as deep as its thickness at its thickest point, it cannot be a hollow that has "re-entered" anything. The "annular, convex surface" and "generally convex" inner walls limitations ensure that the re-entrant portion is a hollow that "re-enters" the bottle; reciting an inward depth-to-thickness ratio of 3.75 is extraneous. Thus, we conclude that the proper construction of the term "re-entrant portion" does not include an added significant depth limitation, much less the inward depth-to-thickness ratio of 3.75.

C.

## Infringement

NAC requests that we vacate the district court's grant of summary judgment of noninfringement because of erroneous claim construction. Based on our review of the district court's claim construction, we affirm in part and vacate in part the court's grant of summary judgment of noninfringement. For the reasons provided above, we agree with the court's construction of the claim limitation "generally convex." Thus, we affirm the district court's grant of summary judgment of noninfringement of all accused bottles found not to meet the "generally convex" limitation.<sup>4</sup> Because we have modified the district court's construction of the "re-entrant portion" limitation, however, we vacate its grant of summary judgment of noninfringement based only on that limitation, and remand for the court to determine whether the limitation is met based on our modified claim construction. For the reasons provided below, we need not consider whether the accused bottles infringe reissue claims 29-42 because those claims have been found invalid.

## II. Invalidity

Whether the claims of a reissue patent violate 35 U.S.C. § 251, and thus are invalid, is a question of law, which we review de novo. Pannu v. Storz Instruments, Inc., 258 F.3d 1366, 1370 (Fed. Cir. 2001) (citations omitted). Under the recapture rule, a patentee is precluded "from regaining the subject matter that he surrendered in an effort to obtain allowance of the original claims." Id. at 1370-71 (citing In re Clement, 131

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<sup>4</sup> In affirming the district court's grant of summary judgment of noninfringement of claims 1-28 on the ground of the "generally convex" limitation, and its grant of summary judgment of invalidity of claims 29-42, see infra, Discussion, part II, we have rendered Plastipak's argument of noninfringement of the nine "trial bottles" on the ground of the "confined substantially" limitation moot.

F.3d 1464, 1468 (Fed. Cir. 1997)). When that has occurred, the patent is invalid. Id. at 1368. We apply the recapture rule as a three-step process: (1) first, we determine whether, and in what respect, the reissue claims are broader in scope than the original patent claims; (2) next, we determine whether the broader aspects of the reissue claims relate to subject matter surrendered in the original prosecution; and (3) finally, we determine whether the reissue claims were materially narrowed in other respects, so that the claims may not have been enlarged, and hence avoid the recapture rule. Id. at 1371 (citations omitted).

NAC appeals from the district court's summary judgment holding reissue claims 29-42 invalid for violation of the recapture rule. According to NAC, the court improperly grounded its invalidity decision on the applicant's arguments and amendments in view of the prior art Dechenne patent and rendered an unduly narrow interpretation of the "generally convex" claim limitation. In doing so, NAC argues mainly that the court failed to give the patent examiner "the deference that is due to a qualified government agency presumed to have properly done its job." Appellant's Opening Br., at 50 (citing McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1353 (Fed. Cir. 2001)). According to NAC, during the reissue proceedings, Plastipak submitted, and the patent examiner rejected, protests making the same recapture arguments that Plastipak made to the court.

Plastipak argues that the applicant violated the recapture rule by removing in the reissue proceedings the "generally convex" restriction from the "inner wall" limitation. According to Plastipak, the applicant amended his claims to add the "generally convex" limitation to the inner walls in order to overcome the Dechenne patent, which was

“slightly concave.” With respect to NAC’s argument that the district court did not give the patent examiner due deference, Plastipak reasserts the court’s position that the patent examiner misapplied the recapture rule, and thus any presumption that the examiner properly did his job was rebutted.

We agree that NAC violated the recapture rule, and thus the reissue claims are invalid. Applying our three-part test, we find that the reissue claims are broader in scope than the originally-issued claims in that they no longer require the “inner walls” to be “generally convex.” Moreover, the broader aspect of the reissue claims relates to subject matter that was surrendered during prosecution of the original-filed claims. Indeed, during prosecution, the applicant conceded that the pending independent claims “have been amended to refer to the convex nature of the inner wall portions of the central re-entrant portion.” ’607 Application, Paper No. 6, at 10. The applicant even argued that the “shape of the base as now defined in the claims differs from those of . . . the Dechenne patent, wherein the corresponding wall portions are slightly concave.” Id. (emphasis added). Finally, the reissue claims were not narrowed with respect to the “inner wall” limitation, thus avoiding the recapture rule.

We reject NAC’s argument that the district court did not give the patent examiner due deference in finding the reissue claims invalid. The examiner’s basis for denying the protests filed against the reissue claims, i.e., that the claims “are considered to be of intermediate scope and the deleted language . . . directed to the convexity of the inner wall . . . are not considered to be critical limitations,” demonstrates the examiner’s inattention to the rule against recapture. ’918 Application, Paper No. 29, at 4. For the reasons set forth above, the deleted language was critical in that it allowed the applicant

to overcome the Dechenne reference. Moreover, that the reissue claims, looked at as a whole, may be of “intermediate scope” is irrelevant. As the district court recognized, the recapture rule is applied on a limitation-by-limitation basis, and the applicant’s deletion of the “generally convex” limitation clearly broadened the “inner wall” limitation. Thus, reissue claims 29-42 are invalid for violating the rule against recapture.

We have considered NAC’s remaining arguments regarding the ’639 patent and find them not persuasive.

### III. Cross-Appeal

One group of appellees cross-appeals to preserve their right to challenge the validity of the ’639 patent in the event that we do not affirm the district court’s noninfringement summary judgment in its entirety. Cross-appeals are necessary and appropriate only “when a party seeks to enlarge its own rights under the judgment or lessen the rights of its adversary under the judgment.” Bailey v. Dart Container Corp., 292 F.3d 1360, 1362 (Fed. Cir. 2002). In seeking to “preserve” their right to challenge validity in the district court at a later time, appellees meet neither criterion. Thus, appellees’ cross-appeal is dismissed.

### CONCLUSION

We affirm the district court’s decision granting summary judgment of noninfringement of claims 1-28 of the ’639 patent on the ground that the accused bottles do not meet the “generally convex” limitation. We further affirm the court’s decision granting summary judgment of invalidity of claims 29-42 for violating the rule against recapture. We vacate, however, the court’s decision granting summary judgment of noninfringement on the ground that certain accused bottles only do not meet the “re-

entrant portion” limitation, and remand for further proceedings consistent with this opinion.

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED.

COSTS

No costs.