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Datasheet for the decision of 24 April 2008

Case Number:	T 1233/05 - 3.3.10
Application Number:	97936797.6
Publication Number:	0922075
IPC:	C09K 5/04
Language of the proceedings:	EN
Title of invention:	

Refrigerant compositions

Patentee:

Ineos Fluor Holdings Limited

Opponent: HONEYWELL INC.

Headword: Refrigerant compositions/INEOS

Relevant legal provisions: EPC Art. 54, 56

Keyword:

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"Novelty (yes) - selection"
"Inventive step (no) - improvement not shown - arbitrary range
- obvious"
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Decisions cited: T 0198/84, T 0249/88; T 0279/89, T 0666/89, T 0720/96, T 0318/02, T 1053/93

Catchword:

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Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 1233/05 - 3.3.10

DECISION of the Technical Board of Appeal 3.3.10 of 24 April 2008

Appellant: (Opponent)	HONEYWELL INC. Honeywell Plaza Minneapolis MN 55408 (US)	
Representative:	Hucker, Charlotte Jane Gill Jennings & Every LLP Broadgate House 7 Eldon Street London EC2M 7LH (GB)	
Respondent: (Patent Proprietor)	Ineos Fluor Holdings Limited First Floor Offices Queens Gate 15-17 Queens Terrace Southampton Hampshire SO14 3BP (GB)	
Representative:	Dee, Ian Mark Potter Clarkson LLP Park View House 58 The Ropewalk Nottingham NG1 5DD (GB)	
Decision under appeal:	Interlocutory decision of the Opposition Division of the European Patent Office posted 21 July 2005 concerning maintenance of European patent No. 0922075 in amended form.	

Composition of the Board:

Chairman:	R.	Fre	eimuth
Members:	J	-C.	Schmid
	D.	s.	Rogers

Summary of Facts and Submissions

- I. The Appellant (Opponent) lodged an appeal on 20 September 2005 against the interlocutory decision of the Opposition Division, posted on 21 July 2005, which found that the European patent No. 922075 in the form as amended during opposition proceedings according to the then pending main request met the requirements of the EPC.
- II. Notice of opposition had been filed by the Appellant requesting revocation of the patent in suit in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and insufficient disclosure (Article 100(b) EPC). Inter alia the following document was submitted in the opposition proceedings:

(1) WO-A-93/11201.

III. The Opposition Division decided that the subject-matter according to the then pending main request fulfilled the requirements of Article 123(2) and (3) EPC and was novel and inventive over document (1). The only disclosure in document (1) of a mixture of two of the components claimed was the disclosure of the mixture of R-245fa and R-134a in a mass composition ratio of 0.5:1 to 1:1, i.e. a ratio outside the claimed range. The claimed compositions were not considered as a selection invention because they were outside of the preferred range of the prior art. Hence the requirements for a selection invention according to decision T 279/89 (not published in the OJ EPO) needed not to be fulfilled. The closest prior art was document (1). The technical problem was to provide a refrigerant composition that should replace the ozone depleting refrigerant R-11 and which additionally should have better physical properties, such as a high coefficient of performance and high refrigeration capacity. Since document (1) was concerned with a replacement of R-12 and since R-11 and R-12 differed considerably in their boiling point, this document gave no hint of a replacement for refrigerant R-11.

IV. At the oral proceedings before the Board, held on 24 April 2008, the Respondent (Proprietor of the patent) defended the maintenance of the patent in suit on the basis of a main request and auxiliary requests 1 to 3, all requests submitted during these oral proceedings and superseding any previous requests.

Independent claims 1, 8 and 10 of the main request read as follows:

"1. A non-azeotropic composition comprising:

(A) from 1 to 20% by weight of 1,1,1,2tetrafluoroethane (R-134a); and

(B) from 80 to 99% by weight consisting of at least one hydrofluorocarbon having a boiling point in the range of from 5 to 40°C selected from the group consisting of 1,1,2,2,3-pentafluoropropane (R-245ca), 1,1,1,3,3-pentafluoropropane (R-245fa) and 1,1,1,4,4,4hexafluorobutane (R-356ffa)."

"8. A heat transfer device containing a composition as claimed in any one of claims 1 to 7."

"10. The use of a composition as claimed in any one of claims 1 to 7 as a replacement for refrigerant R-11."

Claim 1 of the auxiliary request 1 differed from that of the main request exclusively in that the amount of component (A) was in the range of from 5 to 15% by weight and that of component (B) in the range of from 85 to 95% by weight in the composition.

Claim 1 of the auxiliary request 2 was directed to the heat transfer device according to claim 8 of the main request.

Claim 1 of the auxiliary request 3 was directed to the use of the composition as a replacement for refrigerant R-11 according to claim 10 of the main request.

V. The submissions of the Appellant can be summarized as follows:

As regards novelty, the Appellant held that the subject-matter of claim 1 according to the main request lacked novelty with respect to document (1). The claimed subject-matter represented a selection over the composition described in document (1). According to decision T 279/89, three criteria must be satisfied for a selection of a sub-range of numerical values from a broader range to be novel:

(i) the selected sub-range should be narrow;(ii) the selected sub-range should be sufficiently far removed from the known range illustrated by means of examples;

(iii) the selected area should not provide an arbitrary specimen from the prior art, i.e. not a mere embodiment of the prior description, but another invention (purposive selection). The Appellant acknowledged that the two first criteria were satisfied but not the third one, since no effect was associated with the selected sub-portion.

As regards inventive step, the Appellant held that the claimed subject-matter lacked an inventive step in view of document (1). The selected sub-range was arbitrary, since the meaning of replacement of refrigerant R-11 was not clearly defined and, even if some specific properties should be present, for instance the evaporator or condenser pressures, the properties of each of the components of the mixture was known so that the skilled person was able to predict the properties of the mixtures at any ratio. Starting from the compositions of document (1) and wishing to provide a composition having more the properties of refrigerant R-11 rather than those of refrigerant R-12, i.e. aiming at evaporator and condenser pressures lower than those of R-12, the skilled person would provide a composition having an increased proportion of the component having the lower evaporator and condenser pressure, i.e. a composition having an increased proportion of R-245ca or R-245fa compared with that R-134a. The data shown in tables 1 and 2 of the patent specification and in exhibit El submitted with letter dated 26 April 2005 were thus not surprising but wholly predictable.

VI. As regards novelty, the Respondent submitted that the preferred range of the amount of R-134a was more than 50% by weight in the composition of document (1). The skilled person reading document (1) would never have contemplated a composition having the claimed ratio range of 1 to 20 % by weight of R-134a. As regards inventive step, in view of document (1) which represented the closest prior art, the technical problem underlying the patent-in-suit was the provision of a composition of R-134a and R-245ca or R-245fa having a balance of properties making the composition suitable as a replacement for refrigerant R-11.

The solution was the composition according to claim 1 which was characterized by a ratio range of 1 to 20% by weight of R-134a and a ratio range of 80 to 99% by weight of R-245ca and/or R-245fa.

The skilled man would have no reason to start specifically from zeotropic compositions since document (1) disclosed refrigerant compositions being also azeotropic. Thus starting with a zeotropic composition was based on hindsight. Furthermore, there was no certainty of success since the behaviour of refrigerant compositions could not be predicted. The good balance of properties of the claimed compositions could not be expected in the light of document (1). As regards the use claim, the meaning of the purpose as a replacement of refrigerant R-11 was clear to the person skilled in the art since refrigerant R-11 was conventionally used only in specific devices such as chillers. The claimed subject-matter covered thus any use wherein refrigerant R-11 could be used.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be revoked.

The Respondent requested that the appeal be set aside and that the patent be maintained on the basis of the

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main request, or, alternatively, on the basis of auxiliary requests 1 to 3, all requests being filed during the oral proceedings before the board.

VIII. At the end of the oral proceedings the decision of the Board was announced.

Reasons for the Decision

- 1. The appeal is admissible.
- 2. Admissibility of the late filed requests

In response to the objections raised during the oral proceedings with regard to the presence of amendments not occasioned by a ground of opposition (Rule 80 EPC), the Respondent submitted a fresh main request prompted only by those fresh formal objections. The claims are entirely based on the claims of then pending first auxiliary request filed in reply to the Appellant's grounds of appeal. Hence, these amendments are considered to be appropriate and necessary. The claims of the auxiliary request 1 are those of the main request restricted to the composition of claim 2 (former auxiliary request 7); the claims of auxiliary request 2 are those of the main request save the claims directed to the compositions per se are deleted (previous auxiliary request 6), while in auxiliary request 3 only the use claims are retained (claim 10 of the main request; former auxiliary request 3).

The Appellant, which did not rise any objection about the lateness of those requests, was not hindered in its argumentation with regard to the issues of novelty and inventive step by the fresh amendments carried out in the claims at the oral proceedings before the Board, since these amendments did not amount to creating a fresh case necessitating a reconsideration of the objections and evidence brought forward so far by the Appellant against the patentability of the claimed subject matter.

The Board thus exercises due discretion to admit the main and auxiliary requests 1 to 3 into the appeal proceedings.

Main request

3. Amendments

Claim 1 of the main request is based on original claims 1, 5 and 9 and granted claims 1, 2 and 6. Therefore, there are no formal objections to present claim 1 under Article 123 (2) and (3) EPC.

4. Novelty

- 4.1 Claim 1 is directed to a non-azeotropic composition comprising from 1 to 20% by weight of R-134a and from 80 to 99% by weight of R-245ca, R-245fa or R-356ffa. The Appellant objected to novelty based on document (1).
- 4.2 Concerning the question of assessing novelty under the EPC, the Board firstly observes that it is a generally applied principle that for concluding lack of novelty, there must be a direct and unambiguous disclosure in a prior art document, which would inevitably lead the

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skilled person to something falling within the scope of what is claimed.

4.3 The passages in document (1) on page 13, lines 3 to 10 and 18 to 20, as well as claims 75, 74, 68 and 63 depending upon independent claim 61 via claim 62 disclose a zeotropic (= non-azeotropic) composition comprising CF₂HCF₂CFH₂ (R245ca) or CF₃CH₂CF₂H (R245fa) and CF₃CFH₂ (R134a), but without any indication of the ratio of the components comprised therein.

> Mass composition ratios are merely indicated in table 1 of document (1) for compositions comprising R245fa and R134a (page 14). The disclosed range of 0.5:1 to 1:1 indicated that the binary compositions disclosed therein comprise at least 50% by weight of R134a, which lower limit is well above the upper limit claimed, i.e. 20% by weight of R134a. This embodiment disclosed in document (1) is therefore not novelty-destroying for the subject-matter of claim 1.

> It follows that the claimed numerical range of 1 to 20% by weight of R134a, which is narrow, is far away from the ratio specifically disclosed in document (1) of at least 50% by weight of R134a with the consequence that the claimed selection of ratios within the general disclosure of document (1) cannot be considered to have been directly and unambiguously disclosed. The Board therefore concludes that document (1) does not anticipate the claimed subject-matter.

4.4 The Appellant argued that document (1) deprived the claimed invention of novelty since apart from being narrow and far removed from the examples, the third criterion according to decision T 279/89 for a selection to be novel, namely that the selected subrange should not be arbitrarily chosen, was not fulfilled.

However, regardless of whether or not that third criterion would be satisfied by the claimed invention vis-à-vis document (1), the claimed numerical range is narrow and far removed from the specific disclosure of this document with the consequence that already for those reasons novelty of the claimed subject-matter has to be acknowledged.

Nevertheless, the Board notes that the presence or absence of a particular technical effect within the sub-range, i.e. the so-called third criterion raised by the Appellant, appears to fall back upon considerations which should be taken into account in the assessment of inventive step rather than in that of novelty. Novelty and inventive step are, however, two distinct requirements for the patentability of an invention and different criteria should apply for their assessment.

Thus, such particular effect is neither a prerequisite nor can it as such confer novelty; its existence can merely serve to confirm a finding on novelty already achieved, a sub-range being not rendered novel by virtue of a newly discovered effect occurring within it (see decisions T 198/84, OJ EPO 1985, 209, point 7 of the reasons; T 666/89, point 8 of the reasons and T 720/96, point 2.1.3 of the reasons, neither published in OJ EPO). Since the decision T 279/89 cited by the Appellant is explicitly based on T 198/04, it may thus be read in the light thereof. 4.5 Consequently, document (1) is not novelty-destroying for the subject-matter of claim 1 (Article 54 EPC).

5. Inventive step

In accordance with the "problem-solution approach" applied by the Boards of Appeal to assess inventive step on an objective basis, it is in particular necessary to establish the closest state of the art, to determine in the light thereof the technical problem which the invention addresses and successfully solves, and to examine the obviousness of the claimed solution to this problem in view of the state of the art.

- 5.1 The Board considers, in agreement with the Opposition Division and the Parties, that document (1) represents the closest state of the art, and, hence, the starting point in the assessment of inventive step. Document (1) discloses a zeotropic composition comprising CF₂HCF₂CFH₂ (R245ca) or CF₃CH₂CF₂H (R245fa) and CF₃CFH₂ (R134a) for use as refrigerant without requiring any particular ratio of those components.
- 5.2 In view of this state of the art, the Respondent submitted during the oral proceedings that the technical problem underlying the patent in suit, was the provision of a composition of R-134a and R-245ca or R-245fa having a balance of properties making the composition suitable as a replacement for refrigerant R-11.
- 5.3 The patent in suit proposes as the solution the composition according to claim 1 which is characterized

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by a ratio range of 1 to 20% by weight of R-134a and a ratio range of 80 to 99% by weight of R-245ca and/or R-245fa.

5.4 Having regard to table 1 of the specification of the patent-in-suit and the table of exhibit E1 filed on 26 April 2005, the Board is satisfied that the technical problem as defined above is effectively solved by the claimed compositions.

> The compositions comprising R-134a and R-245ca in 10/90 and 5/95 weight ratios have evaporator pressures of 0.86 and 0.52 bar, respectively (see table 1 of the patent-in-suit). These values are comparable with that of R-11, which has an evaporator pressure of 0.5 bar.

> The compositions comprising R-134a and R-245fa in 10/90 and 5/95 weight ratios have evaporator pressures of 0.97 and 0.84 bar, respectively (see exhibit E1). This exhibit, however, does not indicate the evaporator pressure for higher ratios of R-134a, in particular not for the claimed weight ratio of 20/80. This pressure was extrapolated by the Appellant to be about 1.46 bar, which value was not contested by the Respondent which considered it to be comparable with that of R-11, and thus the claimed composition having that ratio was suitable in the context of the invention.

> The claimed compositions also show appropriate condenser pressures. The condenser pressures of compositions comprising R-134a and R-245ca in 10/90 and 5/95 weight ratios are 1.8 and 1.55 bar, respectively, that of compositions comprising R-134a and R-245fa in weight ratios of 10/90 and 5/95 are 2.42 and 2.16 bar,

respectively. Those condenser pressures of the claimed compositions are comparable to that of 1,34 bar of refrigerant R-11.

However, compositions outside of the claimed ratio range also solve the problem underlying the patent-insuit. Thus, the data of table 1 on page 7 of the specification of the patent-in-suit indicate that a composition comprising R-134a and R-245ca in a weight ratio of 50/50 is suitable as a replacement for refrigerant R-11, its evaporator pressure of 1.32 bar being lower than the estimated evaporator pressure of 1.46 bar of claimed compositions, which were considered to be suitable as a replacement of refrigerant R-11 (see above), and thus are even closer to that of R-11 showing an evaporator pressure of 0.5 bar (exhibit E1). Therefore, these compositions outside of the claimed range would also be suitable in the context of the invention.

5.5 It remains to be decided whether or not the proposed solution to the objective technical problem, namely the compositions according to claim 1, is obvious in view of the state of the art.

> Since document (1) describes *inter alia* refrigerant compositions comprising R-134a and R-245ca without requiring any particular ratio of those components (see point 5.1 above), any of the tested compositions indicated in point 5.4 above, the ratio being inside or outside of the claimed ratio of components, are within the general teaching of that document.

Thus, compositions envisaged by the general teaching of document (1) and falling outside of the claimed ratio range are also suitable as a replacement for refrigerant R-11. Hence, the selection of the specific ratio range within the ambit of document (1) of 1 to 20% of R-134a indicated in present claim 1 and purportedly characterizing the proposed solution has not been shown to result in a technical effect vis-àvis the closest prior art.

The selection of the ratio range made is therefore neither critical nor purposive for solving the objective problem underlying the patent in suit, but merely arbitrary, since no technical effect has been shown to be associated with the particular ratio range claimed. The act of picking out at random a range of ratios of components R-134a and R245ca in the compositions of document (1) having no restrictions or limitations as to the amount of the components to be present therein and without providing a particular technical effect, is within the routine activity of the skilled person faced with the problem of providing a refrigerant composition suitable as a replacement for refrigerant R-11. Thus acting routinely, the skilled person would arrive at the claimed invention without the exercise of inventive ingenuity.

- 5.6 For these reasons, the subject-matter of claim 1 is obvious in the light of document (1).
- 5.7 For the following reasons, the Board is not convinced by the Respondent's submissions in support of the presence of an inventive step.

5.7.1 The Respondent argued that the starting composition, i.e. to start with a zeotropic composition, was based on hindsight. However, the Respondent conceded that a zeotropic composition comprising R134a and R245ca was disclosed in document (1). Indeed, claims 63 and 68 of document (1) specifically describe such a composition comprising the claimed component R134a and R245ca, what the Board cannot ignore.

5.7.2 The Respondent further argued that the behaviour of refrigerant compositions was unpredictable and that there was no certainty of success.

However, when assessing inventive step it is not necessary to establish that the success of an envisaged solution of a technical problem was predictable with certainty. In order to render a solution obvious it is sufficient to establish that the skilled person would have followed the teaching of the prior art with a reasonable expectation of success (see decisions T 249/88, point 8 of the reasons; T 1053/93, point 5.14 of the reasons; and T 318/02, point 2.7.2 of the reasons, neither published in OJ EPO).

In the present case, the Board cannot agree with the Respondent's argument that due to some purported uncertainty about the predictability of success, the skilled person would not have contemplated the claimed ratios in order to provide a replacement of refrigerant R-11. Document (1) describes suitable refrigerant compositions comprising R-134a and R245ca at any ratio and the claimed ratios are, thus, within the general teaching of that document. It was only necessary for the skilled man to choose a ratio thereof and to verify the suitability by routine work of the refrigerant composition as a replacement for refrigerant R-11.

- 5.7.3 The Respondent argued that compositions comprising R134a and R245ca and having suitable evaporator pressure may not be suitable as a replacement of refrigerant R-11 if they do not further possess a good balance of properties. The Respondent, however, was unable to indicate precisely which specific properties should be present and only focussed on the relative properties of the refrigerant compositions. Consequently, in the absence of any clear definition of what a "good balance of properties" in the sense of the Respondent is intended to mean, this argument cannot be followed.
- 5.8 As a result, the Respondent's main request is not allowable for lack of inventive step pursuant to Article 56 EPC.

Auxiliary request 1

6. Amendments (Article 123 EPC)

Claim 1 of auxiliary request 1 differs from that of the main request exclusively in that the ratio range is that indicated in dependent claim 2. This amendment is supported by claim 6 of the application as filed and thus satisfies the requirement of Article 123(2) EPC.

As this amendment results in a restriction of the claimed scope, the requirement of Article 123(3) is consequently also satisfied.

7. Novelty

In view of the findings of the Board with respect to the main request indicated in point 4 above, the Board considers the requirement of Article 54 EPC to be satisfied also with respect to claim 1 of auxiliary request 1 which is narrower in scope than claim 1 of the main request.

8. Inventive step

The considerations concerning inventive step with respect to the main request are neither based on nor affected by the indication of a narrower range of ratios of components. As the ratio range comprised in the compositions of present claim 1 are still included within the ambit of document (1), the indication of a specific narrower range can neither provide the claimed compositions with any inventive ingenuity as that choice is still arbitrary and, thus, within the routine activity of a skilled person.

Therefore, the considerations having regard to the assessment of inventive step given in point 5.5 above and the conclusion drawn in point 5.6 supra with respect to the main request apply also to auxiliary request 1, i.e. the subject-matter claimed is obvious and does not involve an inventive step (Article 56 EPC).

In these circumstances, the Respondent's auxiliary request 1 is not allowable for lack of inventive step.

Auxiliary request 2

9. Amendments (Article 123 EPC)

Claim 1 is directed to the heat transfer device containing the composition defined in claim 1 of the main request (claim 8 of the main request) and is based on original claim 15.

Amended claim 1 therefore satisfies the requirements of Article 123(2) and (3) EPC.

10. Novelty

In view of the findings of the Board with respect to the main request indicated in point 4 above, the Board considers the requirement of Article 54 EPC to be satisfied also with respect to claim 1 of auxiliary request 2 which is narrower in scope than claim 1 of the main request.

11. Inventive step

Claim 1 of auxiliary request 2 is restricted to a heat transfer device which contains the refrigerant composition of claim 1 of the main request. However, document (1) also describes the use of the refrigerant compositions in heat transfer devices (see page 8, lines 15 to 36). Hence, the considerations concerning inventive step given in point 5.5 with respect to the main request are not affected by the shifting of the claimed subject-matter to heat transfer devices. Therefore, the conclusion drawn in point 5.6 above with regard to the main request still applies to this request as well, i.e. the subject-matter of claim 1 is obvious and does not involve an inventive step. Moreover, the Respondent has never argued that this amendment would contribute to an inventive step with respect to the teaching of document (1).

12. In these circumstances, the Respondent's auxiliary request 2 is not allowable for lack of inventive step pursuant to Article 56 EPC.

Auxiliary request 3

13. Amendments (Article 123 EPC)

Claim 1 is directed to the use of the composition defined in claim 1 of the main request as a replacement for refrigerant R-11 (claim 10 of the main request) and is based on original claim 17.

Amended claim 1 therefore satisfies the requirements of Article 123(2) and (3) EPC.

14. Novelty

In view of the findings of the Board with respect to the main request indicated in point 4 above, the Board considers the requirement of Article 54 EPC to be satisfied also with respect to claim 1 of the third auxiliary request which is not broader in scope than claim 1 of the main request.

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15. Inventive step

In the present case the interpretation of claim 1 of this request was under dispute in appeal proceedings. It is therefore essential for the decision to be taken to determine the subject-matter of this claim and to identify the technical features defined therein, prior to any assessment of inventive step.

The Appellant argued that no specific purpose was claimed and therefore a necessary feature for a use claim was omitted in the claim while the Respondent submitted that the technical meaning of the purpose indicated in the claim "as a replacement for refrigerant R-11" was clear since refrigerant R-11 was conventionally used only in particular devices such as chillers. The claimed subject-matter covered thus any use of the claimed compositions wherein refrigerant R-11 could be used.

The use claim, however, does not contain any feature stipulating the purported use only in specific devices in the Respondent's sense, so that claimed subjectmatter is not limited in this respect.

Notwithstanding the above, the purpose indicated in the use claim lacks a clear definition, since any given use is open to be labelled arbitrarily "as a replacement for refrigerant R-11" or not, depending exclusively on the mental label the reader wishes to apply, thereby rendering the meaning of that feature vague.

To summarize, there does not exist any unequivocal definition generally accepted in the art for the

feature "as a replacement for refrigerant R-11", and the specification of the patent-in-suit also does not provide any clarification in this respect, with the consequence that this feature leaves the actual subject-matter covered by the claim in doubt and cannot define the claimed subject-matter.

Under these circumstances, that particular purpose, namely "as a replacement for refrigerant R-11" is to be excised from the features defining the subject-matter of that use claim. Hence, any use of the indicated composition is claimed by the present use claim with the consequence that shifting the category of the claim from a product claim to a use claim cannot contribute to an inventive step.

Therefore, the considerations concerning inventive step given in point 5.5 above and the conclusion drawn in point 5.6 above with regard to the main requests still apply to this request as well, i.e. the subject-matter of claim 1 is obvious and does not involve an inventive step.

Consequently, this request shares the fate of the main request, i.e. auxiliary request 3 is rejected for lack of inventive step.

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Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar

The Chairman

C. Rodríguez Rodríguez

R. Freimuth