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Datasheet for the decision of 16 December 2025

Case Number: T 1224/23 - 3.2.03

Application Number: 12153503.3

Publication Number: 2485099

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Language of the proceedings: EN

Title of invention:
Method for producing a watch case middle of reduced weight

Patent Proprietor:
Richemont International S.A.

Opponent:
ICB Ingénieurs Conseils en Brevets SA

Headword:

Relevant legal provisions:
EPC Art. 100(c), 100(b), 100(a), 56

Keyword:
Amendments - added subject-matter (no)
Sufficiency of disclosure - (yes) - no shift of burden of proof to patentee
Inventive step - (yes)

Decisions cited:
G 0001/03, G 0001/19, T 0240/95, T 1610/08

Catchword:

Europäisches Patentamt
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Office européen des brevets

Beschwerdekammern

Boards of Appeal

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Case Number: T 1224/23 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 16 December 2025

Appellant: (Opponent)	ICB Ingénieurs Conseils en Brevets SA Fbg de l'Hôpital 3 2001 Neuchâtel (CH)
Representative:	Hoyng Rokh Monegier B.V. Rembrandt Tower, 30th Floor Amstelplein 1 1096 HA Amsterdam (NL)
Respondent: (Patent Proprietor)	Richemont International S.A. 10, route des Biches 1752 Villars-sur-Glâne (CH)
Representative:	Grünecker Patent- und Rechtsanwälte PartG mbB Leopoldstraße 4 80802 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 May 2023 rejecting the opposition filed against European patent No. 2485099 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman C. Herberhold
Members: B. Goers
N. Obrovski

Summary of Facts and Submissions

I. European patent No. 2 485 099 relates to a method for producing a watch case middle layer by layer from powdered material using an additive manufacturing process.

II. The appeal lies against the decision of the opposition division to reject the opposition based on the grounds of Article 100 (b) and (c) EPC and on Article 100 (a) EPC in conjunction with Articles 54 and 56 EPC.

III. At the end of the oral proceedings before the Board, the parties confirmed the following requests.

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

The patent proprietor (respondent) requested that the appeal be dismissed or, as an auxiliary measure, that the patent be maintained in amended form on the basis of one of auxiliary requests 1 to 3.

IV. Documents relevant to this decision

D2: C. Chaput et al. (2007), "Fabrication of ceramics by stereolithography", RTejournal 4, 2007
D5: US 2010/290319 A1
D6: CH 700 273 A1
D7: WO 2005/025783 A1
D13: Affidavit of Csilla Miko and Suzanne Verheyden
D14: Extracts from I. Gibson et al., "Additive Manufacturing Technologies - Rapid Prototyping to

Direct Digital Manufacturing", Springer, 2010

D15: Extracts from T. Grimm, "User's Guide to Rapid Prototyping", Society of Manufacturing Engineers, 2004

D16: Internet citation, "ZEditTM Pro", published 4 January 2010D17: EP 1 065 576 A1

D22: R. Regenfuß et al., "Advancements in Laser Micro Sintering", Proceedings of the Third International WLT Conference on Lasers in Manufacturing, Munich, 2005

D25: C. Over, "Rapid Prototyping and Rapid Tooling", Tailored Light 2, ed. R. Poprawe, Berlin: Springer-Verlag, 2011, 253-263, published according to DOI: 29 July 2009

D27: M. L. Griffith, J. W. Halloran, "Ultraviolet Curing of Highly Loaded Ceramic Suspensions for Stereolithography of Ceramics" International Solid Freeform Fabrication Symposium

D28: J. Grau et al., "High green density ceramic components fabricated by the slurry-based 3DP process", International Solid Freeform Fabrication Symposium

D29: C. Hinczewski et al., "Ceramic suspensions suitable for stereolithography", Journal of the European Ceramic Society 18(6), 1998, 583-590

D30: H. H. Tang, "Building Ultra-Thin Layers by Ceramic Laser Sintering", Materials Transactions 47(3), 2006, 889-897

V. Claim wording relevant to this decision

Claim 1 of the main request reads (patent as granted, wording added compared with claim 1 as originally filed marked in bold; feature numbering in "[]"):

"[F1] *A method for producing a watch case middle (10) having reduced weight, comprising:*
[F2] *generating a 3-D dataset for the case middle (10),* ***the case middle comprising an outer peripheral surface (12), an inner peripheral surface (14), a bottom surface (20) and a top surface (22);***
[F3] *converting the 3-D data set into a plurality of layers, each layer representing a cross-sectional layer of the middle (10);*
[F4] *forming the case middle (10) layer-by-layer from powdered material using an additive manufacturing process in order to provide the case middle (10) with a unitary construction; and*
[F5] *machining a through hole (40, 42) formed through the middle (10) to a desired finish and/or precision, the through hole being designed to receive a control member stem when a watch movement is mounted inside the middle;*
[F6] *wherein the data set further comprises at least one internal cavity (50) within the case middle (10)* ***so that the case middle (10) has the least one internal cavity (50) formed within it,***
[F7] *the method further comprising removing loose powder from each cavity (50) via one or more powder evacuation holes (60, 62) formed between the at least one internal cavity (50) and an external surface of the case middle (10),*
[F8] ***wherein one or more powder evacuation holes (60, 62) are formed between the bottom surface (20) of the middle (10) and the cavity (50),***
[F9] ***wherein the bottom surface (20) is destined to receive a watch case back.***"

VI. The appellant's arguments, where relevant to the present decision, can be summarised as follows.

(a) Article 100 (c) EPC

The subject-matter of claim 1 extended beyond the content of the application as filed since it combined a single powder evacuation hole with a specific location at the bottom of the case watch middle. However, this location was extracted from an embodiment in which at least three powder evacuation holes were present at the bottom. The claimed subject-matter was thus based on an unallowable intermediate generalisation.

(b) Article 100 (b) EPC

The invention was not disclosed in a manner sufficiently clear and complete to be carried out by a skilled person. The method defined in claim 1 was disclosed in the patent to encompass layer thicknesses down to 1 µm. Even though the thickness range was only defined in the description, its end values were to be considered embodiments of the invention. However, such a small layer thickness was not workable at the filing date, as proven by affidavit D13 and the documents D1, D2, D3, D6, D14 and D15. Also, for the upper value of 100 µm, it was not clear how such big particles could be evacuated without information about the evacuation hole size. In fact, a significant part of the range disclosed in the description was not workable. Even if it were, very small layer thicknesses were only achievable with laser sintering and not with all the methods encompassed by claim 1. In view of the defined thickness range and the statement in paragraph [0037] the respondent sought protection for subject-matter not enabled at the filing date. The burden of proof that

this was not the case lay with the respondent, which had not provided this evidence. The disclosure of D22 was not relevant as this was only an isolated scientific publication, and it did not contain an enabling disclosure for small layer thicknesses.

(c) Inventive step

The subject-matter of claim 1 did not involve an inventive step in view of D2 as the starting point. D2 was a layer-by-layer additive manufacturing process falling under the subject-matter of claim 1. Features [F4] ("from powdered material") and [F7] ("loose powder") did not exclude the powder-containing paste used in D2. The provision of a cavity and the location of a powder evacuation hole in the bottom had no technical effect or were at least obvious in view of common general knowledge or the documents D5 to D7, D14, D15, D25 and D27 to D30.

VII. The respondent's arguments, where relevant to the present decision, can be summarised as follows.

(a) Article 100 (c) EPC

The subject-matter of claim 1 did not extend beyond the content of the application as filed. There was no structural and functional relationship between the number and the location of powder evacuation holes, and there was independent disclosure for both.

(b) Article 100 (b) EPC

The invention was disclosed in a manner sufficiently clear and complete to be carried out by a skilled person. The method defined in claim 1 did not encompass

any specific layer thickness, and there was also no convincing evidence that the range mentioned in the description was not enabled in full. There was also no shift of the burden of proof. Moreover, D22 disclosed examples at or below a layer thickness of 1 µm.

(c) Inventive step

The subject-matter of claim 1 involved an inventive step in view of D2 as the starting point. D2 was a layer-by-layer additive manufacturing process falling outside the scope of claim 1 as claim 1 required loose powder-based layer-by-layer manufacturing. There was no teaching to direct the skilled person away from the paste-based process in D2 towards a loose powder-based process including the formation of a cavity and a powder evacuation hole without using hindsight.

Reasons for the Decision

1. Article 100 (c) EPC

The ground for opposition under Article 100 (c) EPC does not prejudice the maintenance of the patent.

The reasons are as follows (reference is made to the originally filed documents; the paragraph numbering differs between the originally filed documents and the A1 publication).

1.1 Feature [F8] requires at least one powder evacuation hole in the bottom surface of the middle. The appellant argued that powder evacuation holes in the bottom surface were only originally disclosed in paragraph [0019] in the context of an embodiment. This embodiment required a "single contiguous internal cavity" and, *inter alia*, a plurality of powder evacuation holes in the bottom surface ("three such [...] holes"). Therefore, according to the appellant the subject-matter of claim 1 was based on a non-allowable intermediate generalisation.

1.2 However, the location and the number of powder evacuation holes are disclosed independently of each other in the application as filed.

It is true that paragraph [0019] is substantially directed to embodiments having only one contiguous internal cavity. However, before a configuration of powder evacuation holes is described therein (three holes in the bottom surface, one in the top surface), a generic statement is made that "[f]or each cavity, at least one powder evacuation hole 60, 62 is also

formed". This statement is not linked to a particular location of the powder evacuation hole, and it is in line with originally filed claims 1, 3 and 4, where a large and complex cavity as described in paragraph [0019] (extending circularly around the middle and into the lugs) is disclosed in a more generic context. The skilled person thus derives from the original disclosure directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, that independent of the size and form of the cavity the minimum requirement is a single powder evacuation hole per internal cavity.

Providing multiple powder evacuation holes in the bottom could indeed facilitate the step of powder removal from a larger, geometrically complex cavity (e.g. from the above mentioned contiguous internal cavity extending circularly around the middle as well as into the lugs). However, the provision of more than one powder evacuation hole is - even with a specific form and size of the cavity - not described as a mandatory requirement in the application as filed and such a requirement is also not derivable from the whole of the application documents as filed or from the common general knowledge.

1.3 The location of powder evacuation holes is generally discussed in paragraph [0029] of the application as filed. The skilled person derives from this paragraph that the powder evacuation holes are preferably located in locations out of the user's view (see also original claim 11) that will be covered and sealed by, *inter alia*, the watch back. This provides a basis for the location of the powder evacuation hole as defined by features [F8] and [F9].

1.4 To conclude, the application as filed comprises generic disclosure in support of both the provision of only one powder evacuation hole as well as for the provision of powder evacuation holes in the bottom surface destined to receive a watch back. Therefore, no unallowable intermediate generalisation is manifest.

2. Article 100 (b) EPC

The ground for opposition under Article 100 (b) EPC does not prejudice the maintenance of the patent as granted.

2.1 The appellant argued that layer thicknesses as small as 1 µm were explicitly encompassed by the claimed invention due to the ranges defined in paragraphs [0012] and [0030] of the patent, as was concluded in decision T 240/95, Reasons 4.2. With reference to these embodiments and to criteria (ii) and (iii) set out in decision T 1610/08, Reasons 2, the appellant argued that the disclosure of the patent did not allow the invention to be performed over the whole scope claimed, at least not without undue burden.

The appellant substantiated its objection by arguing that a layer thickness of 1 µm was, at the time of the filing date, beyond an "operability threshold" which was, *inter alia*, allegedly shown by the affidavit D13 and documents D1, D2, D3, D6, D14 and D15. In the absence of teaching in the patent on how to carry out the method of the invention with a layer thickness of 1 µm, only a weak presumption of validity was present. The evidence submitted by the appellant was thus sufficient to shift the burden of proof to the respondent. The respondent failed to provide relevant

counterarguments or evidence. D22 was insufficient for this purpose as it was not a representation of common general knowledge.

This is not persuasive for the following reasons.

2.2 No sufficient proof that the range disclosed in the description was not workable

The appellant has not provided convincing evidence suitable to raise serious doubts that a significant part of the disclosed range of layer thicknesses (allegedly at least 10%), and in particular a thickness of 1 µm, was not achievable without undue burden at the filing date.

2.2.1 In line with established case law of the boards, a successful objection of insufficient disclosure presupposes that there are serious doubts, substantiated by verifiable facts. In *inter partes* proceedings, the burden of proof lies with the opponent, which must establish, on the balance of probabilities, that a skilled person reading the patent, using common general knowledge, would be unable to carry out the invention.

However, the appellant's attempt to demonstrate that the invention was not workable within the disclosed range failed for the following reasons.

2.2.2 Contrary to the appellant's assertion, the declaration in affidavit D13 does not allow the conclusion that a layer thickness of 1 µm was not feasible at the filing date. D13 states that "ten years ago [i.e. in 2011, the priority year of the patent], no **industrial** technology allowing parts to be produced by additive manufacturing

using powder layers as thin as 1 µm was available" and that **"commercial machines"** were only available from 2013 onwards. However, it only follows from this assertion that a layer thickness of 1 µm was not a commercial standard at the filing date. It does not allow the conclusion that such values were not technically obtainable at that time.

2.2.3 D22 shows that, at least in a scientific context, layer thicknesses of 1 µm were successfully applied for selective layer sintering (SLS) before the filing date. The purpose of the investigation in D22 was to enhance the resolution in laser micro-sintering (see abstract) under normal atmosphere and at reasonable processing times. Even though the focus of D22 is the application of a particle size of 10 µm, there are also examples using a "tungsten nanopowder" having a "sub-micron" grain size at a layer thickness of 1 µm (see Table 1). The excellent resolution of the final parts obtained by such small particles and layer thickness is shown in Figures 6a and 6b. While according to D22 laser sintering with sub-micron particles needed extra effort in terms of processing time and atmosphere to be applied, these extra efforts do not represent an undue burden in the context of sufficiency of disclosure.

2.2.4 Contrary to the appellant's assertion, D3 does not provide convincing evidence either that a general "operability threshold" for powder-based added manufacturing processes exists due to particle agglomeration.

D3 is only directed to SLS, and its conclusion herein cannot be applied to all powder-based layer-by-layer techniques. As far as the appellant refers to the effects of agglomeration and satellite formation

described in D3 (see Figures 4.3 to 4.5), this is only disclosed for a specific powder of stainless steel ("acier inoxydable") particles having a particle size in the range of 11 to 45 µm (see abstract and Figure 4.3). Therefore, the statement made in D3 does not allow drawing any conclusions for powder-based added manufacturing processes in general applying a particle powder suitable for 1 µm thick layers. Such a powder was not investigated in D3.

2.2.5 While textbook D14 confirms that "when particle size decreases", detrimental effects due to powder agglomeration can occur (reduced powder "flowability", see chapter 5.4.1: "Powder Handling Challenges"), D14 does also not disclose that there is an operability threshold at or above a layer thickness of 1 µm.

2.2.6 The appellant's references to documents D1 and D3 are also not relevant.

D1 refers to a stereolithography process using powder in a polymer solution, and the problem of agglomeration of particles as described in D3 does not apply here. The same applies for D2, which discloses a stereolithography method using ceramic particles in paste form, and problems of agglomeration are thus not comparable to SLS methods as in D3 either.

2.2.7 A further argument raised during the oral proceedings before the Board was that also the upper boundary value of the disclosed range (100 µm) was not enabled since it was not described how to evacuate such large particles through the evacuation hole. This argument is not persuasive either as the size of the powder evacuation hole is not limited in the claim, and feature [F7] functionally requires that the loose

powder can be evacuated and thus implies limitations to the minimum size of the hole. Determining a suitable size of evacuation holes for such particles is well within the capabilities of the skilled person.

2.3 No undue burden for the selection of feasible layer thickness values

2.3.1 As set out above, the invention is workable over the whole range of layer thicknesses described in the patent.

While the invention is not restricted to a particular layer thickness, a certain layer thickness has nevertheless to be chosen by the skilled person when carrying out the claimed invention, as do other layer formation related parameters, such as the layer-by-layer forming method, the to-be-obtained resolution of the final product, the particle size of the powder, the powder material and the operation parameters related to the energy input.

It is apparent to the skilled person that for certain layer-by-layer forming methods, there are technical limits to the layer thickness *per se*, and that these limits may also vary for certain particle materials, particle sizes, etc.

2.3.2 A watch case middle as defined in claim 1 is not a product inherently requiring a very high resolution for its production (this might be different for other products in which high precision is a prerequisite, for example, micro-reactors or other micro-functional parts such as disclosed in D22, which indeed discloses the use of 1 µm thick layers, see D22, chapter 3.2). This is in line with the fact that a uniform layer thickness

of 20 µm is the only example mentioned in the patent (paragraph [0030]) and that in paragraphs [0012] and [0030], no purpose for the selection of the end points is outlined. Even though high precision might in certain embodiments be desired, e.g. for aesthetic reasons, this must be balanced with the efforts for the layer-by-layer production method (for example the increased production time). Nothing else is taught in paragraph [0037] which ends with the conclusion that the finishing of the watch case middle can be done better by machining tools.

2.3.3 It is uncontested and confirmed by the evidence on file that at least layer thicknesses down to 20 µm were state of the art at the filing date.

Textbook D14 provides a comprehensive overview of powdered material based additive manufacturing methods, i.e. details about the materials, particle sizes and operational parameters to be applied. The skilled person learns, for example from chapter 3.3, that a typical ("nominal") layer thickness is 100 µm but varies for different layer-by-layer techniques such as fused deposition (FD) or SLS. With this information, the skilled person has the necessary common general knowledge to carry out the method of claim 1 and the embodiments of the dependent claims (the latter not being challenged by the appellant).

Textbook D15 refers to standard commercial processes (see page 71: "Commercially available systems offer layer thicknesses of [13 to 510 µm]" in a stereolithography polymer solution).

D3 gives in Table 1.1 an overview over commercially available layer thicknesses ("épaisseur des couches") for SLS between 10 and 80 µm.

D6 (a patent document focused on SLS processes) states that layer thicknesses of 20 to 100 µm are commonly applied ("Üblicherweise", see paragraph [0012]). The choice of the layer thickness is linked to the required resolution of the product details (see paragraph [0016]).

2.3.4 In view of this common general knowledge and the fact that claim 1 is not directed to a specific powder-based layer-by-layer technique applying a defined layer thickness, the ratio of G 1/03 (see Reasons 2.5.2) applies: "there is a large number of conceivable alternatives and the specification [complemented with common general knowledge] contains sufficient information on the relevant criteria for finding appropriate alternatives over the **claimed** range [here: the invention according to claim 1, without any restriction as to the layer thickness] with reasonable effort". G 1/03 also states that if this is the case, the inclusion of non-working embodiments (which are not even proven in the present case) are of no harm.

Thus, in the case at hand, the question whether the lower end value of 1 µm of the range described in paragraphs [0012] and [0030] of the patent was obtainable without undue burden could anyway not put into doubt sufficiency of disclosure.

This is also true with respect to the appellant's argument that small layer thicknesses were only feasible with laser sintering. Even if it were established that a combination of a certain material, a

layer-by-layer process and a value of layer thickness close to 1 µm was not feasible at that date, the skilled person would, applying their common general knowledge, simply not have considered working at such processing conditions.

2.3.5 Given this, nor is it persuasive that the statement in paragraph [0037] of the patent according to which "it is envisaged that in the future additive manufacturing processes will enable the thickness of the layers to be reduced and hence for a better overall precision of the features of case middle to be achieved" was an attempt to extend the protection to layer thicknesses to "something which was not obtainable at the filing date", as argued by the appellant.

3. Article 100(a) EPC in conjunction with Article 56 EPC

The only objection of lack of inventive step was based on D2 as the starting point.

3.1 The admittance of combination documents D25 and D27 to D30 submitted by the appellant was challenged by the respondent. As far as reference is made to these documents in the following assessment, the question of their admittance can be left undecided since they cannot successfully support the appellant's position for the reasons explained below.

3.2 D2 is a realistic starting point as it discloses a process for forming a watch case middle (Figure 15) from a powdered material (see chapter 2.1: a ceramic powder is dispersed in a photopolymerisable monomer forming a high-viscosity paste). The monomer is selectively polymerised layer by layer by UV radiation

to form a green part from which uncured powder paste is removed ("cleaned from non-polymerized suspension"). The green part is subsequently debinded, and the ceramic particles are bonded by application of an energy source (sintering).

According to the examples in the figures, the parts obtained can have complex structures, partly with through-holes. According to page 7, chapter 4.2, first paragraph "the possible elaboration of parts is virtually limitless".

3.3 Distinguishing features

3.3.1 It is common ground that D2 does not disclose that at least one cavity is formed in the watch case middle of Figure 15 by the layer-by-layer process (feature [F6]). Consequently, D2 does also not disclose that at least one powder evacuation hole located at the bottom surface is formed (see features [F7] and [F8], according to claim 1, the hole can be formed by any means, see paragraph [0034]).

Claim 1 clearly distinguishes between "cavity" and "powder evacuation hole". The appellant's argument that claim 1 encompasses a powder evacuation hole having substantially the same cross-sectional dimension as the cavity is not a technically reasonable interpretation.

3.3.2 It was under dispute whether the subject-matter of claim 1 encompasses the stereolithographic process disclosed in D2. For the following reasons, this is not the case.

As described above, D2 describes an indirect particle fusing process, wherein an intermediate green body is

formed by binding the ceramic particles via a cured polymer.

It is true that the wording "from powdered material" of feature [F4] alone would not exclude that the powdered material is embedded in a paste matrix as in D2. It is also true that an indirect processing method (i.e. binding the particles by means of a polymer before fusing them) is encompassed by the patent (see paragraphs [0023] and [0033]: "fused, melted or otherwise united together by way of an additive manufacturing process").

However, the method step "removing loose powder" in feature [F7] is not in line with the stereolithographic process disclosed in D2. The term "loose" as used in the patent does not only refer to the fact that particles are not bound to other ceramic particles. It requires that they can move independently of each other.

This is not the case for the high-viscosity paste used in D2, even if this paste may comprise up to 60% particles. Assuming for the benefit of the appellant that the person skilled in the art would provide cavities with one or more evacuation holes on the bottom surface destined to be covered by the watch back, after the solidification step, there would still be a paste of uncured material in the cavity and not a loose powder. In view of this difference, it is of no relevance whether it was common general knowledge or even shown in D2 by the capillary embodiments of Figure 26 that evacuation of uncured paste from cavities was possible by, for example, rinsing or reducing viscosity by ultrasound vibrations.

The appellant's argument that the powder particles in the paste of D2 were loose as the dispersant and that other additives were used to prevent agglomeration and settling of the powder (D2, paragraph 2.1) is not persuasive. To the contrary, the dispersant and other additives serve to distribute and stabilise the powder particles in the paste (for example, to prevent an inhomogeneous distribution of particles in the paste) such that these particles cannot move independently. Given the paste's high viscosity (see D2, page 3, last paragraph and Figure 5), its flowability is very limited, and the powder particles are not loose as they cannot separate from the paste matrix. Therefore, the uncured high-viscosity powder-containing paste of D2 is not a loose powder suitable to be removed from a cavity via a powder evacuation hole as defined by feature [F7].

Feature [F7] thus implies a layer-by-layer forming method substantially different to that disclosed in D2, i.e. based on a loose (usually dry) powder fusion process. Such processes are described in chapter 5 of textbook D14 (for the dry powder processes for ceramic particles, see chapter 5.5.2, first paragraph). While such processes can also encompass indirect processing methods (see D14, Figure 5.7 in which polymer-coated loose particles are applied), they do not encompass a paste-based photolithographic process as disclosed in D2. The appellant's argument with reference to D6 that it was commonly known to optionally mix loose metal powders with a binder (see D6, paragraph [0022]) and that thus there was no clear-cut distinction possible is not persuasive. D6 refers to a low-melting binder, which is not in liquid form but is used either corresponding to the method disclosed in Figure 5.7 of D14 or by adding polymer particles to the metal powder,

still resulting in a loose powder, not a high-viscosity paste.

The appellant's attempt to construe the term "loose powder" more broadly by reference to the ultrasonic consolidation (UC) process mentioned in paragraph [0033] of the patent is not persuasive. The UC process is not relevant for the understanding of the term "loose powder" as it is based on the lamination of foils and is thus not an embodiment of the powder-based process defined by claim 1. Therefore, it cannot support the appellant's broad understanding of the term "loose powder" as "uncured material" in general.

The appellant's reference to documents D27 to D30 and D13 to prove that for very small powder particle sizes, slurry/paste-based layer-by-layer methods were preferable even for common dry powder bed processes is not in contradiction with the above conclusions.

Therefore, as set out in the decision under appeal, the subject-matter of claim 1 only encompasses additive manufacturing methods which are based on loose (dry) powder to be evacuated from cavities filled with uncured powder. This is a further distinguishing feature over the process disclosed in D2.

3.3.3 Thus, D2 does not disclose the following features of claim 1:

(a) forming at least one cavity and one powder evacuation hole in the watch case middle
(b) removing loose powder from each cavity, which also implies applying a loose powder layer-by-layer forming process

(c) locating the at least one powder evacuation hole in the bottom of the case middle

As shown in the following paragraphs, features (a) and (b) in combination involve an inventive step. Feature (c) can thus be disregarded in the following assessment, and the questions whether it has a technical character and to which technical problem it contributes can be left open.

3.4 Effect and objective technical problem

3.4.1 Feature (a) (forming at least one cavity and powder evacuation hole in the watch case middle) has the effect of obtaining a watch case middle with a reduced overall weight and material consumption. This effect is mentioned in feature [F1] and in paragraphs [0005] and [0006] of the patent. However, a cost-saving effect is not proven. While indeed less material is used for the watch case middle, cost savings depend on the chosen material and the volume of the cavities (both undefined in claim 1) and must be balanced against the extra efforts for removing the loose material from the cavities (see D14, chapter 3.7.3).

The appellant argued that there was no such weight-reduction effect since a watch case middle with cavities could have a greater weight than one without cavities if materials of different weight or different dimensions were used. In the absence of a technical effect, there was thus no inventive step, in line with the principles set out in G 1/19.

This is not persuasive.

Applying a technically reasonable understanding of the subject-matter of claim 1, the skilled person recognises that the effect defined in feature [F1] ("having reduced weight") is linked to the feature "the case middle has the least one internal cavity formed within it" [F6] (for the underlying principle, see Case Law of the Boards of Appeal, 10th edn. 2022, II.A.6.1: "The patent must be construed by a mind willing to understand"). The claimed effect of reduced weight is achieved relative to a watch case middle with the same form, dimensions and materials but without any cavities as otherwise no meaningful comparison can be made with respect to "reduced weight" (see also paragraphs [0003] and [0022] of the patent). For the objection of lack of inventive step starting from D2, the reference for such a comparison is the watch case middle in Figure 15 of D2, and the weight reduction is a result of hollowing out this part.

As far as the powder evacuation hole is concerned, this (in combination with the cavity and the layer-by-layer method features) allows evacuating the loose (i.e. unbound) powder encapsulated in the cavities. This feature thus also contributes to the effect of reducing weight and material consumption.

3.4.2 Feature (b) (removing loose powder from each cavity, which also implies applying a loose powder layer-by-layer process, i.e. not in a paste matrix as in D2) facilitates evacuation of the powder from the cavity compared with the removal of an uncured high-viscosity paste as used in D2.

3.4.3 The provision of a cavity with a powder evacuation hole (feature (a)) and the evacuation of loose powder unbound during the layer-by-layer manufacturing process

from this cavity (feature (b)) thus address the common objective technical problem of adapting the method of producing a watch case middle disclosed in D2 to provide a lightweight watch case middle with reduced consumption of building material.

3.5 Obviousness

3.5.1 The Board considers it sufficiently proven for example by textbooks D14 (chapter 3.7.3: "hollowing out parts") and D15 (page 77), that hollowing out parts (distinguishing feature (a)) in powder-based layer-by-layer manufacturing methods, the provision of holes to remove the uncured precursor from the cavities and the cleaning out of these cavities was common general knowledge at the filing date of the patent. This is also confirmed by affidavit D13 (see point 2).

3.5.2 However, this is not the decisive question for the case in hand. The decisive question is whether the skilled person starting from D2 would have chosen a different layer-by-layer process in accordance with distinguishing feature (b) to implement the cavity according to distinguishing feature (a).

In D2, the stereolithographic process is purposely selected from various other additive manufacturing technologies because of advantages described on page 1, penultimate paragraph. As explained in the following paragraphs, the appellant has not presented a convincing motivation for the skilled person to deviate from the stereolithographic process of D2 as such motivation follows neither from common general knowledge nor from any of D16, D25 and D5 to D7.

3.5.3 Common general knowledge as represented by D14 and D15 does not provide a pointer towards the implementation of features (a) and (b). At most, it points the skilled person towards providing cavities and evacuation holes by the stereolithographic method disclosed in D2. The appellant itself argued that a skilled person would consider cleaning out uncured high-viscosity paste from a cavity feasible, even if it involved some effort.

3.5.4 Patent documents D6 and D7 disclose SLS and electro-beam methods for producing jewellery from a loose metal powder (see D6, claim 1 and D7, page 4, second paragraph). The provision of cavities and powder evacuation holes is described in both documents (D6: paragraph [0019]; D7: page 2, lines 25 to 30). However, it is not persuasive that the skilled person would consider a process for manufacturing metal parts for modifying the method for forming a ceramic watch case middle of D2. D7 further states that the principles disclosed in D7 "can be used for manufacturing both metal and polymer material", i.e. ceramic materials are not encompassed by the teaching.

The appellant's argument that the claim does not specify the material of the powder particles is not relevant for this conclusion. When assessing inventive step in accordance with the problem-solution approach, a to-be-combined teaching must be compatible with the features of the starting point and not with all possible embodiments the claim covers. In the case in hand, the starting point is the process of D2, which exclusively applies ceramic particle pastes.

3.5.5 D5 discloses an additive manufacturing process based on fused deposition manufacturing (FD) using thermoplastics (see paragraphs [0016] and [0020]). Even

though the formation of hollow structures is included in the disclosed method (see paragraphs [0012] and [0013]), FD is not a process in which unbound loose powder is removed from the cavity as required by feature [F7]. Instead, FD works with filler material (such as wax) to be removed afterwards. D5 is thus not directed to a process according to the invention and cannot render obvious feature (b).

3.5.6 D16 is a document presenting a software for a 3D printer. While indeed on page 2 of D16 (chapter "Prepare Models") there is a prompt towards the objective technical problem ("Easily hollow solid objects to reduce weight and save money"), it is not apparent how to prepare the ceramic watch case middle using the high-viscosity paste of D2 with a 3D printer according to D16.

3.5.7 D25 confirms that "hollow structures" with "flushing holes" can be produced by stereolithography (see page 261). However, this would not prompt the skilled person to change the layer-by-layer processing method to dry powder.

4. As none of the appellant's objections is persuasive, the appeal is not successful.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Spira C. Herberhold

Decision electronically authenticated