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Datasheet for the decision of 15 October 2020

Case Number: T 1759/14 - 3.4.03

Application Number: 05803386.1

Publication Number: 1810085

IPC: G03F7/20

Language of the proceedings: EN

Title of invention:
A SYSTEM AND A METHOD FOR GENERATING PERIODIC AND/OR QUASI-PERIODIC PATTERN ON A SAMPLE

Patent Proprietor:
Eulitha AG

Opponent:
SÜSS MicroTec SE

Headword:

Relevant legal provisions:
EPC 1973 Art. 54
EPC Art. 52(1)
RPBA Art. 13(1)
RPBA 2020 Art. 25(3)

Keyword:

Admissibility of appeal - (yes)
Novelty - main request (no) - auxiliary request 1 (no)
Late-filed auxiliary requests - admitted (no)
Converging versions of claims - auxiliary request 2 (no)
Justification for late filing - auxiliary request 3 (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 1759/14 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 15 October 2020

Appellant: (Patent Proprietor)	Eulitha AG 5232 Villigen PSI (CH)
Representative:	Rentsch Partner AG Bellerivestrasse 203 Postfach 8034 Zürich (CH)
Respondent: (Opponent)	SÜSS MicroTec SE Schleißheimer Straße 90 85748 Garching (DE)
Representative:	Prinz & Partner mbB Patent- und Rechtsanwälte Rundfunkplatz 2 80335 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 23 June 2014 revoking European patent No. 1810085 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	G. Eliasson
Members:	S. Ward
	A. Jimenez

Summary of Facts and Submissions

I. This is an appeal by the patent proprietor against the decision of the Opposition Division to revoke the European patent EP 1 810 085 on the grounds that the subject-matter of independent claims 1 and 9 of the main and sole request was not new (Article 54 EPC) in the light of document D1.

II. The opposition had been filed against the patent as a whole. The cited grounds for the opposition were lack of novelty, lack of inventive step, insufficient disclosure and unallowable extension of subject-matter (Articles 100(a), 100(b), 100(c), 52(1), 54 and 56 EPC).

III. At the end of the oral proceedings held before the Board the appellant-proprietor (hereinafter, the proprietor) requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request or auxiliary request 1, filed with the letter of 8 June 2016, or on the basis of auxiliary request 2, filed with the letter of 28 October 2019, or on the basis of auxiliary request 3, filed during the oral proceedings.

The respondent-opponent (hereinafter, the opponent) requested that the appeal be rejected as inadmissible or that it be dismissed.

IV. The following document is referred to in this decision:

D1: DE 198 10 055 A1

V. (i) Claim 1 of the main request (including the feature labels used in the written procedure) reads as follows:

*"**1** A system for printing periodic and/or quasi-periodic pattern on a sample (S) by using an interference lithography technique using a grating mask (M), comprising:*

***1.1** a) a photon source (P)*

***1.1.1** that is either a spatially incoherent source in the sense of not providing spatially coherent illumination over the whole surface of the mask (M) or a spatially coherent source,*

***1.1.2** wherein the spatial coherence at the mask is large enough to ensure that a number of beams diffracted by the mask (M) are mutually coherent at the sample (S);*

***1.2** b) a mask (M) having a periodic or quasi-periodic pattern that corresponds to the desired pattern;*

***1.3** said mask (M) being disposed at a first distance from the photon source (P) or after intermediate optical elements such as collimators, collectors, mirrors, lenses, filters and apertures*

***1.3.1** wherein the area of the mask irradiated by the photon source corresponds substantially identical to the area on the sample irradiated by the diffracted photons thereby using all diffracted orders, including the zeroth order, to expose the sample (S); and*

***1.4** c) a sample holder for holding the sample (S)*

1.5 *being disposed in a second distance from the mask (M) on the side opposite to the photon source (P),*

1.6 *whereby the second distance is varied over a range of at least one periodic oscillation of the intensity distribution generated by the number of beams diffracted by the periodic features of the mask pattern in the direction orthogonal thereto during printing of the desired pattern in a recording medium on the sample (S) to obtain a desired average intensity distribution on the surface of the sample (S)."*

(ii) Claim 8 of the main request (including the feature labels used in the written procedure) reads as follows:

*"**8*** *A method for printing periodic and/or quasi-periodic pattern on a sample (S) by using an interference lithography technique using a grating mask (M), comprising:*

8.1 *a) providing a spatially incoherent source (P)*

8.1.1 *in the sense of not providing a spatially coherent illumination over the whole surface of the mask (M) or a spatially coherent source (P),*

8.1.2 *whereby the spatial coherence of the source (P) is large enough to ensure that a number of the beams diffracted by the mask (M) are mutually coherent at the sample (S);*

8.2 *b) providing the mask (M) having a periodic or quasi-periodic pattern that corresponds to the desired pattern;*

8.3 *c) disposing said mask (M) at a first distance from the photon source (P) or after intermediate optical elements such as collimators, collectors, mirrors, lenses, filters and apertures,*

8.3.1 *wherein the area of the mask irradiated by the photon source corresponds substantially identical to the area on the sample irradiated by the diffracted photons thereby using all diffracted orders, including the zeroth order, to expose the sample (S);*

8.4 *d) disposing a recording medium on the surface of the sample (S);*

8.5 *e) providing a sample holder for holding the sample (S);*

8.6 *f) disposing the sample (S) at a second distance from the mask (M) on the side opposite to the photon source (P),*

8.6.1 *whereby choosing the second distance to be varied in a continuous or discrete way over a range of at least one periodic oscillation of the intensity distribution generated by the number of beams diffracted by the periodic features of the mask pattern in the direction orthogonal thereto during printing of the desired pattern in the recording medium on the sample (S) to obtain a desired average intensity distribution on the sample; and*

8.7 *g) illuminating the sample (S) with the radiation originating from the photon source (P) and passing through the mask (M)."*

(iii) The claims of auxiliary request 1 are identical to the method claims (8-19) of the main request, renumbered as claims 1-12; the system claims (1-7) of the main request have been deleted.

(iv) The claims of auxiliary request 2 are identical to the claims of the main request except:

- the following feature has been appended as the final feature of claim 1:
"d) the recorded image has a frequency-multiplied periodicity related to the pattern of the mask (M)";

- the following feature has been appended as the final feature of claim 8:
"h) recording an image with a frequency-multiplied periodicity related to the pattern of the mask (M)";

- claim 19 has been deleted.

(v) The claims of auxiliary request 3 are identical to the method claims (8-18) of auxiliary request 2, renumbered as claims 1-11; the system claims (1-7) of auxiliary request 2 have been deleted.

VI. The Board sent the parties a communication pursuant to Article 15(1) RPBA. The provisional view of the Board was that the appeal was admissible and the requests of the proprietor then on file should be admitted into the proceedings. Moreover, even if some of the reasoning in the contested decision concerning the origin of the Newton's rings in D1 was incorrect, D1 might still be relevant for assessing novelty. Any conclusion reached on this matter for claim 1 of the main request would be likely to apply to method claim 8 (and hence claim 1 of the auxiliary request) also.

VII. The proprietor's arguments, insofar as they are relevant to the present decision, may be summarised as follows:

(i) The appeal was admissible. The statement of grounds of appeal provided an explanation why the Opposition Division's analysis was flawed, and also why the amendments made on appeal further distinguished the claims from D1.

(ii) The main request should be admitted into the proceedings. There was no requirement in appeal to maintain the claims rejected by the Opposition Division unamended. The word "pattern" had been erroneously included in the claims submitted with the statement of grounds of appeal, and its subsequent deletion merely rectified this error.

(iii) The subject-matter of claim 1 of the main request was novel over D1, as feature 1.6 was not disclosed in this document (a sample holder was also not explicitly disclosed).

D1 disclosed that parasitic interference patterns, such as Newton's Rings, were caused by small irregularities, such as elevations of the photo resist layer, and were not generated by diffraction from the mask pattern as required by claim 1.

Moreover, feature 1.6 defined an intensity distribution having periodic oscillations in the direction orthogonal to the mask, which implied a three dimensional intensity distribution, such as a Talbot distribution. The Newton's rings phenomenon was an essentially two dimensional effect which was localised

at the sample surface. Any periodic intensity variation on the surface of the photoresist was due to the movement of the sample and was therefore a time dependent local effect. The three dimensional intensity distribution implied by the claim was independent of the sample movement.

Even under the opponent's interpretation that the oscillations could be generated by the movement of the sample, they would not be periodic, as the Newton's rings were of unequal thickness, as shown in Fig. 2 of D1, and the movement would also generate a lateral shift in the centre of the Newton's rings pattern. Fig. 2 of D1 showed that the Newton's rings would not cover the entire sample, and intensity oscillation of the rings would become aperiodic at the outermost diameter.

(iv) The first auxiliary request comprised only the method claims 8 to 19 of the main request, renumbered. The deletion of the system claims was motivated by the disclosure of Document D1 with respect to the system claims.

(v) Auxiliary requests 2 and 3 should be admitted into the proceedings. The late filing of auxiliary request 2 was occasioned by the Board's opinion that D1 was possibly novelty destroying, even if some of the technical arguments in the decision were incorrect. Auxiliary request 3 was filed to repair the mistake of including device claims in auxiliary request 2.

Both these requests clearly limited the scope of the claimed subject-matter with respect to the previous requests and established novelty and inventive step over D1.

VIII. The opponent's arguments, insofar as they are relevant to the present decision, may be summarised as follows:

(i) The appeal was inadmissible. The grounds of appeal violated Rule 99(2) EPC because it was only explained why the revised claims filed with the grounds of appeal allegedly satisfied the requirements of the EPC, and not why the claims presented by the patentee in the opposition proceedings were incorrectly held as not meeting the requirements of the EPC.

(ii) The main request should not be admitted into the proceedings. There had been a systematic recourse to new amendments throughout the procedure. At oral proceedings before the Opposition Division the proprietor deleted the word "pattern" from features 1.3.1 and 8.3.1, only to re-instate it on appeal, and then to delete it again with the present set of claims. The amended claim sets were *prima facie* not allowable.

(iii) The subject-matter of claim 1 of the main request lacked novelty over D1. The only point of dispute was feature 1.6, and this feature was also disclosed in D1, as could be demonstrated in several ways.

In relation to the Newton's rings, claim 1 did not require that the intensity distribution referred to in feature 1.6 was generated by diffraction from the mask, but only that it was "generated by the number of beams diffracted by the periodic features of the mask pattern". As there was no light in the gap between the mask and the sample other than beams diffracted by the mask (including the zeroth order), the Newton's rings pattern had to be generated by these beams.

Moreover the Newton's rings of D1 displayed an intensity distribution having periodic oscillations in the direction orthogonal to the mask, in that the intensity distribution at the sample surface (which was actually the only intensity distribution which mattered) would vary periodically as the sample was translated in the z direction. The subject-matter of claim 1 of the main request was therefore not novel over D1.

(iv) The proprietor had given no reason why a different conclusion should be reached for the corresponding method claim 1 of auxiliary request 1, and hence this subject-matter lacked novelty over D1 also.

(v) Auxiliary requests 2 and 3 should not be admitted into the proceedings.

Auxiliary request 2 reintroduced system claims which had been dropped from auxiliary request 1, and hence the requirement for convergence with respect to the previous requests was not met.

Moreover, no good reason had been given why auxiliary requests 2 and 3 were not filed much earlier in the proceedings. It was not surprising that the Board expressed the provisional opinion that D1 was possibly novelty destroying on the basis of the Newton's rings; this was precisely the finding of the Opposition Division in the contested decision.

The additional feature of the claims of auxiliary requests 2 and 3 was similar to a feature discussed in the final paragraph on page 7 of the statement of grounds of appeal. The proprietor argued that this feature was absent from D1, thereby further emphasising

the novelty and inventiveness of the claimed system and method. Hence, an auxiliary request incorporating this feature could have been filed at this stage, but was not.

Reasons for the Decision

1. *Admissibility of the appeal*

1.1 According to Rule 99(2) EPC the statement of grounds of appeal shall indicate *inter alia* the reasons for setting aside the decision impugned. The reasons may include arguments that the decision of the Opposition Division was flawed, but this is not an absolute requirement for admissibility. Where amended claims have been filed, an appeal may also be admissible if sufficient reasons are given in the statement of grounds of appeal why the amendments are considered apt to remedy the deficiencies identified by the Opposition Division (*Case Law of the Boards of Appeal, 9th Edition 2019, V.A.2.6.5c*)).

1.2 In the present case, the proprietor's statement of grounds of appeal comprises arguments of both types. Firstly, it is explained (page 3, final paragraph to page 5, first paragraph) why the proprietor considers the Opposition Division to have been wrong in its assessment of the origin of Newton's rings, and why this led it to an incorrect judgement that claim 1 lacked novelty over D1. Secondly, it is explained (page 1, final paragraph) why the amendments to the claims filed on appeal further differentiate the claimed intensity distribution from the Newton's rings of the prior art, "thereby now better distinguishing over D1".

1.3 The arguments of the proprietor therefore satisfy the requirements of Rule 99(2) EPC, and the appeal is admissible.

2. *Admission of the Main Request into the Proceedings*

2.1 Claims 1 and 8 of the main request have been amended compared to the requests filed with the statement of grounds of appeal only by the deletion of the word "pattern" in features 1.3.1 and 8.3.1. The proprietor explained that this word had been deleted from the claims on which the contested decision was based, but inadvertently reinserted in the claims filed with the statement of grounds of appeal. The amendment to the present request rectified this error. The Board sees no reason to doubt this explanation or to regard this amendment as an abuse of procedure.

Moreover, the reason why the word "pattern" was deleted at oral proceedings was that both the Opposition Division and the opponent had argued that the presence of this term contravened the requirements of Article 123(2) EPC. Hence, its removal from the present main request is not in conflict with the requirements of Rule 80 EPC.

2.2 Whether the proprietor's requests comply with the requirements of the EPC or not is the subject of the present appeal. The Board is not persuaded, however, that the amendments made to the main request in appeal are *prima facie* unallowable, i.e. that it is so immediately clear that they do not comply with the requirements of the EPC that this request should not even be admitted.

2.3 The main request is therefore admitted into the procedure.

3. *Article 100(a) EPC: Novelty in relation to D1*

3.1 During the oral proceedings the proprietor was asked by the Board whether it accepted that all of the features of claim 1 of the main request, with the exception of feature 1.6, were disclosed in D1. In reply the proprietor mentioned only that the sample holder (feature 1.4) might not be disclosed explicitly, but did not challenge the response of the Board that a sample holder was at least implicitly disclosed. Hence, the question of novelty boils down to determining whether feature 1.6 (described by the proprietor as the "essence of the invention") is disclosed in D1. Feature 1.6 reads as follows:

"whereby the second distance is varied over a range of at least one periodic oscillation of the intensity distribution generated by the number of beams diffracted by the periodic features of the mask pattern in the direction orthogonal thereto during printing of the desired pattern in a recording medium on the sample (S) to obtain a desired average intensity distribution on the surface of the sample (S)."

In the following, for convenience of reference, the direction orthogonal to the mask is referred to as the z direction, and the coordinates in planes parallel to the mask are referred to as x and y.

3.2 D1 (Fig. 1) discloses a system and method for near-field holography, whereby a mask is placed a short distance from a photoresist layer to be exposed, and the mask is irradiated at 45° by parallel light. The

transmitted 0th-order light interferes with the 1st-order light, which is diffracted by 90°, and the resulting standing wave allows a sharp image of the mask to be transferred to the photoresist.

A second interference effect disclosed in D1 (column 2, lines 2-30; Fig. 2) arises from unevenness of the photoresist layer which causes interference fringes ("Newton's rings") to appear in the thin layer between the mask and the photoresist. According to D1, the undesirable intensity fluctuations caused by the Newton's rings may be eliminated by continuously and periodically changing the distance A (Fig. 1), thereby smearing the interference fringes, so that they appear merely as a background and the sharpness of the transmitted patterns is maintained.

3.3 In the contested decision (Reasons, point 15.4) the Opposition Division found that feature 1.6 was disclosed in D1 as a result of the Newton's rings. In the reply to the statement of grounds of appeal (pages 10 to 13, section 4), the opponent also argued that this was the case, and this argument was maintained throughout the appeal procedure (additional arguments on novelty were also presented; see e.g. letter of 28 September 2016, sections 8 to 8.4).

3.4 In determining whether feature 1.6 is disclosed in D1 as a result of the Newton's rings, the following two questions arise:

(a) can the intensity distribution of the Newton's rings be said to oscillate periodically in the direction orthogonal to the mask (with the distance between mask and sample being varied over a range

of at least one periodic oscillation of this intensity distribution); and

(b) can the intensity distribution of the Newton's rings be said to be "generated by the number of beams diffracted by the periodic features of the mask pattern".

3.5 In relation to question (a), the proprietor argued that the claim was to be understood as defining the generation of a fixed three dimensional intensity distribution, having a periodic intensity variation in the z direction, in the region behind the mask. This periodicity would be apparent at any instant and was not dependent on the motion (or even the existence) of a sample or sample holder.

3.6 The Board accepts (and this was also not disputed by the opponent) that the intensity distribution of the Newton's rings disclosed in D1 would not correspond to this type of three dimensional periodic intensity distribution. At any given instant, the Newton's rings would be localised in the thin cavity between the mask and the sample, and no z-periodicity would be apparent. Moreover, the Newton's rings would disappear if the sample were removed.

3.7 However, D1 discloses (column 2, lines 2-30) that the distance A (Fig. 1) is continuously changed during exposure by moving either the mask or the object to be exposed (column 2, lines 31-34). This causes the Newton's rings to expand and contract over the exposure area (Fig. 2), so that they become merely a smeared-out background.

3.8 Suppose a fixed point P were defined on the surface of the photoresist such that it coincided initially with a bright interference fringe. If the sample were moved in the z direction, the fringes would shift (expand or contact) in the x-y plane, until P was eventually coincident with a dark fringe adjacent to the original bright fringe. If the sample were moved further in the z direction, point P would eventually be coincident with the next bright fringe. As a result of the movement of the sample in the z direction, the intensity at P would have oscillated from bright to dark and back to bright again, and the intensity would continue to vary periodically for as long as the motion in the z direction continued.

The z variation in D1 may be up to a few wavelengths (column 2, lines 20-21), which the skilled person would understand would correspond to more than one intensity cycle or oscillation. Hence, in the terminology of claim 1, "the second distance is varied over a range of at least one periodic oscillation".

By this means one may "obtain a desired average intensity distribution on the surface of the sample (S)", i.e. the Newton's rings are averaged out to an essentially constant background, which does not detract from the image of the mask to be exposed.

3.9 The Board accepts that this second type of periodicity, which arises due to the motion of the sample, is different from the first type of periodic intensity distribution discussed above under point 3.5, and the Board can also accept the proprietor's assertion that claim 1 of the main request was intended to cover the first type of periodic intensity distribution.

However, in the assessment of novelty, the relevant question is not what the claim was intended to cover, but what actually falls within its ambit. For the reasons given above, the Board judges that the second type of periodic intensity variation disclosed in D1 falls within the ambit of claim 1 of the main request.

3.10 It was argued by the proprietor at oral proceedings that even if the claim were considered to extend to variations in the intensity at the photoresist due to motion of the sample in the z direction, this variation would not be truly periodic, as required by the claim.

3.11 Firstly, the proprietor argued that the Newton's rings are of unequal thickness, as shown in Fig. 2 of D1, and that this would lead to an aperiodic intensity variation.

The Board does not agree. Fig. 2 of D1 shows that, at a fixed position in the z direction, the rings are not precisely periodic in the x-y plane (the rings become slightly thinner with increased radius). However, starting from the pattern shown in Fig. 2 of D1, if the sample were moved in the z direction to expand or contract the rings through precisely one periodic cycle, the ring pattern would be identical to the starting pattern. In particular, a point P fixed in the x-y plane and initially coincident with the n^{th} bright ring would, after being moved in the z direction through one periodic cycle, be coincident with the expanded $(n-1)^{th}$ or contracted $(n+1)^{th}$ bright ring, which would now have the same thickness the n^{th} ring had before the sample was moved. After moving through a second periodic cycle, the ring pattern would again be identical to the starting pattern. The Board does not

see, nor did the proprietor persuasively explain, why this would lead to aperiodicity in the z direction.

3.12 It was also argued by the proprietor at oral proceedings that motion of the sample in the z direction would lead to a lateral shift in the centre of the Newton's rings pattern, which would render the intensity distribution non-periodic.

The Board is not persuaded. This effect is not mentioned in D1, and does not appear to figure in any of the proprietor's written submissions. It was therefore for the proprietor to explain this argument in detail at oral proceedings. This should have included a convincing explanation of how, and under what circumstances this effect arises; why, in general, this effect would render the intensity variation at the sample aperiodic; and why this aperiodicity would arise even for the very small movements in the z direction disclosed in D1 (one or a few wavelengths; column 2, lines 20 to 21).

The proprietor's submissions in this regard are, in the opinion of the Board, little more than assertions, which do not plausibly establish that the intensity variation on the moving sample in D1 would deviate from periodicity.

3.13 A further argument was that, even if a periodic intensity variation were acknowledged over parts of the sample, this would not be the case at the outermost edges of the Newton's ring pattern. The Board does not see the relevance of this argument. Even if true, it is not claimed that the periodic oscillations of the intensity distribution must extend over the entire surface of the sample.

Hence, in the light of the above considerations, the Board answers question (a), posed above under point 3.4, in the affirmative.

3.14 Regarding question (b), feature 1.6 requires that the periodic intensity distribution be "generated by the number of beams diffracted by the periodic features of the mask pattern". The proprietor contended that this was to be interpreted in the sense that the intensity distribution was generated *directly by diffraction* from the mask.

3.15 The Board's view, however, is that the literal wording of the claim would allow this feature to be understood to include embodiments where the intensity distribution is generated (by some means) from that light ("the number of beams") which has been (previously) diffracted by the periodic features of the mask. In D1, the thin film interference phenomenon giving rise to the Newton's rings occurs in the thin layer between the mask and the recording medium, and the only light disclosed as being present in that region is that which has been diffracted by the mask into one of the diffraction orders (including the zeroth). Thus the Newton's rings intensity distribution in D1 is "generated by the number of beams diffracted by the periodic features of the mask pattern".

3.16 Hence, on the basis of the wording of the claim, the Board's view is that the disputed feature can be identified in D1. For the purpose of assessing novelty, it is debatable to what extent a claim may be interpreted in the light of the description. However, in the present case, even if guidance on interpretation were to be sought in the description, this would only

further support a broad interpretation. The principal basis for the disputed feature is on page 4, lines 27-29 (column 3, lines 31-33 of the patent specification), and reads as follows:

"The image on the sample is due to the interference of a number of diffracted beams generated by the periodic patterns on the mask".

The image is not disclosed as being due to diffraction from the mask, but rather as arising due to interference among beams diffracted by the mask. In the Board's view this represents an accurate description of the manner in which the Newton's rings arise in D1, and is entirely consistent with the broad interpretation of this feature set out above under point 3.15.

3.17 In the light of the above, the Board therefore also answers question (b), posed above under point 3.4, in the affirmative.

As a result, the Board judges that all features of claim 1 of the main request are disclosed in combination in D1, and hence the claimed subject-matter is not new within the meaning of Article 52(1) EPC and Article 54 EPC 1973. The patent cannot therefore be maintained according to the main request.

4. *Auxiliary Request 1*

4.1 During the oral proceedings the opponent stated that it no longer maintained its objection to admitting auxiliary request 1 into the proceedings, and since the Board also has no objection in this regard, auxiliary request 1 is admitted into the proceedings.

4.2 Auxiliary request 1 comprises the method claims of the main request, but not the system claims. Claim 1 (the sole independent claim) is directed to a method with steps essentially corresponding to the features of the system of claim 1 of the main request.

4.3 Clearly, the point of filing such a request is to serve as a back-up position, so that if the Board were to reject the main request, it might nevertheless be persuaded to maintain the patent according to auxiliary request 1.

Since the Opposition Division found that claim 1 of the main request lacked novelty over D1, it was a foreseeable possibility that the Board might reach the same conclusion. In this case, to persuade the Board to maintain the patent according to auxiliary request 1, it should have been evident to the proprietor that it would need to demonstrate why the claimed method was novel, even if the claimed system had been found not to be novel over D1.

4.4 The Board is unable to identify any persuasive argument to this effect, either in the statement of grounds of appeal, or in the proprietor's subsequent written submissions. In oral proceedings the proprietor only advanced arguments in support of claim 1 of auxiliary request 1 which would have been equally applicable to claim 1 of the main request, despite the Board having already stated that it considered this subject-matter to lack novelty over D1.

4.5 In the absence of any arguments why the Board should reach a different conclusion for auxiliary request 1 to that reached for the main request, the Board finds that the subject-matter of claim 1 of auxiliary request 1 is

not new within the meaning of Article 52(1) EPC and Article 54 EPC 1973. The patent cannot therefore be maintained according to auxiliary request 1.

5. *Auxiliary request 2: Admission into the Proceedings*

5.1 Auxiliary request 2 was filed (with the letter of 28 October 2019) after the statement of grounds of appeal. The opponent argued that it should not be admitted into the proceedings, as it could have been filed earlier and it reintroduced system claims which had been abandoned in auxiliary request 1.

The original summons to oral proceedings was dated 18 February 2019, and hence, according to Article 25(3) RPBA 2020, Article 13 RPBA 2007 applies in the present case (in fact the same conclusion would be reached in relation to the second summons dated 20 December 2019).

5.2 Article 13(1) RPBA 2007 states the following:

"Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy".

5.3 The Jurisprudence of the Boards in relation to the admittance of amended claims submitted during appeal proceedings is summarised in *Case Law of the Boards of Appeal, 9th Edition, 2019*, V.A.4.12. In particular, in the first paragraph of section V.A.4.12.4, the following is stated:

"It is settled case law that the admissibility of amendments depends, among other things, on whether the amended claims converge with or diverge from the subject-matter previously claimed, i.e. whether they develop and increasingly limit the subject-matter of the independent claim of a main request in the same direction and/or in the direction of a single inventive idea, or whether they entail different lines of development because, for instance, they each incorporate different features ...".

5.4 In the present case, the main request comprised both system and method claims, and auxiliary request 1 comprised only method claims. Auxiliary request 2 reintroduces system claims. The proprietor defended the admission of auxiliary request 2 into the proceedings on the grounds that the late filing was a response to the Board's provisional opinion. However, even if that argument were accepted (it will be discussed below in relation to auxiliary request 3), no argument was offered why incorporating claims to a system into auxiliary request 2, when no claims of this category appeared in auxiliary request 1, was consistent with the requirement that new requests should be convergent with existing requests.

5.5 For this reason, in the exercise of the discretion given to it under Article 13(1) RPBA 2007, the Board refuses to admit auxiliary request 2 into the proceedings.

6. *Auxiliary request 3: Admission into the Proceedings*

6.1 Auxiliary request 3 was filed at oral proceedings before the Board and comprises only the method claims of auxiliary request 2. According to the proprietor,

this request repaired the "mistake" of including system claims in auxiliary request 2. The Board accepts that this request overcomes the objection of lack of convergence raised in relation to auxiliary request 2.

Since the claims of auxiliary request 3 were already comprised in auxiliary request 2, the Board also accepts that they were effectively "on the table" before the oral proceedings.

However, auxiliary request 2 was itself filed at a late stage in the proceedings, and so the question remains why these claims could not have been filed earlier, in particular with the statement of grounds of appeal as part of the proprietor's "complete case" within the meaning of Article 12(2) RPBA 2007.

6.2 The proprietor argues that the late filing was a direct response to the provisional opinion expressed in the Board's communication. In particular, while the Board accepted the proprietor's point that some of the arguments of the Opposition Division were technically incorrect (point 7.7), it nevertheless concluded that D1 might be relevant for the question of novelty (point 7.8).

6.3 In general, the boards admit amendments filed in response to objections, evidence or comments which were not part of the decision under appeal but which were raised in writing during the appeal proceedings (*Case Law of the Boards of Appeal, 9th Edition, 2019*, V.A. 4.12.3).

However, the Board's provisional opinion that the Opposition Division may have reached the correct conclusion (even if some of the reasoning in the

decision might have been incorrect) was not a new objection which was not part of the decision under appeal, it was the Board's provisional assessment of the merits of the very objection which led to revocation, which does not open the door to new requests.

6.4 Moreover, the amended feature of claim 1 of auxiliary request 3, by which the proprietor seeks to establish novelty over D1, is the following:

"recording an image with a frequency-multiplied periodicity related to the pattern of the mask (M)".

6.5 The final paragraph of page 7 of the statement of grounds of appeal reads as follows:

"Furthermore, based on the teaching of D1, the period of a grating pattern printed using near-field holography or shadow projection exposure is the same as the period of the grating pattern in the mask (col. 1, lines 64-67). Using the method of the present invention, however, the period of a line-space pattern printed on a sample is half that of the line-space pattern in the mask (p.13 last 3 lines p.14, line 10 and fig. 10, p.7, last 3 lines - p.8, line 17; and fig 1). This result is completely absent from and utterly unpredicted by D1, thereby further emphasising the novelty and inventiveness of the claimed system and method" (underlining in the original).

6.6 While the wording of this passage is not identical to that of the additional feature of auxiliary request 3, it is clear that, even at the stage of drawing up the statement of grounds of appeal, the proprietor appreciated that it might be necessary to rely on a

further feature for "emphasising" novelty over D1, and that a feature defining the periodicity of the image to be different to that of the mask might be suitable to achieve this. It is therefore reasonable to expect an auxiliary request to have been filed with the statement of grounds of appeal having independent claims incorporating such a feature. The Board sees no legitimate reason for withholding such a request until a late stage in the procedure.

6.7 In summary, the Board judges that the filing of auxiliary request 3 at a late stage in the proceedings cannot be justified as being a response to the Board's provisional opinion; if the proprietor had intended to rely on such a request, it could and should have been filed with the statement of grounds of appeal. The Board therefore exercises its discretion under Article 13(1) RPBA 2007 to refuse to admit auxiliary request 3 into the proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Sánchez Chiquero G. Eliasson

Decision electronically authenticated