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D E C I S I O N
of 28 April 1999

Case Number: T 0842/97 - 3.2.1

Application Number: 91311334.6

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Language of the proceedings: EN

Title of invention:
Can bodies

Patentee:
CarnaudMetalbox plc

Opponent:
American National Can Company

Headword:
-

Relevant legal provisions:
EPC Art. 54(2) and (3)

Keyword:
"Novelty (no)"

Decisions cited:
-

Catchword:
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Case Number: T 0842/97 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 28 April 1999

Appellant: (Proprietor of the patent)
CarnaudMetalbox plc
Woodside
Perry Wood Walk
Worcester WR5 1EQ (GB)

Representative:
Parry, Christopher Stephen
Saunders & Dolleymore
9 Rickmansworth Road
Watford, Herts WD1 7HE (GB)

Respondent: (Opponent)
American National Can Company
8770 West Bryn Mawr Avenue
Chicago, Illinois 60631-3542 (US)

Representative:
Miller, James Lionel Woolverton
Kilburn & Strode
20 Red Lion Street
London WC1R 4PJ (GB)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 8 July 1997 revoking European patent No. 0 492 861 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. 0 492 861 was granted on 3 August 1994 on the basis of European patent application No. 91 311 334.6 which claimed priority from GB 90 27 851 dated 21 December 1990.

Independent claims 1 and 7 of the granted patent read as follows:

"1. A metal can body for a beverage can made by drawing and ironing sheet metal to comprise a bottom end wall (2) and a generally cylindrical side wall (3); the side wall comprising a bottom portion (4) of circular cross section connected to the bottom wall, a central portion of constant wall thickness extending above the bottom portion, and a top portion of circular cross-section (6) extending above the central portion and terminating in an open end; wherein the top portion and bottom portion are of greater wall thickness than the central portion and are respectively connected to the central portion through upper and lower cylindrical zones of reducing wall thickness (7, 8); characterised in that the side wall is provided with a plurality of parallel sided panels (11) each joined to the next by an externally convex longitudinal rib (10), said ribs and panels being equally spaced around the circumference of the can body; and in that the ribs and panels terminate at either end within the zones of reducing wall thickness (7, 8)."

"7. A method of forming a can body for a beverage can

according to Claim 1 comprising the steps of

a) blanking a disc from sheet metal, drawing a cup from the disc to form a bottom end wall and a side wall, and wall ironing the side wall to form a can body comprising a bottom end wall (2) and a generally cylindrical side wall (3); the sidewall comprising a bottom portion (4) of circular cross-section connected to the bottom end wall, a central portion (5) extending above the bottom portion, and a top portion (6) of circular cross-section extending above the central portion and terminating in an open end; wherein the top portion (6) and bottom portion (4) are formed to have a greater wall thickness than the central portion (5) and are respectively connected to the central portion through upper and lower cylindrical zones (7, 8) of reducing wall thickness;

the method being characterised by the subsequent step of

b) forming, without further stretching, a plurality of parallel sided panels (11) in the sidewall, each formed to the next by an externally convex longitudinal rib (10); said ribs and panels being equally spaced around the circumference of the can body; wherein the ribs and panels terminate at both their ends within the zones (7, 8) of reducing wall thickness."

Dependent claims 2 to 6 relate to preferred embodiments of the can body according to claim 1.

II. The granted patent was opposed by the present respondents on the grounds that its subject-matter lacked novelty and/or inventive step (Article 100 (a) EPC).

Of the published documents relied upon in the opposition proceedings only the following have played any significant role on appeal:

(D) WO-A-91/11275
(G) US-A-4 578 976
(I) EP-A-0 425 124
(W) "Drawn and Ironed Aluminium Cans", published by Aluminium Company of America, 1975
(X) US-A-4 953 738.

The respondents also relied on the public prior use in February 1990 of an aluminium beverage can having a fluted can body, hereinafter designated the "ANC can".

II. With its decision posted on 8 July 1997 the Opposition Division revoked the patent. The reason given in the decision was that the subject-matter of granted claims 1 and 7 lacked novelty with respect to document X.

III. An appeal against this decision was filed on 4 August 1997 and the fee for appeal paid at the same time. The statement of grounds of appeal was filed on 21 August 1997.

The appellants (proprietors of the patent) requested that the decision under appeal be set aside and the patent maintained as granted (main request) or in the alternative that the patent be maintained in amended form on the basis of a set of claims 1 to 4 submitted with the statement of grounds of appeal (auxiliary request).

The respective preambles of the independent claims 1 and 4 of the amended claims correspond to those of claims 1 and 7 of the granted claims; the respective characterising clauses read as follows:

1. "characterised in that the side wall is provided with a plurality of parallel sided outwardly concave or substantially flat panels (11) each joined to the next by an externally convex longitudinal rib (10), said ribs and panels being equally spaced around the circumference of the can body and said panels having semi-elliptical shaped end areas; and in that the ribs and panels terminate at either end within the zones of reducing wall thickness (7, 8)"

4. "the method being characterised by the subsequent step of

   b) forming, without further stretching, a plurality of parallel sided outwardly concave or substantially flat panels (11) in the sidewall, each formed to the next by an externally convex longitudinal rib (1); said ribs and panels being equally spaced around the circumference of the can body and said

panels having semi-elliptical shaped end areas; wherein the ribs and panels terminate at both their ends within the zones (7, 8) of reducing wall thickness."

IV. Oral proceedings before the Board were held on 28 April 1999.

V. The arguments put forward by the appellants in support of the novelty of the claimed invention can be summarised as follows:

The clear and consistent teaching of document X was that the ribs provided in the side wall of the can body had to be externally concave. The passages relied upon by the Opposition Division in coming to the conclusion that these ribs could be externally convex had been taken out of context. In particular the reference in column 2 at lines 40 to 44 to "concave or convex" groove-rib means had to be seen in the context of the fact that some of the ribs provided in the bottom of the can body were indeed specifically disclosed as being convex. Furthermore, the reference in column 4 at lines 8 to 14 to the advantage of concave ribs over convex ribs in the side wall was merely a figure of speech and could not be assimilated to an actual teaching of such convex ribs.

The measurements of the prior used ANC can performed by both the appellants and the respondents had demonstrated that the ribs and panels at the bottom end of the side wall of the can body did not extend into the transition zone of varying wall thickness but instead stopped some way short of it. Although the

graphs which had been produced of the wall thickness with respect to the longitudinal position along the side wall showed a slight variation in thickness in the area where the ribs ended, this area of slight variation was clearly outside the transition zone which was a well defined area with a markedly higher rate of change of thickness. In this context there was no difficulty in identifying where the ends of the ribs were positioned since the length of the ribs was coextensive with the length of the parallel sided parts of the panels.

Both of documents D and I, which belonged to the state of the art according to Article 54(3) EPC, disclosed metal beverage can bodies having a side wall provided with parallel sided panels separated by externally convex ribs. There was however nothing in either of those documents which gave any indication of the relative position of the ends of the panels and ribs with respect to any transition zones of varying wall thickness which might be present in the wall of the can body. The assertion of the respondents that all can bodies of the type shown in Figure 11 of document D and Figures 8 and 9 of document I would be automatically understood by the person skilled in the art to have transition zones of a length of the order of 12mm at the top and bottom of the cylindrical side wall, so that by notionally applying this information to those Figures he could immediately recognise that the ribs and panels extended into these zones, did not square with the technical realities as could readily be seen alone from the fact that this was not the case in the prior used ANC can.

Similar considerations applied to the lack of novelty objection raised with respect to the disclosure of document G.

In claim 1 of the auxiliary request it had been specified that panels were outwardly concave or substantially flat and had semi-elliptical shaped end areas. This provided a clear distinction over the disclosure of document X for the case that the arguments presented with respect to the novelty of the can body according to granted claim 1 over this document could not be accepted.

VI. The respondents were of the opinion that the subject-matter of granted claim 1 lacked novelty with respect to each of documents D, G, I and X as well as the prior used ANC can.

In particular, they argued that document X had to be seen as disclosing two embodiments of can body, a preferred one with outwardly concave ribs and a less preferred one with outwardly convex ribs. That second embodiment fully anticipated the subject-matter of granted claim 1, as had been correctly decided by the Opposition Division.

As for the prior used ANC can the appellants had in fact conceded that the ribs and panels at the bottom end of the side wall terminated in a wall zone of reducing wall thickness. All they were asserting was that this zone was not the proper transition zone as such where the rate of change of thickness was at its greatest. Even if it were possible to see some distinction between the zones involved this certainly

found no expression in the terms of the claims. Furthermore, there was no clear basis for determining where the ribs ended so that the position chosen by the appellants in this respect was essentially arbitrary.

Each of the documents D, G and I related to the drawn and ironed aluminium can body of very well known basic type. It was common general knowledge that a can body of this type was provided with transition zones of varying thickness at the top and bottom of the side wall, which zones would be of the order of 12mm long, see document W. The person skilled in the art would therefore understand this to be the case with the can bodies shown in documents D, G and I, even though this was not expressly stated there. It was plainly evident from the relevant Figures in these documents that the ribs and panels shown there must as a consequence terminate in these transition zones.

The features incorporated into claim 1 of the auxiliary request would only be effective to establish novelty over documents G and X. They could be of no assistance with respect to documents D and I and the prior used ANC can.

The respondents therefore requested that the appeal be dismissed.

Reasons for the decision

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

2. *Novelty with respect to the published prior art*

2.1 Document X relates to a metal beverage can body having reinforced side and bottom end walls. In the embodiments of can body particularly disclosed the reinforcement of the cylindrical side wall takes the form of a plurality of parallel circumferentially spaced axially extending "groove-rib portions", each of which is (to use the equivalent terminology of present claim 1) "externally" concave, ie is formed by a groove extending radially inwardly from the main cylindrical side wall surface. (Viewed from the inside of the can body such a groove can be considered to form a "rib" and is occasionally referred to in this manner in document X.) The top and bottom ends of the axial grooves are connected to a respective top and bottom circumferentially extending externally concave groove. These circumferentially extending grooves (and hence the ends of the axially extending grooves and of the panels in the side wall defined between those grooves) lie in respective cylindrical top and bottom transition zones of reducing wall thickness which connect the relatively thicker rim and bottom wall portions of the can body to the relatively thinner central portion of the side wall. The bottom wall of the can body is reinforced by a somewhat complex pattern of "groove-rib portions" some of which are constituted by externally concave grooves and others by externally convex ribs.

In essence the finding by the Opposition Division of lack of novelty with respect to document X is based on two short passages at column 2, lines 40 to 44 and column 4, lines 6 to 13. In the first of these it is stated that "In addition, the shallow-depth groove-rib

means have curved concave or convex cross-sectional configurations of relatively large radius ....". This statement refers to "shallow-depth groove-rib means portions in a particular pattern and in particular locations in the bottom wall portion and in the side wall portion of the can body ...." mentioned previously in the same paragraph. In the second quoted passage it is stated that "The axial rib portions extend parallel to the central axis to increase column strength to prevent buckling. An advantage of radially inwardly offset concave, as opposed to outwardly offset convex, rib portions is that there is no abrasion during shipping and handling and the cans may be processed in the usual manner with conventional equipment, such as necker-flanger, decorator and coater machines and the like."

In contrast to the Opposition Division and the respondents the Board can see nothing in those statements, either taken separately or in combination, which can be fairly said to constitute a disclosure of a can body provided with axially extending externally convex ribs in its side wall. The first of the passages, taken from column 2, is drafted in very general terms and is wholly consistent with the fact that some of the "groove-rib means" provided in the bottom wall of the preferred embodiments of can body are specifically disclosed and claimed as being externally convex rib portions so that the person skilled in the art would not understand this passage as teaching that all of the "groove-rib means" disclosed could if necessary be either concave or convex. The second passage, taken from column 4, is merely an explanation as to why externally concave axial grooves

rather than externally convex axial ribs are provided in the side wall of the can body. It stretches the natural meaning of this passage in an unacceptable manner to see in it in effect the description of a less preferred embodiment of can body, ie one with externally convex axial ribs.

The Board cannot therefore agree with the reasoning on which the finding of lack of novelty underlying the appealed decision was based. The respondents have also advanced in the appeal proceedings an alternative route in an attempt to show that the can body of document X can be read onto the granted claim 1 of the contested patent. According to this route they maintain that what are described in document X as grooves or ribs can be equated to the "panels" of claim 1 and that the undeformed regions of the side wall of the known can body can be equated to externally convex "ribs". However, the Board is of the opinion that the ordinary meaning of the terms "rib" and "panel" in the context of granted claim 1 leaves no room for an interpretation where the circumferential extent of a rib is many times that of a panel, as is the case in document X. Thus this line of argument also fails.

2.2 Both of documents D and I were published after the priority date of the contested patent but are entitled to priority from before that date and so belong to the state of the art according to Article 54(3) EPC. Since this state of the art can only be taken into account when considering novelty and not inventive step, cf. Article 56 EPC, second sentence, it is important to compare the claimed subject-matter strictly with what is clearly and unambiguously disclosed in the cited

documents and to avoid any considerations which would be proper only to the issue of obviousness. On this basis the Board, for the following reasons, is of the opinion that the subject-matter of granted claim 1 is not anticipated by either document D or document I.

Of the two documents involved the Board considers document I, which stems from the present appellants, to be the more relevant. Figures 8 and 9 of that document, which are very similar to Figures 5 and 6 of the present patent, show a beverage can body having a cylindrical side wall divided up into a plurality of inwardly concave panels by a corresponding plurality of axially extending externally convex ribs. In column 11 at lines 20 to 25 it is stated that an aluminium can body as shown with 30 ribs has been produced with a wall thickness (ie in the central cylindrical portion) of 0.1mm. The neck and upper shoulder have a thickness of 0.15mm and the bottom wall a thickness of 0.3mm.

Although no transition zones of reducing wall thickness between these thicker regions and the thinner central cylindrical portion are specifically mentioned, it can be accepted having regard to the manufacturing techniques involved that these must be present. What can however not be accepted is that it is implicit for the person skilled in the art that these transition zones are of such axial extent and are positioned in such a manner that the ribs and panels as shown in Figure 8 will as a consequence terminate within them at both ends of the side wall. In support of their contention that this would indeed be the case the respondents have referred in particular to document W, which on page 39 shows an aluminium can body with

transition zones of 1/2 inch (approximately 12mm) length. It is noted however that the bottom transition zone extends around the shoulder between the bottom wall and the side wall of the can body so that the length of the cylindrical portion of the zone is considerably shorter than 12mm. Furthermore, the appellants have argued that the degree to which the transition zone is located in the bottom wall rather than the side wall is not crucial and can vary considerably according to the tooling set-up. In any case the respondents have not shown that the arrangement shown in document W, even if widely used, had the status of an universally accepted standard in the art and that no other possibilities existed.

In document D there is no mention of the neck and bottom wall regions of the can body being thicker than the side wall so that the basis for being implicit for the person skilled in the art that transition zones of reducing wall thickness are present is to that extent weaker. In any case for the reasons explained in detail above with respect to document I the Board cannot accept that the person skilled in the art reading document D would automatically and unequivocally understand that the ribs and panels in the side wall terminate within top and bottom cylindrical portions of any such transition zones which might be assumed to be present.

2.3 As for document G this, like document D, makes no mention of any transition zones of reducing wall thickness or of any relationship between the ends of the ribs and panels and such zones. The same considerations explained above with respect to

documents D and I concerning the lack of an implicit disclosure of the last feature of granted claim 1 apply here with equal force.

2.4 In summary the Board is therefore of the opinion that none of the cited published prior art documents fully anticipates the subject-matter of claim 1.

3. *Novelty with respect to the prior use*

The respondents have submitted uncontroverted evidence (see Exhibits A, B, V1 and V2) to the effect that they had manufactured and sold a substantial number of beverage cans with drawn and ironed aluminium bodies having fluted side walls before the priority date of the contested patent. Cans of this type manufactured and sold in January/February 1990 have been identified and subjected to measurement by both the respondents and the appellants. The cans involved are code dated 65301A29A, testified as indicating a production date of 29 January 1990 in Chicago, and carry a stamped code date of the costumer to which they were sold (Coca-Cola), testified as indicating that they were filled by the customer on 16 February 1990.

It is in no way disputed by the appellants that the cans (the "ANC cans"), which have been measured by themselves and the respondents were made available by prior use and belong as such to the state of the art according to Article 54(2) EPC. What they do dispute vigorously is that the measurements show that the prior used ANC cans exhibited all of the features required by granted claim 1.

The results of the inspection and measurement of the ANC cans by the appellants are reported in their Exhibit 1, the author of which is the named inventor in the present patent (Mr Claydon). In essence the conclusion of the report is that there are cylindrical transition zones of reducing wall thickness at the top and bottom of the cylindrical side wall of the can body and that the flutes in the side wall (ie the panels and externally convex longitudinal ribs lying therebetween) terminate at the top of the side wall in the transition zone of reducing wall thickness but at the bottom of the side wall terminate approximately 1mm short of where the transition zone of reducing wall thickness begins.

An employee of the representatives of the respondents (Mr Copsey) attended the tests on the ANC cans performed by Mr Claydon. In an affidavit, Exhibit Z, he raises certain criticisms of the methodology adopted by Mr Claydon. He also includes data from one series of measurements made by Mr Claydon but excluded from his report. In the opinion of the appellants this series of measurements called into question the accuracy of Mr Claydon's assessment of the relationship between the end of the ribs and the beginning of the bottom zone of reducing thickness.

Be that as it may, the respondents organised their own investigation of the ANC cans, which was performed by a Mr Patton of the company Pechiney in France. The results of this investigation are contained in Mr Patton's affidavit submitted as Exhibit U. The ANC cans were measured using apparatus commercially known as a "Contoruscope" and a "Formmeter" which were

connected to plotting apparatus for producing permanent traces of the results, attached as "Exhibits B to F" to Mr Patton's affidavit. On the basis of these results and visual inspection of the cans Mr Patton came to the conclusion that at both the top and bottom of the can body both the ribs and the panels terminated in a respective zone where the metal was changing in thickness.

In the course of the opposition and appeal proceedings it has more or less been taken as read by both the parties that the ANC can comprised a can body as defined in the preamble of granted claim 1. The Board is also satisfied on the evidence before it that that is the case. In this context it should however perhaps be noted for completeness that the preamble of the claim is not to be understood as meaning that the zones of reducing wall thickness cannot extend around the shoulders at the top and bottom of the can body which connect the neck portion and bottom wall of the can body to the central substantially cylindrical side wall portion of constant wall thickness.

It is also common ground that the side wall of the ANC can body is provided with a plurality of parallel sided panels each joined to the next by an externally convex longitudinal rib, said ribs and panels being equally spaced around the circumference of the can body, as required by the characterising clause of granted claim 1. Furthermore, as can be seen from the above summary of the evidence submitted, the parties concur that at the top end of the can body the ribs and the panels terminate within the cylindrical zone of reducing wall thickness which connects the upper

portion of the generally cylindrical side wall of greater wall thickness with the central portion of constant wall thickness. Thus the only point of dispute is whether at the bottom end of the can body the ribs and panels also terminate within the corresponding zone of reducing wall thickness found there.

In the opinion of the Board there is no real discrepancy between the actual measurement results reported in Exhibit 1 of the appellants and Exhibit U of the respondents, although if there were the Board would probably have tended to the view that the comprehensive results contained in Exhibit U were more persuasive. Where the difference lies is in how Mssrs Claydon and Patton have respectively interpreted their results. The Board is satisfied that in both cases the ribs, which both experts - as the appellants have suggested would be the natural thing to do - have evidently considered as ending at the point where the sides of the panels cease to be parallel, terminate in an area of the side wall in which there is some change in the thickness of the side-wall. The rate of change of thickness in this area is certainly less than in the immediately adjacent area closer to the bottom shoulder of the can body, but in the opinion of the Board is not negligible. For Mr Claydon and the appellants the change of thickness in this area is so marginal that the area cannot be attributed to the transition zone as this would normally be understood. However, as the respondents have correctly pointed out, granted claim 1 does not use the term "transition zone" and contains nothing which could lead to the conclusion that in the "zones of reducing wall thickness" actually referred to the rate of change of thickness had to be constant or

at a certain level. In view of this the Board is convinced on the basis of the evidence before it that the bottom end of the ribs of the body of the ANC can indeed terminated in the zone of reducing wall thickness present at the bottom end of the side wall and that the same was also true of the ends of the panels, which extended a few millimetres further into the zone.

Accordingly, the Board has reached the conclusion that the subject-matter of claim 1 lacks novelty, Articles 52(1) and 54(2) EPC.

4. *Auxiliary request*

Claim 1 according to the auxiliary request includes the additional features that the panels are outwardly concave or substantially flat and have semi-elliptical shaped end areas.

The appellants have indicated that the purpose of these additional features is to provide further distinctions over the state of the art according to document X, they have not argued that the features involved are capable of distinguishing from the prior used ANC can. It is noted however that at least Mr Claydon was of the opinion, as stated in his affidavit, that the bottom ends of the panels "did not finish in the arched regions as claimed". The Board cannot share that view. On the basis of the various photographs of the prior used ANC cans filed as evidence (Exhibits A, U and 1) the Board is satisfied that the bottom end of each panel can be fairly said to comprise a semi-elliptical end area. In this respect it is noted that the claim

contains no information as to the ratio of the length of the short and long diameters of the ellipse involved nor does it require that the whole of the end of the panel extending beyond the ribs be in the form of a semi-ellipse. That the panels of the prior used ANC can are outwardly concave has never been in question in the course of the proceedings.

As a consequence the subject-matter of claim 1 according to the auxiliary request also lacks novelty.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani F. Gumbel