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Formalities officer

Martinez-Orta, Maxima

Date

01-04-2026

Reference
AMC121WEP

Application No./Patent No.
18702977.2 - 1014 / 3583067

Applicant/Proprietor
Casale SA

BRIEF COMMUNICATION

Subject: ☐ Your letter of
☐ Our telephone conversation of
☐ Communication of
☐

Enclosure(s): ☐ Letter from the proprietor of the patent of
☐ Letter from the opponent of
☐ Copy (copies)

Communication:

All annexes to the letter as well as the consolidated list of all opposition citations are available for inspection via the European Patent Register at www.epo.org/register. Should you wish to receive these documents in paper format, they will be supplied to you free of charge if specifically requested on receipt of this communication (OJ EPO 2022, A28).

☒ Rejection of the opposition (Art. 101(2) EPC)

For the Opposition Division



☐ **Registered letter**

EPO Form 2911O 04.22 (25/03/26)

Patent Owner
Exhibit 2009

Casale SA
Page 1



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Application No. / Patent No. 18 702 977.2 - 1014 / 3 583 067 /	Ref. AMC121WEP	Date 01.04.2026
Proprietor Casale SA		

Decision rejecting the opposition (Art. 101(2) EPC)

The Opposition Division - at the oral proceedings dated 05.03.2026 - has decided:

The opposition(s) against the European patent EP-B- 3 583 067 is/are rejected.

The reasons for the decision are enclosed.

Possibility of appeal

This decision is open to appeal. Attention is drawn to the attached text of Articles 106 to 108 and Rules 97 to 98 EPC.

Opposition Division:

Chairman: Engelen, Karen
2nd Examiner: Raimondi, Fabio
1st Examiner: Van der Poel, Wim



Martínez Orta, M
Formalities Officer

Tel. No.: +31 70 340-8967

Branch at The Hague

Enclosure(s): 10 page(s) reasons for the decision (Form 2916)
Wording of Articles 106 - 108 and Rules 97 - 98 EPC (Form 2019)
Minutes of oral proceedings
EP18702977_consolidated list.pdf

to EPO postal service: 25.03.26

Summary of Facts and Submissions

- I. European patent 3 583 067 having the title "PROCESS FOR THE SYNTHESIS OF AMMONIA WITH LOW EMISSIONS OF CO₂ IN ATMOSPHERE" is based upon European patent application No. 18 702 977.2 filed on 31.01.2018. It claims priority of EP17156256 filed on 15.02.2017 and of EP17195305 filed on 06.10.2017.

The mention of the grant of the patent has been published in the European Patent Bulletin of 08.09.2021. Proprietor of the patent is
Casale SA
Via Giulio Pocobelli 6
6900 Lugano
CH.

- II. Notices of opposition have been filed by
Opponent 1:
Linde AG
Klosterhofstraße 1
80331 München
DE
on 08.06.2022

Opponent 2:
thyssenkrupp Industrial Solutions AG
ThyssenKrupp Allee 1
45143 Essen
DE
on 08.06.2022.

- III. Both opponents request revocation of the patent in its entirety based on Article 100(a) EPC, lack of novelty and lack of inventive step. D1 to D11 were filed as evidence within the opposition period (see also annexed consolidated list of cited documents).
- IV. In the observations received on 03.11.2022, the proprietor requests the rejection of the opposition (Article 101(2) EPC).
- V. With letter of 12.05.2023 Opponent 1 filed further submissions as well as documents D12 and D13 (see annexed consolidated list of cited documents).
- VI. On 29.07.2024 the opposition division issued a summons to oral proceedings on 20.05.2025. In the summons the preliminary opinion of the opposition division is also indicated.

- VII. With letter of 31.07.2024 the proprietor requested postponement of the oral proceedings.
- VIII. On 20.09.2024 the opposition division issued a summons to oral proceedings on 09.07.2025. In the summons the preliminary opinion of the opposition division is also indicated.
- IX. With letter of 07.05.2025 Opponent 1 filed further submissions, as well as documents D14 and D15.
- X. On 09.05.2025 third party observations in accordance with Article 115 EPC were filed. Documents D21 to D25 were filed in support of these observations.
- XI. With letter of 09.05.2025 the proprietor filed further observations as well as auxiliary requests 1 to 6.
- XII. Also with letter of 09.05.2025 Opponent 2 filed further submissions as well as documents D16 to D20.
- XIII. With letter of 28.05.2025 Opponent 2 re-filed the documents filed by the third party and provided arguments in view of their *prima facie* relevance.
- XIV. With letter of 06.06.2025 the proprietor provided observations in view of the third party observations.
- XV. With letter of 03.07.2025 Opponent 2 filed further submissions.
- XVI. With letter of 04.07.2025 the third party filed documents D21j to D21n as well as further arguments.
- XVII. The oral proceedings for 09.07.2025 were cancelled due to unforeseen circumstances.
- XVIII. On 19.09.2025 the opposition division issued a new summons to oral proceedings to be held on 05.03.2026. A preliminary opinion was given.
- XIX. With letter of 13.11.2025 Opponent 2 agreed with the last submissions of the third party and filed documents D21j to D21n that had already been filed by the third party. Opponent 2 requested that Dr Klaus Noelker is summoned to be heard as a witness regarding the preparation of D1 if the opposition division considers the evidence on file to be insufficient proof of the publication status of D1.
- XX. With letter of 02.01.2026 the proprietor filed further arguments as well as auxiliary requests 7 to 12.
- XXI. With letter of 05.01.2026 the third party filed further arguments.
- XXII. With letter of 19.02.2026 Opponent 2 filed further arguments.

XXIII. On 05.03.2026 oral proceedings took place before the opposition division with all parties present. Opponent 1 additionally requested to admit D12 and D13 into the proceedings, while the proprietor requested not to admit these documents. During these oral proceedings the decision to dismiss the opposition in accordance with Article 101(2) EPC was taken.

Reasons for the decision

1 The oppositions are admissible because the requirements of Article 99 and 100 EPC and Rules 76 and 77 EPC are fulfilled. It is noted that admissibility of the oppositions was not disputed by the proprietor.

2 Examination of the main request

The main request is the patent as granted. Claim 1 of this request has the following wording:

*Process for synthesis of ammonia from natural gas, comprising:
conversion of a charge of desulphurized natural gas and steam, with oxygen-enriched air or with oxygen, into a synthesis gas (11) containing hydrogen, CO and CO₂, in a conversion section;
a treatment of said synthesis gas (11) comprising at least a shift reaction of the carbon monoxide into CO₂, and subsequent separation of CO₂ from the gas, thus obtaining a CO₂-depleted synthesis gas (12) and a CO₂-rich gaseous flow containing the CO₂ separated from the gas;
optionally, a step for methanation of the synthesis gas and/or addition of nitrogen to the synthesis gas,*

characterized by:

separation of a part (14) of said CO₂-depleted synthesis gas (12) as fuel fraction, wherein said fuel fraction (14) is fed as fuel to at least one furnace and wherein said separation of the fuel fraction comprises the split of said CO₂-depleted synthesis gas into at least a first stream and a second stream, said streams having the same composition, wherein the first stream forms the fuel fraction and the second stream is process gas intended for the synthesis of ammonia, optionally after further purification.

2.1 Priority

Opponent 2 argued that the first priority claimed was not valid, because it would not disclose the feature that the first and second stream have the same composition.

Document D22 is prior art in accordance with Article 54(3) EPC and would become prior art in accordance with Article 54(2) EPC if the oldest priority is not valid.

D26, which is the priority document for the oldest priority, does not explicitly disclose that the the two streams have the same composition. However, the opposition division is of the opinion that D26 does disclose implicitly that the two streams have the same composition. The passage on page 4, lines 20 to 26 of D26 shows that a portion of synthesis gas is allocated to fuel. Page 4, lines 13 to 20 show that the fuel fraction is between 1 and 40% of the available gas. Such a percentage of the available gas only makes sense if the fractions have the same composition.

Page 15, lines 14 to 19 is part of the description of figure 1. It gives a composition for the synthesis gas 12. This stream is split into two streams, 14 and 16. From the figure it is clear that there is only a split of the streams. Also from the text it is clear that there are two portions of streams.

From these passages it is clear that the streams are not submitted to some separation process but are merely divided in two streams.

The feature that the two streams have the same composition is thus implicitly disclosed in D26.

The main request can thus also benefit from the oldest priority, P1.

2.2 **Admissibility of documents**

The proprietor has requested that documents D7a, D12 to D25 should not be admitted in the procedure, as these documents would not be *prima facie* relevant.

2.2.1 **Documents D12 to D16**

Documents D12 to D16 have been cited to show that document D1 is indeed prior art.

Documents D12 and D13 are preprints of the conference of 18/2 to 3/3 2010 in Bahrain. Page ii of D12 indicates a 2010 publishing date. D12 shows a list of presentations given at the conference. In the list we find the presentation of K.Noelker and J. Johanning called "Autothermal reforming: a flexible syngas route with future potential". Document D13 is the part of the preprints in which the actual article from K. Noelker and J. Johanning is shown.

Preprints are handed out to participants of a conference before the conference. However, even if it would be contested that this is the case, the front page of D12 mentions the publication in 2010, which is largely before the earliest priority date of the patent in suit. As opposed to what the proprietor argued, the opposition division considers that the mention of a copyright date of 2010 is an indication that D13 was indeed published well before the earliest priority date.

The combination of documents D12 and D13 are, therefore, considered prior art. In this respect it is noted that D13 has the identical text as D1 and is thus *prima facie* relevant. Documents D12 and D13 are, therefore, admitted into the procedure.

D1 is not considered prior art. D1 has no publication date and it is not clear if this document was available to the public. Document D1 is, therefore, not considered to form part of the prior art. But the fact that D13 has the same content it is, therefore, of no importance.

Documents D14 to D16 were cited to prove the publication of D1. D14 and D15 show that indeed there was a presentation at the conference. However, it does not prove anything concerning the publication of D1, nor does it show what was actually presented at the conference. D16 are only the slides that were allegedly presented at the conference. There is no indication that these slides were publicly available, nor that they were actually shown and presented during the conference. For these reasons documents D14 to D16 are not admitted.

2.2.2 Document D21

Document D21 (with documents D21a to D21n) are cited to prove a presentation during the IFA Technical Committee Meeting 12-14 March 2007 in Ho Chi Minh City, Vietnam.

The following documents were submitted concerning D21:

D21a: link to the website of the of the IFA to the presentation information

D21b: Screenshot of following link in D21a

D21c: Online pdf which is published following the link in D21b

D21d: Slide 1 and 18

D21e: link to the website to the specific slide deck

D21f: Screenshot of following link in D21e

D21g: URL that follows from clicking on D21e

D21h: Screenshot of URL showing slide 1

D21i: Declaration of Svend Erik Nielsen, presenter of D21

D21j: Guidelines for speakers

D21k: URL to membership benefits of IFA

D21l: Screen shots of D21k, Wayback Machine 2006

D21m: URL to the technical meeting

D21n: Screen shots of D21m, Wayback Machine 04.03.2010

The proprietor also filed two documents in view of D21. They are annexed to their letter of 02.01.2026 and mentioned as D21o in the attached consolidated list of cited documents. These documents show that the proprietor was unable to find the relevant documents on the Wayback Machine.

D21i is a declaration of Svend Erik Nielsen, the presenter at the conference in Vietnam and employee of the third party Topsoe A/S. This statement is of no relevance to prove what was presented at a conference. There is established case law that a declaration of the presenter only is not sufficient. A statement from at least one member of the public is also required. See in this respect, for example, T667/01.

However, the opposition division is of the opinion that the publication of the slides is sufficiently proven. D21f suggests that the slide deck is published on 12.03.2007. This website has a link to the slide deck. D21d shows the relevant slides. D21n shows screenshots obtained by the Wayback Machine machine on 04.03.2010. The slides of the presentation are downloadable from there.

The documents presented by the proprietor show that at the time of writing the communication (02.01.2026) it was not possible to download the documents via the Wayback Machine.

The opposition division is of the opinion that the slides were available on 04.03.2010 via the Wayback Machine. The fact that they could not be accessed in 2026 via the Wayback Machine does not seem to be relevant. Not all websites are indexed using the Wayback Machine. The important fact is that it was available before the earliest priority date of the patent in suit. This is the case.

Document D21 is, therefore, considered prior art in accordance with Article 54(2) EPC. As it very close to the claimed invention it is considered *prima facie* relevant and thus admitted in the proceedings.

2.2.3 Admissibility of documents D7a, D17 to D20 and D22 to D25 was not discussed at oral proceedings. A decision on the admissibility of these documents has, therefore, not been taken.

2.3 **Prior art**

It is clear from what is discussed above that documents D12/D13 and D21 are considered part of the prior art in accordance with Article 54(2) EPC. D1, however, is considered not to form part of the prior art in accordance with Article 54(2) EPC.

Because claim 1 of the main request benefits from both priorities, document D22 is only prior art in accordance with Article 54(3) EPC.

2.4 **Article 100(a) EPC, novelty**

During the opposition procedure novelty objections have been brought forward by both opponents and also by the third party.

The opposition division is of the opinion that D6 is not novelty destroying for the following reasons. First of all, as also argued by the proprietor, the embodiment of figure 6 uses air and not oxygen-enriched air or pure oxygen. Secondly, it is not disclosed that the streams have the same composition, wherein the first stream forms the fuel fraction. One could argue that streams 662A and 662B in figure 6 have the same composition, but none of these streams forms the fuel fraction.

The subject-matter of claim 1 is novel over D6.

Document D13 does not disclose that CO₂-depleted syngas is split in two streams having the same composition, nor does it disclose that the CO₂-depleted syngas is used in a furnace. A furnace is an enclosed high-temperature apparatus used to generate heat for warming buildings or industrial processes. The autothermal reformer of D13 is not a furnace.

The subject-matter of claim 1 is novel over D13.

Document D21 does show a combustion of the synthesis gas, but there is no disclosure of a furnace. It has been argued that the steam turbine in D21 should be considered to be a furnace. The opposition division is of the opinion that the steam turbine is not a furnace as it is not an enclosed high-temperature apparatus used to generate heat for warming buildings or industrial processes.

The subject-matter of claim 1 is novel over D21.

2.5 **Article 100(a) EPC, inventive step**

The opponents have chosen different closest prior art documents. Opponent 1 is of the opinion that D13 represents the closest prior art, whereas Opponent 2 is of the opinion that D21 is closest prior art.

The opposition division agrees with the opponents that these documents represent the closest documents for the assessment of inventive step.

Starting from D13

Document D13 discloses a process for the synthesis of ammonia from natural gas. Desulphurised natural gas is subjected to autothermal reforming, followed by water-gas shift and carbon dioxide removal. The ammonia synthesis gas is

converted to ammonia. In the autothermal reforming air, oxygen-enriched air, or oxygen is used. The last paragraph of the text shows that *a complete separation of the entire CO₂ could be realised in the ATR-based plant with little extra investment and an only moderate increase of the plants consumption figure provided the fired heater would be fed with syngas instead of natural gas*. From the paragraph above, it is clear that this carbon dioxide is needed for the conversion to urea (see figure 2; page 122, last two paragraphs).

There are two differences between claim 1 and document D13:

- In claim 1 the CO₂-depleted synthesis gas is split in two streams having the same composition, whereas in D13 this is not the case;
- In claim 1 the CO₂-depleted syngas is used in a furnace, whereas in D13 this is not the case.

As mentioned above, the last paragraph of D13 discloses that complete separation of carbon dioxide can be realised by feeding the fired heater with synthesis gas. The document is not concerned with low carbon dioxide emissions. It is concerned with providing sufficient carbon dioxide for the production of urea (see penultimate paragraph of page 123).

As technical effect it can, therefore, be recognised that the process according to claim 1 has low carbon dioxide emissions. The objective technical problem should, therefore, be defined as the provision of an ammonia process with low carbon dioxide emissions.

The opponents have argued that since D13 teaches that synthesis gas can be used in the heater instead of natural gas, the person skilled in the art would choose the synthesis gas that is produced in figure 2 of D13, more precisely the synthesis gas in which the carbon dioxide has been removed.

There is no indication at all in D13 that it is that synthesis gas that is used. Even if the person skilled in the art would decide to use synthesis gas from the autothermal process itself, there is still no indication that it should be the synthesis gas after the removal of carbon dioxide. The reasoning that this would be the case is based on hindsight.

Also, a combination of D13 and D21 to arrive at the solution proposed in claim 1 would be solely based on hindsight. The strategies provided by D21 for reducing CO₂ emissions are underground disposal of CO₂ and combination of a reforming section with a turbine, without involvement of a furnace (see also the discussion of inventive step when starting from D21).

The subject-matter of claim 1, therefore, involves an inventive step starting from D13 as closest prior art.

Starting from D21

Document D21 discloses a process for making ammonia. Natural gas is desulphurised and then fed to a pre-reformer. After pre-reforming the natural gas is fed to an autothermal reformer, followed by water-gas shift and carbon dioxide removal. Part of the CO₂-lean synthesis gas is fed to a methanator and to the ammonia synthesis, whereas another part is fed to a steam turbine (see last slide).

The difference between claim 1 and D21 lies in the fact that in claim 1 the CO₂-lean synthesis gas is fed to a furnace, whereas in D21 this synthesis gas is fed to a turbine.

As technical effect it can be seen that the process of claim 1 provides a process with reduced carbon dioxide emissions. The objective technical problem can, therefore, be defined as the provision of a process for the production of ammonia with decreased carbon dioxide emissions.

Document D21 is not concerned with lowering carbon dioxide emissions. From the title of slide 18 it is clear that the objective is to integrate the reforming process with a power cycle. It is noted in this respect that there is no accompanying text that goes with the slides.

The person skilled in the art has no reason to replace the turbine with a furnace, as the objective of D21 is power generation.

Based on D21 alone, the person skilled in the art does not get any indication to reduce the carbon dioxide emissions by replacing the turbine with a furnace. D21 does also not provide any link between slides 16 and 18. The steam boiler of slide 16 receives fuel, without any indication of synthesis gas being used as a fuel.

Also document D13 does not give that indication, as was argued by the opponents. It is not clear from D13 what synthesis gas is used, nor is there any indication of reduction of carbon dioxide emissions.

The subject-matter of claim 1 also involves an inventive step starting from D21 as closest prior art.

- 2.6 In writing, further inventive step objections were raised, starting from D3, D7 and D8. These documents are all further away from claim 1 than D13 and D21. Also the opponents chose D13 and D21 as best starting points for the discussion of inventive step.

Datum
Date 01.04.2026
Date

Blatt
Sheet 10
Feuille

Anmelde-Nr:
Application No: 18 702 977.2
Demande n°:

3 **Decision**

As none of the grounds of opposition prejudice the maintenance of the patent, the opposition is rejected in accordance with Article 101(2) EPC.

Article 106
Decisions subject to appeal

- (1) An appeal shall lie from decisions of the Receiving Section, Examining Divisions, Opposition Divisions and the Legal Division. It shall have suspensive effect.
- (2) A decision which does not terminate proceedings as regards one of the parties can only be appealed together with the final decision, unless the decision allows a separate appeal.
- (3) The right to file an appeal against decisions relating to the apportionment or fixing of costs in opposition proceedings may be restricted in the Implementing Regulations.

Rule 97
Appeal against apportionment and fixing of costs

- (1) The apportionment of costs of opposition proceedings cannot be the sole subject of an appeal.
- (2) A decision fixing the amount of costs of opposition proceedings cannot be appealed unless the amount exceeds that of the fee for appeal.

Rule 98
Surrender or lapse of the patent

The decision of an Opposition Division may be appealed even if the European patent has been surrendered in all the designated Contracting States or has lapsed in all those States.

Article 107
Persons entitled to appeal and to be parties to appeal proceedings

Any party to proceedings adversely affected by a decision may appeal. Any other parties to the proceedings shall be parties to the appeal proceedings as of right.

Article 108
Time limit and form

Notice of appeal shall be filed, in accordance with the Implementing Regulations, at the European Patent Office within **two months** of notification of the decision. Notice of appeal shall not be deemed to have been filed until the fee for appeal has been paid. Within **four months** of notification of the decision, a statement setting out the grounds of appeal shall be filed in accordance with the Implementing Regulations.

Further information concerning the filing of an appeal

- (a) Notice of appeal can be filed in accordance with Rule 1 and Rule 2(1) EPC, by delivery by hand, by post, or by technical means of communication. The filing has to comply with the details and conditions and, where appropriate, any special formal or technical requirements laid down by the President of the European Patent Office (R. 99(3) EPC).
- (b) The addresses of the filing offices of the European Patent Office are as follows:

(i) European Patent Office D-80298 Munich Germany	(ii) European Patent Office Postbus 5818 NL-2280 HV Rijswijk (ZH) The Netherlands	(iii) European Patent Office D-10958 Berlin Germany
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- (c) The notice of appeal must contain the name and address of the appellant in accordance with the provisions of Rule 41(2)(c) EPC, an indication of the decision impugned, and a request defining the subject of the appeal. In the statement of grounds of appeal the appellant shall indicate the reasons for setting aside the decision impugned, or the extent to which it is to be amended, and the facts and evidence on which the appeal is based (R. 99(1) and (2) EPC). The notice of appeal and any subsequent submissions stating the grounds for appeal must be signed (R. 50(3) EPC).
- (d) The fee for appeal is laid down in the Rules relating to Fees. The schedule of fees and expenses of the EPO or a reference to the current version is regularly published in the Official Journal of the European Patent Office under the heading "Guidance for the payment of fees, expenses and prices". Fee information is also published on the EPO website under www.epo.org/fees.

18702977.2

CONSOLIDATED LIST – KONKORDANZLISTE - LISTE RÉCAPITULATIVE

P : Casale SA

1 : Linde AG

2 : thyssenkrupp Industrial Solutions AG

	CITATIONS-ENTGEGENHALTUNGEN-ANTÉRIORITÉS	P	1	2
D1	Dr. Klaus Noelker and Dr. Joachim Johanning, <i>Autothermal reforming: a flexible syngas route with future potential</i> , 2010, veröffentlicht als Preprint eines Vortrags		A1	
D2	US 8,137,422 B2		A2	
D3	EP 2 817 260 B1		A3	
D4	Ryota Shimura, <i>Urea Product Expansion by Newly Developed CO2 Recovery Process from Primary Reformer Flue Gas</i> , AIChE TECHNICAL MANULA 2006, Vol. 47, S. 237-246		A4	
D5	P. Heussinger, <i>Hydrogen, 3. Purification</i> , Ullmann's Encyclopedia of Industrial Chemistry, 2011		A5	
D6	US 2004/ 0234426 A1			D1
D7	EP 1 648 817 B1			D2
D8	EP 2 266 922 A1			D3
D9	Max Appl Ammonia Principles and Industrial Practice, 1999, Wiley-VCH, ISBN 3-527-29593-3;			D4
D10	DE 10 2015 210 803 A1			D5
D11	DE 10 2014 209 635 A1			D6
D12	Nitrogen+Syngas preprints, 2010		-	
D13	K. Noelker et al.: Nitrogen+Syngas, "Autothermal Reforming : A flexible Syngas Route with Future Potential" 2010		-	
D14	Conference Report		D14	
D15	Konferenzprogramm		D15	
D16	Presentation Slides: Autothermal reforming: a flexible syngas route with future potential, Dr. Noelker, 02.03.2010			D16
D17	Syngas Production and CO2 Emission Reduction Possibilities, Dr. T. von Trotha, 2010			D17
D18	Presentation Slides: Autothermal reforming: a flexible syngas route with future potential, Dr. T. von Trotha, 2010			D18
D19	Topsoe v. Casale Complaint Jan. 31, 2024			D19
D20	IDS for application Number 96000424, filing date: 31.01.2018			D20

	CITATIONS-ENTGEGENHALTUNGEN-ANTÉRIORITÉS	P	1	2
D21a	IFA web page- https://www.fertilizer.org/resource/ifa-technical-committee-meeting-on-energy-efficiency-and-co2-reduction-prospects-in-ammonia-production-proceedings-ho-chi-minh-city-viet-nam-march-2007/			D11a
D21b	screen shot of D11a			D11b
D21c	https://www.fertilizer.org/wp-content/uploads/2023/01/2007_tech_hcmc_all_slides.pdf			D11c
D21d	screen shot of D11 cat point of slides 1 and 18 of D11			D11d
D21e	https://www.fertilizer.org/resource/future-energy-efficiency-and-co2-reduction-potential/			D11e
D21f	screen shot of D11e			D11f
D21g	https://www.fertilizer.org/wp-content/uploads/2023/01/2007_tech_hcmc_nielsen_svend_slides.pdf			D11g
D21h	screen shot of D11g			D11h
D21i	Declaration of Svend Erik Nielson			D11i
D21j	Guidelines for Speakers, 2007 IFA Technical Committee Meeting, 12-14 March 2007, Ho Chi Minh City, Viet Nam			D21j
D21k	http://www.fertilizer.org/ifa/membership/membershipbenefits.asp			D21k
D21l	Screen shots of D21k captured on the Way Back Machine on 8 December 2006			D21l
D21m	http://www.fertilizer.org/ifa/Home-Page/LIBRARY/Conferenceproceedings/Technical-Conferences/2007-IFA-Technical-Meeting			D21m
D21n	Screen shots of D21m captured on the Way Back Machine on 4 March 2010			D21n
D21o	Screen shots of D21n	A1		
D22	WO2017/134162 A1			D12
D23	US6505467 B1			D13
D24	Extract from "CARBON DIOXIDE CAPTURE AND STORAGE", Intergovernmental Panel on Climate Change. Working Group 111., 2005			D14
D25	WO2010/069626 A1			D15
D26	EP17156256 - priority document of the patent filed 15 February 2017			P1
D27	EP17195305 - priority document of the patent filed 6 October 2017			P2



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Application No. / Patent No. 18 702 977.2 - 1103 / 3 583 067 /	Ref. AMC121WEP	Date 01.04.2026
Proprietor Casale SA		

Provision of a copy of the minutes in accordance with Rule 124(4) EPC

The attached copy of the minutes of the oral proceedings is sent to you in accordance with Rule 124(4) EPC.



Martínez Orta, M
Formalities Officer
Tel. No.: +31 70 340 - 8967

Branch at The Hague

Enclosure(s): Applicants not using the Mailbox can access patent literature via Espacenet
Copy of the minutes (Form 2309)

Application No.:

18 702 977.2

Patent No.:

EP-B-3 583 067

Minutes of the oral proceedings before the OPPOSITION DIVISION

The proceedings were public.

Proceedings opened on 05.03.2026 at 09:22 hours

Present as members of the opposition division:

Chairman:	Engelen, Karen
1st member:	Van der Poel, Wim
2nd member:	Raimondi, Fabio
Minute writer:	Raimondi, Fabio

Present as or for the party or parties:

- For the Proprietor(s): Casale SA
Mr. E. Eterno and Mr M. Zardi as representatives accompanied by Mr. R. Ostuni and Mr. F. Baratto as technical experts
- For the Opponent 1: Linde AG
Mr. W. Fischer
- For the Opponent 2: thyssenkrupp Industrial Solutions AG
Mr. Ch. Salewski, Mr. V. Ambor and Mr. N. Niedlein as representatives accompanied by Mr. B. Mielke and Mr. K. Nölker as technical experts

The identity of the person/s (as well as, if applicable, that of the witness or witnesses) and, where necessary, the authorisation to represent/authority to act were checked.

Essentials of the oral proceedings and relevant statements of the parties:

- 1 The oral proceedings were opened at 9:22. All parties confirmed receipt of the email containing the email addresses of the members of the opposition division (OD) and the telephone number of the chairwoman of the OD (ChOD).
- 2 The ChOD summarised the requests of the parties:
 - 2.1 Opponent 1 (O1) - revocation of the patent in its entirety according to Article 100a EPC in combination with Articles 54 and 56 EPC; admission into the proceedings of D14 and D15;
 - 2.2 Opponent 2 (O2) - revocation of the patent in its entirety according to Article 100a EPC in combination with Articles 54 and 56 EPC; admission into the proceedings of D16-D20 and D21-D25;
 - 2.3 Patent proprietor (PP) - rejection of the oppositions according to Article 101(2) EPC as main request (MR); maintenance of the patent according to auxiliary requests 1-6 filed on 09.05.2025; maintenance of the patent according to auxiliary requests 7-12 filed on 02.01.2026; not admitting D7 and D14-D25 into the proceedings.
 - 2.4 O1 confirmed the requests summarised by the ChOP and added the request to admit documents D12 and D13 into the proceedings. O2 confirmed the requests summarised by the ChOP. PP confirmed the requests summarised by the ChOP and added the request of not admitting D12 and D13 into the proceedings.
- 3 The question of the validity of the priority right based on the previous application D26 was addressed. The ChOD noted that it was disputed whether D26 disclosed that the CO₂-depleted synthesis gas was split into at least a first and a second stream having the same composition. O2 emphasised that although D26 mentioned a separation of the CO₂-depleted synthesis gas, it never stated explicitly that the streams after the separation had the same composition. O2 argued that the term "separation" was broad and could also encompass separation by membrane, partial condensation or adsorption, all of which would change the composition of the streams. O2 added that Fig. 1 of D26 was a

schematic flow diagram which, in the absence of explicit support in the description, could not be interpreted narrowly as disclosing identical compositions. PP replied that the passages on p. 4, l. 13-20 and p. 15, l. 14-19 of D26 unambiguously disclosed splitting of the same CO₂-depleted synthesis gas in a part fed to the furnace and a remaining part fed to the methanator, the two parts having the same composition. PP added that, in D26, it was clearly indicated when “separation” involved a process changing the composition of the streams and that this was not the case in the passages mentioned above concerning the separation of the CO₂-depleted synthesis gas. In addition, PP pointed out that the same interpretation should be followed for D26 and for D21, which O2 had interpreted in the written procedure as disclosing the splitting of CO₂-depleted synthesis gas in two streams having the same composition. O2 responded that the term “remaining” did not, in itself, imply that the composition was unchanged and gave illustrative examples, such as coffee grounds remaining in a cup or the precipitate remaining after a chemical reaction, to argue that a “remaining” portion could have a different composition from the original mixture. O2 further stated that, in D21, the figure and its labelling made it clear that there was a split into streams of equal composition, whereas in D26 no such clear indication was present. O1 stated that they had no additional comments on this topic. Upon enquiry by the ChOD, all parties stated that they had no further arguments to add. The oral proceedings were interrupted at 9:53, and resumed at 10:05.

- 3.1 ChOD announced that the opposition division had concluded that MR claimed validly the priority right from D26.
- 4 The discussion on the MR continued with the topics of the public availability of D1 and D21 and with the question of the admissibility of documents D12–D16, D21 and D21a–D21n. ChOD proposed addressing admissibility and public availability in a single combined discussion, treating D1 and D12–D16 first and then moving to D21 and D21a–D21n.
- 4.1 O1 indicated that D12 and D13 are extracts of a preprint collection of contributions to a conference having a 2010 copyright date. According to O1, D12 and D13 had been distributed to conference participants without confidentiality obligation. In O1's view, this showed that D1, which has the same content as D13, had been made available to the public before the priority date. O1 submitted that D14 and D15 showed that the company Casale AG attended

the conference. O2 added that D13 should be admitted also in view of its relevance for the assessment of inventiveness of the requests on file. PP argued that D1 and D12–D16 lacked of a publication date, and that no evidence demonstrated public distribution before the priority date and in particular that the crucial last paragraph of D1 had been made available to the public. The proprietor stated that the presence of a copyright date did not prove public availability and maintained that the alleged distribution of the preprint collection remained unproven. O2 indicated that Dr. Noelker, the presenter of the original conference paper, was present as an accompanying person at the oral proceedings and that he could be asked to confirm whether the preprints had been distributed. ChOD stated that, according to established case law, a declaration from a presenter was insufficient to prove the content of the presentation and therefore and that Mr Noelker was therefore not summoned as a witness. Upon enquiry by the ChOD, all parties stated that they had no further arguments to add. The oral proceedings were interrupted at 10:32 and resumed at 10:46.

- 4.2 ChOD announced the decision of the OD to admit D12 and D13 and not to admit D14-16. In addition, ChOD announced that the opposition division had concluded that D1 did not form part of the state of the art within the meaning of Article 54(2) EPC, whereas D12 and D13 were considered prior art within the meaning of Article 54(2) EPC.
- 4.3 ChOD opened the discussion on D21 and D21a to D21n, indicating that both their admissibility and whether D21 constituted prior art under Article 54 EPC would be examined. O2 argued that D21 had been made available to the public before the priority date as demonstrated by Wayback Machine (archive.org), which showed that a presentation entitled “Future Energy Efficiency and CO₂ Reduction Potential” by the same author as D21 was downloaded in 2010. O2 referred to T2284/13 in support of the fact of relying on archived web pages despite incompleteness of the archived document and later changes in the website structure. PP replied that the archived link did not work as of today. PP pointed out that the evidence brought forward did not provide any proof that the archived link ever worked before the priority date and, in case it did, that the content of the link was the slides of D21g at a point in time before the priority date. According to PP, the fact that both the archived documents and D21g had the same title and author did not allow to conclude that the content of both documents was the same. O1 stated that they had no additional comments on

this topic. O2 referred to D21i as a declaration by the presenter of the slides stating that the slides had been presented at an IFA technical committee meeting in 2007. PP contested the admissibility and probative value of D21i, stating that it represented a party declaration that did not clearly show which slides had actually been displayed to the public and when. O2 pointed out that slides can be normally downloaded before a conference and that the slides of D12g are available today on the internet. Upon enquiry by the ChOD, all parties stated that they had no further arguments to add. The oral proceedings were interrupted at 11:06 and resumed at 11:25.

4.4 ChOD announced the decision of the OD to admit all documents relating to D21 and that D21 was considered to be prior art pursuant to Article 54(2) EPC.

5 The question of the novelty of the MR was addressed. ChOD reminded the preliminary, non-binding opinion of the OD that the subject-matter of claim 1 of the MR is novel and invited the opponents to indicate whether they wanted to put forward any arguments concerning this point. O1 indicated that they had no comments on this topic. O2 requested to introduce an objection of lack of novelty based on D13, noting that its content was identical to D1 and referring to the arguments provided in writing based on this document. PP referred to their written submissions, without adding further arguments.

5.1 ChOD announced that the OD was of the opinion that the subject-matter of claim 1 of the MR was novel in the sense of Article 54 EPC.

6 The question of inventiveness of the MR was addressed. ChOD explained the preliminary and non-binding opinion of the OD that D21 could be considered as the closest prior art (cpa). ChOD asked the parties to indicate the cpa they would like to use for the assessment of inventive step. O1 indicated D13 as cpa, whereas O2 indicated that they wished to use D21 as cpa. PP pointed out that an objection of lack of inventive step starting from D13 had not been brought forward before in the written procedure. ChOD expressed the opinion of the OD that an inventive step objection based on document D13 was admissible, since the content of this document was identical to the one of D1 and D1 had been used for raising an objection of lack of novelty in the written procedure. ChOD proposed to first assess inventive step starting from D21 as cpa and then to move to the inventive step attacks based on D13 as cpa.

- 6.1 The question of inventiveness when considering D21 as cpa was addressed. O2 identified the presence of a furnace receiving a portion of the CO₂-depleted synthesis gas as distinguishing feature between the subject-matter of claim 1 of the MR and the process of slide 18 of D21 and formulated the objective technical problem as the reduction of CO₂ emissions. O2 argued that the skilled person, aiming to reduce CO₂ emissions, would systematically review the available process streams in D21 and would necessarily identify the CO₂-depleted synthesis gas as the only suitable fuel stream for a furnace. According to O2, this choice was supported by D13, whose last sentence taught to use syngas as fuel for a furnace. PP replied that the title of D21 clarified that the core of the technical teaching of this document was the provision of an integrated reforming and power cycle by integration of a reforming section and a turbine. According to PP, the skilled person aware of this teaching would not deprive the turbine of CO₂-depleted synthesis gas by supplying a portion of it to a furnace. PP added that D21 proposes other measures for decreasing CO₂ emissions, such as underground storage of CO₂. According to PP, D13 concerns a different process and would not lead the skilled person to the solution defined in the MR. O2 replied that implementing a furnace in the process of slide 18 of D21 was obvious also based on the teaching of slide 16 of D21, which showed the presence of a furnace. O1 stressed the relevance of D21, arguing that the process of the MR essentially concerned the generation of hydrogen for ammonia synthesis with reduced CO₂ emissions and that D21 likewise addressed the CO₂-reduced production of hydrogen for ammonia plants. O1 added that, from a technical standpoint, burning hydrogen in a gas turbine or in a furnace both served merely to release energy. PP stated that D21 does not provide any link between slides 16 and 18, the steam boiler of slide 16 receiving normal fuel and not synthesis gas. In addition, PP pointed out that the HRSG of slide 18 was not a furnace, but a heat-exchanger for the production of steam by heat recovery from the turbine exhaust. The oral proceedings were interrupted at 11:57 and resumed at 12:15.
- 6.2 ChOD announced that the OD was of the opinion that the subject-matter of claim 1 of the MR involved an inventive step in the sense of Article 56 EPC when D21 was used as the cpa. The oral proceedings were interrupted for a lunch break at 12:17 and resumed at 13:30.

- 6.3 ChOD opened the discussion on inventive step starting from D13 as cpa. ChOD explained the preliminary non-binding opinion of the OD that D13 did not disclose that the CO₂-depleted syngas was split into two streams of identical composition with one of the streams being supplied to a furnace as a fuel. O1 pointed out that the last paragraph of D13 disclosed supplying synthesis gas to a furnace. According to O1, the skilled person would identify the CO₂-depleted synthesis gas in the process scheme of Fig. 2 as a suitable synthesis gas for the furnace. O1 added that provision of this gas as a fuel to the furnace would require no additional process steps and would therefore be obvious for the skilled person. PP pointed out that the last paragraph of D13 was an "out-of-the-blue" statement, without recognisable relationship with the remaining teaching of D13, which rather focused on the use of CO₂ for the production of urea. PP added that the syngas of the last paragraph of D13 was undefined, that there was no indication in D13 that this syngas was CO₂-depleted and from where it should be obtained. According to PP, D13 would not prompt the skilled person to split the CO₂-depleted syngas into two stream having the same composition and to provide one of them as furnace fuel. O2 argued that the last paragraph of D13 was not unrelated to the remaining disclosure of this document and stressed that this passage must be read in the context of the overall teaching of D13, which concerned the use of a CO₂-depleted syngas stream. O2 submitted that the last paragraph of D13 itself provided both the problem (reducing CO₂ emissions) and the solution (replacing natural gas with syngas), and that the skilled person would recognise that splitting the stream after CO₂ removal was the simplest and most economical measure to implement the suggested solution. O2 also argued that this solution was suggested by D21, where a similar branching was shown. PP replied that the combination of D13 with D21 resulted in a new inventive-step objection that was raised for the same time. PP requested 15 minutes time to prepare a response. The oral proceedings were interrupted at 13:55 and resumed at 14:10.
- 6.4 ChOD asked PP whether they had had sufficient time to prepare their arguments. PP confirmed that they had had enough time. PP argued that the strategies provided by D21 for reducing CO₂ emissions were underground disposal of CO₂ and combination of a reforming section with a turbine, without involvement of a furnace, so that combination of D13 and D21 could lead to the subject-matter of claim 1 of the MR only by hindsight. O2 pointed out that D13 alone would prompt the skilled person to provide the CO₂-depleted synthesis gas to the furnace, the only contribution of D21 being to show that splitting of a CO₂-depleted synthesis gas stream into two portions was the most

straightforward implementation of this solution. O1 and PP indicated that they had no further arguments to add. ChOD announced a break of 5 minutes for deliberation, pointing out that the previous break had already been used by the OD for evaluating the arguments about inventive step as put forward before the previous break using D13 as cpa. Upon enquiry by the ChOD, all parties stated that they had no further arguments to add. The oral proceedings were interrupted at 14:15 and resumed at 14:20.

6.5 ChOD announced that the OD was of the opinion that the subject-matter of claim 1 of the MR involved an inventive step in the sense of Article 56 EPC when D13 was used as the cpa.

7 ChOD invited all parties to indicate whether they had any further requests or comments. Both opponents and PP confirmed that they had none. ChOD asked whether the oral proceedings had run well in a technical sense, and all parties confirmed that this was the case. The chair announced that the opposition division had concluded that none of the grounds of opposition under Article 100 EPC prejudiced the maintenance of the patent as granted and that the oppositions were therefore rejected under Article 101(2) EPC. ChOD informed the parties that the minutes of the oral proceedings and the written decision would be notified as soon as possible and that the opponents had the right to appeal within the applicable time limit. ChOD closed the oral proceedings at 14:23

After deliberation of the opposition division,

- the chairman announced the following **decision** :

"The oppositions are rejected."

Regarding the reasons for the decision, the chairman referred to:

Article 101(2) EPC, second sentence: the grounds for opposition mentioned in Article 100 EPC do not prejudice the maintenance of the patent as granted.

The party/parties was/were informed that the minutes of the oral proceedings and a written reasoned decision (including an indication of the possibility of appeal) will be notified to him/them as soon as possible.

The chairman **closed the oral proceedings** on 05.03.2026 at 14:23 hours.



signed:

Engelen, Karen

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Chairman

signed:

Raimondi, Fabio

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Minute Writer

Enclosure(s):