

Internal distribution code:

- (A) [-] Publication in OJ
- (B) [-] To Chairmen and Members
- (C) [-] To Chairmen
- (D) [X] No distribution

**Datasheet for the decision
of 16 July 2024**

Case Number: T 1099/22 - 3.2.05

Application Number: 15830898.1

Publication Number: 3224025

IPC: B29C64/153, B29C64/393,
B29C64/277

Language of the proceedings: EN

Title of invention:

Apparatus for producing an object by means of additive manufacturing and method for calibrating an apparatus

Patent Proprietor:

Additive Industries B.V.

Opponents:

Renishaw plc
Nikon SLM Solutions AG

Relevant legal provisions:

EPC Art. 123(2)
RPBA 2020 Art. 12(6)

Keyword:

Amendments - added subject-matter (yes)
Late-filed request - admitted in first-instance proceedings
(no) - circumstances of appeal case justify admittance (no)

Decisions cited:

G 0007/93, T 0640/91



Beschwerdekammern
Boards of Appeal
Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1099/22 - 3.2.05

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

Appellant: Additive Industries B.V.
(Patent Proprietor) P.O. Box 30160
5600 GA Eindhoven (NL)

Representative: Algemeen Octrooi- en Merkenbureau B.V.
P.O. Box 645
5600 AP Eindhoven (NL)

Respondent I: Renishaw plc
(Opponent 1) New Mills, Wotton-Under-Edge
Gloucestershire, GL12 8JR (GB)

Representative: Phillips, Patrick James
Renishaw plc
Patent Department
New Mills
Wotton-under-Edge, Gloucestershire GL12 8JR (GB)

Respondent II: Nikon SLM Solutions AG
(Opponent 2) Estlandring 4
23560 Lübeck (DE)

Representative: Schott, Jakob
Wuesthoff & Wuesthoff
Patentanwälte und Rechtsanwalt PartG mbB
Schweigerstraße 2
81541 München (DE)

Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 3 March 2022
revoking European patent No. 3224025 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

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

Summary of Facts and Submissions

- I. The appeal lies from the decision of the opposition division to revoke European patent No. 3 224 025.
- II. Two oppositions were filed against the patent as a whole. The opposition by respondent I (opponent 1) was based on 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), under Article 100(b) EPC and under Article 100(c) EPC. The opposition by respondent II (opponent 2) was based on 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), and under Article 100(c) EPC.
- III. In the decision under appeal, the opposition division came to the following conclusions.
- The subject-matter of claim 1 as amended according to the main request filed in reply to the notices of opposition extended beyond the content of the application as filed for three different reasons (i) to (iii).
 - Auxiliary requests 1 to 7 filed with letter dated 12 November 2021 were admitted into the opposition proceedings.
 - The subject-matter of claim 1 as amended according to each of auxiliary requests 1 to 7 extended beyond the content of the application as filed.
 - Auxiliary requests 8 and 9 filed during the oral proceedings held on 23 November 2021 were not admitted into the opposition proceedings.

IV. Oral proceedings before the board were held on 16 July 2024.

V. The appellant (patent proprietor) requested that:

- the decision under appeal be set aside and that the patent be maintained as amended on the basis of the claims of the main request underlying the decision under appeal or,
- alternatively, on the basis of the claims of one of auxiliary requests 1 to 9 filed with the statement of grounds of appeal (corresponding to auxiliary requests 1 to 9 underlying the decision under appeal),
- 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 10 to 18 filed with letter dated 9 February 2023 if the board were to admit respondent II's new objection of intermediate generalisation into the appeal proceedings,
- the case be remitted to the opposition division for further prosecution if the board were to find the claims of the main request or any of the auxiliary requests 1 to 18 to meet the requirements of Article 123(2) EPC, in so far as the reasons (i), (ii) and (iii) were concerned.

The respondents I and II (opponents 1 and 2) requested:

- that the appeal be dismissed,
- by way of auxiliary request that the case be remitted to the opposition division for further prosecution,
- not to admit auxiliary requests 8 and 9 into the appeal proceedings.

Respondent II (opponent 2) also requested not to admit auxiliary requests 10 to 18 into the appeal proceedings.

VI. Independent claim 1 of the main request has the following wording (the claim feature numbering used by the opposition division appears in square brackets):

"[1.1] Apparatus (1) for producing an object (2) by means of additive manufacturing, comprising:

- [1.2] a process chamber (3) for receiving a bath of material (4) which can be solidified by exposure to electromagnetic radiation (72);
- [1.3] a support (5) for positioning the object (2) in relation to the surface level (L) of the bath of material (4);
- [1.4] a solidifying device (7) for solidifying a selective layer-part of the material on the surface level (L) by means of electromagnetic radiation (71);
- [1.5] a registering device (81) for registering a characteristic related to the surface level (L) of the bath of material (4); and
- [1.6] a control unit (91) connected to the registering device (81) and arranged for using the characteristic obtained by the registering device (81) for controlling the position of the electromagnetic radiation (72) emitted by the solidifying device (7);
- [1.7] a deflector unit (74), which is arranged for deflecting electromagnetic radiation (72) emitted by the solidifying device (7) towards the surface level (L) of the bath of material (4);

[1.8] wherein the registering device (81) comprises at least one imaging device, in particular an optical imaging device, such as a camera unit; and

[1.9] wherein the apparatus (1) comprises a plurality of calibration elements (82, 82a, 82b, 82c, 8d)

provided on or near the support (5), [1.10a] wherein the control means are arranged for controlling the solidifying device (7) based on a geometric characteristic of the plurality of calibration elements (82, 82a, 82b, 82c, 8d) registered by the registering device (81) [1.10b] between the manufacturing of different individual layers of the object by means of the solidifying of a selective layer-part of the material on the surface level (L),

[1.11a] wherein the imaging device is arranged such that the characteristic is registered via the deflector unit (74),

[1.12] wherein the imaging device is arranged for making an image of the plurality of calibration elements (82, 82a, 82b, 82c, 8d), and wherein the registering device (81) is arranged for determining the geometric characteristic of the plurality of calibration elements (82, 82a, 82b, 82c, 8d), providing information on the geometric position of the calibration elements with respect to the surface level of the bath of material, based on the image obtained by the imaging device,

[1.13] wherein the imaging device is arranged such that an optical path (71) of the imaging device, during use of the imaging device, at least partly coincides with an optical path (71) of the electromagnetic radiation (72) generated by the solidifying device (7), during use of the solidifying device (7)."

VII. Independent claim 1 of auxiliary request 1 has the following amendment to feature 1.9 (emphasis by the board).

"[1.9] wherein the apparatus (1) comprises a plurality of calibration elements (82, 82a, 82b, 82c, 8d) provided ~~on or~~ near the support (5),"

VIII. Independent claim 1 of auxiliary request 2 is identical to independent claim 1 of the main request except for the following amendments to features 1.10a and 1.10b (emphasis by the board).

"[1.10a] wherein the control means are arranged for controlling the solidifying device (7) based on a geometric characteristic of the plurality of calibration elements (82, 82a, 82b, 82c, 8d) registered by the registering device (81), during manufacturing of the object, [1.10b] between the manufacturing of different individual layers of the object by means of the solidifying of a selective layer-part of the material on the surface level (L) for using the characteristic for controlling the position of the electromagnetic radiation emitted by the solidifying device during manufacturing of a subsequent layer,"

IX. Independent claim 1 of auxiliary request 3 combines the amendments of auxiliary requests 1 and 2. The independent claims 1 of auxiliary requests 4 to 7 have identical wording to independent claim 1 of the main request, auxiliary request 1, auxiliary request 2 and auxiliary request 3, respectively.

X. Compared to independent claim 1 of the main request, independent claim 1 of auxiliary request 8 has the following amendments to feature 1.10a and 1.12 (emphasis by the board).

"[1.10a] wherein the control ~~means are~~ unit is arranged for controlling the solidifying device (7) based on a geometric characteristic of each of the plurality of calibration elements (82, 82a, 82b, 82c, 8d) registered by the registering device (81)"

"[1.12] wherein the imaging device is arranged for making an image of each of the plurality of calibration elements (82, 82a, 82b, 82c, 8d), and wherein the registering device (81) is arranged for determining the geometric characteristic of each of the plurality of calibration elements (82, 82a, 82b, 82c, 8d), providing information on the geometric position of each of the calibration elements with respect to the surface level of the bath of material, based on the image obtained by the imaging device,"

XI. Compared to independent claim 1 of auxiliary request 3, independent claim 1 of auxiliary request 9 has the following amendments to feature 1.10a, 1.11a and 1.12 (emphasis by the board).

"[1.10a] wherein the control ~~means are~~ unit is arranged for controlling the solidifying device (7) based on a geometric characteristic of each calibration element of the plurality of calibration elements (82, 82a, 82b, 82c, 8d) registered by the registering device (81), during manufacturing of the object,"

"[1.11a] wherein the imaging device is arranged such that the characteristic of said each calibration element is registered via the deflector unit (74),"

"[1.12] wherein the imaging device is arranged for making an respective image of said each calibration element of the plurality of calibration elements (82, 82a, 82b, 82c, 8d), and wherein the registering device (81) is arranged for determining the geometric characteristic of said each calibration element of the plurality of calibration elements (82, 82a, 82b, 82c, 8d), providing information on the geometric position of

said each calibration element of the plurality of
calibration elements with respect to the surface level
of the bath of material, based on the respective image
obtained by the imaging device,"

XII. The appellant's submissions may be summarised as follows.

Main request - Article 123(2) EPC

The opposition division was incorrect in its finding that the requirements of Article 123(2) EPC were not fulfilled.

- *Reason (i)*

Feature 1.12 of claim 1 of the main request had basis in the application as filed. On page 41, lines 3 to 5 of the application as filed, it was disclosed that the camera unit was arranged for making one or more images of calibration elements. By the use of this wording, the application as filed disclosed a first possibility that the camera was arranged for making one image of plural calibration elements and a second possibility that the camera was arranged for making several images of plural calibration elements. This had to be read together with the next sentence according to which the one or more images of one or more of the calibration elements obtained by the registering device were processed by the registering device itself, or were fed to the control unit for being processed there. Hence, this disclosure was not limited to an embodiment comprising a camera unit, but to any imaging device. Although the passages mentioned were part of the description of an embodiment that did not fall within the scope of claim 1 of the main request, the passage

extending from page 41, line 32 to page 42, line 1 of the application as filed indicated that the aforementioned disclosure was not limited to the embodiment of Figure 1, but also to the apparatus of the embodiment of Figure 2. The embodiment of Figure 2 largely corresponded to that of Figure 1 and was thus also arranged for making one image of plural calibration elements. Respondent I's statement that the skilled person would understand that the passages cited in relation to the embodiment of Figure 1 did not apply to the embodiment of Figure 2 was a mere allegation without presenting serious doubts, substantiated by verifiable facts. Furthermore, the mere fact that the imaging device of the embodiment of Figure 2 had a different field of view compared to the embodiment of Figure 1 did not necessarily imply that the imaging device of Figure 2 would not be able to take a single image of plural calibration elements. Its field of view was not reduced to the extent that the respondents claimed it to be. On the contrary, it followed from page 42, lines 10 to 13 and page 5, lines 29 to 31 of the application as filed that an image could be obtained of at least a part of the calibration area. Either side of the bath of powdered material as shown in Figures 3 and 4 of the application as filed might be considered a calibration area provided with plural calibration elements. Nothing implied that the calibration area was restricted to a single calibration element. Reference was further made to claim 6 and page 5, lines 27 to 33 of the application as filed. The alternative embodiment as described on page 41, lines 13 to 31 of the application as filed was not according to claim 1 as granted, nor to claim 1 of the main request or to claim 1 of any of the auxiliary requests. Therefore, this passage was irrelevant in the present appeal proceedings. It should further be considered

that the consideration whether the application as filed disclosed how an image of a plurality of calibration elements could be taken was not a matter of Article 123(2) EPC.

- *Reason (ii)*

Feature 1.10a had basis in the application as filed. The appellant agreed with the statement of the opposition division that a calibration element, by definition, had a geometric characteristic. Hence, a plurality of calibration elements together also, by definition, had a geometric characteristic. In this regard, attention was drawn to page 4, lines 4 to 5 and page 5, lines 1 to 3 of the application as filed. In other words, an example of a geometric characteristic of plural calibration elements together might be a distance between two lines of two calibration elements. In addition to the relative distance, each of the calibration elements 82a-f shown in Figures 3 and 4 of the application as filed had a geometric characteristic in the form of its XY-position. It was further pointed out that the passages on page 4, lines 1 to 3 and on page 4, lines 3 to 5 of the application as filed were not inextricably linked, nor was there an exclusive link with the passage on page 5, lines 1 to 3 of the application as filed, which did not mention the calibration area. The passage on page 4, lines 27 to 29 of the application as filed merely disclosed an alternative embodiment without limiting the disclosure as regards page 4, lines 4 to 5 and page 5, lines 1 to 3 of the application as filed. The creation of the characteristic by the solidifying device was merely an optional requirement suggested on page 5, lines 5 to 6 of the application as filed.

Auxiliary requests 1 to 7

For the same reasons, the requirements of Article 123(2) EPC were fulfilled for claim 1 of each of auxiliary requests 1 to 7.

Auxiliary requests 8 and 9

Auxiliary requests 8 and 9 prima facie met the requirements of Article 123(2) EPC. The board was requested to admit these requests under Rule 12(6) RPBA into the appeal proceedings.

Independent claim 1 of auxiliary request 8 contained limitations that had basis on page 41, lines 4 to 9 and on page 5, lines 14 to 15 of the application as filed. The definite article at the end of feature 1.12 referred to "*an image of each of the plurality of calibration elements*" at the beginning of feature 1.12. In view of the wording of claim 1 of auxiliary request 8 in its entirety, an interpretation wherein only a single image was obtained by the imaging device was illogical. Claim 1 of auxiliary request 8 clearly required that the imaging device was arranged for making a plurality of images each comprising an image of a calibration element. The amendments therefore solved the objections raised in the context of the main request.

The limitations introduced in independent claim 1 of auxiliary request 9 were based on page 4, lines 14 to 18, on page 6, lines 11 to 15 and on page 41, lines 5 to 12 of the application as filed. By virtue of the wording "*[i]n particular*" in said last passage, it was clear that the embodiment was not limited to one geometric characteristic of one calibration element

only. The skilled person would derive from the application as filed that the characteristic of each calibration element was obtained and a respective image of each calibration element was made so that the control of the solidifying device was based on the respective image obtained by the imaging device. Claim 1 of auxiliary request 9 was not limited to an embodiment wherein after each layer a calibration element was registered and, after another layer, another calibration element was registered. An alleged failure of the application as filed to disclose at what time of the process each of the calibration elements were registered was not a matter of Article 123(2) EPC. In this context, particular reference was made to the passages on page 4, lines 19 to 26 and on page 42, lines 17 to 24, whereby the possibility of repeating the registering step directly after the solidifying step was part of an embodiment of the method and was not disclosed as an essential feature. Claim 1 of auxiliary request 9 consistently used the wording "*the object*" so that it was clear that the usage of the plurality of calibration elements related to the manufacturing of a single object.

XIII. The respondents' submissions may be summarised as follows.

Main request - Article 123(2) EPC

The opposition division was correct in its finding that, at least for the following reasons, claim 1 of the main request did not fulfill the requirements of Article 123(2) EPC.

- Reason (i)

There was no direct and unambiguous disclosure for feature 1.12 of claim 1 of the main request. The sentence on page 41, lines 4 to 5 of the application as filed related to the embodiment shown in Figure 1, in which the camera 81, contrary to what was required by feature 1.11a, was not arranged such that the characteristic was registered via a deflector unit. Therefore, this embodiment did not fall within the scope of the claims. Furthermore, it had to be taken into account that the next sentence referred to "*one or more images of one or more of the calibration elements*", i.e. one image contained one calibration element and several images contained several calibration elements. This had to be understood in that the registering device 81 of the embodiment of Figure 1 only captured a single calibration element 82, as opposed to the use of a plurality of registering devices for improved accuracy mentioned on page 41, lines 28 to 31 of the application as filed. Following the passage extending from page 41, line 32 to page 42, line 13 of the application as filed, the main difference between the embodiments of Figures 1 and 2 lied in the position of the imaging device 81 in the apparatus. Unlike the alternative use of a plurality of registering devices in the preceding passage, only one imaging device was mentioned here. Already for this reason, the apparatus of Figure 2 must only capture a single calibration element in one image. Separate images were thus required to capture different calibration elements. It also had to be considered that the arrangement of the imaging device 81 shown in Figure 2 and described on page 42, lines 3 to 6 of the application as filed was the reason that its optical

path 71 had to be directed via a deflection unit and at least partially coincided with the path of the electromagnetic radiation generated by the solidifying device (see feature 1.13 of claim 1). According to page 5, lines 24 to 33 of the application as filed, such an arrangement had the advantage of giving a more direct feedback. The skilled person would thus understand that the embodiments of Figures 1 and 2 differed in how the imaging device was arranged in the apparatus and, as a consequence, in what was viewed by the imaging device. Hence, the arrangement of the camera unit described in the context of the embodiment of Figure 1 on page 41, lines 4 to 5 could not be read across to the embodiment of Figure 2 so that there was no direct and unambiguous disclosure in the application as filed of an apparatus of the type as shown by Figure 2 that could make a single image of plural calibration elements. It was also technically not possible for the imaging device of Figure 2 to record an image of several calibration elements. Due to its specific arrangement requiring an optical device and a deflection unit, the imaging device could not see the entire construction field with all the calibration elements. In practice, the field of view of the imaging device changed depending on the position of the electromagnetic radiation. In the representation of Figure 2, the field of view of the imaging device could only detect the calibration element shown on the left-hand side of the bath. In order to detect the calibration element shown on the right-hand side of the bath, another image must be made. It was thus only possible to detect different calibration elements in separate images. But even if this were technically possible, there was no direct and unambiguous disclosure of such a possibility in the application as filed. In this context, it should be noted that the expression "*calibration area*" on page

42, lines 10 to 16 was not defined. Moreover, the sentence on page 42, lines 32 to 34 of the application as filed did not exclude that the four calibration elements 82a-d were registered by means of different images.

- Reason (ii)

The application as filed did not provide any basis for a single geometric characteristic of a plurality of calibration elements as claimed in features 1.10a and 1.12 of claim 1 of the main request. The geometric characteristic was always mentioned together with a single calibration element, such as on page 4, lines 1 to 6 and page 5, lines 1 to 3 of the application as filed. The passage on page 4, lines 14 to 23 of the application as filed only referred to an image obtained providing information on the geometric position of a single calibration element. Page 6, lines 11 to 15 concerned an embodiment with a plurality of calibration elements without, however, mentioning a geometric characteristic. Assuming that, by definition, a single calibration element had a geometric characteristic (e.g. a length), then, by definition, each calibration element of a plurality of calibration elements should have a geometric characteristic. But this did not mean that a single geometric characteristic was directly and unambiguously disclosed for a plurality of calibration elements. For example, how should one measure the length of a large number of calibration elements? It might be that the geometric position of plural calibration elements would cover information such as the distance between two calibration elements. Such information was contextual but could not be derived without ambiguity from the application as filed. The appellant's interpretation that the distance between

the "*parallel lines*" mentioned on page 5, lines 1 to 3 of the application as filed corresponded to a geometric characteristic of a plurality of calibration elements had no basis whatsoever in the application as filed. Furthermore, the application as filed did not disclose that the solidifying device was controlled based on a geometric characteristic of a plurality of calibration elements. The only disclosure related to the general use of a characteristic for controlling the solidifying device was limited to exactly one calibration element. The passage on page 42, lines 32 to 34 linked plural calibration elements with the registering of geometric information, but claim 1 of the main request was much broader since it did not require the registering of the geometric position.

Auxiliary requests 1 to 7

The requirements of Article 123(2) EPC were not fulfilled for each of auxiliary requests 1 to 7. The arguments provided in respect of the main request apply *mutatis mutandis* for auxiliary request 1 to 7.

Auxiliary requests 8 and 9

Auxiliary requests 8 and 9 were only submitted during the oral proceedings before the opposition division and were therefore filed late. As correctly stated in points 2.4 and 2.5 of the decision under appeal, auxiliary requests 8 and 9 could not remedy the deficiencies raised under Article 123(2) EPC. On the contrary, they introduced even further deficiencies. Therefore, auxiliary requests 8 and 9 were rightly not admitted by the opposition division and should also not be admitted into the appeal proceedings.

Regarding auxiliary request 8, the wording "*an image of each of the plurality of calibration elements*" in feature 1.12 of claim 1 did not necessarily mean that plural images were taken, each of which captured a single calibration element. The appellant relied on page 41, lines 4 to 9 of the application as filed as basis for this amendment. However, this passage related to the embodiment shown in Figure 1 in which the camera unit did not register the images via the deflector unit. As such, there was no basis for taking a single image of each of a plurality of calibration elements when the image was registered via the deflector unit. Also the passage on page 5, lines 14 to 15 of the application as filed did not provide basis for the amendment. The appellant's allegation that an interpretation wherein only a single image was obtained by the imaging device was illogical contradicted the same passage on page 41, lines 4 to 9 of the application as filed. There was no indication in the application as filed that this passage should be interpreted as excluding a single image of a plurality of calibration elements. Moreover, the wording "*a geometric characteristic of each of the plurality of calibration elements*" in feature 1.10a still encompassed the possibility that the solidifying device was controlled based on a single characteristic of the plurality of calibration elements, which was objected to in the context of the main request. Therefore, claim 1 of auxiliary request 8 did not prima facie meet the requirements of Article 123(2) EPC and should not be admitted into the proceedings.

As regards claim 1 of auxiliary request 9, the opposition division correctly concluded that there was no direct and unambiguous disclosure in the application as filed of using a geometric characteristic of each

calibration element of the plurality of calibration elements for controlling the position of the electromagnetic radiation during manufacturing of a subsequent layer. Nor was there basis for registering the geometric characteristic of each calibration element of the plurality of calibration elements between the manufacturing of different individual layers of the object. The passage on page 41, lines 5 to 12 of the application as filed relied on by the appellant only referred to using a geometric characteristic of one calibration element for controlling the solidifying device. In addition, the passage was part of the description of the embodiment shown in Figure 1 and was thus not relevant. Hence, there was no disclosure of the amendment to feature 1.10b in the context of an embodiment where the imaging device registered the characteristic via the deflector unit. Also the passage on page 4, lines 19 to 26 of the application as filed only disclosed a control based on a characteristic of a single calibration element. Moreover, it was confined to the manufacture of a single product. In contrast, by virtue of feature 1.10b, claim 1 of auxiliary request 9 covered an embodiment where for example two products were manufactured, wherein the characteristic was registered after a first part of a layer relating to a first product had been solidified, but before solidification of a second part of the layer relating to the second product began. Nor could the amendment be directly and unambiguously derived from page 42, lines 17 to 24 of the application as filed, which related to repeating the step of registering the characteristic directly after the solidifying step. As the opposition division correctly observed, page 6, lines 11 to 15 of the application as filed appeared to be the most relevant passage as regards a plurality of calibration elements.

However, it did not describe how such a plurality of calibration elements could increase the accuracy of the calibration. Therefore, auxiliary request 9 should not be admitted into proceedings because it prima facie violated Article 123(2) EPC.

Reasons for the Decision

Main request - Article 123(2) EPC

1. In point 2.3.2 of the decision under appeal, the opposition division concluded that the conditions of Article 123(2) EPC were not satisfied for three different reasons labelled (i) to (iii). In the following, the board reviews reasons (i) and (ii).

- *Reason (i)*
2. Feature 1.12 of claim 1 of the main request has its origin in claim 2 of the application as filed, albeit with the restriction that it contains the wording "*an image of the **plurality of calibration elements***" (emphasis by the board) instead of "*an image of the calibration element*". The opposition division held that the application as filed did not disclose how an image of a plurality of calibration elements could be made in the context of Figure 2. The possibility that a single image was made of the plurality of calibration elements was considered neither disclosed nor derivable from the application as filed.
3. The board concurs with the appellant that the passage on page 41, lines 1 to 7 of the application as filed provides a basis for an arrangement of an imaging device for making a single image of plural calibration elements. In particular the wording

*"one or more images of calibration elements 82" and
"one or more images of one or more of the
calibration elements 82"*

confirms that the plurality of calibration elements can either be captured by a single or by more images. However, this passage is part of the detailed description of the embodiment of Figure 1, which does not fall within the subject-matter of claim 1 of the main request. The imaging device 81 of Figure 1 points directly downwards from the top frame part 13 to the support 5. It does not register a characteristic related to the surface level of the bath of material via the deflector unit 74, contrary to what is required by feature 1.11a in combination with feature 1.5.

The appellant argues that, by virtue of the passage starting at page 41, line 32 of the application as filed, the above-mentioned sentences can also be read on the embodiment of Figure 2, which does guide the optical path of the imaging device through the deflector unit. Yet, it follows from the description at the top of page 42 of the application as filed that the main difference between the two embodiments lies in the different position of the imaging device 81. According to page 42, lines 3 to 6, it is key to the apparatus of Figure 2 that

"the imaging device 81 is arranged such that an optical path 71 of the imaging device 81, during use of the imaging device 81, at least partly coincides with an optical path of the electromagnetic radiation generated by the solidifying device 7".

This requirement, which corresponds to feature 1.13 of claim 1 of the main request, is achieved in Figure 2 by deflecting the optical path of the imaging device 81 first by a mirror 98 and then by the deflector unit 74. In the embodiment of Figure 2, the imaging device 81 does thus not point directly downwards to the support 5 but, at least in the space between these optical devices, coincides with the path of the laser beam emitted by the solidifying device 7. The respondents make a convincing case that such an arrangement confines the field of view of the imaging device compared to the embodiment of Figure 1 to the extent that it would prevent capturing both calibration elements 82 shown at the left- and right-hand sides in Figure 2 in a single image.

The board finds it appropriate to note that, assuming the field of view of the imaging device of Figure 2 were not reduced to the extent claimed by the respondents, there is still no direct and unambiguous disclosure that it would be sufficient to take a single image of a plurality of calibration elements. Nor does the "*image of the calibration area*" mentioned on page 42, lines 10 to 16 establish without doubt that more than one calibration element lies within the field of view of the imaging device 81. While the appellant is correct in pointing out that nothing implies that the concept "*calibration area*" is to be restricted to a single calibration element, the possibility that it only covers one calibration element is, conversely, also not excluded by the application as filed.

Furthermore, the board shares the respondents' view that the remark made in the context of Figure 3 on page 42, lines 32 to 34 of the application as filed

"registering of the geometric position of the four elements 82a-82d"

can be understood as a reference to four different images, i.e. one image for each single one of the four calibration elements 82a to 82d.

It must be concluded from the foregoing that the arrangement of the imaging device as described on page 41, lines 1 to 7 of the application as filed does not extend to the embodiment of Figure 2 so that feature 1.12 is without basis in the application as filed.

4. Having regard to the above considerations, the board follows the opposition division's conclusion with regard to reason (i).

- *Reason (ii)*

5. Feature 1.10a of claim 1 of the main request concerns a control of the solidifying device *"based on a geometric characteristic of the plurality of calibration elements"*. The opposition division held that even if, by definition, a calibration element had a geometric characteristic, there was no basis for a single geometric characteristic associated with a plurality of calibration elements.
6. The appellant rebuts that, by definition, a plurality of calibration elements also has a geometric characteristic. The board agrees that a distance between two calibration elements qualifies as a geometric characteristic. Similarly, the combined appearance of calibration elements may very well characterise these elements in a geometric manner.

Nevertheless, the wording of feature 1.10a goes beyond this statement: it requires an arrangement that uses the geometric characteristic of the plurality of calibration elements for controlling the solidifying device. The appellant has not given any basis in the application as filed for such a requirement. The passage on page 4, lines 1 to 5 introduces the concept "*calibration area*", but does not define it in terms of one or more calibration elements. The "*XY-position*" mentioned in this passage is merely an example of a geometric characteristic unrelated to any element. Also the examples of a geometric characteristic listed on page 5, lines 1 to 3 of the application as filed ("*a circle, parallel lines, a triangle, a pentagon, etc, or a spot*") are not associated to a calibration element, let alone to plural calibration elements. Page 6, lines 11 to 15 of the application as filed concerns an embodiment of an apparatus with a plurality of calibration elements, but makes no mention of any geometric characteristic. It is only on page 4, lines 14 to 18 and on page 5, lines 14 to 23 of the general description that the geometric characteristic appears together with a calibration element. In the first of these passages of the application as filed, the control of the solidifying device is

"based on a geometric characteristic of the calibration element",

whereas the second passage is more specific in that

"the image obtained provides information on the geometric position of the calibration element" and "[i]nformation obtained from evaluation of the image [...] may be used to calibrate or control the

position of the electromagnetic radiation emitted by the solidifying device".

Similarly as in claim 1 of the application as filed, the geometric characteristic in these two passages is only disclosed together with a single calibration element.

The respondents are correct when arguing that the only disclosure in the application as filed relating the registering of a geometric characteristic to a plurality of calibration elements is on page 42, lines 32 to 34, i.e. in the context of the detailed description of the embodiment of Figure 3. This disclosure is, however, very specific. It is limited to registering the geometric position of four elements 82a-82d positioned on opposed sides of a generally rectangular bath of material. Moreover, it uses interpolation to more accurately control the position of the laser beam on the surface level of the bath, implying that all four positions are registered. Also here, a single geometric characteristic of plural calibration elements is thus not directly and unambiguously disclosed.

The board adds that, even if feature 1.12 of claim 1 of the main request further constrains the geometric characteristic by "*providing information on the geometric position of the calibration elements with respect to the surface level of the bath of material*", for a control means to comply with feature 1.10a of claim 1, it must be arranged for controlling the solidifying device not on the individual positions of the calibration elements, but on a geometric characteristic of the plurality of calibration elements.

7. It follows from the above that also the opposition division's conclusion with regard to reason (ii) is correct.

- *Conclusion on the main request*

8. In view of the above, the subject-matter of claim 1 of the main request extends beyond the content of the application as filed (Article 123(2) EPC). The appellant's main request is thus not allowable.

Auxiliary requests 1 to 7

9. None of the amendments carried out in the independent claims 1 of auxiliary requests 1 to 7 concerns feature 1.12 (see points VI, VII and VIII above). For that reason, they cannot overcome at least the objection under Article 123(2) EPC discussed in the context of the main request under 'Reason (i)' above. As a consequence, none of auxiliary requests 1 to 7 is allowable.

Auxiliary requests 8 and 9

10. In points 2.4 and 2.5 of the decision under appeal, the opposition division gave its reasons for not admitting auxiliary requests 8 and 9, which were filed only in the course of the oral proceedings held on 23 November 2021. Regarding auxiliary request 8, the opposition division held that the wording of amended feature 1.12 ("*[...] providing information on each of the geometric position of the calibration elements with respect to the surface level of the bath of material, based on **the***

image obtained by the imaging device," - emphasis by the opposition division) did not exclude that a single image of the plurality of calibration elements was made. With regard to auxiliary request 9, the opposition division took issue with the disclosure in the application as filed of the amendment to feature 1.10b ("*[...] for using the characteristic for controlling the position of the electromagnetic radiation emitted by the solidifying device during manufacturing of a subsequent layer,*") in relation with a plurality of calibration elements, arguing that the passage on page 6, lines 11 to 15 of the application as filed did not disclose any information on how the calibration elements were registered during manufacturing of the object, between the manufacturing of different individual layers of the object. The opposition division concluded that independent claim 1 of both auxiliary requests 8 and 9 did not prima facie meet the requirements of Article 123(2) EPC.

11. In its statement of grounds of appeal, the appellant requested the board to admit auxiliary requests 8 and 9 "*under Rule 12(6) [sic] Rules of Procedure of the Boards of Appeal*" into the appeal proceedings. This is understood to be a request for admission under Article 12(6), first sentence, RPBA, which stipulates that the board shall not admit requests, facts, objections or evidence which were not admitted in the proceedings leading to the decision under appeal, unless the decision not to admit them suffered from an error in the use of discretion or unless the circumstances of the appeal case justify their admittance.
12. It is well-established case law that, when reviewing a discretionary decision of a first-instance department, a board of appeal should only overrule the way in which

the department has exercised its discretion if it concludes that it has done so according to the wrong principles, or without taking into account the right principles, or in an unreasonable way (cf. G 7/93 and T 640/91). 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, in order to decide whether or not it would have exercised such discretion in the same way.

13. The appellant does not contest that the principles used by the opposition division when exercising its discretion not to admit auxiliary request 8 and 9 were the right ones. Indeed, assessing the prima facie allowability under Article 123(2) EPC of claim amendments is a generally recognised criterion when deciding on the admission of a late-filed auxiliary request in opposition proceedings (see sections H-II, 2.7.1 and E-VI, 2 of the Guidelines for Examination in the European Patent Office in the March 2021 version valid at the time of the oral proceedings held before the opposition division). Furthermore, the appellant does not criticise that the way in which the opposition division exercised its discretion was unreasonable. In the board's view, points 2.4 and 2.5 of the decision under appeal provide reasonable arguments why the opposition division considered claim 1 of auxiliary requests 8 and 9 to contain subject-matter that extends beyond the application as filed. The board arrives at the conclusion that the decision of the opposition division not to admit auxiliary requests 8 and 9 did not suffer from an error in the use of discretion.

14. It remains to be determined whether the second condition of Article 12(6) RPBA is fulfilled, namely whether the circumstances of the appeal case justify

admitting auxiliary requests 8 and 9. Given that the board concurs with the opposition division that the main request and auxiliary requests 1 to 7 violate Article 123(2) EPC (see points 1. to 9. above), the board does not see any change in circumstances that would affect the question whether auxiliary requests 8 and 9 can be admitted.

15. As the appellant has substantiated its request to admit auxiliary requests 8 and 9 by arguing that the amendments in claim 1 of these requests are suitable to address the issues which led to the decision under appeal, the board finds it appropriate to add the following.

Regarding auxiliary request 8, the appellant is essentially of the view that the wording of claim 1 in its entirety renders the interpretation wherein only a single image is obtained by the imaging device illogical. The board is not persuaded and holds that the respondents have made a convincing case that the amendment to feature 1.12, which links the image to "*each of the plurality of calibration elements*" still permits a logical interpretation that a single image would contain each of the calibration elements, all the more so since "*the image*" in the subordinate clause at the end of feature 1.12 appears in singular form. This speaks against the clear allowability of the amendment of feature 1.12 under Article 123(2) EPC.

With regard to auxiliary request 9, the respondents have explained in a convincing manner why the amendments to claim 1 do not appear to remedy all objections raised under Article 123(2) EPC against claim 1 of the main request. Firstly, the application as filed fails to contain a direct and unambiguous

disclosure of using a geometric characteristic of each of a plurality of calibration elements for controlling the position of the electromagnetic radiation during manufacturing of a subsequent layer. The appellant's reliance on page 41, lines 5 to 12 of the application as filed in respect of the amendment that links the geometric characteristic to "*each calibration element of*" the plurality of calibration elements cannot be understood since, as set out in point 3. above, this passage is part of the detailed description of the embodiment of Figure 1 which does not fall within the claimed subject-matter. Secondly, a generally worded control based on a characteristic obtained by a registering device is only disclosed in the passage on page 4, lines 19 to 26 of the application as filed in reference to a single calibration element. A plurality of calibration elements are mentioned in the general description on page 6, lines 11 to 15 of the application as filed, but no (geometric) characteristic is mentioned in this context, nor is it explained how the plurality of calibration elements improve the accuracy of the calibration. None of the other passages mentioned by the appellant *prima facie* seem to form a basis for the amended feature 1.10a so that the objection raised as 'Reason (ii)' against claim 1 of the main request is *prima facie* not overcome.

16. For the above reasons, the appellant's request to admit auxiliary requests 8 and 9 into the appeal proceedings pursuant to Article 12(6), first sentence, RPBA is refused.

Further requests by the appellant

17. The appellant further requested the decision under appeal to be set aside and the patent be maintained as

amended on the basis of the claims of one of auxiliary requests 10 to 18 filed with letter dated 9 February 2023 if the board were to admit respondent II's new objection of intermediate generalisation into the appeal proceedings. As the board has not considered this objection in its assessment whether the requirements of Article 123(2) EPC are fulfilled, neither for claim 1 of the main request nor for claim 1 of auxiliary requests 1 to 7, auxiliary requests 10 to 18 do not become effective.

18. As an auxiliary measure, the appellant also requested that the case be remitted to the opposition division for further prosecution if the board were to find the claims of the main request or any of the auxiliary requests 1 to 18 to meet the requirements of Article 123(2) EPC, in so far as the reasons (i), (ii) and (iii) were concerned. This condition is not fulfilled since the board has come to the conclusion that Article 123(2) EPC is not complied with for the main request and for auxiliary requests 1 to 7, since auxiliary requests 8 and 9 have not been admitted into the proceedings, and since auxiliary requests 10 to 18 have not become effective.

Conclusion

19. As none of the appellant's requests is allowable, the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



N. Schneider

P. Lanz

Decision electronically authenticated