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**Datasheet for the decision
of 3 July 2018**

Case Number: T 0684/16 - 3.3.07

Application Number: 05728244.4

Publication Number: 1734922

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Language of the proceedings: EN

Title of invention:
Antimicrobial compositions

Patent Proprietor:
ISP INVESTMENTS INC.

Opponents:
Beiersdorf AG
Thor GmbH
Henkel AG & Co. KGaA

Headword:
Antimicrobial compositions/ISP INVESTMENTS INC.

Relevant legal provisions:
EPC Art. 56

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Case Number: T 0684/16 - 3.3.07

D E C I S I O N
of Technical Board of Appeal 3.3.07
of 3 July 2018

Appellant:
(Patent Proprietor)

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted on 22 January 2016
revoking European patent No. 1734922 pursuant to
Article 101(3)(b) EPC.**

Composition of the Board:

Chairman J. Riolo
Members: D. Boulois
 P. Schmitz

Summary of Facts and Submissions

- I. European patent No. 1 734 922 was granted on the basis of a set of 7 claims.
- II. The patent was opposed under Article 100(a), (b) and (c) EPC, on the grounds that its subject-matter lacked novelty and inventive step, was not sufficiently disclosed and extended beyond the content of the application as filed.
- III. The appeal by the patent proprietor lies from the decision of the opposition division to revoke the patent. The decision was based on 2 sets of claims filed with letter of 25 September 2015 as main request and auxiliary request 1.

Independent claim 1 of the main request and auxiliary request 1 read as follows, difference(s) between the main request and auxiliary request 1 shown in bold:

Main request

"1. An antimicrobial composition which is active against bacteria, yeast and mold spores consisting essentially of, by wt.;

- (a) 40-60% of a 1,2-diol wherein the 1,2-diol is 1,2-pentanediol, 1,2-hexanediol and 1,2-octanediol;
- (b) 40-60% of phenoxyethanol; and
- (c) 0-10% of a co-biocide selected from the group consisting of sorbic acid, benzoic acid, dibromodicyanobutane and 1,2-benzisothiazolin-3-one."

Auxiliary request 1

"1. An antimicrobial composition which is active against bacteria, yeast and mold spores consisting essentially of, by wt.;

(a) 40-60% of ~~a 1,2-diol wherein the 1,2-diol is 1,2-pentenediol, 1,2-hexanediol and~~ 1,2-octanediol;

(b) 40-60% of phenoxyethanol; and

(c) 0-10% of a co-biocide selected from the group consisting of sorbic acid, benzoic acid, dibromodicyanobutane and 1,2-benzisothiazolin-3-one."

IV. The documents cited during the opposition proceedings included the following:

D1: ISP Product Info on X-Tend 226

D5: EP 1 238 651

D7: JP H10-053510

D7a: JP H10-053510 English translation

D7b: JP H10-053510 German translation

D12a: JP 2002-128867

D12b : JP 2002-128867 English translation

D14a: JP 2003-286153

D14b : JP 2003-286153 English translation

D15a: JP 2001-335419

D15b : JP 2001-335419 English translation

D16 : EP 1 537 854

D18: Appendix A

D20: EP 1206933

V. According to the decision under appeal, the main request met the requirements of Article 123(3), 123(2) and 100(b) EPC.

None of the documents D1, D12(a) (b), D14(a) (b), D15(a) (b) and D16 was novelty destroying against claim 5 of the main request.

As regards inventive step, D7a was seen as the closest prior art for the main request; it disclosed an

antiseptic composition consisting of 1,2-pentanediol and 2-phenoxyethanol in a ratio of 90:10 to 99.95:0.05. The difference between the claimed formulation and the disclosure of D7a laid in the increase of the amount of 2-phenoxyethanol in the formulation relative to the amount of 1,2-diol. The experimental data D18 were not suitable to support an effect, since it did not relate to the formulations shown in D7a. The problem was thus the preparation of an alternative antimicrobial composition active against bacteria, yeast and mold spores, which was capable to deliver water insoluble biocides into an aqueous care system at relatively high concentrations. The solution was obvious in view of D7a.

The subject-matter of claim 1 of auxiliary request 1 was restricted to a specific 1,2-diol, namely 1,2-octanediol and met the requirements of Articles 123(2), 100(b), 84, and 54 EPC.

D5 was considered to be the closest prior art for auxiliary request 1; D5 described the use of octanediol to increase the preservative activity of a combination of iodopropynyl butyl carbamate (hereinafter IPBC) and phenoxyethanol in topical formulations. Example 1 showed a formulation of 6% IBPC, 31% octanediol and 63% phenoxyethanol. The difference between the claimed subject-matter and D5 was the presence of IPBC and the slightly different ratio of octanediol to phenoxyethanol. The tests in D18 were not able to show an improvement, since its comparative example did not correspond to the formulation of D5. The solution was seen as obvious in view of D5, and auxiliary request 1 did not meet the requirements of Article 56 EPC.

VI. The proprietor (hereinafter appellant) filed an appeal against that decision. With the statement setting out the grounds of appeal the appellant submitted the following pieces of evidence:

D21: Experiments

D22: Challenge Tests

D23: WO 98/47469

The appellant requested that the patent be maintained on the basis of the main request and auxiliary request 1 which were the basis of the decision of the opposition division.

VII. A communication from the Board, dated 16 November 2017, was sent to the parties. In this it was stated, in particular, that none of the requests were inventive over the prior art. It was also stated that the tests D21 showed an effect only for bacteria and not for yeasts or spores, and that the tests D22 showed inconsistent results.

VIII. Oral proceedings took place on 3 July 2018.

IX. The arguments of the appellant, as far as relevant to the present decision may be summarised as follows:

Main request - Inventive step

D5 disclosed compositions in which a diol was used to enhance the efficiency of iodopropynyl butyl carbamate (hereinafter IPBC), which presence was presented as essential in this document. On the other hand, the subject-matter claimed by the main request did not comprise IPBC, which was removed. D5 required indeed the presence of 1,2-octanediol, phenoxyethanol and IPBC. The diol was used to potentiate the activity of

the IPBC. There were thus two significant changes that needed to be made to D5, i.e. the removal of the component whose activity is being potentiated, IPBC, and an alteration of the ratios of the two remaining compounds.

Example 1 of D5, which was cited by the respondents, was a cosmetic composition and was thus representative as to the effect of the claimed biocidal composition.

Comparative example 8 of D14 showed that the compositions of D5 did not provide any effect when IPBC was absent, and that this compound was essential. Example 19 of the patent application also showed that the activity was identical if IPBC was absent. Examples 1 and 15 of the application showed furthermore that the fungicidal activity was not lost when IPBC was absent. This was confirmed by D22.

Starting from D5, there was no motivation for the skilled person to formulate a composition as claimed in which IPBC is not present. There was nothing in any of the cited art which would have caused the skilled person to leave out one component which was consistently represented as essential to achieve preservative activity. Since D5 did not comprise any teaching to remove IPBC, the claimed subject-matter was considered to be inventive over D5.

Auxiliary request 1 - Inventive step

The arguments as to inventive step were the same as for the main request.

- X. The arguments of the respondents, as far as relevant to the present decision, may be summarised as follows:

Main request - Inventive step

According to respondent 01, D5 could be seen as the closest prior art, in view of its example 1. The claimed subject-matter differed from this disclosure in the absence of IPBC and a different ratio between (a) and (b). IPBC was given as essential in the application as filed corresponding to the contested patent, and it was not correct to state during the appeal proceedings that this product had no effect. Moreover, there was no evidence that an effect was linked with the technical differences, and the problem could only be the provision of an alternative composition. The solution was obvious in view of the disclosure of D5, especially paragraph [0032].

According to respondent 02, D20 or D5 could be seen as the closest prior art. Example 1 disclosed a cosmetic composition stabilized by IPBC, phenoxyethanol and 1,2-octanediol. The claimed subject-matter differed in the absence of IPBC and a different ratio between a) and b). Examples 1 and 19 of the application showed that the omission of IPBC in the composition led to a decreased fungicide activity. Since IPBC was a known fungicide, it was expected that the fungicide effect disappeared or diminished. The effect shown in examples 1 and 19 of the application of the contested patent could therefore not be surprising and said result was confirmed by examples 2 or 15 of the patent application. The problem was seen as the provision of a biocide composition with a diminished fungicide activity. The skilled person knew that phenoxyethanol and 1,2-octanediol were mild biocides and knew also that IPBC was a fungicide and therefore would have arrived at the claimed subject-matter.

According to respondent 03, D7, D14 or D5 could be seen as closest prior art. The problem over D5 was seen as the provision of an alternative composition. The solution was obvious in view of D12, D14 or D15.

XI. Requests

The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request or the auxiliary request 1 filed with letter of 25 September 2015.

The respondents requested that the appeal be dismissed.

Reasons for the Decision

1. Main request - Article 56 EPC

1.1 The invention relates to antimicrobial compositions, and, more particularly, to a defined blend of a 1,2-diol and phenoxyethanol, optionally with a co-biocide, which compositions show broad activity against bacteria, fungi and mold spores.

1.2 In its decision, the opposition division considered D7 (see D7a or D7b) as the closest prior art for this request, while it considered D5 as closest prior art for the more restricted subject-matter of auxiliary request 1. This choice was agreed by the appellant in its statement of grounds of appeal.

Respondent 01 considered documents D1, D4 and D7 as the closest prior art, while respondent 02 considered D5 and D20, and respondent 02 considered D5, D7 and D14.

Since D5 was considered as the closest prior art for the subject-matter of auxiliary request 1, which was more restricted than the subject-matter of the main request, inventive step of the main request will first be assessed over this document.

D5 discloses in example 1 an antiseptic composition made from 1% by weight of phenoxyethanol, 0.5% by weight of caprylyl glycol (1,2-octanediol) and 0.1% by weight of IPBC (see also par. [0057]). The disclosed composition comprises therefore a different weight concentration of phenoxyethanol and 1,2-octanediol, namely respectively 63% by weight and 31% by weight. It also comprises IPBC as third antiseptic component.

- 1.3 According to the appellant, the problem is the provision of a composition providing an improved antiseptic effect.
- 1.4 The solution is an antimicrobial composition which does not comprise IPBC and consisting essentially of, by wt. ;
 - (a) 40-60% of a 1,2-diol wherein the 1,2-diol is 1,2-pentanediol, 1,2-hexanediol and 1,2-octanediol;
 - (b) 40-60% of phenoxyethanol;
 - (c) 0-10% of a co-biocide selected from the group consisting of sorbic acid, benzoic acid, dibromodicyanobutane and 1,2-benzisothiazolin-3-one.
- 1.5 Examples 1 and 19 of the patent application were cited by the appellant to demonstrate the existence of an effect. Said examples provide an indirect comparison between compositions without IPBC and compositions comprising IPBC.

- 1.5.1 Example 1 studies the biocidal effect of a composition with a 40/60 weight ratio of 1,2-octanediol/ phenoxyethanol in a screening emulsion at concentrations of 0.5 and 1.0 wt%. The study shows a biocidal activity against the test bacteria *Staph. aureus*, *E. coli*, *P. aeruginosa*, *B. cepacia* at 28 days, but shows also a development of the yeast *C. albicans* and the mold spores *A. niger* after 48 hours when used at the concentration of 0.5 wt% and of *A. Niger* after 48 hours when used at a concentration range of 1.0 wt%. The concentration of *C. albicans* and *A. niger* becomes again acceptable after 7 days at the concentration of 1.0 wt%, but the biocidal composition used at a concentration of 0.5% could not prevent the development of *A. niger* up to 28 days.
- 1.5.2 Example 19 studies the biocidal activity of a composition comprising 1,2-octanedio/phenoxyethanol and 1.25% of IPBC in a screening emulsion at 1.0 and 1.8 wt %. The study shows that, at both concentrations, there is no development of any test organisms, namely the bacteria *Staph. aureus*, *E. coli*, *P. aeruginosa*, *B. cepacia*, the yeast *C. albicans* and the mold spore *A. niger* between 48 hours and 28 days.
- 1.5.3 A comparison between the experimental results of examples 1 and 19 shows therefore an equivalent result as regards the bacteria, but the composition of example 1 without IPBC could not prevent a development, at least temporary, of the yeast *C. albicans* and of the mold spore *A. niger*. The compositions comprising exclusively 1,2-octanediol and phenoxyethanol have undeniably a decreased biocidal activity against *C. albicans* and even a mediocre biocidal activity against *A. niger*.

These results as regards the decreased biocidal activity against the yeast *C. albicans* and of the mold spore *A. niger* are confirmed by other examples of the patent application, such as examples 2 and 15, as it was argued by respondent 02. Said examples 2 and 15 study the biocidal activity of a composition of a 40/60 ratio of 1,2-octanediol/phenoxyethanol in non-ionic emulsions and screening emulsions. These compositions could not show a biocidal activity against *C. albicans* and *A. niger* even after 48 days in the case of example 2. In example 15, the composition used in a screening emulsion at a concentration could also not prevent the growth of *A. niger* at 48 days.

- 1.5.4 Examples 1, 2, 15 and 19 of the patent application show thus undeniably that a composition according to the invention has an equivalent activity in comparison to a composition comprising additionally IPBC, except against yeasts and mold spores, for which the biocidal activity is diminished.

There is no further piece of evidence on file which allows a comparison between compositions as claimed and a composition as disclosed in D5 or between the claimed composition and a composition comprising a diol and phenoxyethanol at the weight ratio shown in D5.

D18, D21 and D22 in particular do not present a comparison between the claimed compositions and compositions as disclosed in D5. Moreover, D22 shows inconsistent results in the comparison between a composition comprising 56:44 of PE:OD according to the invention and a composition of 65:35 PE:OD, especially as regards the effect on fungi or bacteria.

- 1.6 It is thus not possible to establish an improvement over the prior art. Consequently, in the absence of any experimental evidence or arguments establishing a minimum plausibility, the presence of an improvement of the biocidal activity of the claimed composition over the biocidal composition of D5 has not been credibly demonstrated and the technical problem must be reformulated as the provision of alternative biocidal compositions. In view of the information found in the examples of the contested patent, the board is convinced that the problem has been plausibly solved.

- 1.7 The question remaining is whether the skilled person, starting from example 1 of D5, would arrive at the subject-matter of claim 1 of the main request in an obvious manner in order to solve the problem posed.
 - 1.7.1 It belongs to the normal activity of the skilled person to accomplish routine modifications, such as modifying the existing biocidal composition of D5 as part of its normal activity, especially for obtaining a composition with the same or with a decreased biocidal activity. It would in particular be expected that the suppression of IPBC in the compositions of D5 would lead to a decreased fungicidal effect, since IPBC is a commonly known antifungal product.

 - 1.7.2 The Board could not follow the appellant's argument as to the uselessness and the inessentiality of IPBC in the compositions of the present invention, while IPBC is presented as essential in D5. This biocide was indeed also presented as an essential component of the biocidal composition in the original application corresponding to the present patent, and was present as such in many examples of the application as originally filed. This argument is therefore inconsistent with the

disclosure of the original application and cannot be followed for this reason.

1.7.3 The claimed weight ratio between the biocides a) and b) is also an obvious alternative in view of the disclosure of D5. D5 suggests indeed to use octanediol in the range of 0.1-1% and phenoxyethanol in the range of 0.5-1% (see par. [0035]).

1.8 It follows that the composition of claim 1 of the main request does not involve an inventive step, and said main request does not meet the requirements of Article 56 EPC.

2. Auxiliary request 1 - Article 56 EPC

The subject-matter of claim 1 of this request has been restricted to a specific diol, namely, 1,2-octanediol, which is also the diol disclosed in D5. This restriction has no effect on the assessment of inventive step made above for the main request, and the conclusions apply mutatis mutandis also to auxiliary request 1.

Consequently, auxiliary request 1 does not meet the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



S. Fabiani

J. Riolo

Decision electronically authenticated