

Internal distribution code:

- (A) [] Publication in OJ
(B) [] To Chairmen and Members
(C) [X] To Chairmen
(D) [] No distribution

D E C I S I O N
of 30 April 2003

Case Number: T 0518/00 - 3.2.5

Application Number: 92200669.7

Publication Number: 0494098

IPC: B29C 49/08

Language of the proceedings: EN

Title of invention:

Method of blow moulding container

Patentee:

CONTINENTAL PET TECHNOLOGIES, INC.

Opponents:

CONSTAR INTERNATIONAL Holland B.V.

PEPSICO, INC.

REXAM AKTIEBOLAG

Headword:

-

Relevant legal provisions:

EPC Art. 123(2), 76(1), 84, 83, 54, 56

EPC R. 27(1)(b)

Keyword:

"Addition of subject-matter (main and first auxiliary requests, yes; second auxiliary request, no)"

"Divisional application (extension beyond the content of the earlier application as filed - no)"

"Clarity (yes)"

"Sufficiency of disclosure (yes)"

"Novelty (yes)"

"Inventive step (yes)"

"Acknowledgement of prior art (allowable)"

Decisions cited:

T 0359/96, T 0260/85, T 0601/94

Catchword:

-



Case Number: T 0518/00 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 30 April 2003

Appellant I: CONTINENTAL PET TECHNOLOGIES, INC.
(Proprietor of the patent) 7310 Turfway Road
Suite 490
Florence KY 41042 (US)

Representative: Jenkins, Peter David
PAGE WHITE & FARRER
54 Doughty Street
London WC1N 2LS (GB)

Respondent: CONSTAR INTERNATIONAL Holland B.V.
(Opponent 01) Hengelder 42
P.O. Box 122
NL-6940 AA Didam (NL)

Representative: Hepp, Dieter
Hepp, Wenger & Ryffel AG
Friedtalweg 5
CH-9500 Wil (CH)

Appellant II: PEPSICO, INC.
(Opponent 02) 700 Anderson Hill Road
Purchase, New York (US)

Representative: Körber, Wolfhart, Dr. rer.nat.
Patentanwälte
Mitscherlich & Partner
Sonnenstrasse 33
D-80331 München (DE)

Appellant III: REXAM AKTIEBOLAG
(Opponent 03) Box 836
S-201 80 Malmö (SE)

Representative: Rostovanyi, Peter
AWAPATENT AB
Box 5117
S-200 71 Malmö (SE)

Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
15 March 2000 concerning maintenance of
European patent No. 0494098 in amended form.

Composition of the Board:

Chairman: W. Moser
Members: P. E. Michel
H. M. Schram

Summary of Facts and Submissions

I. Appellant I (proprietor of the patent), appellant II (opponent 02) and appellant III (opponent 03) each lodged an appeal against the interlocutory decision of the Opposition Division maintaining European patent No. 0 494 098 (hereinafter referred to as patent in suit) in amended form.

The patent in suit is based on the European patent application as filed with the publication number EP-A-0 494 098 (published version, hereinafter referred to as application as filed), which is a divisional application (Article 76 EPC) of the European patent application as filed with the publication number EP-A-0 247 566 (published version, hereinafter referred to as parent application as filed).

In the decision under appeal, it was held that the grounds of opposition submitted by appellants II and III and the respondent (opponent 01), that is, Article 100(a), (b) and (c) EPC (lack of novelty and inventive step, insufficiency of disclosure and added subject-matter) did not prejudice the maintenance of the patent in suit as amended.

II. The following documents have been referred to in the appeal proceedings:

D4: US-A-4 334 627

D5: DE-A-28 07 949

D8: JP-A-58-185229, together with an English translation thereof

D9: US-A-4 465 199

D11: "Kunststoff-Verarbeitung im Gespräch", Vol. 3, "Blasformen", 1973, pages 227 and 232

D12: CA-A-1 184 718

D30: JP-A-54-88481, together with an English translation thereof.

III. Oral proceedings were held before the Board of Appeal on 30 April 2003. On 4 April 2003, the respondent had informed the Board that he would not take part in the oral proceedings.

IV. The following requests have been submitted:

(i) Appellant I requested that the decision under appeal be set aside and that the patent be maintained on the basis of the following documents filed on 28 March 2003:

(a) claims 1 to 22 as main request; or

(b) claims 1 to 21 as first auxiliary request; or

(c) claims 1 to 21 as second auxiliary request.

(ii) Appellants II and III requested that the decision under appeal be set aside and the patent be revoked.

(iii) The respondent requested that the decision under appeal be confirmed.

V. The main request of appellant I includes a single independent claim, which reads as follows:

"1. A method of increasing stress crack resistance of a transparent blow moulded polyester bottle (30) having a relatively thin biaxially oriented sidewall and a relatively thick less oriented champagne-type base (34) when subjected to alternate pressurisation and caustic washing at 60°C, the method comprising providing a preform (10) having a thicker wall in a base forming flute portion (22) than in a sidewall forming section (16) and stretch blow moulding the preform (10) to form a bottle (30) in which the base (34) has an increased thickness relative to the thickness of the sidewall and is continuously reinforced and without ribs."

Claim 1 of the first auxiliary request of appellant I reads as follows:

"1. A method of increasing stress crack resistance of a transparent blow moulded polyester bottle (30) having a relatively thin biaxially oriented sidewall and a relatively thick less oriented champagne-type base (34) when subjected to alternate pressurisation and caustic washing at 60°C, the champagne-type base including a chime area having a peripheral contact radius and an unoriented recessed central portion, the method comprising providing a preform (10) having an elongated body for forming a container sidewall and being closed at one end and open at the opposite end, said closed

one end being defined by a bottom (24) having a generally hemispherical outer surface, the preform open end having a neck finish and the elongated body having a section tapering in wall thickness for forming a container shoulder portion, the preform also having a thicker wall in a base forming flute portion (22) of the closed end than in a sidewall forming section (16), and stretch blow moulding the preform (10) to form a bottle (30) having a neck finish and a shoulder and in which the chime area of the base (34) is less oriented than the sidewall, and the chime area and the recessed central portion have an increased thickness relative to the thickness of the sidewall, and the base (34) is continuously reinforced and without ribs."

Claim 1 of the second auxiliary request of appellant I differs from claim 1 of the first auxiliary request of appellant I in that the word "cylindrical" is introduced before the words "thicker wall".

VI. In the written and oral proceedings, appellants II and II and the respondent argued essentially as follows:

All the requests of appellant I fail to comply with the requirements of Articles 123(2) and 76(1) EPC, since they contain subject-matter which extends beyond the content of the application as filed and the parent application as filed.

The features omitted from claim 1 of the application as filed are presented as being essential in the application as filed. As regards the passage at page 4, line 49 to page 5, line 1 of the application as filed, the reference to the body to base portion wall

thickness ratio being constant implies that the body portion and the base portion of the preform each have a constant thickness. It is not accepted that only those features relating to the preform set out in the paragraph at page 4, line 49 to page 5, line 1 of the application as filed are necessary to solve the problem of stress cracking. The use of the word "also" at page 5, line 2, indicates that the features of the bottle disclosed at page 5, lines 2 to 5 are also essential. Claim 1 of the main request thus does not comply with the requirement of Article 123(2) EPC.

The omission of the word "cylindrical" from claim 1 of the application as filed results in an extension of subject-matter beyond the disclosure of the application as filed. Claim 1 of the first auxiliary request thus does not comply with the requirement of Article 123(2) EPC.

The omission of the word "returnable", and of the features of the preform being injection moulded, the sidewall of the container being flexible, the container bottom and the neck finish being formed from the flute portion and the neck finish of the preform respectively from claim 1 of the application as filed results in an extension of subject-matter beyond the disclosure of the application as filed. In addition, the absence of features described as being essential also results in an extension of subject-matter beyond the disclosure of the application as filed. Thus, at page 3, lines 30 and 31 of the application as filed, it is stated "that the intrinsic viscosity of PET homopolymers is an important factor relative to reducing crack initiation and propagation problems." Similarly, at page 5, line 8

of the application as filed, the contact diameter radius of the bottle is described as being "critical".

The combination of features of claim 1 as held allowable in decision T 359/96 of 16 June 1998 concerning the parent case are also essential and should be included in claim 1 of the patent in suit. Claim 1 of the second auxiliary request thus also does not comply with the requirement of Article 123(2) EPC.

Claim 1 of the second auxiliary request does not contain all the features disclosed in independent claims 1 and 17 of the parent application as filed. In particular, the features of the container being refillable and maintaining aesthetic and functional viability over a minimum of at least 5 loops as specified in claim 1 of the parent application as filed have been omitted. As regards claim 17, the features of the preform being injection moulded, a threaded neck portion and the flute portion being between the closed end and the preform body have been omitted. The term "when subjected to alternate pressurisation and caustic washing at 60°C" is not disclosed in the parent application as filed. On the other hand, the features of preform and blow moulding temperature, intrinsic viscosity of the PET, body to base portion wall thickness ratio, increased contact diameter ratio, wall thickness in the area of the injection gate, and sidewall crystallinity are disclosed in the parent application as filed as being essential. The requirement of Article 76(1) EPC is thus not satisfied.

As regards claim 1 according to all requests of appellant I, the term "method of increasing stress

crack resistance" is not clear. The terms "relatively thin" as applied to the sidewall and "relatively thick" as applied to the base of the bottle are also not clear. The requirement of Article 84 EPC is thus not satisfied.

The method disclosed in the patent in suit is only directed to the manufacture of a container having all the features of claim 1 of the parent patent and, in particular, a container in which the sidewall has a crystallinity of 24% to 30%, as discussed in decision T 359/96. The requirement of Article 83 EPC is thus not satisfied.

The subject-matter of claim 1 of the second auxiliary request lacks an inventive step in view of document D30 alone or in combination with document D12. In particular, the closest prior art is represented by either the bottle of Example 3 or Comparative Example 3 of document D30, which have the properties set out in Table 3 at page 19. As shown in this table, the chime area of these bottles has an increased thickness and is less oriented than the sidewall.

The subject-matter of claim 1 of the second auxiliary request is thus distinguished over the disclosure of this reference solely by the feature of the preform having a thickened flute portion. This feature is, however, known from documents D11 and D12. Since the only possibilities for altering the form and orientation of the base are to either change the form of the preform or the distribution of heat during blow moulding, the use of a preform having a thickened flute portion in order to provide more material in the region

where it is required does not involve an inventive step.

The subject-matter of claim 1 of the second auxiliary request also lacks an inventive step in view of document D8 alone or in combination with either document D4 or document D5.

The acknowledgement of document D30 introduced into the description is inadequate in that it does not indicate which features of claim 1 of the second auxiliary request are known from this document.

VII. In the written and oral proceedings, appellant I argued essentially as follows:

As stated in decision T 359/96 (point 2 of the Reasons), the description of the application as filed "resembles a scientific research report setting out the various stages of development on the route towards a commercially and functionally viable returnable PET container" and should accordingly be read in this way. At page 2, lines 32 to 34, of the application as filed, it is stated that "It is **an** aim of this invention to provide a method of blow moulding a refillable thermoplastic PET container having a thin-walled, flexible body which can retain its aesthetic and functional performance over five to ten complete refill trips or loops" (emphasis added). This is thus not the only aim, it being noted that the claims of the application as filed do not specify PET. The statement of the problem to be solved is found at page 3, lines 23 to 29, which states that crack failure occurs primarily in the base area. The description continues

at page 4, lines 25 to 27, with the conclusion that caustic solution acts as a stress crack agent. At page 4, lines 28 to 36, it is explained how cracks occur. Then, at page 4, line 49 to page 5, line 1, the solution to the problem is set out. A person skilled in the art would then realise that an invention had been disclosed and would not read further. However, the reference to the body to base portion wall thickness ratio being constant in this passage does not imply any limitation for an individual preform and merely has a meaning when comparing one preform with another.

It is not the correct approach to start from the claims and then work backwards. The person skilled in the art reading the claims of the application as filed would realise that not all the features of the claims are essential for solving the problem of stress cracking, in particular, features relating to the shoulder portion of the bottle. In addition, the plethora of features drawn from the description of the application as filed and alleged by the remaining parties to be essential are merely preferred features. The features of the bottle as set out at page 5, lines 2 to 5, do not have any technical effect and therefore cannot be regarded as being essential. The same applies to the value of intrinsic viscosity disclosed at page 5, lines 6 to 8. Claim 1 of the main request thus satisfies the requirement of Article 123(2) EPC.

The term "cylindrical" as used in claim 1 of the application as filed with respect to the thicker wall in a base forming flute portion is clearly not essential, since the skilled person knows that it is necessary, when forming a preform by injection

moulding, to provide a taper to enable the preform to be separated from the mould core. Claim 1 of the first auxiliary request thus satisfies the requirement of Article 123(2) EPC.

Claim 1 of the second auxiliary request satisfies the requirement of Article 123(2) EPC, the reasons having been given in connection with claim 1 of the first auxiliary request.

Claim 1 of the second auxiliary request also satisfies the requirement of Article 76(1) EPC. The features contained in the independent claims of the parent application as filed and omitted in claim 1 of the second auxiliary request are plainly not essential in order to increase stress crack resistance.

Claim 1 of the second auxiliary request also satisfies the requirements of Articles 83 and 84 EPC. In particular, the method of blow moulding disclosed in the parent application as filed is not restricted to containers having all the features specified in claim 1 of the parent application as filed, or having a specified crystallinity. Claim 1 of the second auxiliary request contains all the features which are necessary to reduce the crack problem.

Document D30 can be regarded as being the closest prior art. The problem is then to produce a bottle having reduced stress cracking during caustic washing and pressurisation. The solution to this problem is to use a preform structure having a cylindrical flute portion.

Document D30 teaches that, in order to change the properties of the bottle, the heating regions should be altered and not the preform structure. This document thus does not provide any incentive to change the preform structure. Document D30 is concerned with the problems of thermal stability during hot filling, which are overcome by maximising the fully expanded zone. As shown in Table 3 at page 19, for the bottle according to the invention, the region of high orientation extends around the chime into the dome. The comparative example is not an appropriate starting point, since it is shown to be unsatisfactory. There is accordingly no disclosure of lower orientation in the chime area. The general teaching of document D30 as well as document D9 is to increase the amount of orientation to obtain strength and flexibility.

In contrast, according to the present invention, it is found that a high degree of orientation in the base area leads to stress cracking.

Document D12 is not concerned with the problems of stress cracking or thermal stability or with bottles having a champagne-type base. A discussion of the teaching of this document is found in decision T 601/94 of 21 January 2000, which concerns an application which is also divided out of the parent application of the patent in suit.

Claim 1 of the second auxiliary request thus also satisfies the requirement of Article 56 EPC.

The acknowledgement of document D30, which has been introduced into the description of the patent in suit, satisfies the requirements of Rule 27(1)(b) EPC.

Reasons for the Decision

1. *Main Request*

1.1 Amendments

A number of features present in claim 1 of the application as filed are omitted from the present claim 1. In order to decide whether or not these amendments are allowable, it must be considered whether or not these features were presented as being essential in the application as filed. These features include:

- (i) the preform having an elongated body, the open end of which having a neck finish and the elongated body having a portion adjacent the neck finish tapering in wall thickness for forming a container shoulder portion, and
- (ii) the closed end of the preform being defined by a bottom having a generally hemispherical outer surface and comprising a cylindrical container base-forming flute portion.

The method of claim 1 is intended to solve the problem of providing "a method of blow moulding a refillable thermoplastic PET container having a thin-walled, flexible body which can retain its aesthetic and functional performance over five to ten complete refill

trips or loops" (page 2, lines 32 to 34 of the application as filed). In particular, known containers are not capable of being refilled and reused, owing to the occurrence of stress cracking which occurs as a result of hot caustic washing and pressurisation (page 2, lines 49 to 53, and page 4, lines 25 to 27 of the application as filed). Whilst the passage at page 4, lines 28 to 36 of the application as filed emphasises the role of the base in stress cracking, it is also noted that "axial crack initiation but not propagation was evident in the shoulder or neck transition area (from the unoriented to the oriented PET bottle sidewall)." It thus cannot be concluded from the description of the application as filed that features of claim 1 associated with the container shoulder portion as set out above under point (i) are not essential for solving problems pertaining to stress cracking.

In addition, the application as filed does not give any indication that features as set out above under point (ii) may be omitted whilst nevertheless solving problems of stress crack resistance. Indeed, the person skilled in the art would expect that the shape of the closed end of the preform will have an effect upon the stress crack resistance of the resulting bottle.

It is not accepted that the passage in the description of the application as filed at page 4, line 49 to page 5, line 1, will suggest to the skilled reader that features which are not mentioned in this passage are not essential for solving the problem of stress cracking, thus implying that all the features mentioned in this passage must be considered essential. This is

clearly not the case. Thus, this passage refers to the body portion being of a constant thickness, and specifies that "the body to base portion wall thickness ratio will remain constant". Claim 1 does not specify that the body portion is of a constant thickness and does not specify a body to base portion wall thickness ratio. Further, the following two paragraphs at page 5, lines 2 to 8 of the description of the application as filed refer to values of the base contact diameter of the resultant bottle and to the intrinsic viscosity of the PET. Again, these features are not present in claim 1. Appellant I has argued that the claims of the application as filed were directed to a method of blow moulding and thus do not relate to the invention now claimed which is directed to a method of increasing stress crack resistance of a bottle. This cannot be accepted. Since claim 1 specifies the steps of providing a preform and stretch blow moulding the preform to form a bottle, the claim is in fact directed to a method of manufacturing a bottle by blow moulding and not to a method in which an existing bottle is treated in some way so as to increase its stress crack resistance. There is thus no reason to suppose that the features specified in claim 1 of the application as filed are not essential for the function of the invention in the light of the technical problem to be solved.

As held in decision T 260/85 (OJ EPO 1989, 105) and subsequently confirmed in a number of decisions, the deletion of such features from an independent claim constitutes a breach of Article 123(2) EPC.

The amendments made to claim 1 of the main request involving the omission of essential features thus do not satisfy the requirements of Article 123(2) EPC and the main request is accordingly not allowable.

2. *First Auxiliary Request*

2.1 Amendments

Claim 1 of the first auxiliary request as compared with claim 1 of the application as filed omits the feature of the thicker wall in the base-forming flute portion being cylindrical. Apart from this feature, the features (i) and (ii) as set out under point 1.1 above have been incorporated into the claim.

Whilst it is noted that the description of the application as filed does not specify that the flute portion 22 is cylindrical, the specific description must be read in conjunction with the drawings, in which the illustrated embodiment has, as shown in Figures 2 and 4, a cylindrical flute portion 22. In this connection it is noted that, since such preforms are generally produced by injection moulding, it is generally desirable to taper the inner surface of the preform from the neck to the bottom thereof in order to enable the preform to be removed from the core of the mould after moulding. It is accordingly necessary to construe the term "cylindrical" as including within its scope a slight taper for the purpose of facilitating injection moulding, whilst nevertheless maintaining a substantially constant wall thickness in this region. The use of the term "cylindrical" is thus not seen as

being in contradiction to the references to the preform being produced by injection moulding.

The amendments made to claim 1 of the first auxiliary request thus do not satisfy the requirements of Article 123(2) EPC and the first auxiliary request is similarly not allowable.

3. *Second Auxiliary Request*

3.1 Amendments

Article 123(2) EPC

Claim 1 refers to "a method of increasing stress crack resistance of a transparent blow moulded polyester bottle" as opposed to the reference in claim 1 of the application as filed to "a method of blow moulding a returnable polyester biaxially oriented container". However, as stated above under point 1.1, the claim specifies the steps of providing a preform and stretch blow moulding the preform to form a bottle, so that the claim is in fact directed to a method of manufacturing a container by blow moulding, and the reference to a method of increasing stress crack resistance is regarded as being an indication of the problem which is intended to be solved by producing the bottle in the specified manner. In this connection, it is not regarded as being appropriate to ask why the amendment was made. The claim must be construed in an objective manner, using the description and drawings as an aid to interpretation.

It was objected that a number of features disclosed in the description, but not present in claim 1 of the application as filed are, in fact, essential for the performance of the invention. For example, the contact diameter radius 32 of the bottle is referred to as being "critical" at page 5, line 8 of the application as filed. Similarly, the intrinsic viscosity of the PET homopolymer is described as being "an important factor relative to reducing crack initiation and propagation problems" at page 3, lines 30 and 31 of the application as filed. It is, however, noted that these features were not present in claim 1 of the application as filed, and these features are regarded as being preferred features which may contribute to a further improvement in stress crack resistance, but are not essential in order to obtain an increase in stress crack resistance.

The amendments made to claim 1 of the second auxiliary request thus satisfy the requirement of Article 123(2) EPC.

The amendments do not extend the protection conferred and are made in order to overcome a ground of opposition. The amendments made to the claims thus also comply with the requirements of Article 123(3) as well as Rule 57a EPC. This was not disputed in the present case.

3.2 Article 76(1) EPC

In the opinion of the Board, the description of the parent application as filed teaches the person skilled in the art a method of forming a transparent bottle by

blow moulding, the bottle possessing increased stress crack resistance when subjected to alternate pressurisation and caustic washing at 60°C. The bottle is thus capable of being cleaned and refilled and thus reused. Features of the preform which give rise to this result are disclosed at page 4, lines 29 to 38, and claim 17, and features of the container are disclosed at page 5, lines 56 and 57; page 6, lines 5 to 8, Figure 5, and claim 9. In connection with the feature of the chime area of the base being less oriented than the sidewall, reference is made to decision T 359/96, point 3.2 of the reasons, where it is stated that this is an inevitable result of the blow moulding process and thus implicitly disclosed.

The subject-matter of claim 1 is thus directly and unambiguously derivable from, and consistent with, the disclosure of the parent application as filed, and the amendments made to claim 1 of the second auxiliary request satisfy the requirements of Article 76(1) EPC.

It was argued that the features of independent claims 1 and 17 of the parent application as filed should be included in the present claim 1. This is not accepted.

Claim 1 of the parent application as filed is directed to a container which maintains "aesthetic and functional viability over a minimum of at least 5 loops wherein each loop comprises:

- (1) an empty state caustic wash followed by
- (2) contaminant inspection and product filling/capping,
- (3) warehouse storage,
- (4) distribution to wholesale and retail locations, and

(5) purchase, use and empty storage by the consumer followed by return to a bottler."

It is not, however, seen as being necessary that claim 1 of the patent in suit should specify these features in their entirety, the claim being concerned with a method of manufacturing a container by blow moulding, to which the cycle of usage of the container is not relevant.

Claim 17 of the parent application as filed specifies that the preform is injection moulded, that the neck portion of the preform is threaded and that the flute portion is situated "between said closed one end and said preform body". It was suggested on behalf of appellant III that these features must be included in claim 1 in order to satisfy the requirements of Article 76(1) EPC. However, the method by which the preform is manufactured and the provision of a screw thread at the neck portion are not regarded as being essential features directed to providing a method of forming a bottle from a preform by blow moulding which solves the problem of increasing stress crack resistance of the bottle. As regards the flute portion, it is not considered that the wording of claim 1 of the second auxiliary request allows of any other arrangement than it being between the closed end and the sidewall forming section.

3.3 Clarity

It was objected that the term "method of increasing stress crack resistance" gives rise to a lack of clarity. However, as set out in paragraph 3.1 above,

this term is understood as being an indication of the problem which is intended to be solved by carrying out the method steps specified in the claim.

The terms "relatively thin" as applied to the sidewall and "relatively thick" as applied to the base of the bottle are clear and mean that the base is thicker than the sidewall.

The requirements of Article 84 EPC are thus satisfied.

3.4 Sufficiency of disclosure

It has been argued that the method disclosed in the patent in suit is only directed to the manufacture of a container having all the features of claim 1 of the parent patent (granted on the basis of the parent application as filed) as maintained in amended form in decision T 359/96 and, in particular, the sidewall having a crystallinity of from 24 to 30%. It is noted that it was held in that decision that the inclusion of this limitation in claim 1 of the parent application as filed was necessary in order to satisfy the requirement of Article 123(2) EPC. This is not, however, the issue at present under consideration.

There is no reason to suppose that the method disclosed in the patent in suit is not capable of producing bottles not possessing all the features of claim 1 of the parent patent as maintained in amended form. There is also no reason to suppose that the method disclosed in the patent in suit is not capable of producing a bottle, the sidewall of which has a crystallinity outside the range of 24 to 30%, whilst nevertheless

having an increased stress crack resistance. The invention is thus disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. The requirements of Article 83 EPC are thus satisfied.

3.5 Novelty

As discussed below in connection with the issue of inventive step, the subject-matter of claim 1 is distinguished over the disclosure of the document regarded as forming the closest prior art, i.e. document D30, by the preform having a thicker cylindrical wall in a base forming flute portion than in a sidewall forming section, and the chime area of the bottle having an increased thickness relative to the sidewall and being less oriented than the sidewall.

Document D4 is solely concerned with bottles whose bottom is reinforced with ribs.

The bottle of document D5 does not possess a chime area having an increased thickness relative to the sidewall.

Whilst the preform and finished product of document D8 possess a sidewall having an increased thickness in its lower region, the product is a squeezable dropper for, for example, eye drops, and not a reusable bottle.

The base of the bottle of document D9 is biaxially orientated, so that there is no suggestion of the chime area of the bottle being less oriented than the sidewall.

Whilst document D11 shows a preform having a thickened region in the base and lower sidewall, there is no mention of the relative wall thicknesses of the resulting bottle, or of the relative degrees of orientation.

Document D12 is concerned with the production of a multi-footed bottle, so that there is no disclosure of the production of a bottle having a champagne-type base.

Thus, none of the prior art documents disclose a method having all the features of claim 1. It may also be noted that no objections of lack of novelty were raised against claim 1 of the second auxiliary request. The subject-matter of claim 1 is thus novel.

3.6 Inventive step

3.6.1 Closest prior art

The closest prior art is represented by document D30, reference being made in particular to Table 3 at page 19. This table sets out thickness, density, expansion and orientation of two bottles, one being made in accordance with Example 3, and the other being made in accordance with Comparative Example 3.

The bottle of Comparative Example 3 is not seen as being a suitable starting point for a bottle having an improvement in its stress cracking resistance properties, thus enabling the bottle to be reused, since it suffers from deformation when filled with hot water at 80°C, as set out in Table 2 at page 18.

As regards the bottle of Example 3, it is made by blow moulding a preform having an elongated body for forming a container sidewall and being closed at one end and open at the opposite end, the closed one end being defined by a bottom having a generally hemispherical outer surface, and the preform open end having a neck finish. The preform thus does not possess a section tapering in wall thickness for forming a container shoulder portion, nor is there a thicker cylindrical wall in a base forming flute portion than in a sidewall forming section.

As regards the wall thickness of the bottle, at point 25, corresponding to the chime area, the wall thickness is 0.395 mm, and thus falls within the values given for points 8, 15 and 22, which lie on the sidewall. However, the wall thickness at points 22, 23 and 24 is somewhat greater than that at points 8, 15 and 25. There is thus no clear and unambiguous disclosure of a chime area having an increased thickness relative to the sidewall. On the other hand, the recessed central area of the base (points 26 and 27) has an increased thickness relative to the thickness of the sidewall, and the base is continuously reinforced and without ribs.

As regards the orientation, the most highly expanded region (a) of the bottle extends into the chime area at point 25 and ends before a "sudden thickness transition point" (see Example 3 at page 15) occurring at point 26, where is found a low expansion portion (b). A non-expanded, non-orientated portion (c) occurs in a recessed central portion at point 27 (it is noted that

Table 3, Example 3 erroneously refers to (a) rather than (c) at this point). As regards the values for axial and circumferential orientation, given in the last column of Table 3, it is noted that, in the axial direction, the orientation at point 25 is greater than that at point 23, but less than that for points 8 and 15. The values for circumferential orientation remain substantially constant. It is further noted that the intention of the inventors of the subject-matter disclosed in document D30 is to increase the biaxially orientated wall area (a) of the bottle and to restrict the low expansion portions (b) to the centre of the bottom (see page 6, lines 3 to 37). There is thus no clear and unambiguous disclosure in document D30 of a chime area which is less oriented than the sidewall.

Document D8 cannot be regarded as the closest prior art. This document does not relate to the production of reusable bottles but to the production of a dropper, for example for eye drops, with a sidewall having a thin portion between upper and lower thicker portions in order to improve the accuracy of dosage of the dropper.

3.6.2 Object of the invention

The object of the invention is to render the bottle capable of being refilled and reused, by reducing stress cracking which occurs as a result of hot caustic washing and pressurisation.

3.6.3 Solution

According to claim 1, the above problem is solved by the preform having a thicker cylindrical wall in a base forming flute portion than in a sidewall forming section, and the chime area of the bottle having an increased thickness relative to the sidewall and being less oriented than the sidewall.

The solution according to the invention is not suggested by any of the cited prior art documents. As stated above, document D30 itself teaches that the strongly biaxially orientated wall area (a) of the bottle should be extended into the chime area, this being achieved by virtue of preheating portions of the preform which come into contact with the mould and the expansion rod during blow moulding (page 9, lines 23 to 32). This thus teaches away from the provision of a chime area which is less oriented than the sidewall.

Document D4 discloses a bottle in which the bottom is reinforced by radial ribs 34 (see, for example, claim 1, and the description at column 2, line 65 to column 3, line 4), and thus teaches away from the provision of a continuously reinforced base.

Document D5 relates to a PET bottle which is intended to be reused. However, this is achieved not with the features of the present invention, but by choosing PET having an intrinsic viscosity greater than 1 (page 5, lines 3 to 9), by modifying the stretching process (page 6, lines 15 to 29), and by using generally thicker walls (page 7, lines 16 to 27).

Document D8 suggests a preform, the lower part 8 of the wall of which is thicker than the middle section 7 of the sidewall (Figure 4). The purpose of this form is, however, to produce a bottle having a thicker lower wall portion 80 adjacent to the base, so as to enable its use as a dropper, for example for eye drops, the feature of a sidewall having a thin portion 70 between thicker portions 60 and 80 being intended to improve the accuracy of dosage of the dropper. The teaching of this document thus does not address problems of stress cracking. In addition, there is no suggestion that the thicker wall portion should be less oriented than the thin portion.

Document D9 contains a similar teaching to that of document D30, to the effect that, in order to obtain strength in the bottom of the bottle, it should be biaxially orientated (see column 1, lines 11 to 29).

Document D11 discloses at page 226, Figure (b), a preform having a greater wall thickness in the bottom region than in the remainder of the preform. The document is in the form of a discussion between two experts, and on page 227, fifth full paragraph, one of these experts comments that such a preform might be used in order to provide more material in the bottom area of the bottle. In reply (sixth full paragraph), the other expert comments that this may cause problems in view of the fact that the thickened portion will show different stretching characteristics as compared with the remainder of the preform, and in an extreme case no stretching at all may occur in the thickened portion. Thus, not only is this document not concerned with the problem of reducing stress cracking, but,

taken as a whole, does not encourage the person skilled in the art to adopt such a preform.

Document D12 discloses the use of a preform as shown in Figure 2, in which the wall thickness continuously increases towards the bottom end, the object being to reduce the amount of plastic material required to form the bottle (page 5, lines 6 to 16). The finished bottle is, however, intended to have a multi-footed bottom (claim 1, line 3). This document is thus not concerned with solving the problem solved by the invention of the patent in suit, and does not offer the solution adopted in the patent in suit.

Other combinations of the above documents also do not lead to the subject-matter of claim 1 without involving an inventive step. Thus, the fact that document D8 is concerned with improving the accuracy of dosage of a dropper and is not concerned with problems of stress cracking when subjected to alternate pressurisation and caustic washing means that the suggested combinations of either document D4 or document D5 with document D8 do not render the subject-matter of claim 1 obvious.

The subject-matter of claim 1 according to the second auxiliary request thus involves an inventive step. Claims 2 to 21 are appendant to claim 1 and similarly involve an inventive step.

3.7 Acknowledgement of the prior art

An acknowledgement of document D30 has been introduced into the description of the patent in suit in the following terms.

"JP-A-54-88481 discloses a biaxially oriented bottle and production method therefor. To provide the bottle with thermal stability, low expansion portions in the champagne-type base and between the shoulder and neck portions are made extremely small, and this is achieved by preheating parison portions corresponding to the neck and the bottom portion contacted by an expansion rod to a high temperature."

It was objected that this is inadequate insofar as no indication is given as to which features of claim 1 according to the second auxiliary request are known from this document. However, in order to satisfy the requirements of Rule 27(1)(b) EPC, it is merely necessary to "indicate the background art which ... can be regarded as useful for understanding the invention ... and, preferably, cite the documents reflecting such art." The passage cited above thus satisfies this requirement, even though no indication is given as to which features of claim 1 are known from this document.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the following documents:
 - (a) claims 1 to 21 filed as second auxiliary request on 28 March 2003; and
 - (b) description, pages 2, 2A, 2B, 3 to 6, submitted during oral proceedings; and
 - (c) drawings, Figures 1 to 6 as granted.

The Registrar:

The Chairman:

M. Dainese

W. Moser