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**Datasheet for the decision  
of 3 May 2012**

**Case Number:** T 1641/11 - 3.3.05  
**Application Number:** 05717230.6  
**Publication Number:** 1738812  
**IPC:** B01D 39/16, B01D 46/00,  
F24F 13/28  
**Language of the proceedings:** EN

**Title of invention:**

Filter comprising non-woven fabric for the filtration and  
elimination of legionella pneumophila

**Applicant:**

Espuelas Peñalva, Joaquin

**Headword:**

Filter/ESPUELAS PEÑALVA

**Relevant legal provisions:**

EPC Art. 54, 56

**Keyword:**

"Inventive step (no) - improvement (yes) - obvious (yes) -  
prior art gives hints to the technical solution"

**Decisions cited:**

T 0766/91, T 0020/81

**Catchword:**

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Case Number: T 1641/11 - 3.3.05

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.05  
of 3 May 2012

**Appellant:** Espuelas Peñalva, Joaquin  
(Applicant) c/Alberite, 11-17  
E-26006 Logrono, La Rioja (ES)

**Representative:** Morgades y Manonelles, Juan Antonio  
Morgades & Del Rio, S.L.  
C/Rector Ubach, 37-39 bj. 2.o  
E-08021 Barcelona (ES)

**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 21 April 2011  
refusing European patent application  
No. 05717230.6 pursuant to Article 97(2) EPC.

**Composition of the Board:**

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

## Summary of Facts and Submissions

- I. European patent application EP 05717230.6 was refused by decision of the examining division, posted with letter dated 21 April 2011, on the ground that it did not meet the requirements of Article 83 EPC.
- II. In the view of the examining division, one of the essential features of the claimed invention was the anti-bacterial treatment in the core and body of the fibres. As the application did not disclose how the said anti-bacterial treatment could be accomplished not only on the surface of the fibres, but also in the core and body of the fibres, the disclosure was considered to be insufficient.
- III. The notice of appeal was filed by letter dated 23 May 2011 and the grounds of appeal were received by letter dated 2 June 2011. The appellant (applicant) enclosed *inter alia* the following new documents:
- D5: US-A-5 180 585
- D6: US-A-4 624 679
- D7: J. Gacén, "*Fibras de Prestaciones Especificas*", Boletin Intexter (U.P.C.), 2001, No. 119, pages 59 to 65 (in Spanish)
- D8: B. Goetzendorf-Grabowska *et al.*, "*Polymer Microspheres as Carriers of Antibacterial Properties of Textiles: A Preliminary Study*", *Fibres & Textiles in Eastern Europe*, Oct./Dec. 2004, vol. 12, no. 4 (48), pages 62 to 64 and
- D9: US-B-6 284 814.

IV. In its provisional communication dated 27 January 2012, the board raised objections under Articles 123(2) and 84 EPC against the pending claims.

Concerning Article 83 EPC, the board considered that the integral incorporation of a bactericide, in particular of organic bactericidal compounds, was a non-trivial task in view of the fact that the manufacture of certain organic synthetic fibres requires high temperatures at which organic anti-bacterial compounds might be destroyed.

The board furthermore raised an objection of lack of inventive step having regard to

D3: GB-A-846 458 (cited in the Search Report)

in combination with D5.

V. Under cover of a letter dated 2 April 2012 the appellant filed a new set of claims as a main request.

VI. Oral proceedings took place on 3 May 2012. The appellant replaced the previously filed claims by a new main request consisting of claims 1 to 3.

VII. Claim 1 thereof reads as follows:

"1. Filter for the filtration and elimination of legionella pneumofila in any installation at risk from legionella pneumofila proliferation, comprising a non woven fabric formed by fibers treated into all of the body with an antibacterial compound, characterized in that

the fibers are selected from polypropylene and polyethylene;

the antibacterial compound is selected from the group formed by permetrine derivatives, isothiazolinone derivatives, organozinc compounds, zirconium phosphates, phenols or chlorinated phenols or mixtures thereof, wherein said antibacterial compound is contained in the fibers between 0.02 % and 65 %;

and the filter is constructed as a sandwich structure comprising:

- (a) said non woven fabric,
- (b) other non woven fabrics, and
- (c) a mesh support of polypropylene, polyethylene, polyester, glass fiber, aluminium, steel or foam adapted to support mechanical forces."

Claims 2 and 3 represent preferred embodiments of the subject-matter of claim 1, on which they depend.

VIII. The appellant essentially argued as follows:

The manufacture of artificial and synthetic fibres, previously treated with anti-bacterial compounds belonged to the state of the art before the priority date of the application under appeal. Reference was made to the documents D4 to D9 cited in the grounds of appeal.

From D7 there was known a polyamide or polyester fibre with a layer of copper sulphur intimately integrated in the polymer as an antistatic treatment. The polyamide fibre had been marketed 15 years ago. The polyester variant was specifically designed for filtering means.

Paper D8 described the antibacterial properties of micro-capsules encapsulated in TRICLOSAN® polylactide fibres.

D9 disclosed polymer masterbatch compositions containing an antibacterial agent for making woven or non-woven polymer fibres. The fibres contained the antibacterial compound in the body of the fibre.

In view of this and other prior art, it would have been redundant to give further detailed information in the patent application, as the person of skill in the art was supposed to know everything which belonged to the prior art.

The appellant argued that a crucial step of manufacturing the fibres used in the application under appeal consisted in mixing chippings of polyethylene or polypropylene with other polymer chippings which had been previously treated with the antibacterial agent. The fiberisation of a melt of these mixed chippings produced polymer fibres having the antibacterial agent in the body of the fibres.

The claimed subject-matter was novel having regard to the available prior art, which did not disclose a filter in sandwich construction for the filtration and elimination of Legionella pneumophila, said filter comprising a non-woven fabric as defined in claim 1. D3 disclosed only filters for air purification (e.g. in air conditioning systems) wherein the fibres were superficially impregnated natural fibres or synthetic fibres, such as cellulose acetate or viscose.

Starting from D3, which represented the closest prior art, the problem underlying the application under appeal consisted in improving the air filter of D3 so as to make it suitable for filtration and elimination of *L. pneumophila*.

As D3 and D9 were silent on filtration or elimination of *L. pneumophila*, the claimed subject-matter involved an inventive step.

IX. Requests:

The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of claims 1 to 3 filed during oral proceedings.

**Reasons for the Decision**

1. Amendments (Articles 84 and 123(2) EPC)

Detailed comments in these respects are not necessary as the application must be refused for the reasons given further below (see point 3).

2. Novelty

2.1 The board is satisfied that the subject-matter of claim 1 is novel having regard to the cited prior art documents.

Since the appeal fails for lack of inventive step, no detailed reasoning is required. Nevertheless, in the present case, the board finds it appropriate to comment

on documents D6, D7 and D8 on which the appellant relied when arguing its case, and on documents D3, D5 and D9, since they are mentioned in the assessment of inventive step.

- 2.2 D3 discloses an air filter comprising a non-woven batt of organic synthetic fibres (cotton, wool, acetate or viscose fibres) impregnated with a biocide, the batt being optionally combined with a strengthening and stiffening scrim (see page 4, lines 55 to 60).

The claimed subject-matter differs from this in that the fibres according to the application in suit consist of polyethylene or polypropylene and in a different choice of the antibacterial compound. Furthermore, a layer of other non-woven fabric is also comprised in the sandwich structure.

Therefore, the claimed subject-matter is novel having regard to D3.

- 2.3 D5 discloses particulate antimicrobial powders comprising inert inorganic particles having a first antimicrobial coating of a metal, such as copper, zinc or silver, and a second coating of silica or silicates, for incorporation into a polymeric matrix (see column 3, line 60 to column 4, line 50; column 8, lines 43 to 45; column 10, lines 23 to 25). These polymers can be processed by the usual techniques such as coating, moulding, extruding, spinning and melt blowing, into articles such as containers, pipes and monofilaments (see column 9, lines 31 to 36; col. 10, lines 43 to 48), or melt-blown antimicrobial fibres for sterile filters etc. (see column 11, lines 38 to 45). Preferably, if



the polymer is solvent soluble, the antimicrobial powder is dispersed in the polymer solution prior to spinning (see column 12, lines 39 to 48). D5 thus requires the use of an antimicrobial powder having a specific structure for incorporation into a polymer fibre. D5 does not disclose filters.

- 2.4 D9 reveals polymer masterbatch compositions comprising high amounts (not less than 10% and up to 50%) of active components, in particular of liquid antimicrobial or antibacterial agents (see column 6, lines 30 to 39). These masterbatches may be added to polymers in the manufacture of fibres for woven and non-woven fabrics in an effective amount to provide a final product having about 1 to 10 weight-% of the agent (see column 8, lines 24 to 35). Specifically mentioned as polymers are polyethylene and polypropylene (see column 3, lines 12 to 20; column 4, lines 12 to 21). Among the antibacterial agents, D9 mentions *inter alia* chlorinated phenols (see column 5, lines 10 to 17); additives other than biocides include insecticides, such as permethrin (see column 5, lines 37 and 54 to 63). D9 does not disclose supported filters made of the fibres containing the antibacterial agent.

Therefore, the claimed subject-matter is novel with respect to D9.

- 2.5 D6 relates to compositions comprising an antimicrobial agent (OBPA (10,10'-oxybisphenoxarsine), isoindole dicarboxamides, tributyltin oxide, zinc omadine, and others) (see column 1, 2 and 42) and an antioxidant (in particular aromatic phenolic compounds), for

incorporation into resin compositions which can be melt-processed or fiberised at elevated temperatures (column 41, lines 20 to 66). D6 does not disclose a filter.

2.6 D7 discloses so-called "R-stat" fibres of high-strength polyamide or polyester "*con una capa de 0.2 µm de sulfuro de cobre intimamente integrada en el polimero*" which imparts antistatic and antibacterial properties (page 60, last paragraph, page 61, first paragraph). A sandwich filter structure as claimed in current claim 1 is not disclosed in D7.

2.7 D8 is about the synthesis of microspheres loaded with Triclosan and their irreversible immobilisation on a viscose non-woven structure. The antimicrobial agent is thus not present in the body of the fibres, but on the surface only. Moreover, D8 was published after the priority date of the present application.

2.8 The requirements of Article 54 EPC are thus met.

3. Inventive step

3.1 The invention is concerned with a filter structure for the filtration and elimination of the bacterium *Legionella pneumophila* from air or water, the filter medium comprising a non-woven fabric consisting of fibres of polypropylene or polyethylene treated in the body of the fibres with selected antibacterial compounds and being arranged in a sandwich structure together with other non-woven fabrics and a supporting mesh.

3.2 Document D3 is considered to represent the closest prior art.

The air filter according to D3 has germicidal and fungicidal properties. The filter medium comprises a non-woven batt of organic synthetic fibres (cotton, wool, acetate or viscose fibres) whose surfaces are impregnated with a biocide (such as an organo-tin compound, e.g. bis-(tributyl)-tin)oxide; TBTO or a silver compound, e.g. silver thiocyanate) (see page 1, lines 17 to 31; page 2, lines 3 to 20; page 4, lines 85 to 111; claims). The batt may also be combined with a strengthening and stiffening scrim (see page 4, lines 55 to 60). The filter is biocidal and inhibits the growth of various air-borne organisms such as *M. aureus*, *E. coli*, *B. subtilis* and others (see page 5, lines 65 to 84).

D3 is therefore concerned with a technical objective similar to the objective according to the invention and also proposes essentially similar technical means for solving it. Therefore, D3 qualifies in the board's view as the closest prior art.

3.3 Starting from D3, the technical problem underlying the application under appeal consists in improving the durability of the bactericidal filter of D3. This problem may be derived from the passage bridging pages 9 and 10 of the application documents as originally filed.

3.4 As a solution to the above defined problem, the application under appeal proposes a filter as claimed in claim 1, characterized in that

- i) the fibres of the non woven fabric are treated into all of the body with an antibacterial compound;
- ii) the fibres are selected from polypropylene and polyethylene;
- iii) the antibacterial compound is selected from the group formed by permetrine derivatives, isothiazolinone derivatives, organozinc compounds, zirconium phosphates, phenols or chlorinated phenols or mixtures thereof, wherein said antibacterial compound is contained in the fibers between 0.02 % and 65 %;
- iv) and the filter is constructed as a sandwich structure comprising:
  - (a) said non woven fabric,
  - (b) other non woven fabrics, and
  - (c) a mesh support of polypropylene, polyethylene, polyester, glass fibre, aluminium, steel or foam adapted to support mechanical forces.

3.5 The present application claims that fibres treated with the antibacterial compound not only on their surface, but also in the body of the fibres provide an increased durability for the antibacterial action (see page 9, last paragraph - page 10, first paragraph, of the application documents as originally filed). The board finds this effect plausible. The board also has no reason to doubt that the antibacterial compounds recited in claim 1, included in the fibres in the amounts of between 0.02 and 65% as stated in the claim, are effective against Legionella pneumophila.

The board is thus satisfied that the claimed subject-matter defines a more durable filter for the filtration and elimination of the bacterium Legionella pneumophila

from air or water, so that the above defined technical problem is successfully solved.

- 3.6 It remains to be decided whether the claimed solution was obvious having regard to the prior art.

The appellant himself argued that the manufacture of artificial and synthetic fibres previously treated with antibacterial compounds belonged to the prior art and even formed part of the skilled person's common general knowledge (see appeal brief dated 2 June 2011, page 5). This emerges in particular from documents D5 and D9, cited by the appellant. The appellant furthermore asserted that the kind of fibres used in accordance with the application under appeal, namely fibres treated in the body (and core) with an antibacterial agent, not only belonged to the state of the art and were known to the skilled person, but even on the market.

According to the established jurisprudence of the Boards of Appeal, common general knowledge is represented by basic handbooks and textbooks on the subject in question; it does not normally include patent literature and scientific articles; see T 766/91 (of 29 September 1993, Reasons 8.2) and T 20/81 (OJ EPO 1982, 217, Reasons 5). However, to the benefit of the appellant, the board accepts his assertions that antibacterial fibres, for instance as described in D9, were common general knowledge. Were it otherwise, the application would clearly be open to an objection under Article 83 EPC, for the reasons already given in the board's preliminary communication dated 27 January 2012 (see point 4).

Therefore, the kind of antibacterial fibres disclosed in D9 constitutes prior art of which the skilled practitioner would have been aware.

As discussed above, the fibres made from the polymer masterbatch compositions of D9 may consist of polyethylene or polypropylene and comprise substantial amounts of antibacterial agents (for instance chlorinated phenols) in the body of the fibre. D9 also discloses the manufacture of polymer fibres for woven and non-woven fabrics, the fibres containing about 1 to 10 weight-% of the antibacterial agent.

The board notes that chlorinated phenols are among the antibacterial compounds used in the application under appeal against *L. pneumophila* (see claim 1). The appellant did not contest that antibacterial compounds as recited in claim 1, for instance chlorinated phenols, were either known to be effective against *L. pneumophila*, or that it was at least obvious to try them in view of their known biocidal properties. In the board's view, the claimed invention cannot, thus, reside in the discovery or choice of particular antibacterial compounds effective against *L. pneumophila*.

The amount of antibacterial agent (1 to 10 weight-%) present in the fibres of D9 falls under the range claimed in claim 1 of the application under appeal.

Due to their manufacturing method, the fibres disclosed in D9 exhibit the desirable property of an antibacterial treatment not only on the fibres' surface,

but throughout the body. They are thus clearly less prone than conventional surface-treated fibres to lose their biocidal activity by abrasion or dissolution of the antibacterial compound. Consequently, filters of an antibacterial fabric including such fibres last longer. These advantageous properties would without doubt attract the attention of the skilled person who is confronted with the technical problem as defined above, namely of improving the bactericidal filter of D3, in particular in terms of its durability.

The board notes that D3 was published in the year 1960. D3 therefore relies on impregnated natural fibres (cotton, wool) or synthetic fibres derived from natural fibres (cellulose acetate, viscose) which were available at that time (see page 2, lines 3 to 9). At the relevant date of the application under appeal, however, there was available a broad variety of synthetic fibres, including fibres of PE or PP, from which the skilled person would select. It was therefore obvious to look at the PE and PP fibres proposed in D9.

No inventive step can be seen in the manufacture of a filter from a non-woven fabric or having a sandwich structure comprising such a non-woven fabric and being supported by a mesh support. The board observes that a strengthening and stiffening scrim for a similar non-woven filter medium is already disclosed in connection with the air filters of D3. Materials such as polyethylene, polypropylene, polyester and glass fibres are obvious choices for the supporting scrim in view of their strength and inertness. The presence of a further layer of a non-woven fabric (claim feature (b)), which is biologically inactive, does not involve an inventive

step either. The board considers this a part of the routine activities of a skilled person confectioning and finishing a filter in order to provide mechanical stability and integrity, as required by the intended use.

In summary, the subject-matter of claim 1 is obvious having regard to D3 and D9, taking into account the skilled person's common general knowledge.

3.7 The requirements of Article 56 EPC are thus not met.

## **Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar

The Chairman

C. Vodz

G. Rath