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D E C I S I O N
of 19 October 2000

Case Number: T 0028/99 - 3.2.1

Application Number: 92111941.8

Publication Number: 0523606

IPC: B65D 83/14

Language of the proceedings: EN

Title of invention:
Floating piston for aerosol can

Patentee:
UNITED STATES CAN COMPANY

Opponent:
Rathor AG

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 0028/99 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 19 October 2000

Appellant: Rathor AG
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Respondent: UNITED STATES CAN COMPANY
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 2 November 1998
rejecting the opposition filed against European
patent No. 0 523 606 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: F. A. Gumbel
Members: S. Crane
J. H. P. Willems

Summary of Facts and Submissions

- I. European patent No. 0 523 606 was granted on 11 September 1996 on the basis of European patent application No. 92 111 941.8.

Independent claims 1 and 2 of the granted patent read as follows:

"1. An aerosol can system comprising a can (10) comprising a generally cylindrical sidewall (12) and top and bottom elements, the lower portion (14) of the sidewall (12) being necked in to a diameter smaller than that of the upper portion of the sidewall (12), a piston (11) disposed within the can (10), the piston (11) comprising a generally cylindrical sidewall (16, 17) with a lower edge, the generally cylindrical sidewall (16, 17) being slightly smaller than the inside diameter of the upper portion of the can sidewall (12), and a top portion (18), the top portion (18) closing the generally cylindrical sidewall (16, 17); characterized in that the piston (11) further comprises recessed projection means (20) depending below the lower edge of the piston sidewall (16, 17), the effective outer diameter of the projection means (20) being somewhat less than the inside diameter of the lower portion (16) of the piston sidewall whereby the recessed projection means (20) set on the can bottom countersink (21) to stabilize the piston (11) when the piston (11) is in its lowermost position.

"2. A piston (11) for use with an aerosol can (10) having a generally cylindrical sidewall (12) and top and bottom elements, the lower portion (14) of the sidewall (12) being necked in to a diameter smaller

than that of the upper portion of the sidewall (12), the piston (11) comprising a generally cylindrical sidewall (16, 17) with a lower edge, the generally cylindrical sidewall (16, 17) being slightly smaller than the inside diameter of the upper portion of the can sidewall (12), and a top portion (18), the top portion (18) closing the generally cylindrical sidewall (16, 17) characterized in that the piston (11) further comprises recessed projection means (20) depending below the lower edge of the piston sidewall (16, 17), the effective outer diameter of the projection means (20) being somewhat less than the inside diameter of the lower portion (16) of the piston sidewall (16, 17) whereby the projection means (20) set on the can bottom countersink (21) to stabilize the piston (11) when the piston (11) is in its lowermost position."

Dependent claims 2 to 8 relate to preferred embodiments of the system according to claim 1 or the piston according to claim 2.

II. The granted patent was opposed by the present appellants on the grounds that its subject-matter lacked novelty and/or inventive step (Article 100(a) EPC). Of the prior art documents relied upon in the opposition proceedings only the following have played any significant role on appeal:

(E1) US-A-4 913 323

(E2) EP-A-0 239 491

(E4) US-A-3 827 607

III. With its decision posted on 2 November 1998 the

Opposition Division rejected the opposition.

- IV. A notice of appeal against this decision was filed on 6 January 1999 and the fee for appeal paid on 11 January 1999.

The statement of grounds of appeal was received on 12 March 1999. In this statement the appellants referred to a new prior art document, viz US-A-4 106 674 (E7).

- V. In a communication dated 11 April 2000 pursuant to Article 11(2) RPBA the Board informed the parties *inter alia* of its preliminary opinion that the belatedly submitted document E7 did not appear more relevant than the prior art documents already on file, so that the Board intended to disregard it pursuant to Article 114(2) EPC.

- VI. Oral proceedings before the Board were held on 19 October 2000.

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

The respondents (proprietors of the patent) requested that the appeal be dismissed and the patent be maintained unamended (main request) or in the alternative in amended form on the basis of the claims according to auxiliary requests I to III filed on 19 September 2000.

- VII. In support of their request the appellants argued substantially as follows:

The subject-matter of independent claim 2 lacked novelty with respect to the piston disclosed in document E4. Taking in particular the piston shown in Figures 9 to 12 of that document it could be seen that the sealing flange constituted the generally cylindrical sidewall of the piston within the meaning of present claim. Depending below the lower edge of this sidewall was a skirt which had a diameter somewhat less than that of the sidewall and constituted projection means within the meaning of the claim. When the piston was in its lowermost position in the can the skirt came to rest on the upwardly domed bottom wall of the can, as could be seen in the schematic drawings of Figures 5 and 7, and acted to stabilize the piston.

As for the system of claim 1 this lacked inventive step with respect to the teachings of documents E1 and E4 and the common general knowledge of the person skilled in the art. Document E1 taught the provision of projections on the lower edge of the piston sidewall which engaged the domed bottom wall of the can when the piston was in its lowermost position. It was obvious that if the lower portion of the can sidewall was necked to a smaller diameter than the rest of the can sidewall then the projections would have to be arranged on a correspondingly smaller diameter to achieve the same effect, as illustrated in principle in document E4.

VII. The arguments of the respondents in reply were essentially the following:

The piston disclosed in document E4 differed from that defined in claim 2 with respect to its structure, mode of operation and purpose. In particular, the known

piston relied on a thin flexible lip-style sealing flange which was pressed against the sidewall of the can to achieve a seal; the claimed piston on the other hand relied for its sealing effect on the viscosity of the product which formed a thin film in a narrow gap of a predetermined size between the piston and can sidewalls. These two basic types of piston arrangement were both well known in the art and it was clearly inappropriate to confound one with the other. There could be no genuine doubt as to what constituted the sidewall of the piston disclosed in document E4; it was certainly not the sealing flange.

Since the claimed invention was specifically concerned with the problem of the tipping of the piston in a can having a sidewall with a necked-in lower portion, it was difficult to see how a combination of the teachings of documents E1 and E4 could render it obvious as neither of these were in any way directed to the solution of this problem. In this respect it had to be noted that the small projections provided around the bottom edge of the sidewall of the piston disclosed in document E1 were solely to form passages for the escape of gas when the can was loaded with product.

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. The claimed invention is concerned with the well known type of pressurized product dispenser in which the product is separated in the can from the gas charge by

means of a floating piston. In particular it is directed to such a dispenser wherein the piston has a generally cylindrical sidewall with a maximum diameter slightly less than the inner diameter of the cylindrical sidewall of the can. This allows a thin film of the product to form between the piston and can sidewalls so as to prevent the pressurised gas from passing the piston and mixing with the product. An example of such a dispenser is disclosed in document E1, which is referred to in the introductory description of the present patent specification. As is mentioned there, the looseness of the piston can lead to it tipping or canting as the can is handled following assembly with the result that the gap between the piston and can sidewalls is non-uniform with the possible consequence of an ineffective seal being formed. The patent specification indicates that this tendency to tip may be aggravated when the can, in a manner well known *per se* (see document E2), has a sidewall which is necked in for the last few millimetres, the sloping transition zone between the different can sidewall diameters interacting unfavourably with the lower edge of the piston.

It is this technical problem which the claimed invention sets out to solve. Claim 1 is directed to a dispenser ("aerosol can system") comprising a can and a piston of the basic form discussed above whereby recessed projection means, having an effective outer diameter somewhat less than the inside diameter of the lower portion of the piston sidewalls, depend below the lower edge of the piston sidewall. These recessed projection means set on the domed bottom wall of the can ("countersink") to stabilise the piston when it is in its lowermost position. Claim 2 on the other hand is

directed to a piston for use with a can having a necked-in lower portion in its sidewall, the piston having the same structural features as the one defined in claim 1. Although the subject-matter of claim 2 is thus a piston *per se* the references in the claim to its interrelationship with the can are not devoid of technical meaning. Given that the cans in question are generally standardised mass-produced items with fairly closely controlled dimensions, the statement that the sidewall of the piston is "slightly smaller" than the inside diameter of the upper portion of the can sidewall serves in the context to identify the basic type of piston sealing mechanism involved, namely the formation of a thin product film between the piston and cylinder sidewalls, see above.

Moreover, it is a requirement of the claim that the piston structure must be such that if the piston were placed in a can with a necked-in lower portion of its sidewall then the projection means would set on the can bottom countersink as mentioned at the end of the characterising clause.

Given that of the two independent claims claim 2 is of broader ambit and also that its subject-matter is being attacked for lack of novelty, it is appropriate of take it first. At the oral proceedings before the Board the parties argued in considerable detail as to whether, at least in those embodiments of piston disclosed in document E4 where there is a single downwardly trailing sealing flange, a thin film of product would be formed between the flange and the piston sidewall. The appellants saw this as being inevitable in view of the technical circumstances and pointed in particular to the passage at column 5, lines 38 to 40, where it is

stated that the sealing flange is initially of preferably slightly less diameter (eg 0.002 to 0.005 inches) than the inner diameter of the can sidewall. (The equivalent dimension mentioned in the present patent specification, cf. column 4, lines 32 to 36, is "a few thousandths" of an inch.) The respondents on the other hand referred to various passages of document E4 which indicated that the resilient sealing flange was intended to be in direct sealing contact with the inner sidewall of the flange (column 2, lines 36 to 38; lines 47 to 50; lines 62 to 67). In the opinion of the Board, however, the answer to this question is not determinative for the novelty of the claimed piston. Claim 2 requires the piston to have a certain structure and the piston of document E4 can only be equated to that structure by considering the sealing flange as constituting the "generally cylindrical sidewall" of the piston and the piston skirt as constituting the "recessed projection means depending below the lower edge of the piston sidewall as set out in the claim. The Board takes the view that the renaming of the elements of the known piston in this manner is a semantic exercise which overlooks the technical realities of the disclosure of document E4. The piston described there comprises a main cylindrical element designated as "piston skirt" or "piston body shell". The outer diameter of the skirt is spaced from the inner sidewall of the can by a significant distance to allow for expansion of the piston due to absorption of oils etc from the product. The thin resilient sealing flange is provided to seal the resulting gap between the piston and can sidewalls. The flexibility of the sealing flange enables both the expansion of the flange and minor indentations in the can sidewall to be accommodated. In use the piston can tilt slightly but

the amount of tilt is limited by the piston skirt (cf. column 5, lines 53 to 61). Taking proper account of all of this there can be no genuine doubt that the piston skirt is the only element of the piston of document E4 which can be fairly termed as a "generally cylindrical sidewall" within the meaning of present claim 2. In particular, it is apparent that a piston notionally comprising only the resilient sealing flange and top closure portion would be unstable and thus a non-workable embodiment, so that to consider the sealing flange as constituting the "sidewall" of the known piston, with its actual sidewall, ie the skirt, relegated to the subsidiary role of "projection means" simply does not square with the facts.

The Board therefore comes to the conclusion that the subject-matter of claim 2 is novel with respect to document E4 (Article 54 EPC). The appellants did not attempt to argue for lack of inventive step of the subject-matter of claim 2 with document E4 taken as a starting point. The investigation of the inventive step of the claimed piston can thus be adequately subsumed under the corresponding considerations directed to the dispenser which is the subject-matter of claim 1.

In the opinion of the appellants the closest state of the art with respect to the claimed dispenser is document E1. This is concerned in particular with the form of the piston and proposes a piston of progressively stepped diameter from its top portion to its lower edge in order to facilitate even distribution of the product between the sidewalls of the piston and the can. The can sidewall is straight without any necked-in portion at its lower end. On loading of the product the piston will therefore come to rest with its

bottom edge engaging the juncture between the sidewall and domed bottom wall of the can. In column 5, lines 26 to 31, it is stated that a series of spaced projections is provided which extend down from the bottom edge of the piston to facilitate the escape of gases under the piston during loading and to prevent the bottom of the piston becoming wedged against the bottom wall of the can. Additionally (column 5, lines 32 to 44) longitudinally extending ribs may be provided on the upper reduced diameter portions of the piston in order to stabilize it against tilting. The appellants argue that if the person skilled in the art wished to use a piston as disclosed in document E1 in a can having, in a manner well known *per se*, a sidewall with a necked-in lower portion, then he would either as a matter of course or having been encouraged by what is shown in document E4 arrange the projections on an effective diameter less than that of the lower portion of the can sidewall. In the opinion of the Board that argument is one which relies heavily on hindsight knowledge of the invention and moreover is disassociated from the guiding principle of problem and solution which should be used when assessing inventive step. As indicated above the technical problem with which the claimed invention is concerned relates to the aggravated tilting of a piston in an dispenser can having a necked-in sidewall at its lower end. The solution resides in the provision of special projection means at the bottom of the piston. Now, neither document E1, nor document E4 is concerned with a dispenser can having a lower necked-in sidewall portion. Only document E1 makes a specific proposal to restrict tilting of the piston and to this end proposes means arranged above the lower portion of the piston and not below it. The piston of document E4 on the other hand is deliberately

allowed a significant amount of tilt by virtue of the resilient sealing flange. Thus the Board finds it unlikely that the person skilled in the art investigating a solution to the technical problem would have reference to documents E1 and E4 in this context but even if he were to do so he would be not lead to adopt the form of piston defined in present claims 1 and 2. For completeness the line of argument of the appellants should nevertheless be followed through to its conclusion. The main purpose of the projections on the bottom edge of the piston of document E1 is to facilitate the escape of gas under the piston during loading. It would appear that this function would in any case be achieved if the projections engaged the top of the necked-in sidewall of the can, rather than the bottom wall, thus making a redesign of the piston in the manner envisaged by the appellants superfluous. The equivalent is true concerning their second purpose of preventing wedging of the bottom of the piston against the bottom wall of the can.

Accordingly the subject-matter of claims 1 and 2 is not obvious with respect to the state of the art and thus involves an inventive step (Article 56 EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

S. Fabiani

F. Gumbel