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**Datasheet for the decision
of 26 February 2020**

Case Number: T 1585/15 - 3.3.02

Application Number: 04255358.6

Publication Number: 1488699

IPC: A01N43/80

Language of the proceedings: EN

Title of invention:
Synergistic microbicidal combinations

Patent Proprietor:
ROHM AND HAAS COMPANY

Opponent:
Thor GmbH

Headword:

Relevant legal provisions:
EPC Art. 123(2)

Keyword:
Amendments

Decisions cited:

T 0962/98

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1585/15 - 3.3.02

D E C I S I O N
of Technical Board of Appeal 3.3.02
of 26 February 2020

Appellant: Thor GmbH
(Opponent) Landwehrstrasse 1
67346 Speyer (DE)

Respondent: ROHM AND HAAS COMPANY
(Patent Proprietor) 100 Independence Mall West
Philadelphia, PA 19106-2399 (US)

Representative: Kent, Venetia Katherine, et al
Patent Outsourcing Limited
1 King Street
Bakewell
Derbyshire DE45 1DZ (GB)

Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 16 June 2015
rejecting the opposition filed against European
patent No. 1488699 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman M. O. Müller
Members: A. Lenzen
R. Romandini

Summary of Facts and Submissions

- I. This decision concerns the appeal filed by the opponent (appellant) against the decision of the opposition division (decision under appeal) to reject its opposition to European patent No. 1 488 699 (patent in suit).
- II. In its notice of opposition, the appellant had requested revocation of the patent in suit in its entirety on the grounds for opposition pursuant to Article 100(a) (lack of novelty and inventive step), Article 100(b) and Article 100(c) EPC.
- III. The following documents, cited during the opposition proceedings, are referred to in the present decision:
- D1 EP 0 745 324 B1
- D2 WO 99/08530 A1
- IV. With its reply to the statement of grounds of appeal, the patent proprietor (respondent) submitted, *inter alia*, six sets of claims as auxiliary requests 1 to 6.
- V. The board issued a communication pursuant to Article 15(1) RPBA on 13 December 2019.
- VI. During the oral proceedings before the board on 26 February 2020, the respondent filed, *inter alia*, auxiliary request 7, which comprised only one claim.
- VII. The final requests of the parties were the following.

The appellant requested that the decision under appeal be set aside and the patent in suit be revoked in its entirety.

The respondent requested

- that the appeal be dismissed (main request), implying that the decision under appeal be confirmed and the patent in suit be maintained as granted,
- in the alternative, that the patent in suit be maintained in amended form on the basis of
 - one of auxiliary requests 1 to 6, filed with its reply to the statement of grounds of appeal, or
 - auxiliary request 7, filed during the oral proceedings before the board.

VIII. The appellant's submissions, where relevant to the present decision, can be summarised as follows.

Main request and auxiliary requests 1 to 6

Simply extracting the MIT/PE weight ratio ranges from table 6 of the application as filed without specifying the microorganism in question, i.e. *P. aeruginosa*, amounted to an unallowable intermediate generalisation.

Auxiliary request 7

Auxiliary request 7 was late-filed and not clearly allowable. It should not be admitted.

Claim 1 was not clear because of the features "*a microbicidal composition comprising a combination of microbicidal agents consisting of a synergistic mixture*" and "*P. aeruginosa American Type Culture*

Collection (ATCC) #9027". Moreover, it did not contain a definition of "*microbicidal agents*". With regard to the composition, used in the method of claim 1, there was still no mention of *P. aeruginosa*. Thus, the argument made in relation to the main request still applied and the subject-matter of claim 1 amounted to an unallowable intermediate generalisation. The omission of the feature "*wherein the composition has 0 or up to 3% halogenated 3-isothiazolone based on the combined weight of halogenated 3-isothiazolone and 2-methyl-3-isothiazolone*", which had been present in the granted claims, extended the protection conferred by the patent, in contravention of Article 123(3) EPC. The lower limit of 1 ppm active ingredient in claim 1 was not high enough to achieve the purpose of the method, i.e. inhibiting the growth of *P. aeruginosa* ATCC #9027, thus violating Article 83 EPC.

Regarding novelty and inventive step, the appellant referred to its submissions in its statement of grounds of appeal.

IX. The respondent's submissions, where relevant to the present decision, can be summarised as follows.

Main request and auxiliary requests 1 to 6

The skilled person would understand that the ranges in claim 1, extracted from the data in table 6 of the application as filed, were not inextricably linked to the microorganism *P. aeruginosa*. That was because the application as filed also disclosed broader ranges without, however, specifying any particular microorganism at the same time (claim 1; page 9, lines 27 to 29; page 18, lines 2 to 4). In this context, decision T 962/98 was relevant. Moreover, the data in

table 6 actually only showed synergism. In as much as additivity or antagonism were indicated in table 6, they were merely the result of using too much of the microbicide(s).

Auxiliary request 7

The appellant's objection under Article 123(2) EPC had been discussed extensively only during the oral proceedings. The subject-matter of claim 1 had now been clearly restricted to the examples in question. This was a fair attempt to overcome this objection and the appellant could not be surprised by it. Hence, auxiliary request 7 should be admitted.

Claim 1 now reflected what had actually been done in the experiments of the patent in suit relating to *P. aeruginosa* and MIT/PE mixtures with weight ratios of 1/30, 1/40, 1/60, 1/80, 1/107 and 1/133. It thus met the requirements of Article 123(2) EPC. It was clear from the wording of claim 1 that only MIT and PE could be present as microbicidal agents in the microbicidal composition. Hence, the requirements of Article 84 EPC too were met. Furthermore, from this it followed that the protection conferred by the amended claim did not extend beyond that conferred by the granted claims, in line with Article 123(3) EPC. The feature "*P. aeruginosa* American Type Culture Collection (ATCC) #9027" was clear to the skilled person. As regards sufficiency of disclosure, table 1 of the patent in suit showed that amounts falling within the range of 1 to 3000 ppm active ingredient inhibited the growth of *P. aeruginosa* ATCC #9027. In as much as the appellant's insufficiency objection concerned the lower limit of that range, it was merely an unsubstantiated allegation.

Reasons for the Decision

Main request (patent as granted)

1. Claim 1 of the patent as granted reads as follows:

"A microbicidal composition comprising a synergistic mixture, the first component of which is 2-methyl-3-isothiazolone, and the second component of which is the phenoxyethanol; wherein the weight ratio of the first component to the second component is from 1/30 to 1/80 or 1/107 to 1/133; and wherein the composition has 0 or up to 3% halogenated 3-isothiazolone based on the combined weight of halogenated 3-isothiazolone and 2-methyl-3-isothiazolone."

For the following discussion it is important that the microbicidal composition of claim 1 is characterised, *inter alia*,

- in that the weight ratio of 2-methyl-3-isothiazolone (MIT) to phenoxyethanol (PE) falls within one of the two ranges "*from 1/30 to 1/80 or 1/107 to 1/133*", and
- in that the mixture of MIT and PE is synergistic.

2. Amendments (Article 100(c) EPC)

2.1 It was undisputed that the application as filed does not literally disclose either or both of the ranges "*from 1/30 to 1/80 or 1/107 to 1/133*" in claim 1.

The four end values of the two ranges are, however, disclosed in table 6 of the application as filed as results of individual measurements.

2.2 Table 6 is a summary of measurements using combinations of MIT and PE against four different microorganisms: *A. niger*, *C. albicans*, *S. aureus* and *P. aeruginosa*. It is reproduced below within quotation marks (emphases added by the board; note that "MI" is used as an abbreviation for 2-methyl-3-isothiazolone in this table instead of MIT).

" Table 6

First Component = 2-methyl-3-isothiazolone
Second Component = phenoxyethanol

<i>Microorganism</i>	<i>Q_a</i>	<i>Q_b</i>	<i>SI</i>	<i>A/B</i>
<i>A. niger</i> (72 hours)	0	4000	1.00	----
	50	3000	0.92	1/60
	50	2000	0.67	1/40
	75	3000	1.00	1/40
	75	2000	0.75	1/27
	100	3000	1.08	1/30
	100	2000	0.83	1/20
	125	3000	1.17	1/24
	125	2000	0.92	1/16
	150	2000	1.00	1/13
	300	0	1.00	----
<i>C. albicans</i> (72 hours)	0	4000	1.00	----
	50	3000	1.00	1/60
	75	3000	1.13	1/40
	75	2000	0.88	1/27
	100	2000	1.00	1/20
	125	2000	1.13	1/16
	125	1000	0.88	1/8
	125	800	0.83	1/6.4

	125	600	0.78	1/4.8
	125	500	0.75	1/4
	150	1000	1.00	1/6.7
	150	800	0.95	1/5.3
	150	600	0.90	1/4
	150	500	0.88	1/3.3
	150	300	0.83	1/2
	200	0	1.00	----
<i>S. aureus</i>	0	4000	1.00	----
(72 hours)	50	2000	1.13	1/40
	60	1000	1.00	1/17
	60	800	0.95	1/13
	80	0	1.00	----
<i>P. aeruginosa</i>	0	3000	1.00	----
(24 hours)	2.5	2000	0.83	1/800
	5	2000	1.00	1/400
	7.5	2000	1.17	1/267
	7.5	1000	0.83	1/133
	7.5	800	0.77	1/107
	7.5	600	0.70	1/80
	10	1000	1.00	1/100
	10	800	0.93	1/80
	10	600	0.87	1/60
	10	400	0.80	1/40
	10	300	0.77	1/30
	15	0	1.00	----

The synergistic ratios of MI/phenoxyethanol range from 1/2 to 1/800. The MI/phenoxyethanol combination showed enhanced control of Gram (+) and Gram (-) bacteria as well as yeast and mold."

2.3 A and B in the table denote MIT and PE respectively. The synergy index (SI) values were determined by the method of Kull et al. using the following formula:

$$SI = Q_a/Q_A + Q_b/Q_B$$

wherein

Q_A : concentration of MIT in ppm, acting alone, which produced an end point (minimum inhibitory concentration (MIC) of MIT)

Q_B : concentration of PE in ppm, acting alone, which produced an end point (MIC of PE)

Q_a : concentration of MIT in ppm, in the mixture, which produced an end point

Q_b : concentration of PE in ppm, in the mixture, which produced an end point

An SI value of less than one is indicative of synergy, and a value of greater than one is indicative of antagonism. When the value is equal to one, additivity is indicated. The A/B ratios in the last column are calculated from Q_a/Q_b .

2.4 The individual weight ratios of 1/30, 1/40, 1/60 and 1/80 have been taken as a basis for formulating the weight ratio range of 1/30 to 1/80 in claim 1 and the values of 1/107 and 1/133 have been taken as a basis for formulating the weight ratio range of 1/107 to 1/133 in claim 1. In the following it is assumed for the sake of argument, and in the respondent's favour, that the construction of ranges from individual

measurement values is allowable in view of Article 123(2) EPC in the present case.

2.4.1 As becomes clear from table 6, the tested mixtures of MIT and PE with weight ratios of 1/30, 1/40, 1/60, 1/80, 1/107 and 1/133 are synergistic against *P. aeruginosa*. As is also evident from table 6, however, mixtures of MIT and PE with a weight ratio of 1/40, i.e. a weight ratio lying within the range of 1/30 to 1/80 according to claim 1, are not synergistic against the other three microorganisms tested. Instead, these mixtures merely show additivity (*A. niger*) or even antagonism (*C. albicans*, *S. aureus*).

2.4.2 The respondent argued in this context that it was evident from the data in table 6 that too much biocide was present in certain compositions, such as the composition with a MIT/PE weight ratio of 1/40 tested against *S. aureus*. The corresponding values of $Q_a = 50$ ppm and $Q_b = 2000$ ppm were actually too high. The apparent antagonism was the inevitable consequence of the way the synergy index was calculated according to Kull et al. (see the equation given above). However, this did not mean that the mixture was not synergistic.

This argument is not convincing as the patent in suit clearly states the amounts of the biocides in the mixtures, i.e. Q_a and Q_b , to be the concentrations in the mixture which produced an end point (= no growth), i.e. to be the concentrations in the **minimum amount of mixture** necessary to cause just no more growth.

It follows that a mixture of MIT and PE with a MIT/PE weight ratio according to claim 1 is synergistic only against *P. aeruginosa*. Thus, the MIT/PE weight ratio ranges of claim 1 and the microorganism *P. aeruginosa*

are inextricably linked to each other. Extracting the ranges of claim 1 from the data in table 6 of the application as filed without at the same time specifying that the mixture must be synergistic against *P. aeruginosa* generates an unallowable intermediate generalisation. This is exactly what has been done in claim 1.

The respondent argued that the amendments in claim 1 had to be considered allowable in view of T 962/98. However, that decision essentially held that, for an amendment based on only a limited number of an example's characteristics to be allowable, those characteristics must not be closely related to the other characteristics of the example. Since this prerequisite is not met in the present case, as shown above, that decision does not apply here.

For the reasons above, the main request is not allowable.

Auxiliary requests 1 to 6

3. Amendments (Article 123(2) EPC)

The independent claims of auxiliary requests 1 to 6 mention at least one of the MIT/PE weight ratio ranges in claim 1 of the main request without, however, specifying that the mixture must be synergistic against *P. aeruginosa*. For the reasons given above these requests are not allowable either.

Auxiliary request 7

4. Auxiliary request 7 comprises only one claim, which reads as follows:

"A non-therapeutic method of inhibiting the growth of P. aeruginosa American Type Culture Collection (ATCC) #9027 in a locus comprising introducing to, at or on, the locus a P. aeruginosa ATCC #9027 inhibiting amount of a microbicidal composition comprising a combination of microbicidal agents consisting of a synergistic mixture, wherein said synergistic mixture consists of a first component which is 2-methyl-3-isothiazolone, and a second component which is phenoxyethanol; wherein the weight ratio of the first component to the second component is: 1/30; 1:40; 1:60; 1/80; 1/107 or 1/133; and wherein the amount of synergistic mixture is from 1 to 3,000 parts per million active ingredient."

5. Admittance

5.1 The respondent filed auxiliary request 7 during the oral proceedings before the board.

The appellant argued that it had raised its objection to claim 1 of the main request - that its subject-matter amounted to an unallowable intermediate generalisation - back in its statement of grounds of appeal. Addressing this objection only now, during the oral proceedings, by way of auxiliary request 7, meant that this request was late-filed.

Furthermore, auxiliary request 7 was not clearly allowable. In this context the appellant raised the following objections.

- Article 84 EPC

The features *"a microbicidal composition comprising a combination of microbicidal agents consisting of*

a synergistic mixture" and *"microbicidal agents"* lacked clarity.

- Article 123(2) EPC

With regard to the composition used in the method of claim 1, there was still no mention of *P. aeruginosa*. Auxiliary request 7 was therefore not allowable for the same reason as that discussed in relation to the higher-ranking requests.

- Article 123(3) EPC

Compared to the set of claims as granted the amount of halogenated 3-isothiazolone was no longer restricted. Therefore, the scope of claim 1 was broader than that of the granted claims.

Based on the above, the appellant requested that auxiliary request 7 not be admitted pursuant to Article 13(1) and (3) RPBA 2007.

- 5.2 Auxiliary request 7 comprises only one claim. This claim is essentially based on granted claims 1, 4 and 5 and has been tailored to properly reflect what was actually done in the experiments of the patent in suit relating to *P. aeruginosa* and MIT/PE mixtures with weight ratios of 1/30, 1/40, 1/60, 1/80, 1/107 and 1/133. Consequently, auxiliary request 7 now focuses on the core of the invention of the patent in suit. The appellant's objection under Article 123(2) EPC was discussed extensively only during the oral proceedings. Therefore, the filing of auxiliary request 7 during them is to be considered a fair attempt to overcome this objection. Furthermore, the board did not find the appellant's arguments as to a lack of clear

allowability convincing (see the discussion of them further below).

For the reasons given above and because the appellant did not present any arguments as to why it could not reasonably have been expected to deal with auxiliary request 7 without adjournment of the oral proceedings (Article 13(3) RPBA 2007), the board decided to admit auxiliary request 7 into the proceedings, pursuant to Article 13(1) and (3) RPBA 2007.

6. Clarity (Article 84 EPC)

- 6.1 The appellant argued that a lack of clarity arose because of the feature "*a microbicidal composition comprising a combination of microbicidal agents consisting of a synergistic mixture*" and because there was no clear definition of "*microbicidal agents*" in claim 1. The well-known solvent ethanol had microbicidal properties. It was not clear whether a composition containing not only MIT and PE in a ratio as required by claim 1 but also ethanol was to be considered a composition referred to in claim 1.

This is not convincing. The beginning of the feature objected to by the appellant, "*a microbicidal composition comprising a combination of microbicidal agents*", is worded in an open form. This part alone therefore does not limit the number of microbicidal agents in the microbicidal composition. However, claim 1 then goes on to require that the microbicidal agents **consist** of a synergistic mixture, and that the synergistic mixture itself **consists** of MIT and PE. This essentially means that only the two microbicidal agents mentioned in claim 1, MIT and PE, may and have to be present in the microbicidal composition. It also

follows that claim 1 gives an unambiguous and exhaustive definition of "*microbicidal agents*" as comprising only MIT and PE, thus excluding ethanol.

- 6.2 The appellant argued too that the feature "*P. aeruginosa* American Type Culture Collection (ATCC) #9027" rendered claim 1 unclear. This specific type of microorganism had apparently been deposited before the priority date of the patent in suit. It could not be excluded that it had been renamed in the meantime.

This is unconvincing. The American Type Culture Collection is a recognised depositary institution and the *P. aeruginosa* type in question was given a number by it. Therefore, even if the microorganism has been renamed in the meantime, it would still be possible to retrieve it at a later date if necessary.

- 6.3 In summary, claim 1 meets the requirements of Article 84 EPC.

7. Amendments (Article 123(2) EPC)

- 7.1 The appellant argued that the microorganism *P. aeruginosa* was still not mentioned in claim 1 insofar as the composition used in the method of claim 1 was concerned. Thus, auxiliary request 7 was not allowable for the same reason as that discussed in relation to the higher-ranking requests.

This was the only objection under Article 123(2) EPC to auxiliary request 7 that the appellant put forward during the oral proceedings.

- 7.2 Apart from the amendments discussed below, claim 1 is based on claims 1 and 3 as filed.

The amount of the synergistic mixture in claim 3 as filed ("*0.1 to 10,000 parts per million active ingredient*") has been limited in claim 1 to "*1 to 3,000 parts per million active ingredient*" based on page 8, lines 26 to 28, of the application as filed.

The further amendments, which are

- the limitation to *P. aeruginosa* and more specifically to *P. aeruginosa* ATCC #9027,
- the limitation to the specific MIT/PE weight ratios of 1/30, 1/40, 1/60, 1/80, 1/107 and 1/133, and
- the limitation of the microbicidal composition insofar as it comprises only MIT and PE as microbicidal agents (see the discussion of clarity above),

are based on the last part of table 6 (see the reproduction of table 6 under point 2.2 above) in conjunction with page 11, lines 16 to 17, of the application as filed (specification of *P. aeruginosa* to *P. aeruginosa* ATCC #9027). These limitations have the result that the subject-matter of claim 1 now reflects what was actually done in the relevant experiments depicted in the last part of table 6 of the patent application as filed. Since the microorganism is specified, the appellant's objection, because of which the higher-ranking requests were found not to be allowable, is no longer relevant.

The requirements of Article 123(2) EPC are thus met.

8. Extent of protection (Article 123(3) EPC)

In claim 1, the feature "*wherein the composition has 0 or up to 3% halogenated 3-isothiazolone based on the combined weight of halogenated 3-isothiazolone and 2-methyl-3-isothiazolone*", which was present in the granted claims, has been omitted. On this basis, the appellant argued that halogenated 3-isothiazolones might now be present in the composition used in the method of claim 1 and consequently that the scope of claim 1 was larger than that of the granted claims.

This is not persuasive. As already explained above, claim 1 has to be construed such that the microbicidal composition comprises only MIT and PE as microbicidal agents. Further microbicidal agents, such as the well-known class of halogenated 3-isothiazoles, are therefore excluded from the composition.

The requirements of Article 123(3) EPC are therefore met.

9. Sufficiency of disclosure (Article 83 EPC)

Claim 1 requires that "*the amount of synergistic mixture is from 1 to 3,000 parts per million active ingredient*". According to the appellant, the lower limit of 1 ppm active ingredient was not high enough to achieve the purpose of the method, i.e. inhibiting the growth of *P. aeruginosa* ATCC #9027.

However, table 1 of the patent in suit (which is table 6 of the application as filed, reproduced above) shows that amounts of active ingredient falling within the claimed range of 1 to 3000 ppm do in fact inhibit the growth of *P. aeruginosa* ATCC #9027. In as much as the

objection specifically concerns the lower limit of that range, the appellant did not substantiate its doubt that the purpose of the method could be achieved. It is thus an unsubstantiated allegation.

Article 83 EPC therefore does not prejudice the maintenance of the patent in suit in amended form based on auxiliary request 7.

10. Novelty (Article 54 EPC)

In its statement of grounds of appeal, the appellant essentially repeated its novelty objection based on D1 which it had already submitted in its notice of opposition. It did not in any way address the reasoning of the opposition division which had rebutted this objection. In its communication pursuant to Article 15(1) RPBA the board expressed its preliminary view that this novelty objection should not be admitted because it lacked substantiation. During the oral proceedings, the appellant did not make any further submissions in this respect. Consequently, the board decided to not admit the appellant's novelty objection based on D1 into the proceedings.

In the absence of any other novelty objections, the board has to conclude that the subject-matter of claim 1 is novel.

11. Inventive step (Article 56 EPC)

In its statement of grounds of appeal, the appellant argued a lack of an inventive step based on D2 as the closest prior art. In its communication pursuant to Article 15(1) RPBA (see in particular points 5.2 to 5.5) the board expressed its preliminary view that it

did not find the appellant's arguments convincing. During the oral proceedings the board stated that the reasoning leading to its preliminary opinion applied *mutatis mutandis* to the subject-matter of claim 1 of auxiliary request 7. The appellant did not make any further submissions in this regard. Consequently, the board saw no reason to deviate from its preliminary opinion. The board has to conclude that the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent with the following claim and a description to be adapted thereto:

Claim 1 according to auxiliary request 7, filed as annex II during the oral proceedings before the board.

The Registrar:

The Chairman:



N. Maslin

M. O. Müller

Decision electronically authenticated