

Internal distribution code:

- (A) [] Publication in OJ
(B) [] To Chairmen and Members
(C) [X] To Chairmen
(D) [] No distribution

D E C I S I O N
of 11 October 2001

Case Number: T 0812/98 - 3.2.3

Application Number: 94926668.8

**International
Publication Number:** WO-A-95/08400

IPC: B05B 11/00

Language of the proceedings: EN

Title of invention:
High pressure atomization systems for high viscosity products

Applicant:
The Procter & Gamble Company

Opponent:

-

Headword:

-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - state of the art"
"Inventive step - (yes) after amendment"

Decisions cited:

-

Catchword:

-



Case Number: T 0812/98 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 11 October 2001

Appellant: THE PROCTER & GAMBLE COMPANY
One Procter & Gamble Plaza
Cincinnati
Ohio 45202 (US)

Representative: Engisch, Gautier
Procter & Gamble
European Technical Center N.V.
Temselaan 100
B-1853 Strombeek-Bever (BE)

Decision under appeal: Decision of the Examining Division 2.3.07.085 of
the European Patent Office posted 5 February 1998
refusing European patent application
No. 94 926 668.8 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
J. P. Seitz

Summary of Facts and Submissions

I. With decision of 5 February 1998 the examining division refused European patent application No. 94 926 668.8 in the light of

(D1) US-A-4 941 595.

II. Against the above decision the applicant - appellant in the following - lodged an appeal on 6 April 1998 paying the fee on the same day and filing the statement of grounds of appeal on 12 June 1998 together with new claims and a revised description.

III. Following the board's Communication pursuant to Article 110(2) EPC dated 23 August 2001 the appellant filed claims 1 to 8 according to the **main request** and to the **auxiliary request**.

IV. Claim 1 of the **main request** reads as follows (obvious errors in features (b), (c) and (d) with respect to "value" instead of "valve", "passageway" instead of "passage way" and "valve seat" instead of "seat valve" being corrected):

"1. A high pressure dispensing and atomization system for a comparatively high viscosity fluid product, said system including a comparatively high viscosity fluid product, a container for storing said product prior to dispensing and atomizing said product, and a manually operated pump sprayer (5) for dispensing said product from said container, said pump sprayer (5) being associated with an opening in said container so as to permit

dispensing of said product from within said container when said pump sprayer (5) is actuated during a dispensing operation, said pump sprayer (5) further including a pre-compression pump mechanism, wherein said product is dispensed only when a pre-determined pressure value is exceeded within said pump sprayer (5), said pump mechanism further including a first cylinder (30) and a second cylinder (40) within said first cylinder (30), said second cylinder (40) having an outer wall defining an interior of said second cylinder (40), said second cylinder (40) including a discharge valve (45) within said interior and a pre-compression spring (55) for biasing said discharge valve (45) toward a closed position, and a nozzle assembly (10) associated with said pump sprayer (5) for dispensing and atomizing said product,

- (a) said pump sprayer (5) includes means for providing reduced flow resistance for high viscosity fluid within said pre-compression pump mechanism to achieve improved operating efficiency and reduced pressure losses, said means for providing reduced flow resistance comprising radial passage means (80) for communicating said product from an area between said first cylinder (30) and said second cylinder (40) into the interior of said second cylinder (40) such that said product is permitted to flow more freely through the wall of said second cylinder (40) to act upon said discharge valve (45), wherein when said product acts upon said discharge valve (45) with sufficient

pressure to overcome said pre-compression spring (55), said product is discharged from said pump sprayer (5) through said nozzle assembly (10); and

- (b) said pre-determined pressure value comprises a comparatively high threshold pressure defining a lower end of an operating range to provide improved atomization of said product;
- (c) said discharge valve (45) opening in a delivery passageway (75) to the nozzle assembly (10);
- (d) said discharge valve (45) contacts a valve seat (85), said discharge valve (45) further being surrounded by a passageway within said second cylinder (40), characterised in that said passageway is tapered from said radial passage means (80) toward said valve seat (85) and the delivery passageway (75), and that this tapering gradually increases the velocity of the fluid product as it moves from a larger passage toward the smaller area, whereby said product is permitted to flow smoothly and freely past said discharge valve (45) toward said nozzle assembly (10) during product discharge."

V. The appellant requests to set aside the decision under appeal and to grant the patent on the basis of claims 1 to 8 of either the **main** or the **auxiliary request**, together with description, pages 1, 2, 6 to 13 of WO-A-95/08400, pages 3 to 5 and 14 submitted on 16 June

1998; and drawings, sheets 1/4 to 4/4 of WO-A-95/08400.

VI. His arguments essentially can be summarized as follows:

- the claimed subject-matter differs from (D1) since (D1) has a narrowed neck "44" between the valve seat and the delivery passageway so that the velocity of the fluid **decreases** as it moves towards the delivery passageway;
- in contrast to the teaching of (D1) the velocity of the fluid **increases** as it moves towards the delivery passageway so that the subject-matter of claim 1 (**main** and **auxiliary request**) is novel;
- contrary to the teaching of (D1) thin-film flow conditions for the fluid to be conveyed between cylindrical parts of the pump mechanism and repeated 90° turns of the fluid are overcome by the claimed gradual tapering of the cross-sectional area along the route taken by the fluid enabling needed flow velocity, pressure and flow rate at the nozzle entrance;
- the claimed invention thereby solves a problem which existed in (D1) and lead to unsatisfactory spray patterns of the fluid to be applied;
- summarizing, a European patent should be granted on the basis of either the **main** or **auxiliary request**.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. *Amendments*

- 2.1 Claim 1 defines a passageway which is tapered from the radial passage means "80" towards the valve seat "85" and the delivery passageway "75" as clearly disclosed in original Figures 1 and 4 and claim 5 ("is tapered...to flow smoothly and freely past said discharge valve"); support of this technical feature can also be found in page 10, lines 3 to 11, as originally filed, from where the effects of this structural feature are also derivable, namely **gradually** increasing the velocity of the fluid to flow smoothly and freely past the discharge valve "45" towards the nozzle assembly "10".

- 2.2 Claim 1 is therefore not open to an objection under Article 123(2) EPC. This is also true for claims 2 to 8.

3. *Novelty*

Nearest prior art document is (D1) which clearly discloses a narrowed neck "44" leading on the one hand to an increased velocity of the fluid and on the other hand to an abrupt **decrease** thereof when entering the channel/passageway to the spray nozzle, see Figures 1/2 of (D1). The teaching of (D1) is therefore contradictory to the subject-matter of claim 1 prescribing that the velocity of the fluid is **gradually increased** as it moves to the delivery passageway "75" -

whereby the fluid is permitted to flow smoothly and freely past the discharge valve "45" to the nozzle assembly "10".

Summarizing, the subject-matter of claim 1 is novel, Article 54 EPC.

4. *Inventive step*

4.1 (D1) as the nearest prior art is characterized by a dispensing and atomization system which is not fully adapted to deal with **high viscosity** fluid products since they are submitted to thin-film flow conditions and to repeated 90° turns, see gaps between cylinders "58" and "24" and "66" and "12" and sharp 90° turns on top of cylinder "58" and at the bottom of cylinder "10" according to Figures 1 and 2 of (D1). It is true that the narrowed neck "44" is tapered on its **entry** side, however, upstream thereof the small gap between "66" and "12" is increased prior to the tapered neck portion so that the velocity of the fluid is **decreased**.

4.2 Starting from (D1) the objectively remaining problem to be solved by the invention is seen in achieving optimum conditions with respect to flow velocity, pressure and flow rate at the nozzle in combination with high viscosity fluid products.

4.3 The solution to the above problem of the present invention is achieved with the features laid down in claim 1, namely by specifically adapting the structural elements of the dispensing and atomization system in the vicinity of the discharge valve "45" to the requirements of high viscosity fluid products in that the passageway between the primary piston "35" and the

discharge valve is tapered starting from the radial passage means "80" towards the valve seat "85" and the following passageway "75". This tapering **gradually increases** the velocity of the fluid which is allowed to flow smoothly and freely past said discharge valve towards the nozzle assembly "10" during product discharge.

- 4.4 The claimed subject-matter leads to a reduced pressure loss and flow reduction within the pump mechanism so that the nozzle is provided with the needed flow velocity, pressure and flow rate at its entrance leading to a comparatively narrow pressure range and ensuring a finely dispersed product spray with a comparatively narrow distribution of particle sizes, under a wide range of actuation circumstances, see page 4, last but one paragraph or page 7, third paragraph or page 10, second paragraph according to WO-A-95/08400 (International Publication Number).
- 4.5 As can be seen from the above advantages inherent to the claimed pump construction according to claim 1 high viscosity fluid products are difficult to handle and necessitate specific parameters to be maintained such as flow velocity, pressure and flow rate at the nozzle to achieve acceptable atomization and spray patterns.
- 4.6 From (D1) a skilled person not knowing the claimed invention and being confronted with the object to be solved by the invention was not directed to the claimed structural features according to claim 1 since (D1) does not disclose the necessity to provide for a tapered passageway prior to the valve seat and the delivery passageway nor would it render such a construction obvious. Rather, (D1) is based on a pump

construction leading to remarkable pressure losses due to sharp turns, narrow spaces and widening passageways of the fluid product. In other words the clear concept governing the pump construction of claim 1 which has to be applied when dealing with high viscosity fluid products is unknown to (D1) so that (D1) is no obstacle to patentability of the subject-matter of claim 1 under Articles 54 and 56 EPC.

4.7 Claim 1 of the **main request** is therefore allowable.

This is true also for claims 2 to 8 which relate to specific embodiments of the subject-matter according to the independent claim 1.

Auxiliary request

5. Claims 1 to 8 of the **main request** being allowable it is not necessary to deal with the merits of the claims according to the **auxiliary request**.

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 grant a patent on the basis of:

Claims: 1 to 8 submitted on 26 September 2001 as **main request** with the following amendments of claim 1,

in feature (b) "valve" amended into
"value",
in feature (c) "passage way" amended
into "passageway",
in feature (d) line 1, "seat valve"
amended into "valve seat";

Description: pages 1, 2, 6 to 13 of WO-A-95/08400,
pages 3 to 5 and 14 submitted on 16 June
1998;

Drawings: sheets 1/4 to 4/4 of WO-A-95/08400.

The Registrar:

The Chairman:

A. Counillon

C. T. Wilson