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Datasheet for the decision of 16 December 2024

Case Number: T 1178/23 - 3.2.05

Application Number: 14736921.9

Publication Number: 3007881

IPC: B29C64/20, B29C64/153, B08B15/04, B22F3/105, B22F10/28, B22F10/322, B22F12/70, B22F12/90, B33Y40/00, B29C64/371, B22F12/67

Language of the proceedings: EN

Title of invention:
Additive manufacturing apparatus and method

Patent Proprietor:
Renishaw Plc.

Opponent:
Nikon SLM Solutions AG

Relevant legal provisions:
RPBA 2020 Art. 11, 12(1)(a), 12(2), 12(4), 12(6)
EPC Art. 54(1), 56, 111(1), 111(2)

Keyword:
Novelty (yes)
Inventive step (no)
Late-filed auxiliary requests - admitted (auxiliary requests 1 to 3: no; auxiliary request 4: admissibly raised)
Remittal (yes)

Decisions cited:
G 0007/93, T 0640/91, T 0820/14, T 1227/14, T 0467/15, T 0525/15, T 1219/19, T 0364/20, T 1800/20, T 0309/21, T 0246/22, T 0446/22, T 0731/22, T 1749/22, T 2036/22, T 2395/22, T 0823/23

Catchword:
To determine whether a submission was admissibly raised pursuant to the conditional clause of Article 12(4), first sentence RPBA, the Board of Appeal assesses whether the department of first instance would have admitted the submission in reliance on the provisions and practice that applied in first-instance proceedings at the time, had a discretionary decision on admittance been required (see points 46 to 48).

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Case Number: T 1178/23 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 16 December 2024

Appellant: (Opponent)	Nikon SLM Solutions AG Estlandring 4 23560 Lübeck (DE)
Representative:	Schicker, Silvia Wuesthoff & Wuesthoff Patentanwälte und Rechtsanwalt PartG mbB Schweigerstraße 2 81541 München (DE)
Respondent: (Patent Proprietor)	Renishaw Plc. New Mills Wotton-Under-Edge, Gloucestershire GL12 8JR (GB)
Representative:	Matthews, Paul Renishaw Plc Patent Department New Mills Wotton-under-Edge, Gloucestershire GL12 8JR (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 28 April 2023 concerning maintenance of the European Patent No. 3007881 in amended form.**

Composition of the Board:

Chair	P. Lanz
Members:	T. Vermeulen
	B. Burm-Herregodts

Summary of Facts and Submissions

I. The opponent filed an appeal against the interlocutory decision of the opposition division finding that European patent No. 3 007 881 as amended according to the first auxiliary request met the requirements of the European Patent Convention.

II. The opposition was filed against the patent as a whole on the basis of the grounds for opposition under Article 100(a) together with Article 54(1) EPC (lack of novelty) and Article 56 EPC (lack of inventive step).

III. The documents mentioned in the decision under appeal are the following.

D1: DE 10 2004 031 881 A1
D2: US 6,215,093 B1
D3: EP 2 431 113 A1
D4: EP 2 335 848 A1
D5: DE 10 2008 024 465 A1
D6: DE 10 2005 014 483 A1

IV. With its letter dated 29 July 2024, the appellant (opponent) submitted a further document D7.

D7: "Sicherheitsblatt gemäß Verordnung (EG) Nr. 1907/2006 (REACH), geändert mit 2015/830/EU - Eisen ≥ 99,5%, p.a., Pulver", Roth, article number 3718, version 1.0 (de), 1 March 2017

V. The parties were summoned to oral proceedings. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA) issued on

25 October 2024, the parties were informed of the board's provisional opinion on the issues of the case.

VI. In an annex to a letter dated 22 November 2024, the respondent (patent proprietor) filed two figures allegedly showing the results of a computer-simulated model of the gas flow achieved by the device disclosed in document D1. These figures will be referred to in the following as 'document D8'.

VII. Oral proceedings before the board were held by videoconference on 16 December 2024.

VIII. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked. It also requested not to admit the first auxiliary request underlying the impugned decision into the proceedings and not to remit the case to the first instance, but, instead, to issue a final decision on the case. If the board considered remittance of the case to the first instance, it was requested to at least decide on the admittance of auxiliary requests 1 to 5 filed with the reply to the statement of grounds of appeal.

The respondent (patent proprietor) requested that the appeal be dismissed (main request) or, alternatively, that the case be remitted to the opposition division for further prosecution or, further alternatively, that the decision under appeal be set aside and the patent be maintained as amended on the basis of the claims of one of auxiliary requests 1 to 5 filed with the reply to the statement of grounds of appeal. It also requested not to admit the appellant's objection of lack of inventive step based on document D3 when taken

alone into the appeal proceedings under Articles 12(2) and 12(6), second sentence, RPBA.

IX. Claims 1 and 13 of the respondent's main request (corresponding to the first auxiliary request which the opposition division held allowable) have the following wording (the feature numbering used in the decision under appeal appears in square brackets).

"[**1.0**] Additive manufacturing apparatus for building objects (103) by layerwise consolidation of material (104), [**1.1**] the apparatus comprising a build chamber (101) containing a working area, [**1.2**] a high energy beam for consolidating material deposited in the working area in layers and [**1.3**] a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110), characterized in that [**1.4**] the gas inlet (112) and gas outlet (110) arranged to be movable within the build chamber (101)."

"[**13.0**] Additive manufacturing method for building objects (103) by layerwise consolidation of material (104), [**13.1**] the method comprising depositing material (104) in a working area in a build chamber (101), [**13.2**] scanning a high energy beam across the working area to consolidate the material (104) in layers and [**13.3**] operating a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110) characterized in that [**13.4**] the method further comprises moving the gas inlet (112) and the gas outlet (110) during building of the object (103)."

X. Claim 1 of auxiliary request 1 is identical in wording to claim 1 of the respondent's main request. The only

amendment in claim 13 of auxiliary request 1 is the following addition to feature 13.0.

"Additive manufacturing method for building objects (103) by layerwise consolidation of material (104), in an additive manufacturing apparatus according to any one of claims 1 to 12,"

XI. Claims 1 and 13 of auxiliary request 2 differs from claim 1 and 13, respectively, of the main request by following amendments.

"1. Additive manufacturing apparatus for building objects (103) by layerwise consolidation of powder material (104), the apparatus comprising a build chamber (101) containing a working area, the build chamber (101) having a window (107), a laser module (105) for generating a ~~high energy~~ laser beam for ~~consolidating~~ melting powder material deposited in the working area in layers, the laser beam directed onto the powder material (104) by an optical module (106) under the control of a computer (160), the laser beam entering the build chamber (101) via the window (107), and a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110), characterized in that the gas inlet (112) and gas outlet (110) are arranged to be movable within the build chamber (101)."

"13. Additive manufacturing method for building objects (103) by layerwise consolidation of powder material (104) in an additive manufacturing apparatus according to any one of claims 1 to 12, the method comprising depositing powder material (104) in a working area in a build chamber (101), scanning ~~a high energy~~ the laser beam across the working area to consolidate the powder

material (104) in layers, the laser beam entering the build chamber (101) via the window (107), and operating a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110) characterized in that the method further comprises moving the gas inlet (112) and the gas outlet (110) during building of the object (103)."

XII. Claims 1 and 13 of auxiliary request 3 have the following amendments compared to claims 1 and 13, respectively, of the respondent's main request.

"1. Additive manufacturing apparatus for building objects (103) by layerwise consolidation of powder material (104), the apparatus comprising a build chamber (101) containing a working area, the build chamber (101) having a window (107), wherein the apparatus is a selective laser melting apparatus in which powder layers are successively deposited across the working area in the build chamber (101) and a laser beam is scanned across portions of each powder layer that correspond to a cross-section of the object (103) being constructed to melt the portions of the powder (104), the apparatus further comprising a laser module (105) for generating ~~a high energy~~ the laser beam for ~~consolidating~~ melting the powder material deposited in the working area in layers, the laser beam directed onto the powder material (104) by an optical module (106) under the control of a computer (160), the laser beam entering the build chamber (101) via the window (107), and a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110), characterized in that the gas inlet (112) and gas outlet (110) are arranged to be movable within the build chamber (101)."

"13. Additive manufacturing method for building objects (103) by layerwise consolidation of powder material (104) in an additive manufacturing apparatus according to any one of claims 1 to 12, the method comprising depositing powder material (104) in ~~a~~ the working area in ~~a~~ the build chamber (101), scanning ~~a high energy~~ the laser beam across the working area to consolidate the powder material (104) in layers, the laser beam entering the build chamber (101) via the window (107), and operating a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110) characterized in that the method further comprises moving the gas inlet (112) and the gas outlet (110) during building of the object (103)."

XIII. Independent claims 1, 3, 10, 11 and 13 of auxiliary request 4 have the following wording.

"1. Additive manufacturing apparatus for building objects (103) by layerwise consolidation of material (104), the apparatus comprising a build chamber (101) containing a working area, a high energy beam for consolidating material deposited in the working area in layers and a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110), the gas inlet (112) arranged to be movable within the build chamber (101), characterized in that the gas outlet (110) arranged to be movable within the build chamber (101), wherein the gas inlet (112) and gas outlet (110) are movable such that a position of the gas inlet (112) relative to the gas outlet (110) can be varied."

"3. An additive manufacturing apparatus for building objects (103) by layerwise consolidation of material

(104), the additive manufacturing apparatus is a laser solidification apparatus comprising a build chamber (101) containing a working area, a wiper (109) for spreading powder (104) across the working area, wherein powder layers are successively deposited across the working area in the build chamber (101), a laser beam for scanning across portions of each powder layer that correspond to a cross-section of the object (103) being constructed to consolidate the portions of the powder (104) and a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110), the gas inlet (112) arranged to be movable within the build chamber (101), characterised in that the gas outlet (110) is arranged to be movable within the build chamber (101), wherein the wiper (109) is mounted to move with at least one of the gas inlet (112) and gas outlet (110)."

"10. Additive manufacturing apparatus for building objects (103) by layerwise consolidation of material (104), the apparatus comprising a build chamber (101) containing a working area, a high energy beam for consolidating material deposited in the working area in layers and a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110), the gas inlet (112) arranged to be movable within the build chamber (101), characterised in that the gas outlet (110) is arranged to be movable within the build chamber (101), comprising a controller (160) (i) for controlling a rate of flow at which gas is propelled into the build chamber (101) from the gas inlet (112) based upon a location of the gas inlet (112) and/or gas outlet (110) in the build chamber (101), and/or (ii) for controlling a rate of flow at which gas is drawn from the build chamber (101) through the gas outlet (110) based upon a

location of the gas inlet (112) and/or gas outlet (110) in the build chamber (101)."

"11. Additive manufacturing method for building objects (103) by layerwise consolidation of material (104), the method comprising depositing material (104) in a working area in a build chamber (101), scanning a high energy beam across the working area to consolidate the material (104) in layers and operating a flow device for generating a gas flow across at least a part of the working area from a gas inlet (112) to a gas outlet (110) comprising moving the gas inlet (112) and the gas outlet (110) during building of the object (103), the method comprising moving the gas inlet (112) and gas outlet (110) to vary a distance between the gas inlet (112) and gas outlet (110), and/or comprising moving the gas inlet (112) and gas outlet (110) to alter the direction of gas flow across the working area, and/or comprising altering a rate of flow at which gas is propelled into the build chamber (101) from the gas inlet (112) based upon a location of the gas inlet (112) and gas outlet (110) in the build chamber (101), and/or comprising altering a rate of flow at which gas is drawn from the build chamber (101) through the gas outlet (110) based upon a location of the gas inlet (112) and gas outlet (110) in the build chamber (101)."

"13. A data carrier having instructions thereon, the instructions, when executed by a processor (161), causing the processor (161) to control an additive manufacturing apparatus according to any one of claims 1 to 10 to carry out the method of any one of claims 11 to 12."

XIV. The appellant (opponent) essentially argued as follows.

Admittance of the first auxiliary request underlying the impugned decision

The first auxiliary request underlying the impugned decision should not be admitted into the proceedings. This request was filed during the first-instance oral proceedings held before the opposition division only after the main request to maintain the patent as granted had been rejected for lack of novelty of granted claim 15 over document D1. The claims of the first auxiliary request corresponded to the claims as granted with the exception that granted independent claim 15 was deleted. But an objection of lack of novelty against granted claim 15 had already been raised in the notice of opposition and in the appellant's letter dated 27 October 2021. Further, the opposition division had already indicated in the communication sent in an annex to the summons for oral proceedings that the subject-matter of granted claim 15 was considered to be not novel over document D1. Although the patent proprietor had filed several auxiliary requests during the written proceedings before the opposition division, none of these addressed the novelty objection against granted claim 15. Instead, all these auxiliary requests contained an independent claim corresponding to granted claim 15. In the interlocutory decision, the opposition division came to the correct conclusion that the first auxiliary request was late filed. The opposition division's further finding that the request was prima facie relevant was clearly incorrect because this also required an analysis of novelty of claims 1 and 13 of the late-filed request over document D3 and, in addition, a detailed discussion on inventive step. Such

an in-depth analysis clearly could not be considered part of a prima facie assessment of the relevance of the request.

Main request

(a) Novelty

Claim 1 of document D1 explicitly disclosed a laser sintering machine and a selective laser sintering (SLS) laser melting machine. The skilled person would be well aware of what was confirmed in paragraph [0003] of document D1, namely that such a machine necessarily required a build chamber held under a protective atmosphere because it required the handling and processing of fine-grained metal powders, typically with grain sizes of less than 100 µm and preferably between 10 and 50 µm. When a laser beam impinged on such a powder, welding smoke, welding spatter and debris were formed. Without a build chamber, the powder bed would be irradiated in the open air, causing severe pollution of the air surrounding the machine. Also, the laser beam would not be shielded. Consequently, such a machine could not be operated without severely threatening the health of the operator. In addition, the absence of a build chamber would inevitably cause oxidation of the metallic powder and, hence, impair the quality of the printed product whilst posing a severe fire and explosion hazard. Thus, the skilled person would not have any doubt that the machine of claim 1 of document D1 necessarily had to comprise a build chamber accommodating the powder bed and the suction device. The skilled person would also understand that the clearly exemplary configuration of paragraph [0010] of document D1 related to a different embodiment, for example a laser welding machine or laser engraving

machine, but not to an SLS or a selective laser melting (SLM) machine. For establishing lack of novelty, it was sufficient if one embodiment of document D1 disclosed all the claimed features. Furthermore, given that the area surrounded by the ring-shaped suction element of document D1 was smaller than the total area of the powder bed, the skilled person would immediately recognise that the supply of protective gas to the locally limited area might help to establish a desired flow pattern in that area, but was clearly not suitable to establish an enclosed atmosphere over the powder bed. Therefore, the respondent's conclusion that, in view of paragraph [0005] of document D1, the device 1 did not require a build chamber was incorrect. The reference to air in claim 13 of document D1 concerned an alternative to supplying an inert gas by means of the ring-like element, similar to what was disclosed in paragraph [0024] of document D1. Thus, document D1 also disclosed feature 1.1 of claim 1 and feature 13.1 of claim 13, which were therefore not novel over document D1.

Regarding document D3, the skilled person was well aware that metallic raw-material powders having an average grain diameter of 20 µm, as disclosed in paragraph [0027], could only be processed by site-selective solidification with the aid of a laser beam when the powder handling happened in an enclosed environment, i.e. when both the powder bed and the powder storage were accommodated within a build chamber during all stages of the process. Data sheet D7 showed that iron powder was considered as an ignitable material for which protective measures were required. The skilled person was also taught by the disclosure of column 6, lines 30 to 37 of document D3 that oxidation of the powder to be processed should be prevented to

avoid a deterioration of the strength of the object to be built. The schematic figures of document D3 showed only the functional components of the device - a machine housing or build chamber which surrounded the cover frame 36, the lifting/lowering frame 34 and the powder supply unit 35 had been omitted. In fact, the schematic arrangement shown in Figure 1 of document D3 could, as such, not be put into operation without violating even basic safety requirements. Moreover, the distribution or spreading of the iron powder as shown, for example, in Figure 2a of document D3, if it were performed in the open atmosphere, would inevitably lead to dust formation which needed to be prevented. The prior-art apparatus was thus necessarily equipped with an additional machine housing. Hence, claims 1 and 13 lacked novelty over document D3.

(b) Inventive step

(i) Starting from document D1

If features 1.1 and 13.1 were not considered to be disclosed by document D1, the objective problem underlying the alleged invention would be to provide an SLS- or SLM-machine which allowed the processing of fine-grained metallic raw material powders. The skilled person, even without considering the disclosure of paragraph [0003] of document D1, would have been well aware that fine-grained metallic raw-material powders could only be processed by SLS or SLM in a safe manner when the powder handling happened in an enclosed environment, i.e. when the powder bed was accommodated within a build chamber. The skilled person would have also known or at least derived from the explicit disclosure of paragraph [0003] of document D1 that a build chamber allowed the generation of a protective

atmosphere and, hence, the processing of metallic raw-material powders that were prone to oxidation. The suction device 1 mentioned in paragraph [0004] of document D1 did allow an effective removal of impurities from a working area 2, but it was clearly not suitable to establish the protective atmosphere over the powder bed that was necessary to ensure the safe and proper operation of an SLS or SLM machine. Even if the suction device were movable together with a scanner head, it could have been implemented by the skilled person within the closed space of a build chamber. Thus, at least when combining the disclosure of claim 1 of document D1 with the teaching of paragraph [0003], the skilled person would have inevitably ended up with the subject-matter of claim 1 and/or claim 13.

The same reasoning applied in view of the combination of document D1 with document D2. The skilled person would have immediately recognised that the process chamber 1 shown in Figure 1 of document D2 allowed the processing of fine-grained metallic powder material with a preferred average grain size of 10 to 50 µm (column 5, lines 9 to 11) without polluting the surroundings of the machine and preventing an undesired oxidation of the raw material (column 9, lines 16 to 20). As document D1 did not disclose any dimensions of the suction device 1, there was no reason why it could not have been fitted into the process chamber 1 of document D2, especially since the height dimensions of the process chamber in document D2 only concerned the embodiment of an apparatus disclosed in Figures 6A and 6B. In the embodiment of Figures 7A and 7B of document D2, the height of the process chamber was not limited because the desired flow pattern of the protective gas was achieved by means of the moving nozzle 27.

As regards the experiments filed as document D8, they were late filed and should not be admitted into the appeal proceedings. The results were based on a specifically selected combination of process parameters which did not allow the general conclusion that no laminar flow was possible with the flow device schematically depicted in document D1. The skilled person would have designed the device of document D1 for a specific pressure and flow velocity such that the flow was laminar and the powder bed would not be disturbed.

Consequently, claims 1 and 13 of the main request were not based on an inventive step when starting from document D1.

(ii) Starting from document D2

In the embodiment of Figures 7A and 7B, the additive manufacturing apparatus of document D2 comprised a nozzle 27 which reached into the process chamber 1 and which travelled together with the laser beam 13 (column 9, lines 3 to 20). The nozzle 27 generated a locally limited protective gas stream at the melting place and the protective gas supplied to the process chamber 1 via the nozzle 27 exited the process chamber 1 via a gas outlet 3. Despite the locally focused supply of protective gas via the nozzle 27, a protective gas atmosphere was established within the entire process chamber 1, which protected raw-material powder deposited in sections of the powder bed other than the current melting place from undesired oxidation. In the embodiment of Figures 7A and 7B of document D2, there was thus no limitation on the height of the build chamber. This prior-art solution differed from the

subject-matter of claim 1 and claim 13 in that the gas outlet 3 was not movable. This had the technical effect that the desired locally limited protective gas stream could be generated with an even higher accuracy. The objective problem was the provision of an additive manufacturing apparatus which allowed the generation of a locally limited protective gas stream with a high accuracy. Since document D2 taught that a locally limited protective gas stream could be generated by means of a movable gas inlet, the additional provision of a movable gas outlet would have been an obvious design measure for the skilled person faced with the objective problem. At least when considering the teaching of document D1, the skilled person would have recognised that a specific accurate concentration of a protective gas stream to a specific location, namely the impinging site of the laser beam onto the powder material to be consolidated, could be achieved if both the gas inlet and the gas outlet were designed to be movable. Consequently, to solve the objective problem, the skilled person would have replaced the nozzle 27 of document D2 with the suction device 1 of document D1. The respondent's argument that the suction device of document D1 would not produce a laminar gas flow across the top side of the build chamber was flawed since, in SLS and SLM machines, the generation of a laminar gas flow immediately above the powder layer was usually mandatory to avoid disturbances of the powder layer and the swirling of particles from the powder layer. The skilled person would therefore have controlled the gas supply and the gas discharge achieved by means of the suction device 1 of document D1 so as to establish a laminar gas flow pattern above the powder layer. The passage in column 8, lines 48 to 50 of document D2 related to the embodiment shown in Figures 6A and 6B, not to that of Figures 7A and 7B.

Therefore, the subject-matter of claims 1 and 13 was not based on an inventive step over a combination of document D2 with document D1.

(iii) Starting from document D3

Assuming that document D3 did not disclose a machine housing that enclosed the power handling components of the known additive manufacturing apparatus, the objective problem when starting from document D3 was to provide an additive manufacturing machine which allowed the processing of fine-grained metallic raw-material powders by site-selective irradiation with a laser beam. The skilled person would have been aware that a solution to the objective technical problem was only possible when the powder handling happened in an enclosed environment, i.e. when all powder-processing components were enclosed within a build chamber. Each of documents D1 and D2 disclosed a build chamber enclosing the powder handling components of an additive manufacturing machine. This prevented pollution of the surroundings of the additive manufacturing machine with raw-material powder particles and irradiation products, such as welding smoke or welding spatter. Further, a protective atmosphere could be established within the process chamber 1 of document D1 to prevent an undesired oxidation of the raw material. Thus, the skilled person faced with the objective problem would have arranged the powder handling components of document D3, i.e. the cover frame 36, the lifting/ lowering frame 34 and the powder supply unit 35, in the build chamber described in paragraph [0003] of document D1 or in the process chamber 1 of document D2. The same reasoning applied to claim 13.

Consequently, the subject-matter of claims 1 and 13 was not based on an inventive step when starting from document D3 in combination with either document D1 or document D2.

Remittal

The case should not be remitted to the department of first instance. Instead, a final decision should be issued. A remittal would significantly prolong the proceedings and, hence, the legal uncertainty on the validity of the opposed patent to the detriment of the appellant. Further, auxiliary requests 1 to 3 could have been presented already during the first-instance proceedings. Requesting a remittal based on the argument that such clearly late-filed claim requests should be examined at two levels of jurisdiction represented an abuse of the procedure. Finally, it would appear that a decision on auxiliary requests 1 to 5 could be made by the board itself without undue burden. If the board should consider remittal of the case to the first-instance department, it was respectfully requested that it at least decide on the admittance of the auxiliary requests.

Admittance of auxiliary requests 1 to 3

Auxiliary requests 1 to 3 were not requests on which the decision under appeal was based and, therefore, they represented an amendment to the respondent's appeal case. They were apparently filed in response to the objections of lack of novelty and lack of inventive step that had, however, already been the subject of the first-instance opposition proceedings. The argument that it would have been obvious for the skilled person to arrange the device of document D1 in a build chamber

had been made in the notice of opposition. The objective technical problem presented on appeal was slightly more detailed because it was taken into account that uncontrolled oxidation always led to safety issues, but its definition had essentially remained the same. A corresponding argument referring to document D3 could be found in the appellant's written submissions dated 27 October 2021. Moreover, in its preliminary opinion, the opposition division had also expressed the view that granted claims 1 and 13 were not inventive in view of the combination of document D1 with document D2 or document D3 with document D2. As regards new auxiliary request 2, it would appear that at least some of the amendments carried out in claim 1 of this request aimed at addressing the objection of lack of original disclosure raised in the appellant's written submissions dated 13 February 2023 against claim 3 of auxiliary request 2 as filed on 13 January 2023. The patent proprietor did not explain why it had been prevented from filing auxiliary requests 1 to 3 in the course of the opposition proceedings. The possibility that a board might decide differently than the opposition division should not be surprising to any party to opposition proceedings. Finally, auxiliary requests 1 to 3 were not suitable for prima facie overcoming the grounds for opposition and gave rise to additional objections.

Hence, auxiliary requests 1 to 3 should not be admitted into the appeal proceedings.

Admittance of auxiliary request 4 - remittal

Auxiliary request 4 included two new independent apparatus claims 3 and 10. Further, granted independent method claim 13 had been replaced by an amended

independent method claim 11 which comprised four different alternatives linked by the expression "and/or" and, hence, had to be considered to be corresponding to four independent method claims. These amendments were not occasioned by a ground for opposition specified in Article 100 EPC. It would contravene the requirements of Rule 80 EPC if the respondent were allowed to amend the claims as granted during opposition proceedings by adding one or more further independent claims to an opposed independent claim as granted. The structure of the independent claims of auxiliary request 4 clearly disqualified the case in hand as an "exceptional case". In addition, auxiliary request 4, at least with regard to claims 1, 3, 10 and 11, developed the previously claimed subject-matter in different, divergent directions. Finally, claim 13 of auxiliary request 4 corresponded to claim 15 as granted, which had been found to lack novelty in the decision under appeal. Its filing worsened the position of the opponent as a single appellant. It was thus requested that auxiliary request 4 not be admitted into the proceedings.

Remitting the case to the opposition division for further prosecution should be the exception, not the rule. In the current case, a remittal would likely result in a further appeal and jeopardise legal certainty. Even if the new features claimed in auxiliary request 4 justified a remittal, the problem was that there were multiple independent claims. It was requested that the case not be remitted, but instead that the allowability of the claims of auxiliary request 4 be examined on appeal.

XV. The respondent essentially argued as follows.

Admittance of the first auxiliary request underlying the impugned decision

The mere fact that amendments were filed after a given date was not on its own a legal basis for not admitting them. Instead, the allowability of the late-filed amendments should be considered on a prima facie basis. In the case in hand, the opposition division had objected to granted claim 15 as lacking novelty over document D1, whereas claims 1 to 14 had been found to be novel over document D1. Accordingly, deletion of claim 15 prime facie overcame the novelty objection based on document D1. The remaining claims corresponded to the claims of the granted patent. Hence, the deletion of claim 15 did not change the factual or legal framework of the opposition. The appellant had had ample opportunity to familiarise and discuss all matters in connection with the remaining claims, particularly in connection with the cited documents D1 to D3, before and at the oral proceedings. Accordingly, the deletion of claim 15 gave rise to no new issues, did not result in the cited documents acquiring any new relevance and expedited the proceedings by removing one of the issues raised during the opposition proceedings. The fact that further discussions were held on the relevance of other documents and combinations of documents for the remaining claims did not mean that the amendment did not prima facie overcome the novelty objection in relation to document D1. As such, the opposition division was correct to admit the first auxiliary request into the opposition proceedings. It was clear from point 4.2 of the reasons for the decision under appeal that the opposition division did

consider whether the first auxiliary request was prima facie relevant and, therefore, the correct principles were taken into account and were not applied in an unreasonable way. Accordingly, there were no grounds for overruling the discretion exercised by the opposition division.

Main request

(a) Novelty

Document D1 did not explicitly or implicitly disclose a build chamber within which the flow device was movable. Firstly, it was not specified in document D1 if the laser processing machine described and shown in the figures was the one of paragraph [0003] which, incidentally, did not mention the oxidisation of particles. Accordingly, it was not derivable from document D1 that the suction nozzle was used in a laser sintering machine in which a protective gas was applied to an entire installation space. Furthermore, the skilled person would not read such a limitation in view of paragraph [0010] of document D1, which required the ring-like element to be mounted in such a way that it could be moved by a motor over the workpiece surface, for example together with a scanner head on a compound slide. Such a setup was typical in directed-energy deposition where there was no absolute need for a build chamber containing a working area in which material deposited in the working area in layers was being consolidated. Accordingly, it was not an inevitable consequence of the teaching of document D1 that the flow device had to be arranged in a build chamber as defined in claims 1 and 13. Secondly, if the ring-like element according to paragraphs [0004] and [0005] of document D1 provided effective suction and prevented

vapours and particles from escaping the work area, then there was no need to provide a build chamber for containing escaped vapours and particles. Thirdly, claim 13 of document D1 disclosed that the ring-like element might supply air. Accordingly, conclusions drawn from an alleged need to prevent the oxidisation of the particles were not derivable from document D1. Essentially, document D1 was silent on how to implement a ring-like gas flow device in a selective laser melting (SLM) machine. Implementing such a flow device would require many modifications of the machine, which were not disclosed. A build chamber within which the flow device was movable was not an inevitable consequence of the disclosure in document D1. Therefore, claims 1 and 13 did not lack novelty over document D1.

The appellant's assertion on the implicit disclosure of a build chamber in document D3 was based on mere speculation. There was no disclosure in document D3 that the entire installation should be enclosed during all stages of the process or that exposure to the user of the raw material could not be avoided by other means, such as protective user equipment. Furthermore, even if it was deemed implicit in the disclosure of document D3 that the entire installation should be enclosed by a chamber, this would not be a "build chamber" as in a chamber in which the build was carried out. In contrast, in document D3, the build was carried out inside cover frame 36 which defined chamber C. By using the term "machine housing" in its discussion of document D3, the appellant implicitly acknowledged that any additional chamber would not be a build chamber. Therefore, claims 1 and 13 were novel over document D3.

(b) Inventive step

(i) Starting from D1

Document D1 did not teach or suggest that the processing of fine-grained metallic raw-material powders was not possible with the flow device disclosed in document D1 alone. In fact, it implied the opposite. Paragraphs [0004] and [0005] of document D1 taught the skilled person that the prior-art apparatus comprised a flow device which prevented vapours and particles from escaping from the defined suction area. It followed from paragraphs [0003] and [0004] of document D1 that the flow device provided an effective suction of gas as an alternative to known machines in which a protective gas was provided to an entire installation space. The prevention of oxidisation was thus already solved in document D1 by providing a local gas flow. The purpose of the movable gas inlet and gas outlet of the patent under dispute was to prevent debris being blown onto powder that had yet to be scanned (see paragraph [0004] of the patent), not to prevent all vapours and particles from escaping from the defined suction area. Accordingly, the patent envisaged a build chamber to contain the particles that did escape the suction region, in which the gas inlet and gas outlet were movable within the build chamber. Therefore, the objective technical problem to be solved by the claimed invention when starting from document D1 was an alternative way of containing the particles whilst preventing debris being blown onto powder that had yet to be scanned. The solution was not obvious from document D1 as the flow device disclosed in document D1 was presented as an alternative to providing a protective gas to an entire installation space.

Accordingly, it was not obvious from the disclosure in document D1 to provide a build chamber for the flow device, in particular not since the flow device was to be mounted in such a way that it could be moved by a motor over the workpiece surface, for example together with a scanner head on a compound slide.

Regarding the combination of documents D1 and D2, the skilled person would not have used the process chamber 1 disclosed in document D2 as this was designed very flat - its height was limited to 20 mm - in order to obtain laminar flow. Given that the use of a movable gas nozzle did not change this conclusion, it applied both to the embodiment of Figures 6A, 6B and that of Figures 7A, 7B of document D2. The flow device of document D1 was at least as tall as it was wide and it was coupled to a scanner head for moving together. The skilled person would have understood from the context of the disclosure of document D1 what the realistic dimensions of such a flow device were, even if no dimensions were given in document D1. The height of a process chamber for such a suction device would have had to be much bigger than 20 mm, especially since the scanner head and the flow device would have been together inside the build chamber. This was incompatible with document D2 where the laser was outside the build chamber. Finally, the ring-like structure of document D1 did not generate a laminar flow, contrary to the teaching of document D2. This was clear from document D8, which presented the results of a computer-simulated model of the gas flow achieved by the device of Figure 3 of document D1 using the Ansys Discovery package. Document D8 was filed in response to the board's communication under Article 15(1) RPBA. A gas velocity of 0.05 m/s was selected for the inlet gas flow and a gas velocity of 0.1 m/s was selected for the

outlet gas velocity. The temperature was set at 22°C. As shown in document D8, even at these extremely low gas flow velocities, multiple eddies were created in the vicinity of the laser exposure point. The gas flow was thus turbulent. Velocities much above this would result in the gas flow not remaining local to the ring gas flow device and, thus, increased turbulence. The provision of a chamber enclosing the entire flow device would not solve the problem of turbulence created by the ring-like flow device of document D1.

Therefore, the subject-matter of claims 1 and 13 was based on an inventive step over document D1 when taken alone or when combined with document D2.

(ii) Starting from document D2

The passage in column 9, lines 8 to 9 of document D2 taught that the nozzle generated a locally limited protective gas flow 24 at the melting point. This clearly was an alternative way of maintaining a laminar protective gas flow above the build-up chamber 7 compared to the solution of Figures 6A and 6B of document D2. In contrast, the suction device of document D1 would not produce a laminar gas flow. Accordingly, even if a person skilled in art had been motivated to improve the accuracy of the locally limited protective gas stream, they would not have used the suction device disclosed in document D1 as such a device failed to achieve the overriding objective of document D2 of maintaining a laminar protective gas flow above the build-up chamber. This logic applied both to the embodiment of Figures 6A and 6B and to that of Figures 7A and 7B described in document D2. Furthermore, document D2 clearly stressed the importance of a slot-like gas outlet on an opposite

side to the gas inlet together with a very flat process chamber in the generation of a laminar flow. However, the ring-like device disclosed in document D1 did not comprise slot-like gas outlets on an opposite side to the gas inlet(s). Rather, the gas outlets were provided in a ring around the gas inlet(s). Accordingly, the skilled person would have understood that the ring-like flow device was contrary to the teaching of document D2. As the gas inlets 10, 31 in document D1 were angled away from at least some of the gas outlets 4, gas had to turn around 180 degrees to be sucked into these gas outlets. This looped path for the gas would, at least for some regions, have to occur with an extremely tight radius to prevent vapours and particles from escaping the defined area. Such a trajectory of the gas would inevitably be turbulent. Moreover, gas introduced through the small inlets 10, 31 at velocities typically used in SLM would not circulate back to the gas outlets within the locality of the ring-like flow device. Gas would inevitably be sucked in from the volume above the ring. This would result in the mixing of the gases and, hence, turbulence. It was clear from document D8 that, even at extremely low gas flow velocities, multiple eddies were created, meaning that the gas flow was turbulent. The provision of a chamber enclosing the entire flow device would thus not have solved the problem of turbulence created by the ring-like flow device of document D1.

The subject-matter of claims 1 and 13 was inventive over a combination of documents D2 and D1.

(iii) Starting from document D3

Document D3 taught that the cover frame 36 and the atmosphere formed therein prevented oxidation of the

powder that would deteriorate the strength of the object to be built. There was no suggestion in document D3 that powder could oxidise when not heated by the laser beam, for example, when the powder layer was outside the cover frame 36. Accordingly, no reason was given in document D3 for providing an additional housing as suggested by the appellant. Further, such an additional housing would not be a build chamber in that the build would be carried out in the volume defined by the cover frame, not in the space between the cover frame and the hypothetical additional housing. Any debris produced using the apparatus of document D3 was already contained within the cover frame 36. Furthermore, in document D3, gas was supplied to and removed from the volume enclosed by the cover frame 36. An additional housing that enclosed all powder handling components, including the cover frame 36 would not have these properties and, therefore, would not be a build chamber. There was no logic in providing both the cover frame 36 and an additional housing as suggested in document D1 or document D2. At best, they were alternative solutions to the same problem, and the skilled person would not have combined these in compatible alternatives.

Hence, the subject-matter of claims 1 and 13 was based on an inventive step when starting from document D3 in view of either document D1 or document D2.

Remittal

The case should be remitted to the opposition division for further prosecution. The lower-order auxiliary requests were not considered by the opposition division. They were fundamentally different in nature to the claims on which the patent was maintained by the

opposition division and thus the issues, even for novelty and inventive step, were different. The respondent would be disadvantaged if it were not heard on these issues at two levels of jurisdiction.

Auxiliary requests 1 to 3

Auxiliary request 1 was submitted in case the board viewed claim 13 of the respondent's main request not to be limited to the gas inlet and gas outlet being moved within the build chamber. The amendment to claim 13 prima facie overcame such an objection and raised no new issues of novelty or inventive step. The circumstances of the appeal justified admitting the request pursuant to Article 12(6), second sentence, RPBA. Auxiliary requests 2 and 3 were submitted in case the board deemed it obvious to enclose the apparatus disclosed in document D1 and/or document D3, including the scanner, in a housing that was considered to be a build chamber. In fact, the cause for the amendments of auxiliary requests 2 and 3 was the new formulation of the objective technical problem in the statement of grounds of appeal, namely to provide the apparatus disclosed in document D1 with a build chamber to provide an enclosed environment for processing the powder in a safe manner. In the notice of opposition, the problem to be solved in view of document D1 had been identified as the establishment of a protective gas atmosphere within a sealed build chamber to allow the processing of metal powders by laser melting which would otherwise not be possible due to uncontrolled oxidation of the metal powders. This formulation had been repeated by the appellant in its letter dated 27 October 2021 and had been used by the opposition division in its preliminary opinion. Point 3 of the appellant's letter of 27 October 2021 did not relate to

document D1. The appellant thus changed the formulation of the problem on appeal, and its arguments on inventive step in respect of document D1 differed from those submitted during the first-instance proceedings. Preventing oxidation by locally shielding the gas was unrelated to the operation in a safe manner. There was no uncontrolled oxidation away from the laser impingement point that was unsafe. Auxiliary requests 2 and 3 had been filed as soon as possible in reply to the statement of grounds of appeal. Accordingly, the circumstances of the appeal case justified the admittance of auxiliary requests 2 and 3 under Article 12(6), second sentence, RPBA.

Admittance of auxiliary request 4 - remittal

The claims of auxiliary request 4 corresponded to those of the first auxiliary request submitted with the letter dated 13 January 2023 in response to the summons to oral proceedings issued by the opposition division. These had been filed within the deadline set under Rule 116 EPC and, thus, were not late-filed. In accordance with the Guidelines in the version of March 2023, E-VI, 2.2.2, amendments submitted before the date set under Rule 116(1) EPC could not, as a rule, be considered to be late filed. Therefore, the claims of auxiliary request 4 were admissibly raised and maintained during the opposition proceedings and should be deemed part of the appeal proceedings.

It was requested that the case be remitted to the opposition division for further prosecution. The board should not take the place of the department of first instance. In the claims of auxiliary request 4, the distinguishing features were fundamentally different compared to the claims of the respondent's main

request. In addition, there had been no opportunity so far to identify the closest prior art, to define the objective technical problem and to discuss the obviousness of the claimed subject-matter. These were special reasons that warranted a remittal.

Reasons for the Decision

Admittance of the first auxiliary request underlying the impugned decision

1. The first auxiliary request underlying the impugned decision was filed during the oral proceedings held on 14 March 2023. The opposition division admitted the request and subsequently held that it met the requirements of the EPC (point 18 ff. of the minutes of the oral proceedings). The appellant requests that the first auxiliary request not be admitted into the proceedings based on the arguments that it should have been filed earlier and that it was incorrectly considered prima facie relevant.

2. Pursuant to Article 12(1)(a) RPBA, the decision under appeal is part of the appeal proceedings. If a claim request forms the basis for the decision under appeal, that claim request is also part of the appeal proceedings. This conclusion is reinforced by the consideration that Article 12(2) RPBA sets out that the primary object of the appeal proceedings is to review the decision under appeal in a judicial manner. The correctness of an opposition division's findings on whether a claim request meets the requirements of the EPC cannot be reviewed without considering the claim request which is, therefore, part of the appeal

proceedings. Moreover, Article 12(2) RPBA provides that a party's appeal case must be directed to the requests, facts, objections, arguments and evidence on which the decision under appeal was based. Given that a board only has discretionary power under Article 12(4) RPBA to admit (or not admit) a request when it does not meet the requirements of Article 12(2) RPBA, a retroactive non-admission of a claim request that forms the basis for the decision under appeal is not possible (T 1227/14, Reasons 1.1.3; T 467/15, Reasons 3.1; see also "Case Law of the Boards of Appeal of the EPO", 10th edition, July 2022, ("Case Law"), V.A.3.4.4).

3. As far as the opposition division's discretionary decision to admit the first auxiliary request into the proceedings is concerned, the board is satisfied that it took into account the right principles in a reasonable way (see G 7/93, OJ 1994, 775, Reasons 2.6 and T 640/91, see Case Law, V.A.3.4.1). In point 4.2 of the reasons for the decision under appeal, the opposition division held that the first auxiliary request was "late-filed but is prima facie relevant because it resolves the conclusion of the opposition division made during oral proceedings on the main request by deleting claim 15". This passage refers to the opposition division's conclusion at the oral proceedings that the subject-matter of independent claims 1 and 13 of the patent as granted was novel over document D1, whereas this was not the case for independent claim 15 of the patent as granted (see point 8 of the minutes of the oral proceedings). It was in reaction to this conclusion that the respondent expressed its wish to proceed with a new first auxiliary request in which claim 15 was deleted. Thus, the opposition division was clearly of the view that admitting the first auxiliary request would remove the

novelty objection previously raised against claim 15 of the patent as granted. In the board's view, this refers to the clear allowability of the request on a prima facie basis, which is in line with the criteria provided by section E-VI, 2.2.3 of the Guidelines in the March 2023 version (applicable at the time of the oral proceedings). Whether the opposition division's assessment of clear allowability was correct cannot be the subject of a review of the discretionary decision. It is generally not the function of a board of appeal to review all the facts and circumstances of the case as if it were in the place of the department of first instance to decide whether it would have exercised the discretion in the same way. Provided that the opposition division has properly exercised its discretion, the board, as a rule, should not overrule its decision on admittance and substitute its own discretion for that exercised at first instance (T 820/14, Reasons 9.5). The same conclusion applies to the appellant's grievance with the late filing of the first auxiliary request during the oral proceedings before the opposition division.

4. Considering further that the framework of the European Patent Convention does not provide a legal basis for excluding, at the appeal stage, a request which was correctly admitted into the first-instance proceedings (T 525/15, Reasons 1.3), the board concludes that the appellant's request not to admit the first auxiliary request underlying the impugned decision into the appeal proceedings is refused.

Main request - novelty (Article 54(1) EPC)

(a) Novelty over document D1

5. There is no dispute between the parties that document D1 discloses an additive manufacturing apparatus with features 1.0 and 1.2 to 1.4 of claim 1 and an additive manufacturing method with features 13.0 and 13.2 to 13.4 of claim 13. The decisive questions are whether the prior-art apparatus has a build chamber containing a working area (feature 1.1) and whether the prior-art method deposits material in a working area in a build chamber (feature 13.1).

6. In the context of additive manufacturing (AM), a build chamber is understood to be an enclosed space that serves for building an object by selectively augmenting a base material. What is, in practice, designated as a build chamber may differ depending on the AM method used. The selective laser melting (SLM) machine shown in the figures of the patent, for example, employs a build platform 102 that is lowered as successive layers of the object are formed. The build chamber 101 of such a machine encloses not only the space above the powder bed but also the volume between the platform and the surface of the powder bed. In fact, paragraph [0047] of the patent implies that the build chamber even extends beyond the partitions 114, 115 and corresponds to the entire space within the outer casing of the machine.

7. A build chamber is not mentioned or shown in document D1. The only passage that suggests an enclosed space is the last sentence of paragraph [0003] which explains that, in known laser melting machines using selective

laser sintering (SLS), it is known to fill an entire building space with protective gas ("ist es [...] bekannt, einen gesamten Bauraum mit Schutzgas zu beaufschlagen"). This shows, at most, that some prior-art SLS machines comprise an enclosed space for building objects and, thus, a build chamber. A flow device with a movable gas inlet and outlet, in accordance with features 1.3, 1.4 and 13.3, 13.4, is, however, not described or implicit in this context.

8. The description of the invention of document D1, including the detailed description of the embodiments shown in Figures 1 to 3, relates to a flow device with movable gas inlet and outlet. But it does not specify whether the AM is carried out in a build chamber or in an open atmosphere. The appellant's central argument in favour of the first alternative is that paragraph [0001] and claim 1 of document D1 mention SLS and SLM machines which, the skilled person knows, are necessarily equipped with a build chamber.

9. The board is aware that SLS machines usually come in a closed casing and often operate under inert conditions to prevent oxidation. Nevertheless, it is not persuaded that *all* SLS machines necessarily require such a protective environment. As set out above, this cannot be derived from paragraph [0003] of document D1 either. The appellant has not convincingly shown that the SLS-machine mentioned in claim 1 of document D1 excludes, by definition, solutions in which objects are built by SLS in an unconfined (or only partially confined) space, however suboptimal this may turn out to be. Features 1.1 and 13.1 are thus not implicit.

10. It follows from the above that the opposition division was correct in its finding that the subject-matter of

claims 1 and 13 of the respondent's main request is novel over document D1 (Article 54(1) and (2) EPC).

(b) Novelty over document D3

11. In point 4.3.2 of the reasons for the decision under appeal, the opposition division came to the conclusion that document D3 failed to disclose feature 1.4 of claim 1 because the supply port 36b and the exhaust port 36c were fixed to the cover frame 36 and, therefore, could not move within the build chamber.

12. This is not disputed by the appellant. Nevertheless, the appellant submits that, for safety reasons, the powder bed and the powder storage are necessarily accommodated within a build chamber during all stages of the process.

13. Yet the only build chamber disclosed by document D3 is the movable chamber C formed by the inner surface of the cover frame 36 and enclosing both part of the top surface of the base 22 and the volume of the penetrating space 34b (paragraph [0029], Figure 1). It is filled with ambient gas, preferably nitrogen gas or argon gas (paragraph [0031]), which is supplied through an inlet 36b and discharged through an outlet 36c. To supply the powder to the working area, a powder supply unit 35 is mounted next to the cover frame so that both can move sideways (Figure 2). However advantageous it may be to confine the entire machine to an enclosed environment during powder handling and all other stages of the process, a second build chamber does not follow from the description, the figures or the claims of document D3.

14. The passage in column 6, lines 20 to 37 of document D3 warns about oxidation of the powder to be processed and proposes to prevent this by controlling the pressure inside the chamber C. In doing so, air is impeded from invading the chamber from the outside. The board accepts that the drawings of document D3 are schematic and do not necessarily show all the details of the AM arrangement. Still, there is no direct and unambiguous disclosure of an additional machine housing surrounding the cover frame 36 and the powder supply unit 35.

15. The board adds that document D7 prescribes safety measures for the safe handling and storage of a specific type of iron powder with a grain size of 10 µm (point 9.2). This is, however, not sufficient for concluding that the use of "iron powder having an average grain diameter of 20 µm" (paragraph [0027] of document D3) inevitably implies a build chamber in addition to chamber C.

16. The specific construction of the machine of document D3, with the powder supply unit 35 arranged outside of the build chamber C, means that powder is not deposited in a working area in a build chamber, as required by feature 13.1.

17. In sum, the subject-matter of both claim 1 and claim 13 of the respondent's main request is novel over document D3 (Article 54(1) and (2) EPC).

Main request - inventive step (Article 56 EPC)

(a) Starting from document D1

18. The board does not share the opposition division's view on inventive step starting from document D1 as set out in points 4.4.1 and 4.5.1 of the reasons for the decision under appeal.

19. Though the SLS machine mentioned in claim 1 of document D1 does not necessarily require a protective environment (see point 9. above), it would have been obvious for the skilled person to provide one, be it for containing inert gases, for preventing build material from escaping and polluting the surroundings, or for avoiding exposure to the laser. This is all the more so in view of the teaching of paragraph [0003] of document D1. There it is acknowledged that known SLS machines have an enclosed space for building objects and, thus, a build chamber. Hence, when starting from document D1, the skilled person would have arrived at the subject-matter of claim 1 and claim 13 of the respondent's main request.

20. The respondent is correct when arguing that the flow device described in paragraphs [0004] and [0005] of document D1 already provides for an effective suction of gas. But it follows from paragraph [0005] of document D1 that the suction device operates in the area surrounding the focal spot of the laser beam ("in der Umgebung des Laserbrennfleckes", "aus diesem definierten Absaugbereich"). However effective such a device may be in removing locally produced debris and gas, it cannot be seen as an alternative to the known machines described in paragraph [0003] of document D1

where a build chamber is key to preventing the oxidisation of the entire powder bed. Nor would the solution described in paragraphs [0004] and [0005] of document D1 shield against the radiation generated by the laser if it were not for a protective housing. Thus, the use of a suction device producing a local gas flow would not have deterred the skilled person from enclosing the entire building space.

21. This view of the matter acknowledges that paragraph [0010] of document D1 addresses the movable arrangement of the suction device with respect to the workpiece surface. This passage suggests that some kind of support structure is envisaged for suspending the suction device over the powder bed while allowing for its relative movement. It does not, however, teach away from the obvious solution of enclosing the build space.

22. Also in combination with the teaching of document D2, the claimed apparatus and method are obvious when starting from document D1. Document D2 concerns the same technical field as document D1 and undisputedly discloses an SLS machine with a build chamber (Figures 1, 6A and 7A: process chamber 1). The embodiment of Figures 6A, 6B explicitly limits the height of the build chamber to 20 mm. The reason behind this is explained in column 8, lines 45 to 67 of document D2. The height limit is required to limit the volume stream of the protective gas flow between the inlet 2 and the low-lying outlet 3 located in the opposite side walls of the build chamber. Arguably, this embodiment is not compatible with the tall flow device of document D1. However, in the embodiment of Figures 7A and 7B of document D2, the build chamber does not have a height limitation since the protective gas flow is locally supplied to the powder bed by means of a nozzle 27 that

travels together with the laser beam 13 (column 9, lines 6 to 12). In this solution, the gas flow is not determined by the relative distance of the side walls or by the height difference between the fixed inlet and outlet but constitutes "an effective laminar stream directly above the area just melted by the laser beam 13" (column 9, lines 16 to 20).

23. The respondent submitted that the ring-like structure of Figure 3 of document D1 does not generate a laminar flow and, therefore, goes against the teaching of document D2. In support of this position, it filed as document D8 the graphical results of a computer model simulating the gas flow achieved by the device of Figure 3 of document D1. The board observes that, in Figure 1 of document D8, the geometry of the device is hidden behind a criss-cross of flow lines. This is different in Figure 2 of document D8: the outline of the device, at least in one cross-section, is clearly depicted. Considering, however, that the flow device represented in the three-dimensional (perspective) view of Figure 3 of document D1 is of a schematic nature, the board is not convinced that Figure 2 of document D8, let alone Figure 1, conveys any conclusive evidence on the fluid dynamic condition of the gas flow around the device. This is all the more so since no information has been provided on the type of gas used in the simulation.

24. In sum, the subject-matter of claim 1 of the respondent's main request does not involve an inventive step when starting from document D1 either when taken alone or in combination with document D2, even when document D8 is taken into account (Article 56 EPC). The same applies to the subject-matter of claim 13 of the respondent's main request.

(b) Starting from document D2

25. Inside the build chamber 1 of the AM apparatus shown in Figures 7A and 7B of document D2, a flow device in the form of a nozzle 27 is operated to direct a protective gas flow 24 to the melting point irradiated by the laser beam 13. The flow device may travel together with the laser beam to supply gas to the entire area where powder 6 is melted (column 9, lines 9 to 12 of document D2). A gas outlet is not disclosed. The subject-matter of claim 1 thus differs from this prior-art disclosure in that the flow device is for generating a gas flow across at least a part of the working area from a gas inlet to a gas outlet (feature 1.3), both arranged to be movable within the build chamber (feature 1.4). Similarly, the subject-matter of claim 13 differs from the AM method disclosed in document D2 by features 13.3 and 13.4.

26. In the appellant's view, the distinguishing feature causes a protective gas flow with an even higher accuracy. This technical effect seems credible. By providing a moving gas outlet in addition to a moving gas inlet, the extent of the gas flow can be better controlled resulting in a more precise flow compared to Figures 7A and 7B of document D2 where it is unclear how the gas leaves the build chamber. The objective technical problem is then to provide an AM apparatus which allows the generation of protective gas flow with high accuracy.

27. It is not disputed that document D1 lies in the same technical field as document D2. The appellant has made a convincing case that the skilled person would have taken the teaching of document D1 into consideration in

an attempt to solve the objective technical problem when starting from the embodiment of Figures 7A and 7B of document D2. This prior-art teaching would have motivated them to replace the nozzle 27 of document D2 by the suction device 1 of document D1 which, by way of the integrated gas inlet and gas outlets, produce a local and more accurate gas flow across at least a part of the working area.

28. The respondent's main counterargument is that the suction device 1 of document D1 does not achieve the overriding objective of document D2 of maintaining a laminar protective gas flow in the build-up chamber. The board does not accept this argument. Even if it is desirable that the protective gas flows smoothly along the working surface in order to avoid eddies swirling up the building powder, some local turbulence may occur (see paragraph [0039] of the patent). Furthermore, the board notes that whether or not laminar flow is achieved generally follows from the relative importance of inertial and friction forces of the fluid. This depends on velocity, characteristic length and kinematic viscosity and is reflected by the value of the Reynolds number. The respondent has not persuaded the board that the circular arrangement of the gas outlets 4 in Figure 3 of document D1 must inevitably result in a turbulent flow of the inert gas supplied by the nozzle. As set out in point 23. above, the computer model results of document D8 do not provide any conclusive evidence on the flow condition around the device disclosed by document D1.

29. In view of the above, the subject-matter of claim 1 and claim 13 of the respondent's main request does not involve an inventive step in view of document D2 when

combined with document D1, even when taking document D8 into account (Article 56 EPC).

(c) Starting from document D3

30. The AM apparatus of document D3 already has a build chamber C filled with an inert gas (see point 13. above). Any debris produced using this prior-art apparatus would be contained within the cover frame 36. The board concurs with the respondent that the skilled person would not have been prompted by the teaching of document D1 or D2 to provide an additional housing that enclosed the powder handling components of the apparatus of document D3. Even if such a build chamber is mentioned in paragraph [0003] of document D1 and is explicitly shown in document D2, the skilled person would have had not reason to combine the cover frame 36 of document D3 with a further build chamber, in particular considering that the gas supply tank 71 and the gas recovery device 72 are connected to the gas inlet and gas outlet, respectively (Figure 1 of document D3).

31. Therefore, the subject-matter of claim 1 and claim 13 of the respondent's main request involves inventive step in view of document D3 when combined with either document D1 or document D2 (Article 56 EPC).

(d) Conclusion on inventive step

32. For the reasons set out in points 18. to 24. and 25. to 29. the requirements of Article 56 EPC are not fulfilled for the subject-matter of claims 1 and 13. The respondent's main request is thus not allowable.

Request for remittal

33. The respondent requested that the case be remitted to the opposition division if the board did not hold its main request allowable. It submitted that the lower-order auxiliary requests had not been considered by the opposition division and that the claims of these requests were fundamentally different in nature to the claims on the basis of which the patent was maintained by the opposition division. The respondent would therefore be disadvantaged if it were not heard on these issues at two levels of jurisdiction.

34. Under Article 111(1), second sentence EPC, a board of appeal may either decide on the appeal or remit the case to the department which was responsible for the appealed decision. The appropriateness of a remittal to the department of first instance is governed by Article 11 RPBA. The existence of special reasons within the meaning of this article is to be decided upon by the board. This discretionary decision is taken by the board on a case-by-case basis.

35. As the respondent's main request is not allowable, the next claim request in the order chosen by the respondent is auxiliary request 1. This request was filed for the first time on appeal. Compared to the claims of the respondent's main request, the only amendment in auxiliary request 1 concerns the addition of a reference to the apparatus claims in the independent method claim 13. Claim 1 of auxiliary request 1 has remained unamended.

36. The respondent's view that auxiliary request 1 is fundamentally different in nature to the claims on the basis of which the patent was maintained by the

opposition division can thus not be accepted. Moreover, it needs to be considered that, in the event of a remittal, the opposition division would be bound by the *ratio decidendi* of the board, in so far as the facts are the same (Article 111(2) EPC). Because of the identical wording of claim 1 of both the respondent's main request and auxiliary request 1, the opposition division would thus have to decide in line with the reasons for the board's decision on claim 1 of the respondent's main request when examining claim 1 of auxiliary request 1. Such a course of action would run counter to procedural economy.

37. Further considering that no special reasons within the meaning of Article 11 RPBA are present, the board decided not to remit the case to the opposition division at this stage of the proceedings.

Admittance of auxiliary requests 1 to 3

38. Pursuant to Article 12(4), first sentence RPBA, any part of a party's appeal case which is not directed to the requests, facts, objections, arguments and evidence on which the decision under appeal was based is regarded as an amendment, unless the party demonstrates that it was admissibly raised and maintained in the proceedings leading to the decision under appeal. Any such amendment may be admitted only at the discretion of the board (Article 12(4), second sentence RPBA). Article 12(4), fifth sentence RPBA provides that the board must exercise its discretion in view of, inter alia, the complexity of the amendment, the suitability of the amendment to address the issues which led to the decision under appeal, and the need for procedural economy.

Under Article 12(6), second sentence RPBA, the board must not admit requests, facts, objections or evidence which should have been submitted, or which were no longer maintained, in the proceedings leading to the decision under appeal, unless the circumstances of the appeal case justify their admittance.

(a) Auxiliary request 1

39. Given that the claims of auxiliary request 1 were filed for the first time on appeal, they are to be regarded as an amendment of the respondent's appeal case under Article 12(4), first sentence RPBA and may therefore only be admitted at the discretion of the board (Article 12(4), second sentence RPBA). However, the amendments to the claims of auxiliary request 1 compared to the claims of the respondent's main request only concern independent claim 13. Claim 1 of auxiliary request 1 is identical in wording to claim 1 of the respondent's main request. In view of the negative conclusion on inventive step in point 32. above, admitting auxiliary request 1 into the appeal proceedings would thus go against procedural economy (Article 12(4), fifth sentence RPBA).

40. Auxiliary request 1 was therefore not admitted pursuant to Article 12(4), second sentence RPBA.

(b) Auxiliary requests 2 and 3

41. Each of claims 1 and 13 of auxiliary requests 2 and 3 contain considerable amendments compared to the claims of auxiliary request 1. In its reply to the statement of grounds of appeal, the respondent submitted that these claim requests had been filed in case the board

deemed it obvious to enclose the apparatus disclosed in document D1 and/or D3, including the scanner, in a housing that was considered to be a build chamber. Auxiliary requests 2 and 3 were thus essentially pre-emptive reactions to inventive-step objections starting from document D1 or document D3 against the subject-matter of claims 1 and 13 of the respondent's main request. However, these objections had been raised by the appellant in the notice of opposition (point III. 2.1 "Lack of inventive step over D1") and in the letter dated 27 October 2021 (points II.1 "Lack of novelty/ inventive step over D1" and II.3 "Lack of novelty/ inventive step over D3") against identical claims 1 and 13 of the patent as granted. Moreover, in points 4.1.2.1 and 4.1.2.2 of the communication sent in annex to the summons for oral proceedings, the opposition division gave its preliminary opinion that the subject-matter of granted claims 1 and 13 did not involve an inventive step when starting from either document D1 or document D3. Therefore, the respondent had cause to file the claims of auxiliary requests 2 and/or 3 during the proceedings before the opposition division.

42. In its letter dated 22 November 2024, in what appears to be a change of mind, the respondent argued that auxiliary requests 2 and 3 were actually a reaction to a new formulation of the objective technical problem included in the statement of grounds of appeal in the context of inventive step starting from document D1. It is correct that the second paragraph in section V.2.1 of the statement of grounds of appeal makes mention of processing fine-grained metallic raw-material powders "in a safe manner", an aspect that was apparently not raised in the proceedings before the opposition division. Nevertheless, this aspect is supposed to highlight the common general knowledge of the skilled

person; it is not put forward as part of the objective technical problem. In addition, the following sentence ("The skilled person also knows [...]") in section V.2.1 of the statement of grounds of appeal clarifies that the safety aspect is to be understood within the context of "the generation of a protective atmosphere", i.e. as a measure for preventing an uncontrolled oxidation of the metallic powders used as the build material. The board is therefore not persuaded that the appellant reformulated its objective technical problem on appeal. At most, the statement of grounds of appeal includes refinements of previously submitted arguments on the obviousness of the claimed subject-matter.

43. In sum, the respondent did not convincingly show that the circumstances of the appeal justified admitting auxiliary requests 2 and 3 under Article 12(6), second sentence, RPBA.

Admittance of auxiliary request 4

44. The claims of auxiliary request 4 have the same wording as those of the first auxiliary request filed with the letter dated 13 January 2023 in the proceedings before the opposition division. This first auxiliary request effectively became the second auxiliary request when the respondent filed a new first auxiliary request at the oral proceedings held on 14 March 2023 and renumbered the previous requests accordingly (see point 37 of the minutes of the oral proceedings). Since the opposition division held the first auxiliary request filed at the oral proceedings to be allowable (it corresponds to the respondent's main request on appeal), the lower-ranking second auxiliary request did not come into effect. The decision under appeal was

thus not based on the second auxiliary request. By filing auxiliary request 4 on appeal, the respondent essentially resubmitted an unexamined claim request. The boards often use the expression "carry-over request" to refer to such a situation.

45. Article 12(4), first sentence RPBA provides that auxiliary request 4 is to be regarded as an amendment of the respondent's appeal case, unless the respondent demonstrates that it "was admissibly raised and maintained in the proceedings leading to the decision under appeal" (see point 38. above). This means that if it is shown that these two conditions are met, auxiliary request 4 is part of the appeal proceedings; if not, then it is an amendment which, under Article 12(4), second sentence RPBA, may be admitted only at the discretion of the board.

(a) *Admissibly raised*

46. For the assessment of the first condition, the decisive question is whether the first-instance department would have admitted the request had a discretionary decision on admittance been required (T 364/20, Reasons 7; see also T 2395/22, Reasons 1.3.3; T 246/22, Reasons 4.13, "one viable approach"). The explicit use of the past tense ("was admissibly raised"*)* and the reference to the proceedings leading to the decision under appeal imply that the perspective of the first-instance department is addressed in the conditional clause in Article 12(4), first sentence RPBA. In other words, it needs to be determined how the first-instance department - in the current case, the opposition division - would have proceeded in reliance on the provisions and practice that applied at the time.

47. This view of the matter is supported by the consideration that, without the first-instance perspective, a decision on the "admissibly raised" condition might lead to a different assessment of the admittance of a request that was filed but not decided on in first-instance proceedings compared to another, higher-ranking request that was filed under the same circumstances but was admitted and held allowable by the first-instance department. Setting minimum requirements *post factum* in appeal for determining whether a request was admissibly raised before the opposition division (T 364/20, Reasons 7.2.10; T 1800/20, Reasons 3.4; T 309/21, Reasons 4.3; T 246/22, Reasons 4.14, "another approach"; T 1749/22, Reasons 3.3) is tantamount to applying different admittance criteria for auxiliary requests filed at the same time and under the same circumstances in first-instance proceedings. Arguably, such an approach would compromise legal certainty. Moreover, replacing the first-instance perspective with what essentially is an exercise of discretion on the part of the board would render the discretionary decision of Article 12(4), second sentence RPBA redundant.

48. To assess whether the first-instance department would have admitted a request, it must be established whether it had discretion not to admit the request and, if so, which practice applied at the time when the decision on admittance would have been taken. As a general rule, parties may expect first-instance departments of the EPO to act in accordance with the Guidelines until such time as they – or the relevant legal provisions – are amended (see section I.3 of the Guidelines for Examination at the EPO in all versions valid as from November 2017). This means that the Guidelines need to be considered in the version valid at the relevant time

(T 446/22, Reasons 3.4; T 731/22, Reasons 2.2; T 823/23, Reasons 7.16). A similar approach is taken when, upon reviewing first-instance discretionary decisions in appeal, the board has to ascertain whether a first-instance department exercised its discretion in accordance with the right principles (see, for example, point 3. above; see also T 1219/19, Reasons 36, 41 and 41.1, T 2036/22, Reasons 1.5.2 and T 823/23, Reasons 7.15). The board is aware of the considerable amendments to the Guidelines over the years, which, in turn, may impact how the "admissibly raised" condition is to be assessed in individual cases (T 246/22, Reasons 4.13 refers to a "moving target"). However, amendments to the Guidelines often reflect developments in the case law of the Boards of Appeal. They cannot therefore constitute an impediment for the board in considering the Guidelines when determining how the opposition division would have proceeded at the relevant time.

49. In the case in hand, it is uncontested that the opposition division had discretion to decide on the admission of the first auxiliary request filed with the letter dated 13 January 2023. In this regard, the respondent referred to the criteria set out in section E-VI, 2.2.2 of the Guidelines in the version as of March 2023 and argued that the first auxiliary request was filed within the deadline set under Rule 116 EPC and could not, as a rule, be considered to be late filed. The board concurs with the respondent that, at the time of the oral proceedings on 14 March 2023, the opposition division would have considered the March 2023 version of the Guidelines had a discretionary decision on the admittance of that auxiliary request been required. The relevant section E-VI, 2.2.2 of the March 2023 version of the Guidelines includes the

provision that "amendments submitted before the date set under Rule 116(1) EPC cannot, as a rule, be considered as being late-filed". In view thereof, the board is satisfied that the respondent demonstrated that current auxiliary request 4 was admissibly raised in the proceedings leading to the decision under appeal.

(b) *Maintained*

50. According to point 37 of the minutes of the oral proceedings held before the opposition division, the respondent renumbered the first auxiliary request filed with the letter dated 13 January 2023 at the end of the oral proceedings. This implies that this claim request was not withdrawn but maintained in the proceedings leading to the decision under appeal.

(c) Conclusion

51. Having regard to the above considerations, the board concludes that auxiliary request 4 is not an amendment of the respondent's appeal case but is part of the appeal proceedings (Article 12(4), first sentence RPBA).

Remittal

52. The claims of auxiliary request 4 have been significantly amended compared to the claims of the respondent's main request. The allowability of the new subject-matter of the claims was not examined by the opposition division. These constitute special reasons within the meaning of Article 11 RPBA for remitting the case to the opposition division (see point 34. above)

and is in keeping with the primary object of appeal proceedings of reviewing the decision under appeal in a judicial manner (Article 12(2) RPBA, see point 2. above).

53. Therefore, the board decided to remit the case to the opposition division for further prosecution (Article 111(1), second sentence EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division for further prosecution.

The Registrar: The Chair:

N. Schneider P. Lanz

Decision electronically authenticated