BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Publication in the Official Journal Yes / No

File Number: T 466/91 - 3.2.1

Application No.: 85 902 255.0

Publication No.: WO 85/04852

Title of invention: Pump for dispensing liquid from a container

Classification: B67D 5/42, 5/06; B65D 23/12; B65D 53/02

D E C I S I O N
of 12 March 1992

Applicant: Risdon Corporation

Headword:

EPC Article 56

Keyword: "Inventive step (yes)"

Headnote

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 466/91 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 12 March 1992

Appellant : Risdon Corporation
One Risdon Street
Naugatuck CT 06770 (US)

Representative : Warren, Anthony Robert
BARON & WARREN
18 South End
Kensington
London W8 5BU (GB)

Decision under appeal : Decision of Examining Division 088 of the European Patent Office dated 18 January 1991 refusing European patent application No. 85 902 255.0 pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : F. Gumbel
Members : P. Alting van Geusau
C. Payraudeau

Summary of Facts and Submissions

I. European patent application No. 85 902 255.0 filed on 11 April 1985 as the international application PCT/US 85/00637 and published on 7 November 1985 under No. WO 85/04852 was refused by a decision of the Examining Division dated 18 January 1991.

II. The reason given for the refusal was that the subject-matter of the independent Claim 1 filed with letter of 2 July 1990 did not correctly reflect the nearest prior art and moreover lacked an inventive step in the meaning of Article 56 EPC having regard to the teachings of the documents US-A-4 144 987 (D1) or DE-A-2 711 795 (D2) and US-A-4 025 046 (D3).

According to the Examining Division, a comparison of the disclosure of D1 or D2 with the subject-matter of Claim 1 revealed that the only remaining differing feature related to an alternative construction of the inlet valve which was in itself already known in a very similar pump disclosed in D3.

The application of this valve construction in a pump according to D2 was considered to come within the normal design possibilities of the skilled person and did therefore not involve an inventive step.

III. An appeal was lodged against this decision on 15 March 1991 together with payment of the appeal fee. The Statement of Grounds of Appeal was submitted on 22 May 1991.

IV. In a telephone call between the Appellant and the Board's Rapporteur on 11 November 1991 some amendments of the

application documents concerning points of clarity were agreed upon.

The Appellant requested, as a main request, grant of a patent on the basis of the following documents:

Claims:
- 1 to 6 as filed with letter of 2 July 1990 with the amendments to Claim 1 as proposed in the Statement of Grounds of Appeal and to Claim 6 as agreed upon over the telephone on 11 November 1991.

- 7 to 11 as filed with letter of 19 June 1989, Claim 11 comprising the amendment proposed with letter of 2 July 1990.

Description:
- pages 1, 4 to 8 and 17 as filed with letter of 2 July 1990 with the amendments on pages 4, 5 and 17 as agreed over the telephone on 11 November 1991.

- pages 2, 3, 9 to 16 as originally filed with the amendments proposed with letter of 2 July 1990 and the amendments on pages 11 to 16 as agreed upon over the telephone on 11 November 1991.

Drawings:
- pages 1/3 to 3/3 as originally filed, with the amendment to figure 4 on page 2/3 (reference numeral 88 inserted) as agreed upon over the telephone on 11 November 1991.

V. Claim 1 of the main request reads as follows:

"1. A non-throttling pump for dispensing liquid from a container (14) having a cylinder (30) having an inlet (32) for receiving liquid from said container (14); a piston (36) slidable reciprocally in said cylinder (30), said piston (36) having an interior chamber (42) along its length and having an opening (44) at one end thereof for dispensing liquid from said chamber (42), said piston (36) being slidable against a bias through a downward stroke and with said bias through an upward stroke; a valve member (46) positioned in said chamber (42) and having a dispensing valve (48) at one end portion biased toward a position closing said opening (44), said valve member (46) being movable under liquid pressure against said bias away from said opening (44) to dispense liquid from said chamber, said valve member (46) having a second end portion (58) having a cylindrical surface (60); an inlet valve (62) for opening and closing said inlet (32) of said cylinder (30), said inlet valve (62) including a cylindrical sleeve having a cylindrical surface (64) of a diameter (66) sized to frictionally engage, provide a liquid seal, and slide with respect to said cylindrical surface (60) moving with said second end portion (58) of said valve member (46) until seated on said inlet (32), said inlet valve (62) sliding with respect to said valve member end portion (58) during further travel of said valve member (46) with respect to said cylinder (30), said cylinder (30) having a floor (70) adjacent said inlet (32), whereby movement of said piston (36) reduces the volume of said chamber (42) thereby increasing pressure in said chamber to provide a positive pressure differential

between said chamber (42) and said container (14), said pressure differential forcing said cylindrical sleeve against a seat to seal said inlet (32); said inlet valve (62) being movable with said valve member (46) during an initial portion of said upward stroke of said piston (36) to open said inlet (32), characterised in that said inlet (32) comprises an opening (32) surrounded by an annular ring (72) projecting upwardly from said floor (70); said ring (72) has an outer diameter sized to fit within said cylindrical sleeve, said pressure differential forcing said cylindrical sleeve radially inwardly against said annular ring (72) to seal said inlet opening (32)."

VI. In support of his main request, the Appellant essentially submitted the following arguments:

The valid Claim 1 has been amended to correctly reflect the prior art according to D1 or D2 which was one ground of rejection of Claim 1.

Considering inventive step of the subject-matter of Claim 1, both D1 and D2 disclose dispensing pumps in which the inlet valve is located within the cylindrical chamber of the pump at an intermediate position between the connection to the suction tube at the bottom of the chamber and the dispenser outlet at the top of the chamber.

D3 on the other hand discloses a pump including an elongate tubular projection 1c mounted in the bottom of the cylinder 1 and a sleeve 10 which slides over projection 1c so that, during the downward stroke of the piston 5, liquid contained in the cylinder 1 cannot return to the suction tube 3. When the push-button 7 is released,

the sleeve 10 must move upwardly by a sufficient distance to clear the top of the elongate projection 1c so that the cylinder 1 can be replenished with liquid via the section tube.

If a skilled person was to attempt to substitute the valve construction of D3 for the valve in either D1 or D2 at the intermediate valve position in D1 or D2, then there would be insufficient space in the chamber above the valve for the sleeve to lift clear of the elongate projection and thus clearly a total reconstruction of a number of other parts of the pump, for example the outlet valve member and the piston, would also be necessary. A skilled person would thus not regard the incorporation of the valve of D3 into the pump of D1 or D2 to be an obvious modification.

Moreover, even if the valve of D3 could be readily incorporated into the pump of D1 or D2, then the resulting arrangement would not include an essential feature of Claim 1, namely that the inlet valve is opened during an initial phase of the upward stroke of the piston. Whilst it is conceded that this is a feature of the valves in D1 and D2, it is evidently not a feature of the valve of D3 due to the length of the tubular projection 1c.

In addition, the frictional force between sleeve 10 and protrusion 1c of the valve in D3 when the actuator is pushed to a lower point is extremely high in comparison to the sleeve of the pump as claimed in the present application. Thus, not only does the sleeve in D3 not open immediately upon release of the actuator, but also, there is a substantial amount of friction and therefore, the pump in D3 would need a much greater force of actuation than the pump as claimed. Since the pump of the present invention is primarily intended to be used for perfumes so that the feel is very important with respect to the user,

it would not be desirable to have a large actuation force, as in the pump of D3.

Hence, it is contested that a skilled person would consider modifying the pump of either D1 or D2 as proposed by the Examining Division, and secondly even if he did, it would not result in the claimed invention. As there is no apparent reason for a skilled person to attempt to combine the documents as proposed by the Examiner and such a combination would not, in any event, lead to the claimed invention without the addition of a further step, it is submitted that the subject-matter of Claim 1 involves an inventive step.

VII. The Appellant auxiliarily requested the grant of a patent on the basis of a second set of claims containing an independent Claim 1A (which is a combination of Claims 1 and 4 of the main request) as submitted with the Statement of Grounds of Appeal and dependent Claims 2, 3 and 5 to 11 of the main request renumbered 2 to 10. He also auxiliarily requested oral proceedings in case the main request would not be considered as allowable by the Board.

Reasons for the Decision

1. The appeal is admissible.

2. Formal allowability of the amendments (main request)

2.1 The subject matter of the Claims according to the main request is based on the following originally filed Claims and disclosures in the application as filed:

Claim 1:	combines the features of Claims 1 and 4 as filed,
Claims 2, 3 and 4 to 9:	correspond essentially to Claims 2, 3 and 5 to 10 as filed,
Claims 10 and 11:	correspond respectively to the subject-matter of Claim 19 that remained after deletion of the subject-matter of the divisional application, (see also page 16, paragraphs 1 and 2) and to Claim 20.

All Claims thus meet the requirement of Article 123(2) EPC.

2.2 The amendments to the description and drawing have been carried out in order to bring the application in agreement with the subject matter now claimed. The requirements of Article 84 EPC as concerns clarity as well as those of Rule 27(1)(b) and 32(2)(i) EPC are also met. Further it is acknowledged that subject-matter has been divided out of this application.

These amendments also comply with Article 123(2) EPC.

3. Novelty (main request)

3.1 The Board notes that the Examining Division considered both D1 and D2 to represent the closest prior art. However, D1 does not disclose an inlet valve including a cylindrical sleeve as defined in Claim 1 but rather a known inlet valve consisting of a ring-shaped elastic element 16 slidably fitted onto a movable valve rod 12.

In the opinion of the Board therefore only D2 comprises all the precharacterising features of Claim 1 of the main request and since none of the other documents cited in the application or in the International and European search reports come any closer to the subject matter of Claim 1, D2 is considered to represent the closest prior art.

3.2 The pump claimed in Claim 1 differs from the pump disclosed in D2 by the characterising features which define that said inlet (32) comprises an opening (32) surrounded by an annular ring (72) projecting upwardly from said floor (70); said ring (72) has an outer diameter sized to fit within said cylindrical sleeve, said pressure differential forcing said cylindrical sleeve radially inwardly against said annular ring (72) to seal said inlet opening (32).

3.3 The subject-matter of Claim 1 which thus satisfies the requirements of Rule 29(1) EPC is therefore novel in view of the cited prior art.

4. Inventive step (main request)

4.1 In the pump disclosed in D2, the inlet valve is located within the cylindrical chamber of the pump at an intermediate position between the connection to the suction tube at the bottom of the chamber and the dispenser outlet at the top of the chamber. The inlet valve is formed of two co-operating conical surfaces (36, 37). It is indeed stated on page 3, last part of the second paragraph of D2 that the sealing of the inlet valve is improved by the pressure build-up in the chamber (39) to force the inlet valve sleeve against the valve seat (37). However, the force resulting from this pressure build-up in the pump chamber acts in the axial direction

of the valve on the flat conical surfaces of the sleeve and of the seat. Due to this construction, in spite of the extra force, minor imperfections of the valve surfaces may give rise to leakage of the liquid back from the pump chamber into the container during the dispensing stroke of the pump.

4.2 When compared to the known pump disclosed in D2 the characterising features of Claim 1 as referred to in point 3.2 above provide the effect that the pressure differential forces the inlet valve tube radially inwardly against the annular inlet ring - which thus implies a sufficient flexibility of the valve tube end - to seal the chamber with respect to the container.

The positive pressure differential provides a tight seal that prevents any seepage of liquid into the container during the dispensing stroke (see the original page 4, last six lines and the insert on page 5 of the current description).

4.3 The objective problem to be solved by the pump according to Claim 1 can therefore be seen in an improvement of the inlet valve so that, although allowing immediate opening during the initial portion of the upward stroke, a tight seal during the dispensing stroke is achieved.

4.4 Although there is stated in D2 that sealing is improved by the pressure build-up in the chamber to force the valve surfaces against each other, there is no disclosure nor teaching derivable from this prior art to an additional closing of the valve by radial deformation of one of the valve parts as implied by the features of Claim 1.

Therefore D2 cannot, in the Board's opinion, be considered to give a lead to the particular design and functioning of the inlet valve of Claim 1 under consideration.

In D1 the inlet valve is in the form of a ring-shaped elastic element which, even if it is probably able to ensure a better seal as the conical shaped valve surfaces of the construction of D2, presents drawbacks associated with the use of such an additional valve part having a sealing surface not only with respect to the chamber shoulder 17 but also with respect to the sliding valve rod 12.

This known valve is thus of substantially different construction and functioning as compared to the one defined in Claim 1 and can also not give the skilled person any incentive to solve the above stated problem in the manner as now claimed.

D3 discloses an atomiser pump of a similar type as the pump defined in the preamble of Claim 1. In this construction the inlet valve is constituted by the interacting functioning of a sleeve 10 (see the embodiment shown in Figures 2 and 3) and a cylindrical projection 1c on the floor of the pump housing 1. During the pumping stroke, the sleeve 10 slides in a telescoping manner on the projection providing a seal between these two parts.

However, because of the length of the projection 1c inserted into the sleeve 10, no liquid is drawn into the pump during the initial stage of the upward stroke; in accordance with the text in column 3, line 20 it is stated that fluid is only allowed to flow into the pump when the lower end of the sleeve 10 clears the projection 1c.

Further, no disclosure or hint can be derived from this document that the pressure differential could be used to

improve sealing by forcing the sleeve 10 against the projection 1c. In fact, any deformation of the sleeve 10 (or 26' in the embodiment of Figure 5), would indeed make telescoping of the tubes and therefore also the pumping movement even more difficult than it is already normally the case when using telescoping tubes.

4.5 Thus, due to the incompatibility of the valve of D3 with the requirement of an immediate opening during the initial phase of the upward stroke of the piston the skilled person would also not be able to derive from this document any incentive to modify the pump of D2 in the manner disclosed in the characterising part of Claim 1 under consideration.

It cannot therefore be maintained, in the Board's judgment, that the specific construction of the inlet valve defined in the characterising portion of Claim 1 is in itself known from or obvious in view of D3 and it is thus not considered necessary to comment upon the Appellant's arguments concerning the necessary adaptations of the pumps shown in D1 or D2 to incorporate a valve in accordance with D3.

4.6 Among the other documents cited only US-A-4 122 982, US-A-4 212 332 and US-A-2 362 080 concern non-throttling pumps without ball type valves. These known pumps comprise inlet valve designs and functioning similar to the inlet valves disclosed in D2 and D3 and cannot give the skilled person any incentive to the inlet valve defined in Claim 1 either for the reasons set out above.

4.7 Summarising, the Board comes to the conclusion that the subject-matter of the present Claim 1 cannot be derived in

an obvious manner from the cited prior art and, accordingly, involves an inventive step having regard to Article 56 EPC.

5. The pump according to Claim 1 of the main request is, therefore, patentable (Article 52(1) EPC) and a patent may be granted on the basis of this Claim 1 and the dependent Claims 2 to 11 which represent particular embodiments within the meaning of Rule 29(3) EPC of the pump according to Claim 1 together with the valid description and drawings.

6. Since the main request is allowable there is no need to consider the auxiliary requests.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division with the order to grant a patent on the basis of the documents referred to in point IV of this decision.

The Registrar: The Chairman:

S. Fabiani F. Gumbel