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D E C I S I O N
of 3 May 2001

Case Number: T 0367/98 - 3.2.1

Application Number: 92117740.8

Publication Number: 0537773

IPC: B21D 51/26

Language of the proceedings: EN

Title of invention:

Method and apparatus for necking containers

Patentee:

American National Can Company

Opponent:

Schmalbach-Lubeca AG

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 83, 84, 100(b), 123(2), 123(3)

Keyword:

"Added subject-matter (no)"
"Extension of scope of protection (no)"
"Sufficiency of disclosure (yes)"
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0367/98 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 3 May 2001

Appellant: Schmalbach-Lubeca AG
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 3 February 1998
rejecting the opposition against European patent
No. 0 537 773 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: F. Gumbel
Members: M. Ceyte
P. Mühlens

Summary of Facts and Submissions

- I. The respondent is proprietor of European patent No. 0 537 773 (application No. 92 117 740.8).
- II. The patent was opposed by the appellant (opponent) on the grounds of added subject-matter under Article 100(c) EPC, insufficiency of disclosure under Article 100(b) EPC and lack of patentability under Article 100(a) EPC.

The following state of the art was *inter alia* cited:

D3: EP-A-20 926

D5: US-A-3 964 413

- III. By its decision posted on 3 February 1998 the Opposition Division rejected the opposition and thus maintained the patent as granted.
- IV. On 9 April 1998 the appellant (opponent) lodged an appeal against this decision, with the appeal fee being paid at the same time.

The statement of grounds of appeal was filed on 15 June 1998 together with an expert's report from Prof. Dr-Ing. Eckart Doege.

- V. Oral proceedings before the Board were held on 3 May 2001.

The appellant requested that the decision under appeal be set aside and the patent be revoked in its entirety.

The respondent (patent proprietor) requested that the appeal be dismissed and the patent be maintained on the basis of:

Claims: 1 to 9 filed in the oral proceedings.

Description: pages 4, 7 and 11 filed in the oral proceedings
pages 2, 3, 5, 6, 8 to 10, 12, 13 as granted.

Drawings: as granted.

VI. Clam 1 as amended reads as follows:

"1. A method of forming a tapered neck around an open end of a drawn and ironed container (16) to produce a reduced diameter portion (212) above a side wall (210) through a smooth shaped portion (211) by die necking a necked-in portion on the end of the side wall (210) and a reduced diameter portion (212) adjacent said open end with the necked-in portion having a first segment (CA1) contiguous with said side wall (210) and a second segment (CR1) contiguous with said reduced diameter portion (212); characterized by positively reforming with a die only an upper part of the necked-in portion consisting of the second segment (CR1) and the reduced diameter portion (212) in a die necking operation to decrease the diameter and length of the reduced diameter portion (212) and increase the axial length of the necked-in portion to form a single smooth neck profile on said container."

VII. In support of its requests, the appellant made essentially the following submissions:

- (i) Amended claim 1 basically corresponds to claim 11 as originally filed in the parent application. However there is no basis for the generalization of the wording "metal container" in claim 11 as originally filed to "container". There is also no basis in the application as filed for the replacement of the expression "including" by "consisting of" in the characterising portion of amended claim 1. Claim 1 as amended is therefore not allowable under Article 123(2) EPC.

- (ii) Claim 1 as granted requires the step of reforming only an upper part of the necked-in portion. Amended claim 1 specifies that this step is accomplished by "positively" reforming only the upper part with a die. This implies that the lower part may also be reformed, although not positively with a die. This alternative, the free reforming, being not comprised in claim 1 as granted, there is an extension of the scope of protection and thus a violation of Article 123(3) EPC.

- (iii) The requirement above implies that the lower arcuate portion of the necked-in portion i.e. that adjacent to the side wall of the container, is not positively reformed and thus undergoes a small plastic deformation. However, the expert's report from Prof. Dr-Ing. Eckart Doege shows clearly that the lower arcuate portion is according to Table IV significantly reformed. The 58% change given therein cannot be regarded as a

minor plastic deformation, on the contrary it must be considered as a substantial plastic deformation, which is evidently inconsistent with the claimed teaching, according to which the segment in question is not positively reformed with a die.

Expressed differently, the expert's report as well as *inter alia* Table IV of the patent specification show that the skilled person would not be able to arrive at the claimed teaching, that is reforming only an upper part of the necked-in portion without significantly reforming the lower arcuate segment. In such case the claimed teaching would not meet the requirement of Article 83 respectively 100(b) EPC. In the alternative there would be an objection under Article 84 EPC (clarity).

- (iv) From the foregoing it is apparent for a skilled person that what is actually achieved by the patent in suit is reforming of the entire necked-in portion including its lower arcuate segment.

Document D3 discloses a die necking method which preferably includes three die necking steps. The first two die necking steps disclosed therein produce a container having a smooth necked-in profile. The first die necking operation produces a temporary reduced diameter portion and a temporary curvilinear transition portion. The second die necking operation completely reforms the entire "temporary curvilinear transition portion" formed in the first die necking portion (cf. page 4, lines 5 to 9 of D3 as well as the

expert's report from Prof. Dr-Ing. Eckart Doege). It follows that the claimed method lacks novelty having regard to D3.

- (v) Even if the patent should be considered to disclose the claimed invention clearly enough for it to be performed by the skilled person, in spite of Figures 6 and 11 and the values given in the Tables II and IV, in a manner that only the upper portion is significantly reformed, such a teaching would be obvious in view of D3 and common general knowledge. On page 14 lines 14 to 16 it is namely stated the following:

"Alternately, subsequent forming steps, in accordance with the percentage limits of step two, can be used to achieve larger percentage reductions, while maintaining a single necked configuration".

Thus, D3 teaches that the two first die necking steps can be repeated in order to achieve larger percentage reductions while maintaining a smooth necked-in profile. The skilled person would realise that this can only be accomplished by increasing the axial length of the necked-in portion and thus by reforming the necked-in portion with the exception of its lower arcuate segment.

- VII. The respondent (patent proprietor) rejected the arguments brought forward by the appellant. It submitted that the patent in suit discloses the claimed invention clearly enough for it to be performed by the skilled person, even though some parts of the

description are inconsistent with the claimed teaching. The subject-matter of amended claim 1 was clearly novel and inventive over the opposed prior art.

Reasons for the Decision

1. The appeal is admissible.
2. *Formal allowability of the amendments; clarity*
 - 2.1 Contrary to the appellant's submissions, the amendment of the wording "metal container" in claim 11 as originally filed to "drawn and ironed container" in amended claim 1 is implicitly disclosed in the patent application as originally filed and thus does not contravene Article 123(2) EPC, since it is readily apparent to any technician that a drawn or ironed container is necessarily made of metal. That the container is formed by drawing and ironing is apparent from the description and the drawings and was not objected to as such.
 - 2.2 Claim 1 as at present amended requires that only an upper part of the necked-in portion "consisting of" the second or upper arcuate segment and the reduced diameter portion is "positively" reformed with a die. This wording can be derived from the following passage of the original disclosure page 36, paragraph 2 corresponding to page 11, lines 39 to 47 of the patent specification:

"It can be seen that the second or upper arcuate segment CR, which is the upper part of the necked-in portion is reformed in each subsequent necking

operation while the tapered portion is enlarged. At the same time, the first arcuate segment CA while not being positively reformed by the die, will have a change in its radius of curvature due to a free forming...".

Reference is also made to the further pertinent passage (original page 40 or page 13, lines 21 to 24 of the specification):

"As in the previous embodiment the lower arcuate segment is minimally freely reformed in the six necking operations while the upper part of the necked-in portion including the second arcuate segment is repeatedly reformed."

The above disclosure can only be construed to mean that the upper part of the necked-in portion consisting of the second or upper arcuate segment and the reduced diameter portion adjacent the open end are positively reformed with a die, while the first arcuate segment is not positively but freely reformed.

It follows that the above amendment is adequately supported by the application as filed and is therefore allowable under Article 123(2) EPC.

- 2.3 The appellant contended that by virtue of the added feature "positively", implying the alternative of "free reforming" the lower part being introduced in claim 1 as presently worded, there is an extension of the scope of protection and thus a violation of Article 123(3) EPC. That submission is not correct: the effect of adding the word "positively" in the claim is to exclude the free reforming of the upper part from the scope of protection. On the other hand the notion that the lower

part may undergo a certain reforming step was already to be implied by the skilled reader of claim 1 as granted, in particular when taking account of the passages of the description as referred to above under point 2.2. This means that the scope of protection after this amendment is not extended but limited since one possibility is excluded. Thus this addition does not violate Article 123(3) EPC.

2.4 Claim 1 as at present worded specifies that the upper portion which is positively reformed with a die is the reduced diameter portion adjacent the open end and the second or upper arcuate segment. This provides an adequate definition of the wording "only the upper portion". Thus the appellant's submission the term "only the upper portion" is an indefinite one which renders the claim unclear (Article 84 EPC) does not apply any longer.

3. *Insufficiency of disclosure*

The requirement in claim 1 that only an upper portion of the necked-in portion is positively reformed with a die is an essential feature of the invention. This avoids failure at that location from excessive work hardening of the metal as well as scratching of the outer surface of the container. Also by positively reforming only the upper portion of the necked-in portion, the first or lower arcuate segment of the necked-in portion which is contiguous to the side wall is not overworked.

However, Dr Doege's report shows that the lower arcuate segment is significantly reformed according to Table IV of the patent specification. The fact that the lower

arcuate segment is reformed is also illustrated in Figures 6 to 11 and 19 to 21 of the patent in suit.

This appears to contradict to some extent the teaching of claim 1 and the effects aimed at. There was however no evidence or argument from the appellant to suggest that this contradiction is such that a skilled person would be unable to understand the claimed teaching. The fact that some drawings and tables do not appear to be fully consistent with the claimed teaching is not sufficient to establish insufficiency of disclosure.

Furthermore, independent claims 1 and 10 of the granted patent consistently teach that only an upper part of the necked-in portion is reformed. This teaching is also supported by various passages in the description. Reference is made to page 3, lines 20 to 23 where the following is stated:

"In operation, as the can passes through the apparatus after the initial operation, each of the die necking operations partially overlaps and reforms only a part of previously-formed portion to produce a necked-in portion extends the desired length" (emphasis added).

At page 9, lines 22 to 25 it is said that "the lower segment of the tapered portion adjacent the cylindrical side wall remains substantially unchanged while the second arcuate segment or upper part of the tapered portion is reformed". At the same page at lines 28 and 49, it is emphasized that the lower arcuate segment of the necked in portion "remains essentially unchanged". Reference is also made to page 11, lines 40 to 42 where it is said that the lower arcuate segment is "not positively reformed" and at page 13, line 21 where the

lower arcuate segment is said to be "minimally freely reformed." Furthermore, Figure 18 shows clearly that the lower arcuate segment remains in essence unchanged.

The Board assumes therefore that the skilled person when reading the granted patent as a whole will definitely understand the teaching of the European patent in the sense of reforming with a die only the upper portion excluding the lower arcuate segment but will construe its meaning that there is some free reforming of the lower part of the necked-in portion.

Article 100(b) requires not only that a skilled person be able to understand the teaching of the claim but also that he be able to implement it. This requirement is in the present case met since the interaction of the first and second dies with the container to produce the smoothly tapered neck is clearly set forth: the first lower arcuate will have a change in its radius during the process, but this change is not due to positive contact by the dies. This change in radius is due to a free reforming (see page 11 line 21 of the patent in suit).

The appellant has submitted that contrary to the statement at page 11, line 42, the free forming was not due to the inherent spring back characteristics of the metal. Since this statement has been deleted this objection need not be considered further.

It follows from the above considerations that the claimed teaching can be understood and implemented by a skilled reader. Accordingly the Board concludes that the claimed invention meets the requirements of Articles 83 and 100(b) EPC.

4. *Novelty*

Prior art document D3 discloses a die necking method which preferably includes three die necking operations. In the first die necking operation "a first temporary reduced diameter portion is formed proximal to and juxtaposed to the open end of the container, and a first temporary curvilinear transition portion is formed intermediate of the temporary reduced diameter portions and the remainder of the cylindrically shaped wall (emphasis added), cf. page 3 last paragraph of D3. In the second die necking operation "the first temporary diameter portion is reformed..." and "the first temporary curvilinear transition is reformed to provide a first curvilinear transition portion that is intermediate of the first reduced diameter portion and the remainder of the cylindrical shape wall" (emphasis added), cf. page 4 first paragraph of D3.

Thus contrary to the requirement of amended claim 1 the second die necking operation disclosed in D3 completely reforms the "first temporary curvilinear transition portion" formed in the first die necking operation.

Furthermore, as correctly stated by the respondent designation of the curvilinear transition portion formed in the first die necking operation as "temporary" in the description of D3 represents an additional support for the fact that the entire necked-in portion is completely reformed in the second die necking operation. The term "temporary curvilinear transition portion" excludes by definition any type of permanent structure.

Although it is true that D3 teaches the use of

"subsequent forming steps" to achieve "larger percentage reductions while maintaining a single necked configuration" (page 4, lines 14 to 16), this does not change the fact that the second die necking step completely reforms the entire necked-in portion formed in the first die necking step.

Finally, although Dr Doege in his report emphasised the contradiction between the claimed teaching and some parts of the description, he conceded that in the claimed method only the upper portion of the necked in portion is reformed. In contrast thereto it was said that according to Figure 9 of D3, not only the upper arcuate portion and the tapered portion but also the lower arcuate portion were subsequently reformed.

It follows that the subject-matter of amended claim 1 is novel over the opposed prior art document D3 which was the only prior art document which played a role at the oral proceedings concerning novelty.

5. *Inventive step*

- 5.1 Both parties agreed that document D3 represents the nearest prior art.

An objective assessment of what is actually achieved by the subject-matter of amended claim 1 over the nearest prior art allows the problem to be formulated as an improved method of necking a drawn and ironed container which avoids scratching and overworking the shoulder portion extending from the side wall to the necked-in portion (see in particular, page 3, lines 43 to 45, and page 12, lines 12 to 15 of the patent specification).

As outlined above, this problem is solved by the step defined in claim 1 of positively reforming only an upper part of the necked-in portion consisting of the reduced diameter portion and the upper arcuate segment contiguous with said reduced diameter portion, so that the lower arcuate segment is not positively reformed, being not brought into contact with the die when the reduced diameter portion and the upper arcuate segment are reformed.

- 5.2 As has been already explained in point 4 above, there is no disclosure or suggestion in document D3 of reforming only the upper portion of the necked-in portion consisting of the reduced diameter portion and the upper arcuate segment because in the second die necking operation the entire previously necked-in portion is reformed.

The appellant contended that the claimed teaching would be obvious in view of the passage of D3 at page 14 lines 14 to 16 and common general knowledge:

The above passage relates to "the subsequent forming steps" and not to the first two steps. It by no means teaches a second die necking operation which positively reforms only the necked-in portion with the exception of the lower arcuate segment which is freely reformed.

Even if larger percentage reductions could only be achieved by reforming only the upper part of the necked-in portion in the subsequent steps while maintaining a smooth necked-in profile, this would not have prevented the skilled person from performing the second die necking step as taught in D3 that is by completely reforming the entire necked-in portion which

is formed during the first die necking step.

5.3 The claimed teaching is also inventive over the combination of D3 and D5, because D5 teaches a process of die forming a short-height, small radius strengthening hoop at the peripheral edge of the side wall (column 4, lines 49 to 51). The strengthening hoop conditions the container for the second die necking operation, and allows for a greater than normal reduction in diameter during the second operation. As shown in Figures 7 and 8 of D5, the container is not in a condition to produce an end portion, because the strengthening hoop is placed too close to the open end, leaving no room to create a flange for double seaming. The second die necking operation, as shown sequentially in Figures 9 and 10 of D5, forms a necked-in portion axially lower on the container than the strengthening hoop formed in the first operation. The second die necking operation completely reforms the strengthening hoop into the reduced diameter. It is evident that the second die necking operation in D5 does not reform only an upper portion of the necked-in portion as required by claim 1. Thus, it is clear that D5 does not disclose or suggest the claimed solution.

5.4 Therefore, in the Board's judgement the subject-matter of claim 1 involves an inventive step (Article 56 EPC) so that the patent is to be maintained on the basis of this main claim.

6. Dependent claims 2 to 9 which concern particular embodiments of the invention claimed in claim 1 are likewise allowable. This is also true for the description now on file.

Thus the opposition grounds do no prejudice the maintenance of the patent in amended form.

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 documents indicated in point V above.

The Registrar:

The Chairman:

S. Fabiani

F. Gumbel