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**Datasheet for the decision
of 21 December 2023**

Case Number: T 0598/20 - 3.4.02

Application Number: 14798807.5

Publication Number: 3069421

IPC: H02B13/055, H01H33/56, H01B3/56

Language of the proceedings: EN

Title of invention:

Water and Contamination Adsorber for CO2 Insulated Electrical Apparatus for the Generation, Transmission, Distribution and/or Usage of Electrical Energy

Patent Proprietor:

Hitachi Energy Ltd

Opponent:

Siemens Aktiengesellschaft

Headword:

Estimating amount of adsorber/HITACHI

Relevant legal provisions:

EPC Art. 56, 52(2)(c)
RPBA 2020 Art. 13(2), 12(1)(a), 12(2), 12(6)

Keyword:

Inventive step - (no) - main request, and auxiliary requests 1, 3 to 12, 14

Exclusion from patentability - method for performing mental acts (yes) - auxiliary request 13

Amendment after summons - exceptional circumstances (no) - auxiliary requests 6.2, 8.2 and 12.2

Late-filed request - auxiliary requests 2 and 15 - admitted (no)

Decisions cited:

T 1307/17, T 0565/16, T 1480/16, T 0995/18, T 1151/18,
T 1597/16

Catchword:

The deletion of claims is not excluded from the scope of the term "amendment" in Article 13 RPBA 2020.

The impact of a particular change to the appeal case on procedural economy is not a criterion for deciding whether that change is an "amendment" within the meaning of Article 13 RPBA 2020. Rather, the impact on procedural economy is a criterion when a board, at the next step of the assessment, exercises its discretion to decide whether a change that has already been qualified as an "amendment" is to be taken into account. See reasons 7.



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Case Number: T 0598/20 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 21 December 2023

Appellant:
(Patent Proprietor)

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted on 9 January 2020
revoking European patent No. 3069421 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman R. Bekkering
Members: F. Giesen
C. Almberg

Summary of Facts and Submissions

I. This appeal by the patent proprietor (appellant) lies from the decision of the opposition division dated 9 January 2020 to revoke European patent No. 3 069 421.

The reason for the decision under appeal was inter alia that none of the independent claims of the requests on file involved an inventive step in view of document

E1: WO 2012/038442 A1.

II. Oral proceedings before the board took place on 21 December 2023.

During the oral proceedings the proprietor filed auxiliary requests 6.2, 8.2 and 12.2.

The proprietor (appellant) requested that

the appealed decision be set aside and that the patent be maintained as amended on the basis of the claims of the main request or

on the basis of the claims of one of auxiliary requests 1 to 15, all filed with the statement of grounds of appeal on 19 May 2020, or

on the basis of the claims of one of auxiliary requests 6.2, 8.2 and 12.2, filed during the oral proceedings, to be ranked right after auxiliary requests 6, 8 and 12, respectively.

The opponent (respondent) requested that

the appeal be dismissed and that none of the auxiliary requests be admitted.

III. Claim 1 of the main request reads as follows:

- M1.1 *"Electrical apparatus for the generation, transmission, distribution and/or usage of electrical energy, said electrical apparatus comprising*
- M1.2 *a housing enclosing an electrical apparatus interior space,*
- M1.3 *at least a portion of the electrical apparatus interior space forming at least one insulation space,*
- M1.4 *in which an electrical component is arranged and*
- M1.5 *which contains an insulation medium surrounding the electrical component,*
- M1.6 *the insulation medium comprising carbon dioxide, characterised by*
- M1.7 *the insulation space comprising at least one insulation space compartment,*
- M1.8 *in which an amount of adsorber (m_{ads})*
- M1.9 *for reducing or eliminating an amount of water and further contaminants from the insulation medium is arranged,*
- M1.10 *wherein m_{ads} complies with the following formula (II):*

$$m_{ads} \leq 0.1 \frac{m_{CO_2}}{k_{ads,CO_2}} \text{ (II)}$$

M1.11 with m_{CO_2} being the amount of carbon dioxide present in the respective insulation space compartment at the time when placing the adsorber into the insulation space compartment; and

M1.12 k_{ads,CO_2} being the adsorption capability of the adsorber towards carbon dioxide at the predetermined temperature T_0 at the time when placing the adsorber into the insulation space compartment, and

M1.13 wherein the insulation medium additionally comprises an organofluorine compound,

M1.14 the amount of adsorber m_{ads} arranged in the at least one insulation space compartment

M1.15 in particular in each insulation space compartment,

M1.16 complies with the following formula (Ii):

$$m_{ads} \geq \frac{m_{H_2O}}{k_{ads,H_2O}} + \sum_{i=1}^n \frac{m_{dp_i}}{k_{ads, dp_i}} \quad (Ii)$$

M1.17 with m_{H_2O} being the amount of water present in the respective insulation space compartment at the time when placing the adsorber into the insulation space compartment,

M1.18 k_{ads,H_2O} being the adsorption capability of the adsorber towards water at a predetermined temperature T_0 at the time when placing the adsorber into the insulation space compartment,

M1.19 m_{dp_i} being the amount of a respective decomposition product dp_1 , dp_2 ... dp_n created in and/or released into the respective insulation space compartment between gas maintenance or gas replacement intervals, with i being an index for the i -th decomposition product, and

- M1.20 *k_{ads, dpi} being the adsorption capability of the adsorber towards the respective i-th decomposition product dp₁, dp₂, ..., dp_n at the predetermined temperature T₀, and*
- M1.21 *at least one decomposition product is a decomposition product of the organofluorine compound."*

The board adopts, here and in the following, the feature labelling from the opponent's reply to the statement of grounds of appeal.

The wording of claim 12 of the main request is identical to that of claim 1, with the exception of features M1.10 to M1.12, which are replaced by the following feature:

- M12.9 *"wherein the at least one insulation space compartment comprises a volume-specific amount of less than 5 kg adsorber (m_{ads}) per cubic meter of the volume of the insulation space compartment"*

Claim 19 of the main request reads as follows:

"Method for determining an optimum amount of an adsorber (m_{ads}) for the adsorption of water and further contaminants in an electrical apparatus for the generation, transmission, distribution and/or usage of electrical energy, in particular in an electrical apparatus of any one of the preceding claims, said electrical apparatus comprising a housing enclosing an electrical apparatus interior space, at least a portion of the electrical apparatus interior space forming at least one insulation space, in which an electrical component

is arranged and which contains an insulation medium surrounding the electrical component, the insulation medium comprising carbon dioxide, the insulation space comprising at least one insulation space compartment, the method comprising the step of

a) determining for the at least one insulation space compartment the amount of water m_{H_2O} present in the insulation space compartment at the time when placing the adsorber into the insulation space compartment;

b) determining for the at least one insulation space compartment the amount of carbon dioxide m_{CO_2} present in the insulation space compartment at the time when placing the adsorber into the insulation space compartment;

wherein the insulation medium additionally comprises an organofluorine compound,

c) determining for the at least one insulation space compartment the lower limit of the amount of adsorber m_{ads} by formula (Ii)

$$m_{ads} \geq \frac{m_{H_2O}}{k_{ads,H_2O}} + \sum_{i=1}^n \frac{m_{dp_i}}{k_{ads, dp_i}} \quad (Ii)$$

with m_{H_2O} being the amount of water present in the respective insulation space compartment at the time when placing the adsorber into the insulation space compartment,

k_{ads,H_2O} being the adsorption capability of the adsorber towards water at a predetermined temperature T_0 or at a first predetermined temperature T_1 at the time when placing the adsorber into the insulation space compartment,

m_{dpi} being the amount of a respective decomposition product dp_1 , dp_2 ... dp_n created in and/or released into the respective insulation space compartment between gas maintenance or gas replacement intervals, with i being an index for the i -th decomposition product, and $k_{ads,dpi}$ being the adsorption capability of the adsorber towards the respective i -th decomposition product dp_1 , dp_2 , ... dp_n at the predetermined temperature T_0 or at the first predetermined temperature T_1 ,

with at least one decomposition product being a decomposition product of the organofluorine compound, and

d) determining for the at least one insulation space compartment the upper limit of the amount of adsorber m_{ads} by formula (II)

$$m_{ads} \leq 0.1 \frac{m_{CO_2}}{k_{ads,CO_2}} \quad (II)$$

with k_{ads,CO_2} being the adsorption capability of the adsorber towards carbon dioxide at the predetermined temperature T_0 or at a second predetermined temperature T_2 at the time when placing the adsorber into the insulation space compartment, and

e) introducing the adsorber in the determined amount in the insulation space compartment."

IV. Claims 1 and 12 of auxiliary request 1 are identical to claims 1 and 12 of the main request.

V. Claim 1 according to auxiliary request 2 contains in addition to the features of claim 1 of the main request the feature

"the predetermined temperature T_0 being room temperature"

between feature M1.20 and M1.21.

Claim 12 of auxiliary request 2 contains a corresponding amendment.

Claim 19 according to auxiliary request 2 contains all features of claim 19 of the main request except for the feature

"e) introducing the adsorber in the determined amount in the insulation space compartment."

The independent claims of auxiliary request 3 are identical to those of auxiliary request 2.

The independent claims 1 and 12 of auxiliary request 4 are identical to those of auxiliary requests 2 and 3, but the independent method claim is deleted.

VI. Claim 1 according to auxiliary request 5 has all features of claim 1 of the main request and, at the end of that claim, the feature

"the amount of adsorber m_{ads} being selected such that a lower limit given by first formula (Ii) is determined at a first predetermined temperature T_1 , an upper limit given by second formula (II) is determined at a second predetermined temperature T_2 , and the first predetermined temperature T_1 is chosen higher than the second predetermined temperature T_2 ".

Claim 12 of auxiliary request 5 is identical to claim 12 of the main request. Claim 19 of auxiliary request 5 is identical to claim 19 of auxiliary request 2.

Claims 1 and 12 of auxiliary request 6 are identical to claims 1 and 12 of auxiliary request 5. Auxiliary request 6 does not contain method claims.

Claim 1 of auxiliary request 6.2 is identical to claim 1 of auxiliary request 5. This request does not contain further independent device or method claims.

VII. Claim 1 of auxiliary request 7 contains, in addition to the features of claim 1 of auxiliary request 5, the feature

"the first predetermined temperature T_1 being chosen equal to about room temperature and the second predetermined temperature T_2 being chosen smaller than room temperature"

at the end of the claim.

Claim 12 of auxiliary request 7 is identical to claim 12 of the main request. Claim 19 of auxiliary request 7 is identical to claim 19 of auxiliary request 2.

Claim 1 of auxiliary request 8 is identical to claim 1 of auxiliary request 7. Claim 12 of auxiliary request 12 is identical to claim 12 of the main request. Auxiliary request 8 does not contain method claims.

Claim 1 of auxiliary request 8.2 is identical to claim 1 of auxiliary request 7. Auxiliary request 8.2 does not contain further independent device or method claims.

VIII. Claim 1 of auxiliary request 9 contains, in addition to the features of claim 1 of the main request, the feature

"the at least one insulation space compartment comprising a volume-specific amount of less than 5 kg adsorber per cubic meter of the volume of the insulation space compartment"

at the end of the claim.

Auxiliary request 9 does not contain a further independent device claim. Claim 17 of auxiliary request 9 is identical to claim 19 of auxiliary request 2.

Claim 1 of auxiliary request 10 is identical to claim 1 of auxiliary request 9. This request does not contain further independent claims.

IX. Claim 1 of auxiliary request 11 contains, in addition to the features of claim 1 of the main request, the feature

"and the insulation space is formed by at least two insulation space compartments separated from each other, the amount of adsorber (m_{ads}) arranged in

each insulation space compartment complying with the formula (Ii):

$$m_{ads} \geq \frac{m_{H_2O}}{k_{ads,H_2O}} + \sum_{i=1}^n \frac{m_{dp_i}}{k_{ads, dp_i}} \quad (Ii) \quad "$$

Claims 12 and 19 of auxiliary request 11 are identical to claims 12 and 19 of the main request.

Claim 1 of auxiliary request 12 is identical to claim 1 of auxiliary request 11. Claim 12 of auxiliary request 12 is identical to claim 12 of the main request. This request does not contain any method claims.

Claim 1 of auxiliary request 12.2 is identical to claim 1 of auxiliary request 11. This request does not contain further independent claims.

- X. Claim 1 of auxiliary request 13 contains, in addition to the features of claim 1 of the main request, the feature

"and the insulation space is formed by at least two insulation space compartments separated from each other, the insulation space compartments comprising a volume-specific amount of less than 5 kg adsorber per cubic meter of the volume of the insulation space compartment and the amount of adsorber (m_{ads}) arranged in each insulation space compartment complying with the formula (Ii):

$$m_{ads} \geq \frac{m_{H_2O}}{k_{ads,H_2O}} + \sum_{i=1}^n \frac{m_{dp_i}}{k_{ads, dp_i}} \quad (Ii) \quad "$$

Auxiliary request 13 does not contain further independent apparatus claims. Claim 17 of auxiliary

request 13 is identical to claim 19 of auxiliary request 2.

Claim 1 of auxiliary request 14 is identical to claim 1 of auxiliary request 13. Auxiliary request 14 does not contain further independent claims.

XI. Claim 1 of auxiliary request 15 contains, in addition to the features of claim 1 of the main request the feature

"the at least one insulation space compartment comprising a volume-specific amount of less than 5 kg adsorber per cubic-meter of the volume of the insulation space compartment, wherein the electrical apparatus comprises a molecular sieve as adsorber, the molecular sieve having an average pore size from 2 Å to 13 Å"

at the end of the claim.

This request does not contain a further independent device claim. Claim 17 of auxiliary request 15 is identical to claim 19 of the main request, but with the words "for the generation, transmission, distribution and/or usage of electrical energy, in particular in an electrical apparatus" deleted.

Reasons for the Decision

1. *Admissibility of the appeal*

The appeal complies with the requirements of Articles 106 to 108 and Rule 99 EPC. It is therefore admissible.

2. *Main request - Inventive step*

2.1 The subject-matter of claims 1, 12 and 19 of the main request does not involve an inventive step in view of document E1 within the meaning of Article 56 EPC.

2.2 Starting point

The board is persuaded that document E1 is a suitable starting point for the examination of inventive step. Like the subject-matter of claims 1 and 12 it concerns an electrical apparatus for the generation, transmission, distribution and/or usage of electrical energy comprising an insulation gas comprising CO₂ and an organofluorine compound as well as an adsorber (see the following point regarding this feature). It implicitly also concerns a method of determining the amount of the adsorber.

2.3 Distinguishing features

In the board's view, the features M1.10 to M1.12, M1.14 and M1.16 to M1.20 are the distinguishing features of claim 1 of the main request over document E1. These features concern the determination of the lower and upper limits of the adsorber amount.

The appellant argued that E1 does not disclose an adsorber but an absorber ("absorption means"). The board acknowledges that in the field of pure chemistry there is a clear distinction between "absorption" and "adsorption". However, in the technical field of gas insulated high voltage gear, these expressions are often used interchangeably, see for example decision T 1307/17, reasons 2.2. E1 discloses zeolites to be a specific example of "absorption means". This shows that E1 merely uses somewhat imprecise nomenclature. However, it is clear that the absorption means according to E1 are an adsorber within the meaning of the opposed patent, which, for example in paragraph [0007], also discloses zeolites as an instance of adsorption means. Zeolites according to E1 are also an adsorber in the sense of pure chemistry. The appellant also argued that ambiguities in E1 could not be resolved to the appellant's disadvantage. However, the board merely applies the generally applicable rule of interpretation that the meaning of an expression has to be determined inter alia considering its context.

The respondent argued that claim 1 was not new, which implies that there are no distinguishing features over the disclosure of E1. The reason for this view was that claim 1 was a product-by-process claim, because the steps of determining the amount of adsorber were not product features, but belonged to the method of manufacturing the electrical apparatus. The only limiting effect of these steps was the final amount of adsorber placed within the electrical apparatus. While the board agrees to the observation that claims 1 and 12 include product-by-process features and that the steps concerning the method of determining the amount of adsorber are not structural product features, document E1 does not contain a direct and unambiguous

disclosure of the amount of adsorber in the electrical apparatus and therefore as to whether the amount falls within the claimed range.

2.4 Technical effect and objective technical problem

The above distinguishing features define a range for the adsorber amount.

The lower end point of that range (equation Ii) is chosen such that the adsorber can adsorb all moisture and water that is estimated to be present in the insulation space at the time of filling it as well as all decomposition products that occur over the course of operation between gas maintenance or gas replacement intervals. The technical effect achieved by the lower end point is to ensure that the adsorber can remove all unwanted moisture and decomposition products.

The upper end point of that range (equation II) is chosen such that at most 10% of CO₂ present when placing the adsorber are removed.

The board agrees with the observation in the decision under appeal that the amount of CO₂ present in the insulating space at the time when placing the adsorber is not defined in claim 1 (cf. point 8.2). The claim therefore encompasses situations where the insulation gas mainly comprises CO₂ at high pressure. This is in line with the only specific example of the patent, which indicates as lower end point 110 g of adsorber and as upper end point 4.4 kg, i.e. forty times as much (cf. paragraph 127).

The appellant argued that the technical effect of the claimed range was to allow for an efficient removal of

water and decomposition products from the insulation space, and at the same time to keep the influence of the adsorber on the insulation and arc-extinction performance of the insulation medium to an acceptable degree or to a minimum.

The board can accept that an excessive amount of adsorber could negatively impact the insulation and arc-extinction performance of the insulation medium. The board therefore can accept that the technical effect adduced by the appellant is achieved.

The objective technical problem is therefore to avoid any negative influence of moisture and decomposition products on the insulation and arc-extinguishing properties of the insulation gas, while also avoiding excessive adsorption of the CO₂ itself.

The respondent argued that the amount of water and CO₂ used as basis for the calculation of the amount of adsorber were undefined in the claim, and the resulting amount of adsorber was therefore essentially not limited. Therefore no technical effect could be attributed to it. Given the board's conclusion, that the subject-matter of claim 1 of the main request does not involve an inventive step even when accepting the technical effects attributed to the range for the amount of the adsorber by the appellant, the board does not have to deal with this argument in further detail.

2.5 Assessment of the solution

Concerning the obviousness of the solution, the board agrees with the respective reasoning in the decision under appeal.

It is the very purpose of the adsorber to remove moisture and decomposition products from the insulation medium. In order for its purpose to be fulfilled, a skilled person would have provided enough adsorber material to adsorb moisture initially present and decomposition products completely during a gas replacement or maintenance interval.

A skilled person would also have provided a safety margin, such as 2 to 3 times the minimum estimated adsorber amount. However, it did not require any inventive activity, but it merely amounted to normal practice, to avoid providing excessive amounts, such as forty times the required minimum amount of adsorber. As the opposition division convincingly argued, such amounts would incur excessive cost and require excessive storage and handling and, the board adds, they would also require excessive space in the insulation compartment.

Any avoidance of pressure swings at forty times the minimum amount are therefore simply a bonus effect, that a skilled person would always have achieved by using a normal and obvious safety margin. Simply pointing out a beneficial effect that a skilled person would inevitably have achieved in the course of the application of ordinary skill does not involve an inventive step.

- 2.6 The appellant argues that E1 did not disclose that water should be removed, and consequently that E1 did not suggest a minimum amount of adsorber for removal of water. The adsorber in E1 had a different purpose namely the removal of decomposition products. Removal of humidity was only mentioned in the context of prior art switchgear with air as insulation gas.

However, the board agrees with the opposition division and the respondent that it was (and still is) common practice to remove moisture in gas insulated electrical equipment. This is independent of the type of insulating gas because humidity is released by polymer parts in the insulation compartment, as the opposed patent states itself in paragraph [0041], and as was known by a skilled person. Therefore it is immaterial that E1 only speaks about moisture removal in the context of air insulated prior art equipment. The opposed patent itself states in paragraph [0015] that the presence of water was unwanted but almost impossible to avoid, which the board sees as a confirmation of its view.

Furthermore, it is immaterial in the board's view that E1 is silent on the effect of excessive adsorber amounts on the CO₂ gas. The board can agree to the appellant's view that avoiding excessive pressure reduction helps identifying leaks in the insulation space. However, in the logic of the problem-solution approach, a skilled person does not require a specific pointer to solve a technical problem based on a bonus effect. Rather, the skilled person would have achieved that bonus effect, as its name already suggests, as a bonus in the course of the exercise of normal skills or of solving another problem.

The board is also not persuaded by the appellant's argument that a skilled person would have been motivated by E1 to use as much as possible of the adsorber material in order to prolong the time until the adsorber is fully saturated by degradation products, thus allowing longer intervals between replacement of the adsorber. The replacement intervals

are not defined in claim 1 and can therefore not be tacitly treated like a distinguishing feature. The board also considers it an unpersuasive contention that a skilled person would not have considered an upper limit for the amount of adsorber. Clearly the insulation compartment of E1 will mainly be filled with insulation gas and the liquid reservoir, which puts a natural limit on the amount of adsorber that can be placed in it. The appellant has not demonstrated credibly that a skilled person would realistically have considered as much adsorber as possible in the electrical apparatus of E1, without considering any upper limit, ignoring cost and space requirements.

Moreover, the appellant argued that the function of the adsorber in E1 was vital for the functioning of the apparatus. It had the function of removing decomposition products. If these were not removed, no fresh fluoroketone from the liquid reservoir could evaporate into the gas phase, which would compromise the insulation and arc-extinguishing capabilities of the insulation gas. Furthermore, the pressure would rise excessively due to the presence of decomposition products in the gas phase. Since in the apparatus according to E1, the adsorber was vital for the working principle, a skilled person would not have been motivated by E1 to foresee an upper limit for the amount of the adsorber. However, the respondent is correct in pointing out that claim 1 does not exclude the presence of fluoroketone with a liquid reservoir. The board wishes to add that according to paragraphs [0086] to [0104] of the patent fluoroketones are preferred examples for the claimed organofluorine compound. According to page 6, lines 13 to 21 of E1, unlike the conventional SF₆, fluoroketones do not recombine after being decomposed by an arc. The liquid

reservoir is therefore even technically required if fluoroketones are used as foreseen according to the patent. The appellant's argument is therefore not persuasive.

2.7 The same reasoning applies *mutatis mutandis* to independent apparatus claim 12 according to the main request. The upper limit of 5 kg adsorber per cubic meter of the volume of the insulation space compartment is even more excessive than that defined in the specific example.

2.8 Moreover, the same reasoning applies *mutatis mutandis* to independent method claim 19 according to the main request. Like the apparatus claims, the method claim merely states that the adsorber amount should be enough to safely adsorb moisture and decomposition products but not so excessive as to adsorb too much CO₂. The board cannot discern anything in this general statement nor in the mathematical way of expressing it that could be considered inventive.

3. *Auxiliary request 1 and 3 to 14 - Admittance*

3.1 The board decided not to accede to the respondent's request not to admit auxiliary request 1, and 3 to 14.

3.2 The respondent argued with regard to all auxiliary requests filed with the statement of grounds of appeal that they were to be considered late filed because they were not filed with the notice of appeal as was, according to the respondent, required by Rule 99 EPC.

3.3 Contrary to the respondent's contention, Rule 99(1)(c) EPC merely stipulates that the notice of appeal has to

contain a request defining the subject of the appeal. According to the Case Law of the Boards of Appeal, 10th edition, 2022 ("CLBA"), V.A.2.5.2 c), third and fourth paragraphs, this provision is satisfied if the notice of appeal contains a request, which may even be implicit, to set aside the appealed decision in whole or, where applicable, only in part. The respondent's contention is also in direct contradiction to Article 12(3) of the revised Rules of Procedure of the Boards of Appeal ("RPBA 2020"), which provides that the statement of grounds of appeal (not the notice of appeal) has to contain a party's complete appeal case, which expressly includes the specification of all requests.

3.4 Apart from being renumbered, auxiliary requests 1, and 3 to 14 (with the exception of auxiliary requests 6.2, 8.2 and 12.2) are identical to auxiliary requests that were submitted, maintained and decided on during the first-instance opposition proceedings. The board therefore considers these requests to form part of the basis of the appeal proceedings, see Article 12(1) (a) and (2) RPBA 2020.

4. *Auxiliary request 1 - Inventive step*

Auxiliary request 1 contains a claim that is identical to claim 12 of the main request. It is therefore not allowable for the same reasons.

5. *Auxiliary request 2 - Admittance*

5.1 The board decided not to admit auxiliary request 2 under Article 12(6), first sentence, RPBA 2020.

5.2 Auxiliary request 2 is identical to auxiliary request 7 subject of the appealed decision. The opposition division did not admit then auxiliary request 7 into the proceedings. The appellant has not provided any convincing argument as to why the board should overturn the discretionary decision of the opposition division.

The board cannot see anything wrong in the opposition division's exercise of discretion when arguing that the reformulation of claim 18 in then auxiliary request 7 as an independent claim failed to meet the criteria of Rule 80 EPC. The appellant has not presented any specific reason as to why this amendment was occasioned by a ground for opposition, apart from the unconvincing blanket statement that the amendment was occasioned by the ground for opposition according to Article 100(a) EPC. For that reason alone the discretionary decision to disregard the request was not erroneous, nor do the circumstances of the appeal case justify the admittance.

6. *Auxiliary request 3 to 6 - Inventive step*

6.1 The board came to the conclusion that auxiliary requests 3 to 6 were not allowable.

6.2 The subject-matter of claim 19 of auxiliary request 3, compared to the main request, is not limited to placing the determined amount of adsorber into the apparatus. The absence of this feature has no effect on the assessment of inventive step. Therefore the subject-matter of claim 19 does not involve an inventive step for the same reasons as claim 19 of the main request.

6.3 Claim 12 of auxiliary request 4 specifies, in addition to the features of claim 12 of the main request, that the predetermined temperature T_0 is room temperature. The value for the adsorption capability of the adsorber towards water and the decomposition compounds that enters the formulae of claim 12 is therefore to be taken at room temperature.

The appellant argued that the purpose of this amendment was to address the opponent's argument that the formulae allowed for an extremely broad range of adsorber.

The appellant argued further that the electrical apparatus according to the claim were typically operated outdoors. The board can agree. This means that in operation the apparatus will be subject to temperature variations around room temperature. The choice of a single temperature, such as room temperature, to estimate the adsorption capacity towards water and decomposition products is merely a choice that simplifies the calculation, while at the same time rendering the estimate less accurate.

The skilled person would readily have predicted this advantage and disadvantage. The choice of room temperature merely amounts to applying ordinary skill. The subject-matter of claim 12 of auxiliary request 4 therefore does not involve an inventive step in view of E1.

6.4 Claim 12 of auxiliary request 5 is identical to claim 12 of the main request. Its subject-matter therefore does not involve an inventive step in view of E1 for the same reasons.

Claim 19 of auxiliary request 5 is identical to claim 19 of auxiliary request 2 (and 3). Its subject-matter therefore does not involve an inventive step in view of E1 for the reasons given for auxiliary request 3.

6.5 Claim 12 of auxiliary request 6 is identical to claim 12 of the main request. Its subject-matter therefore does not involve an inventive step in view of E1 for the same reasons.

7. *Auxiliary request 6.2 - Admittance*

7.1 The board considers the deletion made in auxiliary request 6.2, filed during the oral proceedings before the board, to be an amendment. The board further decided not to take this amendment into account under Article 13(2) RPBA 2020.

7.2 The appellant argued that the present deletion of independent claims from a request did not represent an "amendment" within the meaning of Article 13 RPBA 2020, in particular since the deletion was merely a waiver serving to limit the appeal case. The appellant made reference to decisions T 565/16, T 1480/16, T 995/18, T 1151/18 and T 1597/16. This view would imply that the board does not have a discretion to disregard auxiliary request 6.2. which would then automatically be part of the appeal proceedings (cf. Article 12(1)(a), (2) and (4), first sentence, RPBA 2020).

In decision T 1480/16, the deletion of all claims of a category was not considered to be an amendment because in that case this did not change the factual and legal situation ("geänderte Sachlage") or raise any new issues to be discussed, see reasons 2.3 and catchword.

The reasoning in the decisions in T 995/18, reasons 2, and T 1151/18, reasons 2.1, on this point is similar to that of the decision in T 1480/16.

Also the reasoning in decision T 1597/16 seems to hinge upon the fact that no new factual and legal situation was created ("kein anderer sachlicher bzw. patentrechtlicher Streitgegenstand") by the deletion of an alternative within an independent claim, see reasons 4.4.1.

Decision T 565/16 does not contain any reasoning to support its view that certain claim deletions are not amendments, see reasons 4.

7.3 The board is neither persuaded by the general approach in these decisions to what it takes to qualify as an "amendment", nor by the way in which the appellant applies that jurisprudence to the present case.

7.4 Possibly in further contrast to some of these early decisions applying the RPBA 2020, this board considers that there can be no discretion unless there is an amendment.

The board also notes in respect of the decisions invoked by the appellant that an approximately equal number of further decisions, listed in the CLBA, V.A. 4.2.2 d), takes the contrary view that the deletion of claims does represent an amendment to the appeal case.

7.5 This board is persuaded by this second line of jurisprudence because it cannot recognise anything in the wording of the RPBA 2020 that would restrict the term "amendment" to exclude the deletion of claims,

including when allegedly or actually only serving to limit the appeal case (and the decisions invoked by the appellant give no explanations to the contrary).

In particular, the board cannot recognise any link in the wording of the RPBA 2020 between the question as to whether a change to the appeal case is an amendment within the meaning of the RPBA 2020 and the influence of such change on procedural economy. On the contrary, whether it is detrimental (or neutral or beneficial) to procedural economy is an express criterion in the RPBA 2020 only at the next step, in the exercise of discretion after a change to the appeal case has been qualified as an amendment (cf. Articles 12(4) and 13(1), fourth sentences, RPBA 2020). Thus, the ordinary meaning of the term "amendment" in its context is not concerned with procedural economy. In other words, the impact on procedural economy is not a criterion when assessing whether, at all, there is discretion.

- 7.6 The board is not persuaded by the way the appellant applies the cited jurisprudence to the present case. Contrary to the factual situation underlying these decisions, in the present case the deletion of the group of claims beginning with independent apparatus claim 12 introduces new issues that need to be examined. Before the filing of auxiliary request 6.2, there was no claim request on file which made it necessary to examine the subject-matter of claim 1 thereof. Auxiliary requests 5 and 6 contained a claim with identical subject-matter as claim 1 of auxiliary request 6.2. However, there was no need to examine this subject-matter separately because these requests were not allowable anyhow due to the presence of further independent claims 12 and 19. These claims were unallowable for the same reasons as higher ranking

auxiliary requests. Claim 1 according to auxiliary requests 7 and 8 contains all limitations of claim 1 of auxiliary request 6.2 and a further limitation (namely that T_1 is room temperature and T_2 is lower). However, also these requests were unallowable due to the presence of further independent claims (namely claim 12 and claim 19) that had already been dealt with in the context of the higher ranking requests.

This change to the appellant's appeal case would therefore have shifted the focus and discussion to issues which, up to that point, had not needed to be examined.

If the appellant's view that the late deletion of claims at issue does not constitute an amendment were correct, it would follow that a board does not have a discretion as to its admittance. As a consequence, to avoid any shift of the focus and discussion to unexamined issues, such a board would be prompted to examine every claim of every request filed in due time with the statement of grounds of appeal or the reply. This would be strikingly contrary to the primary object of appeal proceedings to review the appealed decision in a judicial manner (cf. Article 12(2) RPBA 2020). This cannot have been the legislative intent.

7.7 For these reasons, the deletion of claims made in auxiliary request 6.2, filed at oral proceedings before the board, constitutes an "amendment" within the meaning of Article 13 RPBA 2020.

7.8 In deciding whether to take the amendment into account, the main criterion is whether there are exceptional circumstances.

7.9 In favour of considering auxiliary request 6.2, the appellant argued that the preliminary opinion of the opposition division concerning granted independent apparatus claims 1 and 12 was positive for the appellant. Thus, there had been no need to amend the claims up to the oral proceedings before the opposition division. However, this argument neglects that it follows from the conclusion in point 8.2 of the decision under appeal that the subject-matter of claim 12 according to auxiliary requests 5 to 8 also did not involve an inventive step. If the appellant had wanted to pursue auxiliary request 6.2, they should have filed this request with the statement of grounds of appeal, at the latest, and not waited until the oral proceedings before the board. What the appellant has presented are no exceptional circumstances justifying the admittance of auxiliary request 6.2, let alone any cogent reasons (Article 13(2) RPBA 2020).

7.10 The main criterion can, at this stage of the appeal proceedings, be complemented by the criteria of Article 13(1) RPBA 2020. The shifted focus and discussion to new issues that would follow, if auxiliary request 6.2 were to be considered, would entail more work for all involved to the detriment of procedural economy (Article 13(1), fourth sentence, RPBA 2020).

7.11 For these reasons, auxiliary request 6.2 was not taken into account.

8. *Auxiliary requests 7 to 12 - Inventive step*

8.1 Auxiliary requests 7, 8, 11 and 12 contain a claim whose subject-matter is identical to that of claim 12 of the main request. This subject-matter does not

involve an inventive step in view of E1 for the same reasons as the main request.

8.2 Auxiliary requests 9 and 10 contain a claim 1 whose subject-matter defines an upper limit for the adsorber amount of 5 kg per cubic metre. The board's reasoning concerning claims 1 and 12 of the main request directly applies to this amended subject-matter. Therefore it does not involve an inventive step in view of E1 for the same reasons as the main request.

9. *Auxiliary request 8.2 and 12.2 - Admittance*

9.1 The board considered the respective deletion made in auxiliary requests 8.2 and 12.2, filed during the oral proceedings before the board, to be an amendment, and decided not to take these requests into account under Article 13(2) RPBA 2020.

9.2 The reasons for the board in arriving at this decision were essentially the same as for auxiliary request 6.2. The appellant did not provide further arguments and the same underlying considerations apply.

9.3 The admittance of auxiliary request 8.2 would have introduced new issues to be examined, as the presence of a claim that is identical to claim 12 of the main request in auxiliary requests 7 and 8 did not make an examination of the subject-matter of claim 1 according to auxiliary request 8.2 necessary before this request was filed during oral proceedings before the board.

9.4 The same applies to the admittance of auxiliary request 12.2. Due to the presence of claims with subject-matter which is identical to that of claim 12 of the main

request in auxiliary requests 11 and 12 it had not been necessary, before the filing of auxiliary request 12.2, to deal with the subject-matter of claim 1 according to the latter.

10. *Auxiliary request 13 - Exclusion from patentability*

10.1 The subject-matter of claim 17 according to auxiliary request 13 is excluded from patentability pursuant to Article 52(2)(c) EPC.

10.2 The respondent objected to the independent method claim in the version without the feature "*e) introducing the absorber in the determined amount in the insulation space compartment*" (cf. point 6 of the reply to the appeal) as containing subject-matter which defined a mental act as such, which was excluded from patentability according to Article 52(2)(c) EPC. The appellant did not present any counter-arguments.

10.3 The board agrees with the respondent. The subject-matter of claim 17 of auxiliary request 13 merely defines calculations on the basis of input information that can be estimated or taken from data sheets. They merely lead to output information in the form of an estimated number. The claimed subject-matter therefore covers a purely mental act.

11. *Auxiliary request 14 - Inventive step*

11.1 The subject-matter of claim 1 of auxiliary request 14 does not involve an inventive step in view of document E1.

- 11.2 Claim 1 of auxiliary request 14 specifies that the insulation space of the apparatus is formed by at least two insulation space compartments. The amount of adsorber in each compartment is calculated according to formulae II and Ii but claim 1 defines an additional upper limit of 5 kg adsorber per cubic metre.
- 11.3 The appellant argued that it was beneficial that the amount of adsorber in each insulation compartment could be adapted to the electrical component in that compartment. For example a power switch produced arcs and thus needed a higher amount of adsorber than merely current carrying components. A skilled person would have merely provided standard amounts of adsorber in each compartment. Document E1 did not suggest adapting the amount of adsorber in each compartment.
- 11.4 The board is not persuaded. Rather, the respondent argued correctly that claim 1 was not limited to the amount of adsorber being different in the at least two insulation space compartments. Consequently, claim 1 of auxiliary request 14 defines a mere duplication. The board also explained in the context of the main request that a skilled person would, in the course of the exercise of ordinary skill, have chosen an amount of adsorber, which might have been two to three times the required amount as a safety margin. Thereby the skilled person would have remained below the upper limits defined by formula II and the additional upper limit of 5 kg adsorber per cubic metre without exercising inventive skill.

12. *Auxiliary request 15 - Admittance*

12.1 The board decided not to admit auxiliary request 15 under Article 12(6) RPBA 2020.

12.2 Auxiliary request 15 is identical to auxiliary request 2 subject of the appealed decision, with claim 1 specifying that the adsorber is a molecular sieve with a given pore size. The opposition division did not admit then auxiliary request 2 into the proceedings. The appellant has not provided any arguments as to why the board should overturn the discretionary decision of the opposition division. The board itself also does not see any reason to do so. The condition for admittance according to Article 12(6), first sentence, RPBA 2020, that the decision of the opposition division was erroneous, is therefore not met.

Furthermore, the circumstances of the appeal case also do not justify the admittance. The appellant's argument on inventive step relies wholly on features that are also present in claim 12 of the main request, but not on those concerning the molecular sieve. The opposition division held, and the respondent also argues, this feature not to be a further distinguishing feature over E1 (cf. point 11.1 of the decision under appeal), which discloses Siliporite as adsorber. Siliporite had a pore size of between 3 and 13 Å. The board agrees. Therefore, the decision not to admit auxiliary request 15 did not suffer from an error in the use of discretion nor do the circumstances of the appeal case justify its admittance.

13. *Conclusions*

Since there is no allowable request on file, the board must accede to the respondent's request that the appeal be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



L. Gabor

R. Bekkering

Decision electronically authenticated