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**Datasheet for the decision
of 15 September 2020**

Case Number: T 0311/18 - 3.3.05

Application Number: 09756626.9

Publication Number: 2367601

IPC: A62D1/00, C08J9/14, C09K3/30,
C09K5/04

Language of the proceedings: EN

Title of invention:
TETRAFLUOROPROPENE COMPOSITIONS AND USES THEREOF

Patent Proprietor:
The Chemours Company FC, LLC

Opponents:
ARKEMA FRANCE
Daikin Industries, Ltd.

Headword:
Tetrafluoropropene compositions/Chemours

Relevant legal provisions:
EPC Art. 54, 56, 123(2), 83

Keyword:

Main and third aux. requests - Novelty (no)
First and fourth aux. requests - Disclaimer - allowable (no)
second and fifth to twelfth aux. requests - inventive step (no)
thirteenth aux. request - allowable (yes)

Decisions cited:

G 0001/03, G 0001/16, T 0666/89, T 0939/92, T 0593/09,
T 0282/12

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 0311/18 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 15 September 2020

Appellant: The Chemours Company FC, LLC
(Patent Proprietor) 1007 Market Street
Wilmington DE 19801 (US)

Representative: Dannenberger, Oliver Andre
Abitz & Partner
Patentanwälte mbB
Postfach 86 01 09
81628 München (DE)

Appellant: ARKEMA FRANCE
(Opponent 1) 420, Rue d'Estienne d'Orves
92700 Colombes (FR)

Representative: Bandpay & Greuter
30, rue Notre-Dame des Victoires
75002 Paris (FR)

Respondent: Daikin Industries, Ltd.
(Opponent 2) Umeda Center Bldg.
2-4-12, Nakazaki-Nishi
Kita-ku
Osaka 530-8323 (JP)

Representative: Hoffmann Eitle
Patent- und Rechtsanwälte PartmbB
Arabellastraße 30
81925 München (DE)

Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
8 January 2018 concerning maintenance of the
European Patent No. 2367601 in amended form.**

Composition of the Board:

Chairman E. Bendl
Members: G. Glod
 R. Winkelhofer

Summary of Facts and Submissions

I. The appeals lodged by the patent proprietor (appellant 1) and opponent 1 (appellant 2) lie from the opposition division's decision finding that the amended European patent EP-B-2 367 601 on the basis of what was then auxiliary request 2 met the requirements of the EPC.

The following documents cited in the impugned decision are of relevance here:

D3: WO 2006/094303 A2

D5: WO 2008/157757 A1

D16: WO 92/11339 A1

D20: D.W. Shao and E. Granryd, Int. J. Refrig., Vol 21, No. 3, pages 230-246, 1998

D21: EP 0 509 673 A1

II. With the statement of grounds of appeal appellant 1 submitted first to seventh auxiliary requests.

III. Among other documents, appellant 2 submitted the following with the statement of grounds of appeal:

D24: WO 2008/105366 A1

D24a: English translation of D24

IV. On 1 October 2018, appellant 1 submitted eighth to twenty-fourth auxiliary requests.

V. On 24 January 2019 appellant 1 submitted a new third auxiliary request replacing the previous one.

VI. In its communication under Article 15(1) RPBA 2020 of 19 May 2020, the board was of the preliminary opinion

that the thirteenth auxiliary request was possibly allowable.

Claim 1 of the main request (patent as granted) is as follows:

*"1. A composition selected from near-azeotropic compositions consisting of:
1 weight percent to 98 weight percent HFO-1234yf, 1 weight percent to 98 weight percent HFC-152a, and 1 weight percent to 98 weight percent HFC-125;
1 weight percent to 98 weight percent HFO-1234yf, 1 weight percent to 98 weight percent HFC-125, and 1 weight percent to 98 weight percent HFC-134a, with the proviso that said composition is not 50 weight percent HFO-1234yf, 30 weight percent HFC-125 and 20 weight percent HFC-134a;
1 weight percent to 55 weight percent HFO-1234yf; 45 weight percent to 98 weight percent HFC-32, and 1 weight percent to 55 weight percent HFC-134a;
1 weight percent to 97 weight percent HFO-1234yf, 1 weight percent to 97 weight percent HFC-134a, 1 weight percent to 97 weight percent HFC-125, and 1 weight percent to 5 weight percent HFC-32;
1 weight percent to 35 weight percent HFO-1234yf, 1 weight percent to 40 weight percent HFC-134a, 30 weight percent to 78 weight percent HFC-125, and 6 weight percent to 39 weight percent HFC-32; or
1 weight percent to 50 weight percent HFO-1234yf, 1 weight percent to 40 weight percent HFC-134a, 1 weight percent to 50 weight percent HFC-125, and 40 weight percent to 97 weight percent HFC-32."*

Claim 1 of the first auxiliary request has been amended as follows (amendment underlined):

"1. [...] 1 weight percent to 98 weight percent HFO-1234yf, 1 weight percent to 98 weight percent HFC-125, and 1 weight percent to 98 weight percent HFC-134a, with the proviso that said composition is not 50 weight percent HFO-1234yf, 30 weight percent HFC-125 and 20 weight percent HFC-134a and that said composition is not a composition obtained after leaking 10%, 20% or 30% at 23 °C from a vessel charged to 90% full with a composition which is 50 weight percent HFO-1234yf, 30 weight percent HFC-125 and 20 weight percent HFC-134a; [...]."

In claim 1 of the second auxiliary request, the second option of claim 1 of the main request has been replaced by a list of specific ternary mixtures.

In claim 1 of the third auxiliary request, the first option of claim 1 of the main request has been replaced by a list of specific ternary mixtures.

The fourth auxiliary request is based on the third auxiliary request and includes the same disclaimer as the first auxiliary request.

In claim 1 of the fifth auxiliary request, the first and second options of claim 1 of the main request have each been replaced by a list of specific ternary mixtures.

In claim 1 of the sixth auxiliary request three specific ternary mixtures of the first and second options were deleted as compared with claim 1 of the fifth auxiliary request.

In claim 1 of the seventh auxiliary request three specific ternary mixtures of the first option and all

ternary mixtures relating to the second option were deleted as compared with claim 1 of the fifth auxiliary request.

In claim 1 of the eighth auxiliary request the first and second options were deleted from claim 1 as granted.

In claim 1 of the ninth auxiliary request the following wording was introduced at the end of claim 1 of the eighth auxiliary request:

"wherein the composition is near-azeotropic at 23°C."

In claim 1 of the tenth auxiliary request the first to third options were deleted from claim 1 as granted.

In claim 1 of the eleventh auxiliary request the first to third and fifth options were deleted from claim 1 as granted.

In claim 1 of the twelfth auxiliary request the first to fifth options were deleted from claim 1 as granted.

In claim 1 of the thirteenth auxiliary request the first to third, fifth and sixth options were deleted from claim 1 as granted. It reads as follows:

*"1. A composition selected from near-azeotropic compositions consisting of:
1 weight percent to 97 weight percent HFO-1234yf, 1 weight percent to 97 weight percent HFC-134a, 1 weight percent to 97 weight percent HFC-125, and 1 weight percent to 5 weight percent HFC-32."*

Claims 2 to 7 all refer back to claim 1 and correspond to claims 2 to 7 as granted.

VII. The respondent (opponent 2), appellant 1 (patent proprietor) and appellant 2 (opponent 1) withdrew their requests for oral proceedings on 15 June, 29 June and 3 July 2020, respectively, on condition that the board maintained its preliminary opinion.

VIII. Appellant 1's arguments relevant to the present decision can be summarised as follows:

The objections relating to sufficiency of disclosure were in fact objections under Article 84 EPC, which was not a ground for opposition.

The subject-matter of claim 1 of the main request was novel over D5. The data-modeling by means of NIST's Refprop 9 program was not convincing evidence since the exact mixture ratio was not reproduced.

D3 disclosed many binary azeotropic and ternary azeotropic mixtures. There was no pointer to select a specific binary composition as the starting point for the question of inventive step. It also failed to provide any motivation to add HFC-134a, let alone HFC-134a as the only further component and only in specific small amounts. If a third compound were to be added, then D3 taught using HFC-143a or isobutane, but not HFC-152a or HFC-134a.

The disclaimer in claim 1 of the first auxiliary request was based on D5, which was prior art under Article 54(3) EPC since the priority of P1 was validly claimed.

IX. Appellant 2's arguments relevant to the present decision can be summarised as follows:

There was insufficiency of disclosure since "near-azeotropic" was not clearly defined and could not be obtained over the whole range claimed.

The priority was not validly claimed since D5 was the first application for the claimed subject-matter.

D5 anticipated claim 1 since the skilled person seriously contemplated working in the claimed ranges. The last example in Table 5 of D5 also destroyed the novelty of claim 1.

When starting from D3 as the closest prior art, the skilled person would arrive at the claimed ternary and quaternary mixtures without exercising inventive skill simply by slightly modifying the binary and ternary compositions known from D3. They would not expect a modification of this kind to significantly change the properties of the starting product.

- X. The respondent (opponent 2) did not make any submissions as to the substance of the appeals.

- XI. Appellant 1 requests that the decision be set aside and that the oppositions be rejected or, alternatively, that the patent be maintained on the basis of one of the first, second or fourth to seventh auxiliary request submitted on 15 May 2018, the third auxiliary request submitted on 24 January 2019, or one of the eighth to twenty-fourth auxiliary requests, submitted on 1 October 2018.

Appellant 2 requests that the decision be set aside and that the patent be revoked.

The respondent requests that appellant 1's appeal be dismissed.

Reasons for the Decision

Main request (patent as granted)

1. Claim construction - claim 1

It is noted that the description cannot be used to read into the claim a feature that is not present (Case Law of the Boards of Appeal of the EPO, 9th edition, 2019, II.A.6.3.4). Claim 1 relates to a composition selected from several near-azeotropic compositions. The term "near-azeotropic" composition has no well-defined meaning. It appears evident that to determine whether a given composition meets this requirement, the test used is of importance, i.e. that not all the compositions listed will be near-azeotropic with whatever test used (see for example composition 20/40/20/40 on page 17 of the patent in suit). The wording "near-azeotropic" has to be understood as limiting the compositions to those that have this - albeit not clearly defined - property. Otherwise the presence of this expression in the claim would be meaningless.

2. Article 100(b) EPC

The board sees no reason to deviate from the opposition division's position, for the following reasons:

The board agrees that the expression "near-azeotropic" is not clearly defined since there exist several methods for characterising such a composition, as indicated in the patent (paragraph [0023]).

Yet this property cannot be deemed ill-defined within the meaning of T 593/09 (Reasons 4.1.4) since the patent as a whole contains information on how to determine whether a composition is to be considered near-azeotropic.

On page 4, lines 5 to 8 in combination with paragraph [0121], the patent indicates how to determine whether a specific composition fulfils the requirement of "near-azeotropic". There is no evidence that the filling content and the leak rate have a considerable impact on the results for the claimed compositions.

3. Article 100(a) EPC in combination with Article 54 EPC
 - 3.1 The board agrees with the opposition division's position that the composition obtained after 10% leakage of a composition of 50 weight% HFO-1234yf, 30 weight% HFC-125 and 20 weight% HFC-134a (see D5: page 38, Table 5, last composition, 10% leakage) falls within the scope of claim 1. Such a composition is near-azeotropic and has a composition falling under the second option of claim 1. There is no evidence on file that would contradict this finding based on appellant 2's data submitted during the opposition proceedings.
 - 3.2 However, the board does not concur with the opposition division's finding concerning the first option of claim 1. Notwithstanding the question of whether D5 can be considered to contemplate the ranges of 1 to 98, within the meaning of T 666/89, OJ EPO 1993, 495, D5 does not appear to disclose that the composition comprising HFO-1234yf, HFC-152a and HFC-125 (D5: claim 10, page 49, line 11) is near-azeotropic. As indicated above (point 1), the composition with the indicated amounts

of constituents is not considered to inevitably lead to a near-azeotropic composition.

3.3 The same applies to the other options of claim 1.

3.4 Since claim 1 of the main request does not meet the requirements of Article 54 EPC, this request must fail.

First auxiliary request

4. Article 123(2) EPC

The requirements of Article 123(2) EPC are not met for the following reasons:

The disclaimer introduced in claim 1 is not allowable since, for the subject-matter disclaimed, D5 is not prior art under Article 54(3) EPC, but rather it is the first application within the meaning of Article 87(1) (b) (see T 282/12, Reasons 2). Consequently the patent in this case does not validly claim priority for said subject-matter and D5 is prior art under Article 54(2) EPC for the disclaimed subject-matter.

The requirements for a disclaimer to be allowable, as set out in G 1/16, OJ EPO 2018, A70, in combination with G 1/03, OJ EPO 2004, 413, are therefore not met.

Second auxiliary request

5. Article 56 EPC

5.1 The patent relates to compositions consisting of a tetrafluoropropene and at least one other compound.

5.2 D3 is the closest prior art. It also relates to ozone depletion potential and global warming potential (page 2, lines 6 to 10) and discloses many compositions consisting of a tetrafluoropropene and at least one other compound (see for example Tables 3 and 4 on pages 21 to 25). A good starting point is the azeotropic composition consisting of 10.9% HFO-1234yf and 89.1% HFC-125 (second composition in Table 3, page 21). The fact that there are many compositions disclosed is irrelevant since all these compositions are available to the skilled person and one of them is the closest prior art.

D20 does not relate to ozone depletion potential and global warming potential and does not disclose a tetrafluoropropene.

D16 does not provide any information on global warming, nor does it disclose a tetrafluoropropene.

D21 does not disclose a tetrafluoropropene either.

D24/D24a is not more relevant than D3 since it does not explicitly disclose a composition comprising HFO-1234yf. Said fluoropropene is only disclosed as part of a list of preferred fluoropropenes.

Therefore, D20, D16, D21 and D24/24a are less suitable as the closest prior art than D3.

5.3 The problem to be solved by the patent in this case is to provide compositions with low or zero ozone depletion potential and lower global warming potential as compared with existing refrigerants (paragraph [0007] of the patent).

- 5.4 This problem is already solved in D3 (see page 32, lines 25 and 26). The problem in view of D3 is therefore the provision of an alternative refrigerant composition.
- 5.5 The problem is solved, for example, by a composition according to claim 1 characterised in that the composition additionally contains 1 to 98 weight% HFC-152a (option 1).
- 5.6 The solution is obvious since D3 itself teaches that HFC-152a can be used in combination with HFO-1234yf and HFC-125 (see page 14, lines 9-14). This is one possible solution among many others to the rather unambitious problem. An arbitrary selection from the possible solutions cannot involve an inventive step (T 939/92, Reasons 2.5.3, OJ EPO 1996, 309).
- 5.7 The requirements of Article 56 EPC are not met, so this request is not allowable.

Third auxiliary request

6. Article 54 EPC

The novelty objection against the main request still applies since the second option of claim 1 of the main request remains part of claim 1. Therefore, this request is not allowable either.

Fourth auxiliary request

7. Article 123(2) EPC

This request includes the same disclaimer as the first auxiliary request, so the same objection under Article 123(2) EPC applies. This request is not allowable.

Fifth to seventh auxiliary requests

8. Article 56 EPC

The objection under Article 56 EPC against the second auxiliary request still applies since adapting the amounts of the constituents of the ternary mixture of option 1 is within a skilled person's abilities. These requests must fail.

Eighth auxiliary request

9. This request is the request held allowable by the opposition division.

10. Article 56 EPC

D3 discloses near-azeotropic ternary mixtures of HFC-32/HFC-125/HFO-1234yf at a mass weight distribution of 40/50/10 and 10/60/30.

The only difference in the quaternary mixtures claimed in option 6 of the patent as granted (now option 4) is the presence of HFC-134a.

As indicated under point 5.4, the problem to be solved with respect to D3 is the provision of an alternative refrigerant composition.

In view of the rather unambitious problem addressed by the patent in suit with respect to D3 (page 14, lines 9-14), the solution is obvious. It is within the skilled person's abilities to adjust at least some of the weight percent ranges. The board cannot accept the argument that D3 would teach away from HFC-134a since D3 explicitly mentions using HFC-134a in combination with HFO-1234yf (page 14, line 11).

Therefore, this request is not allowable either.

Ninth to twelfth auxiliary requests

11. Article 56 EPC

The reasoning regarding the eighth auxiliary request also applies to these requests since they still contain option 6 of claim 1 as granted.

These requests are not allowable either.

Thirteenth auxiliary request

12. Article 12(4) RPBA 2007

In reply to appellant 2's appeal, appellant 1 submitted this auxiliary request, among other requests. Claim 1 is limited to the fourth option of claim 1 of the patent as granted.

The request can be considered an appropriate reaction to appellant 2's statement of grounds of appeal, which included new inventive-step objections. Therefore it is part of the proceedings.

13. Article 83 EPC

The conclusion reached in point 2 above applies, so the requirements of Article 83 EPC are met.

14. Article 54 EPC

The requirements of Article 54 EPC are fulfilled for the following reasons:

The novelty objection against the main request (point 3.1) no longer applies since it related to a ternary mixture and not to a quaternary mixture as now claimed. In addition, the comments made under point 3.3 in combination with 3.2 still apply.

15. Article 123(2) EPC

The board sees no reason to deviate from the opposition division's position regarding Article 100(c) EPC.

15.1 Although the original claims including the sixth option of original claim 3 did not relate to compositions consisting of the indicated constituents, but only to compositions comprising them, it is directly and unambiguously derivable from the application as filed, in particular from Table 2, that compositions consisting only of a very limited number of compounds - within a certain range - are the preferred embodiments.

15.2 The dependent claims correspond to claims 9 to 14 of the application as filed, which only referred back to claim 1. As indicated in the impugned decision (page 4, second paragraph), said claims have a basis in the description. Although these passages in the description relate to more general embodiments, it is evident that

they also encompass the preferred embodiments which are now part of claim 1. The skilled person understands that the preferred combinations disclosed in the application as filed are also suitable for the processes and apparatuses in original claims 9 to 14.

16. Article 56 EPC

The requirements of Article 56 EPC are fulfilled for the following reasons:

The solution to the stated problem - provision of an alternative refrigerant composition (point 10 above) - is not obvious since the amount of HFC-32 is at least 10% in the ternary mixtures presented in the table on page 64 of D3. Although D3 mentions amounts as low as 1 weight% HFC-32 (for example claim 7), there is no pointer towards such low amounts in quaternary mixtures when starting from the disclosed ternary mixtures.

Since no such guidance is present in the other prior art either, claim 1 involves an inventive step.

The same applies to claims 2 to 7, which directly refer to claim 1.

17. Consequently, the thirteenth auxiliary request is allowable.

18. Rule 103(4)(c) EPC: Partial reimbursement of the appeal fees

Since all parties withdrew their requests for oral proceedings, the decision can be issued in writing without oral proceedings. Appellant 1 withdrew its request within one month after notification of the

communication pursuant to Article 15(1) RPBA 2020. Appellant 2 did not withdraw the request within the stipulated time limit, so the conditions for reimbursing it 25% of the appeal fee are not fulfilled.

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 in amended form on the basis of the claims of the thirteenth auxiliary request, submitted on 1 October 2018, and a description to be adapted accordingly.
3. Appellant 1 (patent proprietor) is reimbursed 25% of the appeal fee.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated