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**Datasheet for the decision
of 21 January 2009**

Case Number: T 0183/07 - 3.2.05

Application Number: 96910645.9

Publication Number: 0817716

IPC: B29C 49/12

Language of the proceedings: EN

Title of invention:

Pressurized refill container resistant to sprue cracking and method of making

Patentee:

CONTINENTAL PET TECHNOLOGIES, Inc.

Opponents:

Rexam AB
PepsiCo Inc.

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56

Relevant legal provisions (EPC 1973):

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Keyword:

"Late filed ground of opposition (not admitted)"
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0183/07 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 21 January 2009

Appellant:
(Opponent 01)

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Decision under appeal:

Decision of the Opposition Division of the European Patent Office posted 21 November 2006 rejecting the opposition filed against European patent No. 0817716 pursuant to Article 102(2) EPC 1973.

Composition of the Board:

Chairman: W. Zellhuber
Members: P. Michel
M. J. Vogel

Summary of Facts and Submissions

- I. The appellant (opponent 01) lodged an appeal against the decision of the Opposition Division rejecting the opposition filed against European Patent No. 0 817 716.
- II. Oral proceedings were held before the Board of Appeal on 21 January 2009.
- III. The appellant requested that the decision under appeal be set aside and that the European Patent No. 0 817 716 be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request) or, as an auxiliary measure, that the decision under appeal be set aside and the patent be maintained on the basis of one of the sets of claims filed as first to fourth auxiliary requests on 19 December 2008.

The party as of right (opponent 02) indicated that they would not be represented at the oral proceedings.

- IV. The following documents are referred to in the present decision:

E1: EP-B-0 247 566

E2: US-A-5,198,248

E3: US-A-5,066,528

E4: US-A-4,334,627

E20: US-A-4,387,815

E21: WO-A-96/24525

E22: WO-A-97/20677

V. Claims 1 and 19 as granted (main request) read as follows:

"1. A refillable plastic container (120) for pressurized applications able to withstand at least 10 refill cycles including a caustic wash at a temperature of at least 60°C and subsequent filling with a pressurized liquid at 4.0 atmospheres without crack failure, the container including a body having a substantially transparent biaxially-oriented sidewall (124) and a base (125), the base including a standing ring (127) around a push-up dome (128) with a dome center adjacent a central axis (CL) of the container, wherein the dome (128) and standing ring (127) form a substantially amorphous base portion, thickened relative to the sidewall (124), for resistance to caustic stress cracking, and the dome has an outwardly concave exterior surface that slopes downwardly from the central axis (CL) to the standing ring (127) and continues adjacent the central axis (CL) without an outwardly convex dish to prevent sprue cracking in the dome (128) of the container."

"19. A method of making a refillable plastic container (120) for pressurized applications able to withstand at least 10 refill cycles including a caustic wash at a temperature of at least 60°C and subsequent filling with a pressurized liquid at 4.0 atmospheres without crack failure, the container having a substantially transparent biaxially-oriented sidewall (124) and a base (125), the base including a standing ring (127) around a push-up dome (128) with a dome center adjacent a central axis (CL) of the container, the container

being stretch blow molded from a preform (42,52,62),
wherein:

the mold base (90,90') has a dome-shaped surface (92,92') for forming the container dome (128) without a dish adjacent the central axis (CL) and the dome (128) and standing ring (127) form a substantially amorphous base portion, thickened relative to the sidewall (124), for resistance to caustic stress cracking, and wherein the preform is axially stretched with a stretch rod (80) such that the stretch rod tip (81) holds the center (112) of a preform dome-forming section (117) in contact with a center of the dome-shaped cavity and the surrounding dome-forming section (117) is radially expanded without entrapment to avoid the formation of surface defects in the dome (128)."

VI. The appellant has argued substantially as follows:

The ground of opposition under Article 100(c) EPC which was not admitted into the opposition proceedings should be admitted into the appeal proceedings in view of its relevance.

The subject-matter of the claims of the main request extends beyond the disclosure of the application as filed. In particular, there is no basis for the features of claims 1 and 19, "without an outwardly convex dish", "an outwardly concave exterior surface", and "the dome and standing ring form a substantially amorphous base portion".

Whilst the application as filed refers to the absence of a dish in claim 2, the only reference to an "outwardly convex dish" is in connection with the

discussion of a prior art document at page 6, line 3. The amended claims thus do not exclude the presence of a dish which has a form other than convex, for example conical.

The subject-matter of claims 1 and 19 lacks novelty in view of the disclosure of documents E2, E21 and E22.

Document E2 discloses a container having a base portion with a concave, rather than convex, dish. The dome is thus without an outwardly convex dish.

The ability of a refillable container to withstand the cycles specified in claims 1 and 19 is not a limitation of the subject-matter of the claims. In addition, the procedure specified in the claims is merely a standard testing procedure and the performance characteristic results from the remaining claimed features.

As set out in the submission of 19 December 2008 and illustrated by the bottle produced at oral proceedings, a container manufactured in accordance with the procedure of document E21 satisfies the specified performance characteristic and has a substantially amorphous base portion.

Since, in the heating step described at page 10, lines 3 to 13, the side wall is heated to a higher temperature than the base, the side wall will inevitably have a higher crystallinity than the base. In addition, as mentioned at page 11, line 17, conventional blow moulding could also be used in place of the disclosed two step process.

Since claims 1 and 19 are not entitled to the claimed priority date, the subject-matter of claims 1 and 19 also lacks novelty in view of the disclosure of document E22.

The subject-matter of claims 1 and 19 further lacks an inventive step with respect to a combination of document E20 with either E1 or E2, or document E4 with document E1.

The subject-matter of claim 1 differs from the disclosure of document E20 in that the base is thickened and amorphous and that a specific recycling loop is specified.

Since the base of the container of document E20 does not have a dish, the problem of sprue cracking does not arise. The object of the invention is thus to provide an improved base to overcome the problem of cracking.

Document E1 offers a solution to this problem. As stated at page 5, lines 5 to 15, the base portion should be thickened, and as indicated at page 6, line 23, the PET should be unorientated. Whilst other problems may arise, as indicated at page 6, lines 31 to 36, nevertheless the cracking problem would be solved. Since the dish is not described in document E1, but only shown in Figure 5, there is no incentive to introduce this feature.

Document E2 also suggests a thickened base construction for overcoming the problem of cracking (column 4, lines 41 to 54 and column 5, lines 1 to 6).

In an alternative approach, document E4 is considered to be the closest prior art. Claim 1 is distinguished over the disclosure of this document solely in that the container is refillable.

The object of the invention is thus to make the container refillable.

This problem is addressed by document E1. As discussed at page 4, lines 3 to 49, the bottle of document E4 is susceptible to crack failure in the unorientated base area. The solution to this problem is to make the reinforcing of the base continuous (page 5, lines 5 and 6). Since the bottle of document E4 does not have a dish, it is not necessary to introduce such a dish when following the teaching of document E1.

The subject-matter of claim 1 thus does not involve an inventive step, the same reasoning also applying to claim 19.

VII. The respondent has argued substantially as follows:

The opposition division correctly exercised their discretion in not admitting the late filed ground of opposition under Article 100(c) EPC into the proceedings. The ground should therefore not be admitted into the appeal proceedings.

The reference in claims 1 and 19 to an "outwardly convex dish" serves to clarify the meaning of the term "dish" as referring to a dish on the exterior surface of the container. There is thus a clear disclosure of this feature in the application as filed.

Document E2 discloses a container having a base similar to the prior art discussed in the patent in suit with reference to Figures 1 to 4. The dome has an exterior surface that initially slopes upwardly rather than downwardly from the central axis and has an outwardly convex dish, as shown in Figure 3 between the reference numerals 32 and 70. This feature corresponds to the portion 44 of the mould shown in Figure 9.

Document E21 does not disclose a container able to withstand the conditions specified in claims 1 and 19. There is furthermore, no disclosure in document E21 of any portion of the container being amorphous.

The method of making containers of document E21 does not inevitably result in containers having a substantially amorphous base portion, or which has the performance characteristics specified in claims 1 and 19. In particular, the heating step described at page 10, lines 3 to 13, will result in crystallisation of the base portion. Neither does the use of a conventional method of manufacture as mentioned at page 11, line 17 inevitably result in substantially amorphous base portion.

As regards the tests referred to in the letter of 19 December 2008, these involve choices, such as bottle size, wall thickness, stretch ratio and copolymer content. In addition, there is no indication of the method steps and whether or not they were in accordance with those described in document E21.

The feature of the "amorphous" base portion is an absolute requirement of the base portion and does not merely refer to a lower crystallinity than the side walls.

Document E22 does not form part of the prior art for claims 1 and 19, since these claims are entitled to the priority date of 29 March 2005.

The subject-matter of claims 1 and 19 is thus new.

Document E1 represents the closest prior art. The problem to be solved is to prevent sprue cracking, which occurs for the reasons set out in paragraph [0015] of the patent in suit. This problem is solved by the base construction as defined in claim 1, which avoids entrapment.

If document E20 was to be regarded as the closest prior art, which is not accepted, the problem to be solved would still be to prevent sprue cracking in the base.

Document E1 does not offer a solution to this problem, and only discloses bases having a dish. As stated at page 6, lines 26 to 30, the injection gate must be accurately centred within the base. This can only be achieved by providing a dish of the form shown in Figure 5. The problem of sprue cracking is thus not solved. In addition, the bases of the containers of documents E20 and E1 are fundamentally different and there is no incentive to use a base having the geometry of document E20, but the material of document E1.

Document E4 cannot be regarded as the closest prior art, since it relates to disposable containers.

The subject-matter of claims 1 and 19 thus involves an inventive step.

Reasons for the Decision

Main Request

1. *Amendments*

1.1 *Objection under Article 100(c)*

In the application as originally filed (published version), Figures 5 to 7 show three alternative embodiments of the base of a preform positioned in a blow mould base. As is shown in the figures, the mould has a form which will result in the dome of the container having an outwardly concave exterior surface that slopes downwardly from the central axis (CL) to the standing ring and continues adjacent the central axis (CL) without an outwardly convex dish. In addition, it is disclosed at page 6, lines 30 and 31, that the dish is eliminated.

Whilst the term "convex" is only used at page 6, line 3, in connection with a prior art container base, the term is construed as clarifying the reference to the dish as being a protrusion situated on the exterior surface of the dome and is not seen as excluding dishes having any particular form. In addition, the reference at page 6, lines 30 and 31 to the dish being eliminated is

understood as referring to the outwardly convex dish of page 6, line 3.

At page 8, lines 24 to 30, it is disclosed that the container base is thickened relative to the sidewall and substantially amorphous. In view of the passage at page 8, lines 7 to 10, the reference to the base must be understood as meaning the portion of the container formed by the lower mould (102), including the dome and the standing ring.

The ground of opposition under Article 100(c) EPC thus does not *prima facie* put the maintenance of the patent in suit at risk. The Board is thus of the opinion that the Opposition Division correctly exercised their discretion not to admit the ground of opposition under Article 100(c), so that the ground should not be admitted into the appeal proceedings.

2. *Novelty*

2.1 Document E2

The dome of the container disclosed in document E2 does not have an outwardly concave exterior surface that slopes downwardly from the central axis to the standing ring and continues adjacent the central axis without an outwardly convex dish.

As shown most clearly in Figure 3 of document E2, a gate is situated at the central axis of the dome, corresponding to the gate 129 of the embodiment of Figure 11 of the patent in suit. However, the exterior surface of the dome does not slope downwardly from the

gate, but rather upwardly, reaching a maximum height above the chime c near the lead line of reference numeral 70. This construction results in the presence of an outwardly convex dish surrounding the external gate.

2.2 Document E21

The disclosure of document E21 is considered to be comprised in the state of the art in view of Article 54(3) EPC.

Whilst the container disclosed in document E21 may be reusable (page 1, lines 20 to 22), it is not unambiguously disclosed that the container would be capable of withstanding the conditions specified in claim 1. These features must be regarded as characterising the claimed container, and cannot be regarded as merely relating to an intended use of the container, since it is possible to submit any particular container to testing in order to establish whether or not it satisfies the criteria specified in claim 1.

As set out in the submission of 19 December 2008, bottles have been produced in accordance with the teaching of document D21 that fall within the parameters specified in claim 1. However, the bottles which were tested represent a choice of particular features, such as bottle size, side wall and base thickness and stretch ratio. The particular PET chosen also represents a selection in terms of the amount of copolymer present. The choice of a high copolymer PET would lead to a lower degree of crystallinity. There is

thus no evidence that, when following the teaching of document D21, containers able to withstand at least 10 refill cycles will be inevitably produced.

It was alleged by the appellant that the method of manufacture disclosed in this document would inevitably result in a container having a substantially amorphous base portion.

Document E21 specifies a method comprising a first moulding step to form an intermediate container from a preform, followed by a heating step, in which the sidewall of the container is heated to approximately 160 to 230°C and the base is heated to approximately 60 to 120°C, followed by a second moulding step (see claim 1). As stated at page 11, lines 7 to 11, during the second moulding step, the portion of the wall of the mould corresponding to the base of the container is heated to a temperature between 20 and 130°C, preferably between 90 and 120°C. The use of such temperatures, which may substantially exceed the glass transition temperature of PET, may result in thermal crystallisation of the material of the base.

Thus, following the method of manufacture disclosed in document E21 does not inevitably result in a container having a substantially amorphous base portion.

2.3 Document E22

The subject-matter of claims 1 and 19 of the patent in suit is entitled to the priority date of 29 March 1995, derived from the date of filing of USSN 08/412,807. The disclosure of the priority document is essentially the

same as that of the application as filed. The claims are thus entitled to the priority date of 29 March 1995 for the same reasons as the amendments to claims 1 and 19 satisfy the requirements of Article 123(2) EPC (cf. point 1.1 above).

Document E22 thus does not form part of the state of the art.

2.4 The subject-matter of claim 1 is thus new.

3. *Inventive step*

3.1 Closest Prior Art

It is suggested on behalf of the appellant that either document E20 or E4 could be regarded as representing the closest prior art.

Document E4 discloses a container in which the base is reinforced by the provision of circumferentially spaced radial ribs (column 1, lines 27 to 41). As discussed in document E1 at page 3, line 30 to page 5, line 2, the containers of document E4 are not suitable for refilling, since they suffer from caustic stress cracking and volume change when subjected to refill cycles including a caustic wash. Document E4 thus does not provide a suitable starting point for the invention of the patent in suit, which relates to a refillable container able to withstand at least 10 refill cycles.

Document E20 is thus regarded as the closest prior art. This document discloses a container having three zones, D₁, D₂ and D₃, as shown in Figure 1. The passage at

column 5, lines 13 to 33, indicates that it is desirable for the material of zones D_1 and D_3 to be in property range 1, while the material of zone D_2 should be in property range 5. As explained at column 3, lines 21 to 41, the material in property range 1 is crystalline. At column 10, lines 38 and 39, it is also stated that the first and third regions are in a thermocrystallized state. The dome and standing ring thus do not form a substantially amorphous base portion base. In addition, the base is not thickened relative to the sidewall.

3.2 Problem to be solved

The patent in suit regards the closest prior art as being a container of the type disclosed in document E3 and similar to that disclosed in document E2, which is discussed at paragraphs [0023] to [0027] of the patent in suit with reference to Figures 1 to 4. Starting from this prior art, the problem to be solved is that of increasing resistance to sprue cracking (paragraph [0014]). This problem arises owing to material entrapped between the stretch rod and the mould at an outwardly convex dish 29 being stretched and drawn against the mould surface during blow moulding.

Such a problem does not, however, arise during blow moulding of the container of document E20, which does not have an outwardly convex dish.

The problem to be solved may be regarded as being to improve the resistance of the base of the container to

stress cracking when subjected to refill cycles involving a caustic wash.

3.3 Solution

Document E1 suggests that the use of a bottom wall thickened relative to the sidewall contributes to a solution to this problem (page 5, lines 5 to 15).

However, the base of the container disclosed in document E1 has a shape as illustrated in Figure 5, including an outwardly convex dish. There is no indication in document E1 to the person skilled in the art that the base of the container of document E20 should be modified by increasing the thickness of the base, without adopting other features of the form of the base as disclosed in document E1.

In particular, document E1 indicates that perfect centering of the preform in the mould is important in order to minimise variations in wall thickness of the amorphous area of the base and thereby compensate for the reduced strength of the amorphous area (page 6, lines 27 to 36). The dish assists in achieving such centering. On the other hand, the base of the container of document E20 relies upon the provision of a crystallised area D_3 in order to achieve the desired strength. There is thus no incentive to provide an amorphous region having the form of the crystalline region D_3 of the container of document E20.

The same applies to the disclosure of document E2. As discussed above, under point 2.2, the base of the

container of document E2 also includes an outwardly convex dish.

In addition, there is no suggestion in either of documents E1 and E2 that the dome and standing ring should form a substantially amorphous base portion.

3.4 Thus, the subject-matter of claim 1 involves an inventive step. Claim 19, directed to a method of making a refillable plastic container having the features specified in claim 1 involves an inventive step for the same reasons. Claims 2 to 18 and 20 to 35 relate to preferred aspects of the container and method respectively and also involve an inventive step for the same reasons.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Meyfarth

W. Zellhuber