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Datasheet for the decision of 17 November 2025

Case Number: T 0539/24 - 3.3.05

Application Number: 18702499.7

Publication Number: 3592698

IPC: C01B21/26, C01B21/28, C01B21/46, B01D53/02, B01D53/56

Language of the proceedings: EN

Title of invention:
A PLANT FOR THE PRODUCTION OF NITRIC ACID, A RELATED PROCESS AND METHOD OF REVAMPING

Patent Proprietor:
Casale SA

Opponent:
YARA International ASA

Headword:
Production of Nitric acid/Casale

Relevant legal provisions:
EPC Art. 84, 123(2)
RPBA 2020 Art. 13(2)

Keyword:
Clarity - main request (no) - auxiliary requests 1, 2, 4, 5, 6 (no)
Amendments - allowable (no)
Amendment after summons - taken into account (no)

Decisions cited:
G 0003/14, T 1800/21

Catchword:

Europäisches Patentamt
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Beschwerdekammern

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Case Number: T 0539/24 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 17 November 2025

Appellant: (Opponent)	YARA International ASA Drammensveien 131 0277 Oslo (NO)
Representative:	De Clercq & Partners Edgard Gevaertdreef 10a 9830 Sint-Martens-Latem (BE)
Respondent: (Patent Proprietor)	Casale SA Via Pocobelli, 6 6900 Lugano (CH)
Representative:	M. Zardi & Co S.A. Via G. B. Pioda, 6 6900 Lugano (CH)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 16 February 2024 concerning maintenance of the European Patent No. 3592698 in amended form.**

Composition of the Board:

Chairwoman	S. Besselmann
Members:	G. Glod
	O. Loizou

Summary of Facts and Submissions

I. The appeal of the opponent (appellant) concerns the opposition division's decision that European patent No. EP 3 592 698 B1 in amended form based on the main request met the requirements of the EPC.

II. Claim 8 of that main request reads as follows.

"*8. A dual-pressure process for the synthesis of nitric acid comprising the following steps:*
a) oxidation of a stream of ammonia (10), providing a gaseous effluent (15) containing nitrogen oxides;
b) subjecting said gaseous effluent (15) to a process of absorption of nitrogen oxides, obtaining an output product stream (27) containing nitric acid and nitrogen oxides and a tail gas mainly composed of nitrogen;
said step a) being operated at a reaction pressure and said step b) being operated at an absorption pressure greater than the reaction pressure,
c) compression of the gaseous effluent (15) obtained from said step a) from the reaction pressure to the absorption pressure in a suitable compressor (5);
d) subjecting said output product stream (27) from the absorption step to a first bleaching process, wherein nitrogen oxides are stripped with a first stripping medium (39) from said output stream (27), providing a partially stripped nitric acid stream (40) and a nitrogen oxides-loaded stripping medium (41), wherein said product stream (27) is the product effluent of the absorption tower;
e) subjecting said partially stripped nitric acid stream (40) to a second bleaching process, wherein nitrogen oxides are stripped with a second stripping

medium (16) from said output stream (40), providing a stream of nitric acid (29);
f) said nitrogen oxides-loaded stripping medium (41) is recycled to the discharge-side of the compressor (5)."

Claim 8 of auxiliary request 1 additionally includes the following feature at the end of the claim.

"*, wherein said second bleaching process is performed in a second bleacher, the second bleacher operates at a lower pressure than the first bleacher, and the partially stripped nitric acid stream leaving the first bleacher partially flashes gas dissolved therein in a control valve before being admitted into the second bleacher.*"

Compared with claim 8 of auxiliary request 1, claim 8 of auxiliary request 2 additionally includes the following feature at the end of the claim.

"*, wherein said first bleaching process is performed in a first bleacher and said first stripping medium is cooled in a heat exchanger at the discharge-side of said compressor before its admission into said first bleacher, and said first stripping medium is oxygen-enriched air.*"

Claim 1 of auxiliary request 3 reads as follows.

"*1. A method of revamping of a dual-pressure plant for the synthesis of nitric acid which comprises:*
a reactor (4), wherein a stream of ammonia (10) is oxidized to provide a gaseous effluent (15) containing nitrogen oxides;
an absorption tower (6), wherein nitrogen oxides contained in said gaseous effluent (15) react with

water to provide an output product stream (27) containing nitric acid and nitrogen oxides and a tail gas,
said reactor (4) operating at a reaction pressure and said absorption tower (6) operating at an absorption pressure greater than the reaction pressure;
a compressor (5), which elevates the pressure of the gaseous effluent (15) of the reactor from the reaction pressure to the absorption pressure;
a bleacher (7), wherein nitrogen oxides are stripped with a stripping medium (16) from the output product stream (27) of the absorption tower providing a stream of nitric acid (29), said bleacher operating substantially at the reaction pressure;
said method of revamping being ***characterized by:***
installation of at least a further bleacher (37);
re-directing the output product stream (27) from the absorption tower (6) to said further bleacher (37), wherein nitrogen oxides are stripped with a stripping medium (39) to provide a partially stripped nitric acid stream (40) and a nitrogen oxides-loaded stripping medium (41);
directing said partially stripped nitric acid stream (40) to the existing bleacher (7), wherein nitrogen oxides are further stripped to provide said stream of nitric acid (29);
recycling said nitrogen oxides-loaded stripping medium (41) to the discharge-side of said compressor (5),
the installation of a heat exchanger (43) at the delivery-side of said stripping medium compressor (42) to cool down the stripping medium (39) before its admission into the newly installed bleacher (37),
said partially stripped nitric acid stream (40) being flashed in a suitable valve (31) before its admission

into the existing bleacher (7) operating substantially at the reaction pressure."

Claim 1 of auxiliary requests 4 to 6 correspond to claim 8 of the main request and auxiliary requests 1 and 2, respectively.

Claim 1 of auxiliary request 7 corresponds to claim 1 of auxiliary request 3 but additionally contains the underlined feature below.

"*1. [...] recycling said nitrogen oxides-loaded stripping medium (41) to the 5 discharge-side of said compressor (5),*
said newly installed bleacher (37) operating substantially at the absorption pressure and said nitrogen oxides-loaded air stream (41) being directly recycled to the discharge-side of said compressor (5), the method comprising the installation of a compressor (42) providing 10 the newly installed bleacher (37) with said stripping medium (39) substantially at said absorption pressure,
the installation of a heat exchanger (43) at the delivery-side of said stripping medium compressor (42) [...]."

III. The following documents are cited herein.

D1: D. Hind, "Nitric acid Debottlenecking", presentation at the ANNA Ammonium Nitrate-Nitric Acid Conference held in Tucson, Arizona (US) on 3 October 2014

D4: M. Thiemann et al., "Nitric Acid, Nitrous Acid, and Nitrogen Oxides", Ullman's Encyclopaedia of Industrial Chemistry, vol. 23, sixth completely revised edition, 2003, pages 1 to 41

IV. The arguments of the respondent (patent proprietor), where relevant to the present decision, can be summarised as follows.

The amendment in claim 8 of the main request did not result in a lack of clarity. The skilled person would recognise that the feature added to claim 8 clarified that the entire product effluent exiting the absorption tower was subjected to a first bleaching process. This argument applied to the main request and auxiliary requests 1, 2 and 4 to 6.

The skilled person reading claim 1 of auxiliary request 3 would understand that the presence of a stripping medium compressor was implied by the wording of the claim. There was no violation of Article 123(2) EPC.

Auxiliary request 7 was submitted in response to the board's objection under Article 123(2) EPC. This had not been raised before, which amounted to exceptional circumstances justifying the admission of this request. In addition, claim 1 of this request was a combination of granted claims only, thereby meeting the requirements under Articles 84 and 123(2) and (3) EPC. This request did not introduce any additional complexity and the same arguments as those already set out with respect to auxiliary request 3 applied with respect to allowability.

V. The appellant's arguments, where relevant, are reflected in the Reasons for the Decision set out below.

VI. At the end of oral proceedings, which were held on 17 November 2025, the parties' requests were as follows.

The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request), or alternatively that the patent be maintained in amended form on the basis of one of auxiliary requests 1 to 6 submitted during the opposition proceedings or on the basis of auxiliary request 7 submitted on 14 November 2025.

Reasons for the Decision

Main request

1. Article 84 EPC

The requirements of Article 84 EPC are not met.

Claim 8

Compared to the patent as granted, claim 8 of the main request includes the additional feature "wherein said product stream (27) is the product effluent of the absorption tower". This feature may therefore be analysed for compliance with Article 84 EPC (G 03/14, Reasons 81).

According to the respondent, this feature was supposed to clarify that the *entire* product effluent exiting the absorption tower was subjected to the first bleaching process. However, this is not what the claim

stipulates. The wording of the claim is open ("*comprising* the following steps" [emphasis added]). Step b) relates to obtaining "an output product stream 27". Step d) defines that the output product stream 27 of the absorption process is to be subjected to a first bleaching process. This does not exclude the formation and processing of other streams, for instance those flowing parallel to output product stream 27, or those being diverted from it or fed into it. This view is supported by the description. It is evident from Figure 2 of the patent that the output product stream 27 of the absorption process is not identical to the inflow 28 to the first bleaching process. The output product stream 27 is mixed with the nitric acid solution stream 25 to produce stream 28, which is fed to the first bleacher 37 (paragraphs [0061] and [0065] to [0068]). Consequently, the output product stream 27 and the feed stream subjected to the first bleaching process are not the same. The skilled person understands that additional processing of the output product stream of the absorption tower is possible before subjecting it to the first bleaching process.

It is also evident from the open wording of claim 8 of this request ("comprising") that it is not mandatory for the *complete* product output of the absorption step, i.e. the *full amount* of the nitric acid containing product withdrawn from the bottom of the absorption tower, to be subjected to the first bleaching process. The claim does not contain any words like 'complete', 'entire', 'all', etc., and does not exclude an additional process step wherein the output product stream is subjected to a different process from a first bleaching process.

The wording "wherein said product stream (27) is the product effluent of the absorption tower" in the present context does not imply that the *entire* product output of the absorption step is directed to the first bleaching process. Consequently, the inclusion of this additional feature in claim 8 of the main request (as compared with claim 8 as granted) results in an ambiguity, since this feature is supposed to provide a different meaning for "product effluent" from "output product stream", which, however, lacks further specification. This feature, which is taken from the description, does not appear to imply any additional limitations to claim 8. The amendment thus results in a lack of clarity and conciseness.

Consequently, the main request is not allowable at least for not fulfilling the requirements of Article 84 EPC.

Auxiliary requests 1 and 2

2. Article 84 EPC

It was not contested by the respondent that the objections under Article 84 EPC with respect to claim 8 of the main request also applied to claim 8 of these auxiliary requests.

Consequently, auxiliary requests 1 and 2 are not allowable either.

Auxiliary request 3

3. Article 123(2) EPC

Claim 1 of auxiliary request 3 is based on claims 11, 14 and 15 of the patent as granted. However, claim 14 as granted refers to claim 13, which relates to a compressor. Claim 1 is consequently not a combination of granted claims only.

According to claim 1 of this request, the heat exchanger has to be installed at the delivery side of the stripping medium compressor. However, claim 1 does not specify such a compressor. One possible understanding of claim 1 is that the heat exchanger has to be installed at the specified position if the compressor is present. This understanding is completely in line with claim 3, which foresees the installation of a compressor, implying that such a compressor is not necessarily present in the method of claim 1. Even if the respondent's interpretation (which is difficult to reconcile with claim 3) that claim 1 already implied the presence of a stripping medium compressor were accepted, then this would not be the only possible understanding of claim 1. Therefore, an ambiguity is present.

In the application as filed, the heat exchanger (43) is only disclosed in combination with the compressor (42) (see claims 13 and 14 as filed and page 5, lines 18 to 24, of the application as filed). It is evident from this passage that the heat exchanger should cool down the first stripping medium obtained after compressing. The heat exchanger is clearly linked to the compressor. A disclosure of the heat exchanger without the

compressor is not derivable from the application as filed.

Since claim 1 does not unambiguously require the presence of both the compressor and the heat exchanger, its subject-matter is not directly and unambiguously derivable from the application as filed.

Consequently, the requirements of Article 123(2) EPC are not met and auxiliary request 3 is not allowable either.

Auxiliary requests 4 to 6

4. Article 84 EPC

Claim 1 of these requests corresponds to claim 8 of the main request and auxiliary requests 1 and 2, respectively.

The respondent did not dispute that the objections against claim 8 of the main request and auxiliary requests 1 and 2 also applied to claim 1 of auxiliary requests 4 to 6.

Consequently, none of these requests are allowable.

Auxiliary request 7

5. Article 13(2) RPBA

This request is a combination of claims 11 to 15 as granted. It was submitted one working day before the oral proceedings, in reply to the communication under Article 15(1) RPBA. Article 13(2) RPBA applies.

The respondent took the view that this was a legitimate reaction to the board's objection under Article 123(2) EPC against auxiliary request 3, which had been newly raised in the communication pursuant to Article 15(1) RPBA. In addition, the respondent argued that this request was based on granted claims only.

However, this does not explain why the request was only filed on the last working day before the oral proceedings, six months after the board's communication and two months after the initially set date for oral proceedings, which were ultimately cancelled but for reasons not relevant to the decision.

The board sees no exceptional circumstances justified by cogent reasons that would warrant taking into account auxiliary request 7 at this very late stage of appeal proceedings (Rule 13(2) RPBA).

There may be cases where late submissions are taken into account under Article 13(2) RPBA. However, in such cases, it has to be without doubt that the objections previously raised by the other party are overcome (see T 1800/21, Reasons 3.4.7). This is not the case here.

Furthermore, even if the respondent's position were accepted, then a newly raised objection is not a carte blanche for submitting yet another auxiliary request. It still needs to be evaluated whether the amendments *prima facie* overcome the issues raised (clear allowability) (Case Law of the Boards of Appeal of the EPO, 11th edition, 2025, V.A.4.5.4. e) and e)(i)). In contrast to the respondent's view, the argument that the request might not introduce any new, additional complexity is not sufficient.

In the current case, the respondent relied on the arguments already given in connection with auxiliary request 3 with respect to the question of inventive step. In particular, it argued that D1 did not disclose a heat exchanger and a flash valve. These features would not have been rendered obvious by the prior art. These arguments do not establish a case of *prima facie* allowability, in that they do not clearly overcome the objections raised by the appellant. A flashing valve is not explicitly disclosed in D1, but it is known to the skilled person. This is confirmed by the patent itself (paragraph [0061], relating to the prior-art setup of Figure 1) and by the fact that the valve is not part of the revamping in claim 1. The addition of a heat exchanger after a compressor to recover the heat of compression is known to the skilled person, as illustrated in D4.

Consequently, at least clear allowability has not been established.

Therefore, Auxiliary request 7 has not been taken into account.

6. In summary, neither the main request nor auxiliary requests 1, 2, 4, 5 and 6 meet the requirements of Article 84 EPC; auxiliary request 3 is not allowable under Article 123(2) EPC; and auxiliary request 7 has not been taken into account.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairwoman:

C. Vodz S. Besselmann

Decision electronically authenticated