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Datasheet for the decision of 7 August 2012

Case Number: T 2344/08 - 3.3.05

Application Number: 02079621.5

Publication Number: 1291588

IPC: F24F 6/02, A01G 9/24, C02F 1/44, B01D 61/36

Language of the proceedings: EN

Title of invention:
Use of an apparatus for augmenting humidity

Patentee:
Design Technology and Innovation Limited

Opponent:
Solar Dew International B.V.

Headword:
Humidifier/DESIGN TECHNOLOGY AND INNOVATION LIMITED

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (main request): no - obvious technical solution"
"Prohibition of reformatio in peius - patent maintained in amended form in accordance with the auxiliary request"

Decisions cited:
G 0009/92, G 0004/93

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 2344/08 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 7 August 2012

Appellant: (Patent Proprietor)
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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 6 October 2008 concerning maintenance of the European patent No. 1291588 in amended form.

Composition of the Board:

Chairman: G. Raths
Members: H. Engl
S. Hoffmann

Summary of Facts and Submissions

I. European patent EP-B-1 291 588 was granted with 9 claims.

The only independent claim reads as follows:

"1. Use of a humidity augmenting apparatus consisting of a water source, a non-porous hydrophilic membrane, optionally at least one opening for filling the apparatus with the water source, and optionally a support material, wherein the non-porous hydrophilic membrane is coated or adhered onto the support material,

wherein said water source contains water and at least one of a suspended solid, a dissolved solid, a pollutant, a salt, and a biological material,

wherein said non-porous hydrophilic membrane allows the water to pass through the membrane and be emitted as water vapor into an airspace of an enclosed chamber, said non-porous hydrophilic membrane preventing the at least one suspended solid, dissolved solid, pollutant, salt, and biological material from passing through the non-porous hydrophilic membrane,

wherein said non-porous hydrophilic membrane comprises one or more layers of hydrophilic polymers, said hydrophilic polymer being selected from a copolyetherester elastomer, a polyether-block-polyamide, a polyether urethane, a homopolymer of polyvinyl alcohol, a copolymer of polyvinyl alcohol, and mixtures thereof,

further wherein the one or more layers of hydrophilic polymers have a water vapor transmission at a thickness of 25 microns of at least 400 g/m^2/24hours according to ASTM E96-95 (procedure BW), said water vapor transmission rate being measured at an air temperature of 23° C, relative humidity of 50% and an air velocity of 3 m/s,

for providing moisture to an airspace of an enclosed chamber."

Dependent claims 2 to 9 define further embodiments of the use of claim 1.

II. The European patent was opposed on the ground of opposition according to Article 100(a) EPC (lack of novelty and lack of inventive step).

III. The opposition division relied *inter alia* on the following documents:

D1: US-A-5 595 662;

D2: H. Brüschke, *"Industrial application of membrane separation processes",* Pure & Applied Chem., vol. 67, no. 6, pages 993 to 1002 (1995);

D4: EP-A-0 521 726; and

D5: B. Dettwiler et al, *"Bioproduction of Acetoin and Butanediol; Product Recovery by Pervaporation"*, 5th Proc. Int. Conf. Pervaporation Processes Chem. Ind. (1991), pages 308 to 318, Robert A. Bakish, Publisher, Bakish Mater. Corp., Englewood, NJ.

IV. The opposition division rejected the patentee's main request because of lack of inventive step having regard to document D4 and common technical knowledge. The apparatus disclosed in D4, due to its non-porous hydrophilic membrane and its porous hydrophobic tube/support (the water-evaporation conduit), was considered to be capable of augmenting the humidity in an airspace. The technical problem underlying the patent in suit was to provide moisture to an airspace of an enclosed chamber. It was obvious for the skilled person that the apparatus of D4 could be used to entrain water vapour in the air in the proximity of the humidifying equipment and that this could be done as well in an enclosed chamber. As the claim did not specify any particular size or shape of the enclosed chamber and as the degree of humidification of the airspace was also not stated, the claimed subject-matter lacked an inventive step.

However, the opposition division decided that the subject-matter of the claims in accordance with the auxiliary request related to a simple, non-obvious alternative to the humidifying equipment disclosed in D4. The European patent was thus maintained in amended form on the basis of the claims of said auxiliary request.

V. The patentee's (appellant's) notice of appeal and the grounds for appeal, received by letters dated 16 December 2008 and 13 February 2009, respectively, are directed against the decision of the opposition division, posted on 6 October 2008, to reject the main request.

VI. The respondent (opponent) did not file requests or observations.

VII. Oral proceedings took place on 7 August 2012 in the absence of the parties who had previously informed the board that they would not attend (see the respondent's letter dated 3 July 2012 and the appellant's letter dated 3 August 2012).

VIII. The appellant essentially argued as follows:

Novelty

The key documents discussed before the opposition division were D1 and D4. With respect to D1, the opposition division had already acknowledged that it did not describe the use of an apparatus to provide moisture in a chamber. The apparatus of D1 included other essential parts, such as a plastic sheet/condensing surface and a purified water collecting zone with a closable outlet. Therefore, the subject matter of claim 1 was found to be novel having regard to D1.

D4 disclosed a conduit and the use of it in a humidifier device, as shown in Figure 1. The apparatus further required a fan to humidify the environment. The casing of Figure 1 was not "enclosed". Air and entrained vapour were deliberately blown out of the casing into the surrounding environment. The conduit of D4 (as illustrated in Figures 3 and 4) did not correspond to the humidity augmenting apparatus of the patent in suit. The conduit was made from a hydrophobic tubing of polymeric material which allowed the water to

pass through and be emitted as water vapour. A non-porous hydrophilic vapour-permeable coating on the inner surface of the hydrophobic tubing served to prevent contamination by oils and surfactants. The hydrophilic coating could be a polyurethane resin containing oxyethylene groups; this material was not the same as the polyether urethane which was used as the non-porous hydrophilic membrane of the present invention. Therefore, the claimed subject-matter was novel in view of D4.

Inventive step

D4 represented the closest prior art as it was the only document concerned with the problem of air humidification.

The problem addressed by the patent in suit was how to provide humidity to an enclosed airspace in a simple, but effective, way.

The claimed solution consisted in the use of a very simple humidity augmenting apparatus consisting only of a water source and a non-porous hydrophilic membrane. Such an apparatus and its use were not taught by any of the cited prior art documents.

D4 did not suggest that the conduit alone could function as the humidity augmenting apparatus. Essential to D4 was the porous hydrophobic tubing which was used as the humidifying conduit in D4. As discussed above, a fan was also essential in D4.

While D4 taught the use of a hydrophilic coating to prevent contamination of the conduit tubing, this hydrophilic coating was not the same as the non-porous hydrophilic membrane which was the essential feature of the simple humidity augmenting apparatus in accordance with the present invention. There was no motivation for the skilled person to either change the coating material disclosed in D4 or to use this coating as the conduit per se.

Therefore, the subject-matter of claim 1 as granted involved an inventive step having regard to D4.

IX. Requests

The appellant requested in writing that the contested decision be set aside and the European patent be maintained as granted or, in the alternative, that the contested decision be upheld and the patent be maintained in amended form as per the auxiliary request filed during the oral proceedings before the opposition division.

The respondent did not file any requests.

Reasons for the Decision

1. Novelty

The board agrees with the novelty assessment of the opposition division, in particular as regards the disclosures of documents D1 and D4. Further comments in

this respect are not necessary as the main request cannot be allowed for the reasons set out below.

2. Inventive step (main request - claims as granted)

2.1 The patent in suit is concerned with the use of a humidity augmenting apparatus, comprising a non-porous hydrophilic membrane, for providing moisture to an airspace of an enclosed chamber.

2.2 D4 is considered to represent the closest prior art.

Said document discloses a humidifier comprising a water supply reservoir (2) and a water-evaporation conduit (1) consisting of a water evaporation tubing (3) of a porous hydrophobic polymeric material and of a continuous non-porous hydrophilic water-vapour permeable membrane (4) coated onto or attached to the inner side of the tubing (see column 1, lines 3 to 5; column 2, lines 24 to 33; claim 1; Figure 1). The non-porous hydrophilic membrane (4) may consist of a polyurethane resin containing oxyethylene groups having a water vapour transmission of at least 1000 $g/m^2/day$, preferably in the range of 5,000 to 90,000 $g/m^2/day$ (see column 2, lines 50 to 58; column 3, lines 3 to 5). The humidifier device of D4 further comprises a fan (11) which blows air over the surface of the water-evaporation conduit which entrains the water vapour emanating from the conduit. The air and entrained water vapour are blown out of the humidifier equipment into the surrounding environment, thus humidifying it.

2.3 Having regard to D4, the object of the patent in suit is to provide a simplified humidifying apparatus useful

for providing moisture to an airspace of an enclosed chamber.

2.4 As a solution to the above defined problem, the patent in suit proposes the use of a humidifying apparatus according to claim 1, characterized in that the apparatus consists only of a water source, a non-porous hydrophilic membrane and an optional support material for coating or adhering the membrane onto it, and in that the apparatus is used for providing moisture to an airspace of an enclosed chamber.

2.5 As to the success of the solution, due to the term "consisting of", the wording of the claims thus excludes the presence of further essential parts or equipment, such as a fan, for blowing air over the surface of the water-evaporation membrane.

The board is therefore satisfied that the object of the patent in suit of providing a simplified humidifying apparatus, having regard to the closest prior art of D4, has been successfully solved.

2.6 It remains to be decided whether or not the claimed solution is obvious having regard to the prior art.

In the board's judgment, it belongs to the common technical knowledge that the water transport across a membrane and the evaporation of water vapour from the membrane's surface (the pervaporation process) is controlled by the difference in chemical activities on the feed and permeate sides, respectively (see D5, pages 310 and 311, and Figure 1). Document D2 (see page 993, last paragraphs) sets out in detail that for

separation across a semi-permeable membrane to occur, a driving force (a gradient in pressure, concentration, temperature, electric field) has to be applied and maintained across the membrane. It is also explained that the gradient in chemical potential needs to be maintained by continuous removal of the migrating components from the side of the lower chemical potential, or otherwise chemical equilibrium would be reached and no further separation would occur (see D2, paragraph bridging pages 993 and 994).

The skilled person would immediately realize that a fan which blows fresh (dry) air over the surface of the water-evaporation conduit and thus entrains the water vapour emanating from the conduit exactly serves the above-mentioned purpose of continuous removal of the migrating component from the side of the lower chemical potential and thus maintaining the driving force across the membrane. It is also obvious that a forced ventilation can be dispensed with if natural convection and diffusion are sufficient to maintain a gradient in chemical potential which is strong enough to keep the process going at the desired speed. It cannot be disputed that the water-evaporation conduit of D4, consisting of the porous hydrophobic polymeric tubing and the non-porous hydrophilic polymeric membrane attached to it, in combination with a water reservoir, would be sufficient to provide a certain amount of moisture to an airspace, even without the fan proposed in D4. Therefore, the board cannot see any inventive idea in the concept of omitting the fan from the humidifier disclosed in D4, at the cost of a less efficient humidification process.

2.7 Another matter of course is to realize that the humidifying equipment of D4 can be used for providing humidity not only to an open airspace, but also to an airspace of an enclosed chamber. In the latter case, it would be apparent to those of skill in the art that - depending on the relative size of the said enclosed airspace - at some point saturation and/or condensation of water vapour would occur. The board observes in this context - as did the opposition division - that claim 1 on file neither puts any limitation on the properties of the enclosed chamber in terms of its size and shape nor contains a feature concerning the degree of humidification to be achieved. Thus, this particular claim feature does not support the presence of an inventive step, either.

2.8 The board cannot, thus, come to any other conclusion than the opposition division in the contested decision, namely that it is self-evident and does not involve an inventive step to use a humidifying equipment known in its essential features from D4, but without a fan, in an enclosed chamber for the purpose of providing moisture to an airspace of said enclosed chamber.

2.9 According to an argument of the appellant, D4 taught the use of a hydrophilic coating to prevent contamination of the conduit tubing, but this hydrophilic coating was allegedly not the same as the non-porous hydrophilic membrane which was the essential feature of the simple humidity augmenting apparatus in accordance with the present invention.

The board disagrees with this argument. The polyether urethane - which is one of the preferred materials for

the non-porous water-vapour permeable hydrophilic membrane in accordance with the patent in suit - falls under the definition of a polyurethane resin containing oxyethylene groups, specifically recited in D4 as a membrane material (see column 2, lines 50 to 58), the oxyethylene groups in the diol component of the polyurethane (usually polyoxyethylene glycols [PEG] or polyoxypropylene glycols [PPG]) containing polyether moieties. To the extent that the appellant's argument suggests that D4 only disclosed a hydrophilic membrane coating, it is sufficient to point out that the patent in suit explicitly encompasses coatings of the non-porous water-vapour permeable hydrophilic membrane material on a support material (see claim 1).

2.10 In conclusion, the subject-matter of claim 1 as granted does not fulfil the requirements of inventive step (Article 56 EPC).

The appellant's main request is therefore not allowable.

3. Auxiliary request - *no reformatio in peius*

The appellant requested as an auxiliary request, that the contested decision be upheld and the patent be maintained in amended form as per the auxiliary request filed during the oral proceedings before the opposition division.

Pursuant to G 9/92 and G 4/93 (both OJ EPO 1994, 875), if the patentee was the sole appellant against an interlocutory decision maintaining its patent in amended form, neither the board of appeal nor the non-

appealing opponent could challenge maintenance of the patent as thus amended.

As in the instant case the opponent did not file an appeal, the above doctrine of prohibition of *reformatio in peius* applies. It follows that this board is not competent to examine and decide on the auxiliary request as filed during the oral proceedings before the opposition division and maintained in the contested decision.

The board therefore decides to dismiss the appeal, it being understood that the effect of such a decision is *de facto* that the European patent is maintained in amended form in accordance with the appellant's auxiliary request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar | The Chairman

G. Rauh | G. Raths