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Datasheet for the decision of 9 July 2013

Case Number: T 1372/10 - 3.2.07

Application Number: 02257123.6

Publication Number: 1312417

IPC: B05B 7/04, B05B 1/04

Language of the proceedings: EN

Title of invention:
Air assisted liquid spray nozzle assembly

Patent Proprietor:
SPRAYING SYSTEMS CO.

Opponent:
Lechler GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step: yes"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1372/10 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 9 July 2013

Appellant: (Opponent)
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Respondent: (Patent Proprietor)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 29 April 2010 rejecting the opposition filed against European patent No. 1312417 pursuant to Article 101(2) EPC.

Composition of the Board:

Chairman: H. Meinders
Members: K. Poalas
I. Beckedorf

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the opposition division rejecting the opposition against European patent No. 1 312 417.

II. Opposition had been filed against the patent as a whole based on Articles 100(a) EPC (lack of novelty and lack of inventive step) and 100(c) EPC (unallowable amendments).

III. The opposition division found that the grounds for opposition under Articles 100(a) and (c) EPC do not prejudice the maintenance of the patent as granted.

IV. The following documents of the opposition proceedings are relevant for the present decision:

D1: US 4 591 099
D2: DE 196 04 902
D4: DE 31 31 070
D5: US 3 251 556
D6: DE 39 30 287
D7: DE 297 19 714 U.

V. With its communication dated 7 March 2013 the Board summoned the parties to oral proceedings on 9 July 2013. The annex to said summons reflected *inter alia* the Board's provisional opinion that the subject-matter of claim 1 according to auxiliary request 1 filed with letter dated 21 December 2010 and having the disputed term "end" replaced by the term "end face" solves the issue with Article 100(c) EPC and involves an inventive step. This preliminary opinion was accompanied by

substantive arguments, which can be found in the reasons for the present decision.

VI. With its letter dated 5 April 2013 the appellant merely informed the Board that it will not be attending the oral proceedings scheduled.

VII. Oral proceedings took place before the Board on 9 July 2013. Although having been duly summoned, the appellant did not attend the oral proceedings, as announced, and the proceedings were continued without the party according to Rule 115(2) EPC and Article 15(3) RPBA.

(a) The appellant requested in writing that the decision under appeal be set aside and the European patent No. 1 312 417 be revoked.

(b) The respondent (patent proprietor) requested that in setting aside the decision under appeal the patent be maintained on the basis of the set of claims filed as main request during the oral proceedings.

VIII. Independent claim 1 according to the main request filed during the oral proceedings reads as follows:

"An air assisted spray nozzle (12) comprising:
a hollow body (24) having a mixing and atomizing chamber (25), an air inlet orifice (26) through which a pressurized air stream is directed into said mixing and atomizing chamber (25), and a liquid inlet orifice (30) through which a liquid stream is directed into said mixing and atomizing chamber (25) at an angle to the direction of said pressurized air stream,

an impingement post (38) extending into said chamber (25), said post (38) being in substantial alignment with said liquid inlet orifice (30) and having an end face (40) approximately on a longitudinal axis of the hollow body against which a liquid stream directed into said chamber (25) from said liquid inlet orifice (30) impinges, said post (38) being disposed transversely to the direction of travel of a pressurized air stream directed into said chamber (25) from said air inlet orifice (26), and
a spray tip (22) having a discharge orifice (48) in fluid communication with said mixing and atomization chamber (25)and through which liquid is discharged in a predetermined spraying pattern characterized by said impingement post end face (40) being formed with an inwardly directed recess (58) for receiving the liquid stream (40) introduced into said chamber (25) from said liquid inlet orifice (26) and directing the liquid away from the end face (40) for enhanced intermixing by the pressurized air stream introduced into said mixing and atomizing chamber (25) from said air inlet (26) for breaking down and atomizing of the liquid prior to direction through said spray tip discharge orifice (48)".

IX. The appellant's arguments from the written proceedings can be summarised as follows:

Claim 1 - Inventive step, Article 56 EPC

(a) The only difference between the subject-matter of claim 1 and the spray nozzle known from either Dl or D4 is that the impingement post end face is formed with an inwardly directed recess.

(b) The problem to be solved is reducing the energy consumption for the pressurised air and the provision of a more uniform distribution of the droplets within the nozzle.

(c) According to D4 a mixture of fluid and air in a mixing chamber has to be such that each of part of the air stream has to have an atomising effect and has to come into contact with liquid drops. For the skilled person it is thus immediately clear that it has to be ensured that both the pressurised air stream and the liquid droplets deflected by the impingement surface have to fill out the whole cross section of the mixing and atomising chamber.

(d) The teaching of D4 itself is thus sufficient reason for the person skilled in the art to improve the nozzle known from D4 not only as far as it concerns the form of the liquid inlet and of the air inlet but also the form of the impingement surface of the impingement post.

(e) It is well known to the skilled person from its general technical knowledge that any recess on an impingement surface influences the space distribution of the deflected liquid droplets impinging on said surface. The skilled person seeking to solve the above-mentioned problem would immediately recognise that that there exist only two simple possible configurations, namely one with a concave recess and one with a convex outer surface of the impingement post. He would then

only need to select the first one out of said two possible configurations and would arrive at the subject-matter of claim 1 without the exercise of an inventive activity.

(f) D2 discloses an air assisted spray nozzle with very similar structure to those known from D1 or D4 and teaches that the design of the impingement area affects the liquid distribution within the mixing chamber, see column 2, lines 35 to 55. It shows further a concave recess being integrated in the wall of the mixing chamber.

(g) The subject-matter of claim 1 thus does not involve an inventive step over a combination of the teaching of Dl or D4 with the teaching of D2.

(h) The teaching that the design of the impingement surface affects the liquid distribution within the mixing chamber is also derivable from each of the documents D5, D6 or D7. D5 describes an inclined impingement surface with respect to the liquid inlet. D6 describes an inwardly extending recess on an impingement surface for a water jet. Although the spray nozzle known from D7 is intended for irrigation of plants the skilled person would apply the teaching of D7 concerning the influence of the design of the impingement surface to the liquid distribution to the impingement post within the mixing chamber of a spray nozzle known from D1 or D4.

No substantive reaction to the Board's preliminary opinion was filed by the appellant.

X. The respondent argued essentially as follows:

(a) Nowhere in D4 or D1 exists a hint that the impingement surface may be anything other than flat. Therefore there is nothing in D4 or D1 to lead the skilled person to consider a change in the form of the impingement post, let alone to provide a recess in said surface.

(b) The skilled person is aware that there are numerous factors that can be modified to affect the atomisation and there is nothing in Dl or D4 to teach or suggest that the geometry of the end of the post should be changed whereas the skilled person is taught that other factors such as the air inlet orifice and liquid inlet orifice may be varied to affect the atomisation of the liquid spray in the chamber.

(c) The appellant has not provided any evidence for the common general knowledge that the skilled person is believed to have and thus the skilled person has not in fact been shown to know that the form of the impingement surface would influence the impingement of the liquid jet and atomisation of the liquid jet in the mixing chamber.

(d) D2 teaches the removal of the impingement post. The skilled person starting from D1 or D4 and following the teaching of D2 would remove the impingement post from the spray nozzle known from D1 or D4 and so it would not arrive at the subject-matter of claim 1.

(e) D6 is a document which is not from the same or a neighbouring technical field as the patent in suit. D6 is further not concerned with atomisation of a liquid stream and there is no pressurised air assistance in the device known from D6. D6 provides a closed bell shaped sheet of water and is therefore far removed from the field of the patent in suit, so that the skilled person trying to improve the liquid atomisation efficiency in the mixing chamber of the air assisted spray nozzle known from D1 or D4 would not take said document into consideration.

(f) D7 relating to a device for watering plants using a conventional hose is not from the same or a neighbouring technical field as the patent in suit, it is not concerned with atomisation of a liquid stream nor is there any pressurised air assistance in the device of D7. D7 teaches only that different impingement surface shapes provide different irrigation intensity levels and is therefore far removed from the field of the patent in suit, so that the skilled person trying to improve the liquid atomisation efficiency in the mixing chamber of the air assisted spray nozzle known from D1 or D4 would not take said document into consideration.

Reasons for the decision

1. *Claim 1: Inventive step, Article 56 EPC*

1.1 The Board's opinion concerning the presence of an inventive step in the subject-matter of claim 1 according to auxiliary request 1 filed with letter dated 21 December 2010, further having the disputed term "end" replaced by the term "end face", was positive. The subject-matter of claim 1 according to the present main request has identical wording. Said opinion was expressed under section 3 of its summons to oral proceedings as follows:

"The Board in agreement with the decision of the opposition division and the respondent's arguments considers for:

a) the teaching of D1 or D4 taken alone: since there is no incentive in documents D1 or D4 for the skilled person to change the geometry of the end face of the post by providing an inwardly directed recess at said end face it seems that such a change would not be performed, unless with the benefit of hindsight;

b) the teaching of D1 or D4 in combination with the teaching of D2: D2 is a document teaching that ***instead of a post*** *projecting into the mixing chamber from one side, an impingement surface in the wall of the chamber should be provided so that mixing can take place over the whole volume of the chamber, whereby said impingement surface may be in the form of a concave recess. Thus it seems that D2 cannot be used as a basis for information concerning the geometry of the end face*

of a post projecting into the mixing chamber, or one would have to isolate the teaching regarding the concave recess in the chamber wall from the teaching that no post should be provided;

c) the teaching of D1 or D4 in combination with the teaching of D6: it seems that the skilled person seeking to solve the problem of improving the liquid atomization efficiency in the mixing chamber of the air assisted spray nozzle known from D1 or D4 would not take into consideration D6 since it is not from the same or a neighbouring technical field as the field of air assisted spray nozzles, is not concerned with the above-mentioned problem, has no pressurised air assistance and provides a closed bell shaped sheet of water;

d) the teaching of D1 or D4 in combination with the teaching of D7: it seems that the skilled person seeking to solve the problem of improving the liquid atomization efficiency in the mixing chamber of the air assisted spray nozzle known from D1 or D4 would not take into consideration D7 since it is not from the same or a neighbouring technical field as the field of air assisted spray nozzles, is not concerned with the above-mentioned problem, has no pressurised air assistance and teaches only that different impingement surface shapes provide different irrigation intensity levels.

The Board considers further that the skilled person seeking to improve the liquid atomization efficiency in the mixing chamber of the air assisted spray nozzle known from D1 or D4 would not take into consideration

D5 since it is not from the same or a neighbouring technical field as the field of air assisted spray nozzles, is not concerned with the above-mentioned problem, has no pressurised air assistance and teaches only the inclination of the post end surface and not the provision of a recess at said end surface".

1.2 The above-mentioned opinion of the Board has neither been commented on nor has it been contested by the appellant.

1.3 Because the respondent in its main request eliminated the problem under Article 100(c) EPC resulting from the previously used term "end" by replacing it with the term "end face", the only issue to be evaluated by the Board is the issue of inventive step. Under these circumstances, the Board having once again taken into consideration all the relevant aspects of the case remains of the same opinion as expressed under point 1.1 above.

1.4 Furthermore, the Board cannot follow the appellant's argument that starting from a spray nozzle known from D1 or D4 the person skilled in the art would be led by its general technical knowledge to modify the impingement post end face so as to have an inwardly directed recess, for the following reasons:

1.4.1 Even accepting that the skilled person is aware of the fact that the form of an impingement surface influences the distribution pattern of the liquid droplets deflected by such a surface, the Board cannot see that this is to be understood as an incentive for the skilled person to modify the form of the end face of

the impingement post in the air assisted spray nozzle known from D1 or D4 so that said end face is formed with an **inwardly directed recess**. Furthermore, the appellant did not provide any supporting evidence for its allegation that the skilled person **would** find within his general technical knowledge a hint to modify, out of the different structural details and working conditions of the air nozzle known from D1 or D4, the form of the end face of the impingement post, let alone to form it with an inwardly directed recess.

1.5 For the above-mentioned reasons the Board concludes that the subject-matter of claim 1 involves an inventive step and meets therefore the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of the following documents:

description: page 2 filed during the oral proceedings, pages 3 to 5 of the patent as granted,

claims 1 to 9: filed during the oral proceedings,

figures 1 to 7: of the patent as granted.

The Registrar: The Chairman:

E. Goergmaier H. Meinders