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D E C I S I O N
of 14 March 2000

Case Number: T 0912/98 - 3.2.1

Application Number: 93301773.3

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Title of invention:
Closure for containers

Patentee:
M C G CLOSURES LIMITED

Opponent:
CROWN CORK AG

Headword:
-

Relevant legal provisions:
EPC Art. 84

Keyword:
"Clarity (no)"

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-

Catchword:
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Case Number: T 0912/98 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 14 March 2000

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 31 July 1998 revoking European patent No. 0 561 545 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: F. Gumbel
Members: S. Crane
J. Willems

Summary of Facts and Submissions

I. European patent No. 0 561 545 was granted on 20 December 1995 on the basis of European patent application No. 93 301 773.3

II. The granted patent was opposed by the present respondents on all of the grounds available under Article 100 EPC, namely lack of novelty and/or inventive step (Article 100(a) EPC), insufficiency of disclosure (Article 100(b) EPC) and addition of subject-matter (Article 100(c) EPC).

III. With its decision posted on 31 July 1998 the Opposition Division revoked the patent. The reasons given for the decision were that claim 1 of the respective sets of claims according to both the main and auxiliary requests under consideration were unclear contrary to Article 84 EPC and that claim 1 according to the auxiliary request contained added subject-matter contrary to Article 123(2) EPC.

IV. A notice of appeal against this decision was filed on 10 September 1998 and the fee for appeal paid at the same time.

The statement of grounds of appeal was filed on 5 November 1998. With this statement the appellants submitted first to third sets of amended claims for consideration by the Board with a view to overcoming the objections raised in the contested decision. With a letter received on 8 March 1999 they submitted a fourth set of amended claims.

V. In a communication pursuant to Article 11(2) RPBA posted on 25 November 1999 the Board commented on various issues with respect to Articles 84, 123(2) and 123(3) concerning the amended claims. In point 3(c) the Board stated *inter alia* that it was not clear what was meant by the statement that the obverse curve is "more sharply defined" than the other curves and that to the extent that the intended meaning was that the radius of curvature was smaller than that of the other curves, it would appear difficult to reconcile this with what was shown in the drawings.

VI. With a letter received on 3 February 2000 the appellants cancelled the previous first to fourth sets of claims and replaced them with fifth to seventh sets.

VII. At oral proceedings before the Board on 14 March 2000 the appellants requested maintenance of the patent in amended form on the basis of the fifth set of claims (main request) or in the alternative on the sixth or seventh sets of claims (first and second auxiliary requests respectively).

Claim 1 according to the main request reads as follows:

"A container closure (1) moulded from plastics material and comprising a crown (2), an annular skirt (3) depending from the crown and formed with a screw thread (4) on its internal surface;

a tamper evident ring (6) connected to the end of the skirt remote from the crown by a series of frangible bridges (5) extending across an axial gap between the ring and the skirt and being adapted to accept capping load:

said ring (6) having spaced along its inner surface a plurality of radially inwardly projecting protrusions (11) each having an abutment surface (12) generally facing the crown but having a slight inclination away from the crown in the radially inward direction, and an inwardly facing cam surface (9) inclined away from the crown;

characterised in that the inwardly facing cam surface is continuous and has a compound curve tapering downwardly from the abutment surface (12), said compound curve comprising an extended gentle curve (9a) tapering circumferentially of said ring in the screwing-on direction, a sharper curve (9b) tapering axially of the closure, and an obverse curve (13), more sharply defined than the other curves (9a, 9b) of the compound curve, tapering circumferentially of the ring in the screwing-off direction."

The respective preambles of claim 1 according to the first and second auxiliary requests correspond to the preamble of claim 1 of the main request. The respective characterising clauses read as follows:

First auxiliary request:

"characterized in that the inwardly facing cam surface has a continuous compound curve tapering downwardly from the abutment surface (12), said compound curve being formed with both an extended gentle curve (9a) tapering circumferentially of said ring in the screwing-on direction and an intermediate curve (9b) extending axially of the closure and with an obverse curve (13), more sharply defined than the other curve portions (9a, 9b) of the compound curve tapering

circumferentially of the ring in the screwing-off direction.

Second auxiliary request:

"characterised in that the inwardly facing cam surface is continuous and has a compound curve tapering downwardly from the abutment surface (12), said compound curve comprising an extended gentle curve (9a) tapering circumferentially of said ring in the screwing-on direction, a sharper curve (9b) tapering axially of the closure, and an obverse curve (13), more sharply defined than the other curves (9a, 9b) of the compound curve, formed circumferentially of the ring in the screwing-off direction, further wherein the length of spacings between the protrusions (11) in the circumferential sense exceed the circumferential length of each protrusion and wherein the protrusions (11) are so disposed about the central axis of the closure (1), that no two protrusions are diametrically opposite to each other in any sense."

The respondents requested that the appeal be dismissed.

VIII. The arguments brought forward by the appellants in support of their requests can be summarised as follows:

The objections raised in the contested decision had either been met by the amendments made or were not justified.

In particular, the requirement added to the preamble of the claim that the frangible bridges were adapted to accept capping load would have been immediately

apparent to the person skilled in the art reading the original application from which it was evident that the closure to which the invention related was of this well known type.

As for the definition of the form of the three curves making up the cam surface of the protrusions the terms used were substantially the same as those used in the description as originally filed so that there could be no objection to added subject-matter. Furthermore, the definition was clear in itself and unambiguously conveyed the requirement that the radius of curvature of the obverse curve (13) was smaller than that of the other two curves (9a) and (9b). The term "obverse" was merely used to indicate that the curve involved extended in the opposite direction to the extended gentle curve (9a).

IX. In reply the respondents argued substantially as follows:

There was nothing in the original application which could be understood as teaching that all of the capping load was transferred via the frangible bridges, indeed original dependent claim 7 indicated that embodiments were envisaged where this was not the case. If on the other hand the intended meaning of the amendment made to the preamble of claim 1 was that the frangible bridges could accept some but not all of the capping load than the added requirement was substantially meaningless, as this would always be the case, and the amendment should therefore be disallowed as being superfluous.

The terms "extended gentle curve", "sharper curve" and "obverse curve more sharply defined than the other curves" were each unclear in themselves and even taken together did not provide an adequate definition of the form of the cam surface to which they related. If, on the other hand, the contention of the appellants was accepted that the person skilled in the art would understand the terms as meaning that the "obverse curve" was to have a smaller radius than the "sharper curve" which in turn had a smaller radius than the "gentle curve", than that construction of claim 1 according to the main request found no basis in the original disclosure so that the claim understood in that way would fall foul of Article 123(2) EPC. The same objection applied *mutatis mutandis* to claim 1 of the auxiliary requests.

Another objection under Article 123(2) EPC which applied to claim 1 of all three requests was to the requirement that the cam surface be "continuous", there being no equivalent disclosure of this in the originally filed application documents.

Reasons for the Decision

1. The appeal complies with the formal requirements of Articles 106 to 108 and Rules 1(19 and 64 EPC; it is therefore admissible.

2. Given the relative technical simplicity of the subject-matter involved it is perhaps somewhat surprising that the way the alleged invention has been defined in the claims has given room to so much contentious discussion

between the parties. The patent is concerned with a well known form of screw-threaded "tamper evident" container closure, in other words a closure which cannot be removed from the container and then replaced without leaving evidence of the fact. To this end a tamper evident ring is connected to the bottom of the closure skirt by a series of frangible bridges and the ring has a plurality of inwardly facing projections each with an upper abutment surface which engage under a security band formed on the neck of the container. When the closure is screwed off the neck of the container the abutment surfaces of the protrusions prevent axial movement of the tamper evident ring with the result that the frangible bridges are broken. At the time that the closure is originally applied to the container the protrusions have to pass over the security band, which deforms the tamper evident ring and can lead to permanent damage. There is therefore a need to provide protrusions which by virtue of an appropriate inner camming surface offer as little resistance as possible to the closure being successfully applied, but which nevertheless offer as mush resistance as possible to the tamper evident ring being screwed off intact with the closure.

What the patent proposes in this respect is protrusions having the form which can be seen in Figures 1, 2A and 2B of the drawings. Referring to Figure 1 of the original application each protrusion has an overall outline shape, seen in plan view from the axis of the closure, which approximates to a quarter ellipse with one longer straight side extending circumferentially and a shorter straight side extending axially downwardly therefrom. That shorter straight side is

located at the rear end of the protrusion considered in the screwing-on direction of the closure. The abutment surface of the protrusion extends along the longer straight side thereof. The curved side of the protrusion joining the ends of the straight sides to complete the quarter-ellipse is therefore at the forward end of the protrusion seen in the screwing-on direction. Referring to the cross-sections of Figures 2A and 2B it can be seen that the main forward facing, i.e. camming, surface area portion of the protrusion is curved both in the circumferential and the axial directions, with the thickness of the protrusion decreasing both in the forwards direction and downwardly, thus giving a curved wedge which tapers both circumferentially and axially. The rear end of this wedge considered in the circumferential direction extends along the shorter straight side of the protrusion mentioned above and is formed by a relatively narrow, sharply re-entrant surface.

None of this is the subject of any real dispute between the parties. What is in dispute, having regard to the requirements of both Article 84 EPC (clarity) and Article 123(2) EPC (addition of subject-matter) is the way in which the appellants have sought to define the shape of the inwardly facing surface of the protrusions in the characterising clause of claim 1 in an attempt to provide a more adequate distinction over the state of the art relied upon by the respondents.

In particular, the respondents take the view that each of the terms "extended gentle curve", "sharper curve" and "obverse curve more sharply defined than the other curves" is inherently unclear and fundamentally

unsuited clearly to define the matter for which protection is sought as required by Article 84 EPC. The Board cannot agree with that contention in its wide-ranging generality.

It is true that each of the terms "extended gentle curve" and "sharper curve", considered individually, is of a relative nature and imprecise; taken as a pair, however, and read in the light of the description there can be no genuine doubt as to what the requirement of claim 1 is, namely that the radius of curvature of the inwardly facing cam surface considered in the axial direction is smaller (i.e. the curve is "sharper") than the radius of curvature of this surface in the circumferential direction. The respondents argue that such a relationship between the radii of curvature was not in fact originally disclosed. Again, the Board cannot agree. Although the description of the drawings in the original application is somewhat obscured by inconsistency in terminology and mention of a "Figure 2c" which does not exist, the references in column 3, lines 22 to 25, of the published A-document to an "extended gentle radius (9a)" and a "smaller radius 9b" and in column 3, lines 35 to "the comparatively gentle curve (9a)" taken in conjunction with what is shown in the original Figures 2A and 2B themselves, provide adequate support for this interpretation of the claim.

It is however different with respect to the definition of the portion of the surface of the protrusion which tapers circumferentially in the screwing-off direction as an "obverse curve, more sharply defined than the other curves". Since it is not clear in the context

what the "definition" of a curve is intended to be there is corresponding obscurity about a requirement that one curve be "more sharply defined" than another. The argument of the appellants that the term could only be understood as meaning that the radius of the "obverse curve" is smaller than that of both the "extended gentle curve" and the "sharper curve" cannot be accepted by the Board most importantly for the reason that there is no basis for this in the original disclosure. It is merely stated at column 3, lines 27 to 29 of the description that "obverse curve (13) is much more sharply defined than the other portion of the compound (9) as shown in Figure 2B". That Figure, which shows the cross-section of a protrusion in the circumferential direction, can however in no way be taken as indicating to the person skilled in the art that the relevant surface portion (erroneously referenced as "9b" in the Figure, since corrected to "13" in the corresponding Figure of the patent specification) should have a radius of curvature smaller than that even of the "extended gentle curve" (9a) which can be seen there. Indeed the opposite seems to be more the case; the relevant surface portion appears to form a substantially flat step which joins the rearward edge of the forward facing camming surface of the protrusion to the inner surface of the tamper evident ring. In fact, the relevant surface portion (again erroneously referenced as "9b") is defined more or less in these terms, namely as "a more sharply re-entrant inclined surface" in original dependent claim 2. (For completeness it should be noted that in amending Figure 2B with respect to the erroneous reference numeral the relevant surface portion has also, presumably inadvertently, been re-drawn and given

a slightly more convex appearance.) Furthermore, there is nothing in the described function of the "obverse curve (13)" which could lead the person skilled in the art to the conclusion that this should be of a smaller radius than the curves (9a) and (9b). All that is said in this context, cf. column 3, lines 50 to 57, of the description is that on unscrewing the closure the obverse curve (13) presents a leading edge to the security band and that the "sharper definition of curve (13) makes it much more difficult for the ring to jump the shoulder of the security band". The Board cannot see how the person skilled in the art would associate with that statement any requirement as to the radius of curvature of the obverse curve (13) in relation to the radii of the curves (9a) and (9b).

The Board therefore comes to the conclusion that respective claims 1 according to the main request and first and second auxiliary requests, all of which refer to an "obverse curve (13), more sharply defined than the other curves (9a, 9b)" are unclear and cannot be allowed (Article 84 EPC).

In these circumstances there is no need to investigate whether, as alleged by the respondents, the use of the term "obverse" in the claims is in itself unclear. Similarly there is no need to investigate the objections of the respondents with respect to the addition of subject-matter.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani F. Gumbel