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**Datasheet for the decision  
of 4 July 2023**

**Case Number:** T 1408/19 - 3.4.03

**Application Number:** 11162291.6

**Publication Number:** 2511939

**IPC:** H01J37/244, H01J37/28

**Language of the proceedings:** EN

**Title of invention:**

Arrangement and method for the contrast improvement in a charged particle beam device for inspecting a specimen

**Patent Proprietor:**

ICT Integrated Circuit Testing Gesellschaft für  
Halbleiterprüftechnik mbH

**Opponent:**

Carl Zeiss Microscopy GmbH

**Relevant legal provisions:**

EPC Art. 108, 56

EPC R. 76(2) (c)

RPBA Art. 12(4)

**Keyword:**

Admissibility of appeal - (yes) - admission of the line of attack forming the basis of the appeal is not a legal requirement for the admissibility of appeal  
Late-filed facts - no reason not to admit new line of attack  
Admissibility of opposition - (yes) - corrigible erroneous reference  
Inventive step - (yes)

**Decisions cited:**

T 0344/88, G 0007/95, T 0748/91

**Catchword:**

On the admissibility of an opposition in case the publication data of a piece of evidence is erroneous in the notice of opposition (Reasons, point 2)

Rule 76(2)(c) EPC merely requires an **indication** of the facts and evidence presented in support of the argued grounds for opposition, but not necessarily every piece of evidence need already be presented along with the notice of opposition. For an admissible opposition it is normally sufficient that the indications given in the notice of opposition permit the substantive content of the offered evidence to be established only at a later stage, provided that this substantive content can be established without undue effort and still within a reasonable time. (Reasons, point 2.5.1)



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Case Number: T 1408/19 - 3.4.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.03**  
**of 4 July 2023**

**Appellant:** Carl Zeiss Microscopy GmbH  
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**Representative:** Carl Zeiss AG - Patentabteilung  
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**Respondent:** ICT Integrated Circuit Testing Gesellschaft für  
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**Representative:** Zimmermann & Partner  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 20 March 2019  
rejecting the opposition filed against European  
patent No. 2511939 pursuant to Article 101(2)  
EPC.**

**Composition of the Board:**

**Chairman** M. Stenger  
**Members:** M. Ley  
T. Bokor

## Summary of Facts and Submissions

- I. The appeal is against the decision of the opposition division rejecting the opposition against European patent EP 2 511 939 B1 pursuant to Article 101(2) EPC.
- II. At the end of the oral proceedings before the board, the appellant-opponent (hereinafter: *appellant*) requested that the appealed decision be set aside and that the European patent be revoked in its entirety.
- III. At the end of the oral proceedings before the board, the respondent-proprietor (hereinafter: *respondent*) requested that the appeal be rejected as inadmissible or at least dismissed, or that the decision under appeal be set aside and the patent be maintained in amended form on the basis of any one of auxiliary requests 1 to 9 submitted with the reply to the statement setting out the grounds of appeal.
- IV. Reference is made to the following documents:  
  
EP 1 068 630 B1 (E2)  
Dictionary of Microscopy, 2005, John Wiley & Sons, Ltd., page 33
- V. Claim 1 as granted has the following wording (appellant's feature labelling):  
  
*A charged particle beam device for inspecting a specimen, comprising*  
**a** *a charged particle beam source (5) adapted to generate a primary charged particle beam (7) and*  
**b** *an objective lens device (40, 45) adapted to*

direct the primary charged particle beam onto the specimen (3);

- c1** a retarding field device (46, 47) adapted to accelerate secondary charged particles starting from the specimen (3),
- c2** wherein a first group (17a) of the secondary charged particles comprises secondary charged particles starting from the specimen with high starting angles, and a second group (17b) of the secondary charged particles comprises secondary charged particles starting from the specimen with low starting angles;
- d1** a first detector device (15) having a circular shape,
- d2** comprising at least two detector segments for detecting secondary particles,
- d3** a central opening (16), wherein the central opening (16) is configured for letting pass the primary charged particle beam (7) coming from the charged particle beam source (5) and for letting pass the first group (17a) of the secondary charged particles;
- e** wherein the objective lens device (40, 45) is adapted such that particles with different arbitrary starting angles from the specimen (3) exhibit crossovers at substantially the same distance from the specimen, forming a common crossover (90), and
- f1** a first aperture (100) located between the objective lens and the detector,
- f2** having an opening with a diameter equal to or smaller than the central opening (16) in the detector device (15), and
- g** which is provided in a position which fulfills at least one of the following properties:

- (i) it is in the vicinity of the common crossover (90),*
- (ii) it is at a position in the vicinity of the magnetic lens gap in an area of the maximum spread of stray electrons.*

VI. Claim 8 as granted has the following wording:

*A method of inspecting a specimen with a charged particle beam device, comprising*  
*generating a primary charged particle beam (7) on a first optical axis;*  
*focusing the primary charged particle beam onto the specimen (3) using an objective lens device (40, 45);*  
*generating a secondary charged particle beam by the primary charged particle beam at the specimen, the secondary charged particle beam comprising a first group (17a) of secondary charged particles starting from the specimen with high starting angles (18) and a second group (17b) of secondary charged particles starting from the specimen with low starting angles (19);*  
*focusing the secondary charged particle beam, such that particles with different arbitrary starting angles from the first group and from the second group exhibit crossovers in substantially the same distance from the specimen (3), forming a common crossover (90);*  
*blocking stray electrons with a first aperture (100) disposed between the objective lens device (40, 45) and a detector (15) having a circular shape, wherein the detector (15) has a central opening (16) configured for letting pass the primary charged particle beam (7) and for letting pass the first group (17a) of the secondary charged particles, and*  
*wherein the first aperture (100) has an opening with a*

*diameter equal to or smaller than the central opening (16) in the detector device (15); and detecting particles of the secondary charged particle beam.*

VII. The parties' relevant arguments can be summarised as follows:

1) Appellant:

The subject-matter of independent claims 1 and 8 as granted did not involve an inventive step over the disclosure of document E2. Detector 74 with opening 77 shown in figure 8 of E2 was a first aperture within the meaning of claim 1, detector 91 with its opening being the first detector. The claimed relationship between the dimensions of both openings was either derivable from figure 8 of E2 or at least obvious to the skilled person.

2) Respondent:

The appellant had based the appeal exclusively on new arguments and new attacks that had not been presented during the first-instance proceedings. This new line of attack should not be admitted into the appeal proceedings. In the absence of admissible appeal grounds the appeal should be rejected as inadmissible.

The opposition was insufficiently substantiated due to the erroneous citation of the publication number of document E2, and therefore was not admissible.

The appellant had not questioned the findings of the opposition division relating to alternative (ii) of feature g in claim 1 as granted, see paragraphs 39. to

39.2 of the impugned decision. Alternative (ii) of claim 1 was therefore not made the subject of the appeal proceedings.

The subject-matter of claims 1 and 8 as granted with alternative (i) did involve an inventive step (Article 56 EPC) over the disclosure of document E2. Detector 74 of figure 8 cannot be an aperture within the meaning of claims 1 or 8.

### **Reasons for the Decision**

1. Admissibility of the appeal, admission of the new line of attack into the appeal proceedings
  - 1.1 The major part of the usual formal requirements for the existence and admissibility of the appeal (fee, time limit, adversely affected party, etc.) were undisputed, and the board is satisfied that these requirements were met.
  - 1.2 According to the respondent, the appellant had based its appeal exclusively on new arguments and new attacks that had not been presented during the first-instance proceedings, either in writing or during the oral proceedings, and that had therefore also not been considered in the decision under appeal. These arguments were late-filed. Accordingly, the appeal - including only late-filed arguments and attacks - was to be rejected as inadmissible.

Document E2 was interpreted differently in the statement setting out the grounds of appeal from its interpretation during the opposition procedure. In particular, the "first aperture" was equated with the opening 44 ("Druckstufenblende 44", "Öffnung 41") of E2



during the opposition proceedings. In contrast, in the statement setting out the grounds of appeal, the "first aperture" was equated with the opening 77 of detector 74 in E2. The "first detector device" was equated with detector 91 of E2, and not with detector 74, contrary to the view of the opposition division. To support this argument, the appellant submitted a new document (page 33 of the *Dictionary of Microscopy*). For these reasons, this new interpretation of E2 corresponded to a new line of argument.

As a consequence, features c1, e, f1 and f2 were mapped to completely new features of document E2, so that a wholly fresh case was presented on appeal. The new line of argument was also not *prima facie* relevant.

In addition, the respondent submitted that no reasons had been provided as to why this new line of argument had been presented now and not earlier, during the opposition proceedings.

Finally, the respondent submitted that the new line of argument was actually an objection concerning novelty and not an objection concerning inventive step. Since inventive step was the only ground of opposition raised during the opposition proceedings, the newly-raised objection, even if presented as being a lack of inventive step, concerned novelty and consequently presented a new ground which should not be admitted into the proceedings.

- 1.3 The appellant pointed out that document E2 had been discussed throughout the opposition proceedings. The interpretation that detector 74 of figure 8 in E2 was a first aperture within the meaning of feature f1 was a reaction to the impugned decision, namely the

opposition division's conclusion that detector 91 of figure 8 could not be the first detector within the meaning of feature d1.

- 1.4 The board observes that the respondent did not present any formal legal basis for its argument that the new and arguably inadmissible attack directly leads to inadmissibility of the appeal. The board is not convinced that, apart from the factual basis, the argument is correct in law. The board is not aware of any legal provision, either in the EPC or in the RPBA, that would stipulate inadmissibility of the appeal as the legal consequence where no attacks remain in the appeal as a result of their non-admission. Nor is this supported by the case law. The fact that attacks presented in the appeal may not be admitted in the course of examination of the appeal does not lead to the (retroactive) finding that the appeal was not reasoned (and hence inadmissible), but at most to the dismissal of the appeal. Whether the reasons are suitable for achieving the purpose of the appeal is a question of allowability and not admissibility, at least as long as such reasons are not manifestly insufficient or irrelevant. The board's possible finding on the non-admittance of the attack is based on the board's discretionary powers. By contrast, the usual admissibility conditions of an appeal are stipulated by specific legal provisions, normally requiring that the board examine these conditions *ex officio*. The board's finding on the admissibility of the appeal is not a discretionary decision, but follows directly from the letter of the law. However, this question need not be decided in the present case, as the board refrained from not admitting the argued new attack, as set out below.

1.5 The board holds that the appellant had not based its appeal on a different (new) ground for opposition. In the statement setting out the grounds of appeal, the appellant raised the ground of lack of inventive step and not of lack of novelty, in line with the opposition procedure. Although it seems that the objection made is in substance comparable to a novelty objection, the appellant did not formally raise a new ground. The appeal can thus not be dismissed on that basis (see also Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, V.A.2.6.4 a)).

According to Article 12(4) RPBA 2007, which is applicable in view of Article 25(2) RPBA 2020, without prejudice to the power of the board to hold inadmissible facts, evidence or requests which could have been presented in the first-instance proceedings, everything presented by the parties under Article 12(1) RPBA 2007 shall be taken into account by the board if and to the extent it relates to the case under appeal and meets the requirements in Article 12(2) RPBA 2007.

The board is of the view that the line of argument presented by the appellant for the first time in the statement setting out the grounds of appeal is *prima facie* relevant to the outcome of the appeal, contrary to the respondent's submission.

Furthermore, it is based on the same evidence that was considered, during the opposition proceedings, as representing the closest state of the art, namely document E2. That is, neither the ground for opposition nor the evidence has changed. The fact that the appellant interprets document E2 in its statement setting out the grounds of appeal differently from the way it was interpreted in the opposition proceedings is

not sufficient to consider the new line of argument as being late-filed. On the contrary, the allegation of lack of novelty in view of the closest prior-art document E2 can be considered in the context of deciding upon the ground of lack of inventive step as set out in decision G 7/95, OJ 1996, 626, Headnote.

The appellant in its statement setting out the grounds of appeal presents a discussion concerning the interpretation of detector 91 of E2 in the context of the claim. The opposition division was of the opinion that detector 91 could not be referred to as the "first detector device", and the appellant responded thereon. The new line of argument is thus a direct response to the decision of the opposition division.

For the reasons set out above, the board sees no reason to hold inadmissible (Article 12(4) RPBA 2007) the appellant's line of argument with respect to E2. It is thus part of the proceedings and must be taken into account by the board.

In view of the above, the board also sees no reason to hold the appeal inadmissible on the basis of the respondent's own argument, quite apart from the board's observations made in point 1.4 above.

## 2. Admissibility of the opposition

- 2.1 The opposition division held that the opposition was admissible and, in particular, that the requirements of Rule 76(2)(c) EPC were met.

In the notice of opposition, document E2 was indicated by a number (EP1068360) and a name ("Essers"). From the reasoning in the notice of opposition, it was apparent

beyond any doubt that E2 concerned a scanning electron microscope. EP1068360, i.e. E2, as indicated in the notice of opposition, concerned a method and device for quantifying DNA and RNA. This was immediately apparent as an error, the subject-matter concerning quantification of DNA being too far away from scanning electron microscopes.

For the opposition division it was decisive that the proprietor was in a position to retrieve the correct publication number of E2 in a patent database by using the name "Essers" as the name of the inventor of E2 and a database query such as "scanning electron microscope", and thus without needing to undertake further investigations.

The opposition division also cited decision T 344/88, in which it had been concluded that it would be taking formal requirements too far to reject the opposition simply because the wrong number had been given for a cited patent specification.

Based on these findings, the opposition division accepted the correction according to Rule 139 EPC and did not qualify the opposition as inadmissible.

- 2.2 The respondent disagreed, and maintained its view that the opposition was insufficiently substantiated and, therefore, inadmissible, without explicitly stating what should be the legal consequence if the board were to accept the respondent's argument. However, based on the procedural situation leading to the appeal, namely the rejection of the opposition by the division, the logical consequence of the argued inadmissible opposition can only be the dismissal of the opponent's appeal. Thus the board takes it from the respondent's

submissions that this argument is provided in support of the requested dismissal of the appeal.

2.3 The respondent argued as follows:

According to Rule 76(2)(c) EPC, a notice of opposition should contain the grounds on which the opposition is based, as well as an indication of the facts and evidence presented in support of these grounds. The content of the statement of grounds must be such as to enable the patent proprietor and the opposition division to examine the alleged ground for revocation without recourse to independent enquiries.

Document E2 was referenced with the publication number EP 1 068 **360** (instead of EP 1 068 **630**), which related to a document presenting a method for quantifying DNA. Therefore the proprietor could not form any opinion or judgement on the facts presented. The line of argument based on document E2 consequently missed its goal, rendering the opposition unsubstantiated, contrary to the requirements of Rule 76(2)(c) EPC.

The respondent further did not share the opposition division's view that E2 could be directly identified without recourse to independent enquiries and further investigations. From the incorrect publication number and the name "Essers" it was not possible to identify the correct publication number of E2 using e. g. Espacenet. When trying to do so, the respondent found 378 results. Unacceptable independent enquiries and further investigations would therefore have been necessary to enable the proprietor to understand the objections raised. The mere specification of a name could not be sufficient to provide the evidence required for a substantiated opposition.

During the oral proceedings before the board, the respondent stated that decision T 344/88, page 8, second paragraph, last sentence held that, for an admissible opposition, the opposition division should have been able to identify the correct publication number within the nine-month period according to Article 99(1) EPC. This would not have been possible in the present case, because the notice of opposition was filed on the last day of said nine-month period.

- 2.4 The appellant agreed with the opposition division that the correct publication number of E2 was retrievable without undue effort by the opposition division, the respondent or the board.
- 2.5 The board shares the opposition division's opinion concerning the erroneous citation of document E2, and refers in this context to decision T 344/88 (Reasons for the decision, point 6.).
- 2.5.1 The board observes that Rule 76(2)(c) EPC merely requires an **indication** of the facts and evidence presented in support of the argued grounds for opposition, but that not necessarily every piece of evidence need already be presented along with the notice of opposition. Clearly, an offered witness testimony can inevitably be given only after the filing of the notice in which the particulars of the witness are indicated. However, the effective evidence will be available to the division only later. On that basis, it should also be sufficient if the indications given in the notice of opposition permit the substantive content of the evidence offered to be established only at a later stage, provided that this substantive content can be established without undue effort and still within a reasonable time, e. g. in good time for the

preparations of the division for oral proceedings or the like. Witness evidence is regularly only available at the oral proceedings.

- 2.5.2 In the present case, the notice of opposition stated that the subject-matter was not new and/or inventive in view of a European patent, and detailed reasons were provided, making it at least plausible that such a patent indeed existed, and was not merely a phantom or imaginary document. The description of the citation was sufficiently detailed in the notice of opposition that the proprietor and the opposition division could clearly identify the document from the available material on the basis of the information provided by the opponent. For example, section 1.2 of the notice of opposition provides a detailed description of the content of E2. Contrary to the respondent's submission, the board finds that a search in Espacenet using "Essers" as applicant and either the class of the patent in suit "H01J37" in the field "CPC" or the word "microscope" in the field "title" provides document E2 as the first or second result, respectively.
- 2.5.3 Hence the correct document E2 is easily selected from Espacenet without excessive investigations using the expression "Essers" and the additional information that E2 deals with an "electron microscope" (or even simply a "microscope").
- 2.5.4 Therefore the facts and evidence submitted in accordance with Rule 76(2)(c) EPC are sufficient for the ground of opposition to be correctly understood by the opposition division and the proprietor, and to be able to be examined as to its validity.



2.5.5 As to the respondent's argument relating to page 8, second paragraph, last sentence of decision T 344/88, the board takes the view that a requirement that the opposition division must actually be able to identify the correct publication number within the nine-month period according to Article 99(1) EPC cannot be derived therefrom. The relevant passage states (point 6 of the Reasons, second paragraph, translation by the board): "It is not relevant whether the Office has actually corrected the error in the period remaining between receipt of the notice of opposition and the expiry of the opposition period. The only decisive factor is that, within the opposition period, the oversight was evident and that the description of the document enabled the Opposition Division to identify it beyond any doubt." In the board's reading, the required "enablement" of the division only means that the necessary information should be available within the time limit, but it is not required that the division also check whether it is indeed in a position to correct the error by itself and still within the time limit. This is clear from the first sentence of the cited passage.

The board observes that this is also the only sensible interpretation of the cited findings of T 344/88. It would be completely unrealistic to expect the opposition division to immediately check such errors - it follows from the normal daily operation of the Office that the division will be assigned to the file only later, and in all likelihood will not even see the file within the opposition period.

On that basis, and in agreement with decision T 344/88, the present board also takes the view that in the case at hand it is decisive that all material and

information necessary for (possibly later on) establishing the correct publication number of E2 was submitted prior to expiry of the nine-month period according to Article 99(1) EPC.

In conclusion, the admissibility of the opposition is not called into question by the erroneous publication number of E2 in the notice of opposition. With respect to the line of attack using E2, the opposition was clearly substantiated. Since the argument is rejected, the board must also reject dismissing the appeal (or holding it inadmissible) on the basis of this argument.

3. Opposed patent

The opposed patent relates to a charged particle beam device (e. g. a scanning electron microscope) configured to image a specimen 3 with a charged particle beam, particularly for inspection applications, testing applications, lithography applications and the like, as well as to a respective inspection method, see [0001] and figure 2 of the opposed patent (reproduced below).

A primary electron beam 7 is directed onto the specimen 3 using the objective lens device 40, 45. Secondary electrons are emitted by the specimen 3 and at least partially pass back through the objective lens device 40, 45.

The objective lens device 40, 45 is adapted such that secondary electrons with different starting angles exhibit crossovers at substantially the same distance from the specimen, forming a common crossover 90, see paragraphs [0021] and [0022] of the opposed patent.

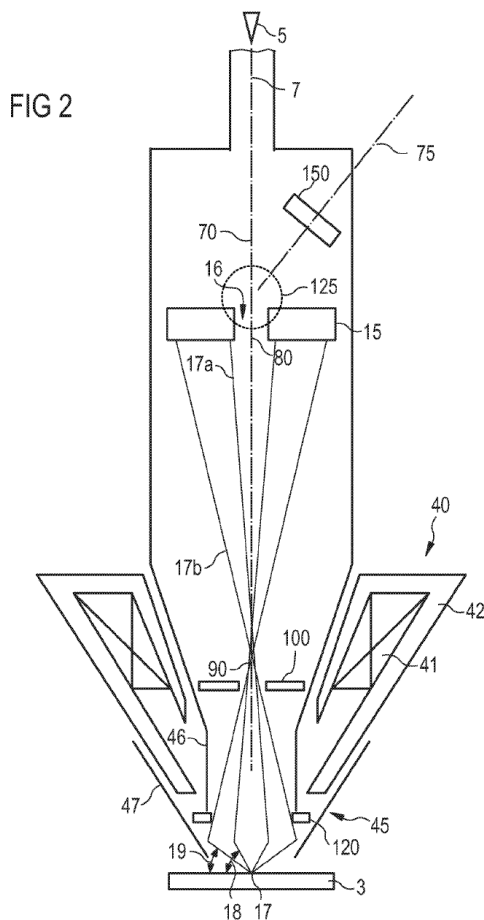


Figure 2 of the opposed patent

A detector 15 with a circular shape and a central opening is provided. Secondary electrons starting from the specimen 3 with high starting angles (with respect to the specimen surface) carrying little topographic information pass through the central opening of the detector 15 (towards optional second detector 150), and secondary electrons starting from the specimen 3 with smaller starting angles carrying most of the topographic information are detected by the first detector 15, see paragraph [0023] of the opposed patent.

According to claim 1, the circular detector 15 is segmented, i.e. comprises a plurality of segments. Each

segment can detect a defined portion of the secondary particle angular spectrum and thus creates topographic contrast, see paragraph [0033] of the opposed patent.

A first aperture 100 is provided between the objective lens 40, 45 and the detector 15. According to a first claimed alternative (i), the first aperture 100 is provided in the vicinity of the common crossover 90 and serves for blocking stray electrons which should not contribute to the signal of the topographic detector 15. These blocked electrons in the secondary electron spectrum may be high-energy electrons which would create stray electrons upon collision with device components or would subsequently be randomly scattered over the topographic detector. These unwanted electrons are not focused by the objective lens to the common crossover 90 and can therefore be blocked in an effective way by the first aperture 100, which is arranged in the vicinity of the common crossover 90, see paragraphs [0024] to [0026] of the opposed patent.

The first aperture 100 has an opening with a diameter equal to or smaller than the opening in the topographic detector.

According to a second claimed alternative (ii), the first aperture 120 for blocking the stray electrons is arranged at a position in the vicinity of the magnetic lens gap in an area of the maximum spread of the stray electrons.

4. Inventive step (Article 56 EPC)

4.1 The opposition division held that document E2 could not render the subject-matter according to granted claim 1 obvious. The "first detector device" defined in claim 1

could not correspond to detector 91 of E2. Only detector 74 could correspond to the first detector, but lacked detector segments. The aperture of E2 (i.e. opening 41) was not located between the objective lens and the detector. E2 was silent on the size of the opening 77 of detector 74.

- 4.2 The appellant argued that document E2 disclosed at least features a, b, c1, c2, d1, d2, d3, e, f1 and g of claim 1 and the corresponding features of claim 8.

E2 described a scanning electron microscope ("Rasterelektronenmikroskop"), which is a charged particle beam device for inspecting a specimen, comprising a charged particle beam source (figure 9, cathode 99, [0028], [0098]) adapted to generate a primary charged particle beam (figure 8, reproduced below, and figure 9, [0029]).

An objective lens device adapted to direct the primary charged particle beam onto the specimen was disclosed in paragraphs [0029] and [0031], figure 1, elements 48, 50, 55, 62 and 64. Secondary electrons were generated, see paragraph [0037].

As electrode 50 was earthed (figure 4) and the beam tube 55 (figure 8) connected to a high voltage, primary electrons were decelerated. The same electric field accelerated secondary charged particles starting from the specimen (paragraph [0100], when the microscope was operated without elements 18 and 44), see also paragraph [0038].

Fig. 8

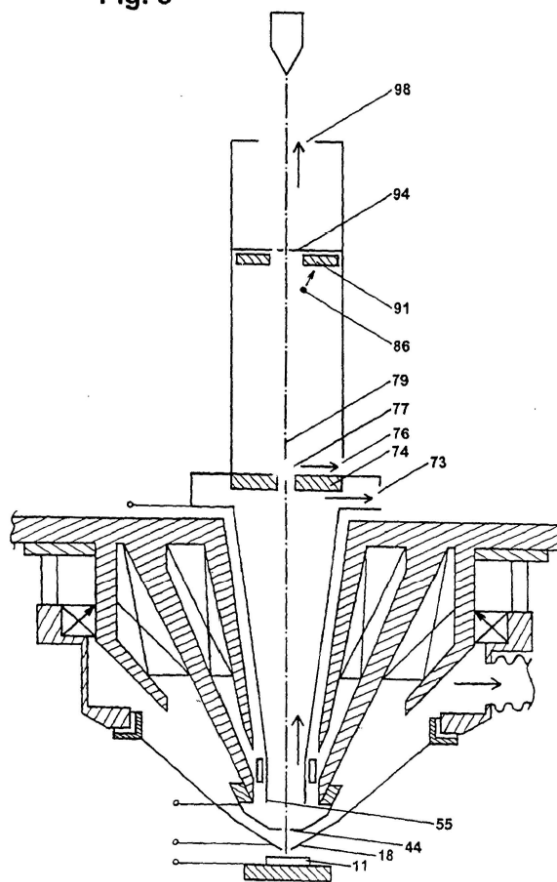


Figure 8 of document E2

Paragraph [0100] further disclosed secondary electrons emitted with low starting angles with respect to the optical axis (i.e. in a direction close to the optical axis). These could be grouped in accordance with feature c2 of claim 1. Paragraph [0100] also made it clear that one aim of detector 91 in E2 was to improve the contrast in case of a specimen with topology (*"Sie sind für die Untersuchung tiefer Löcher und stark zerklüfteter Strukturen erforderlich, für die der zusätzliche obere Detektor in idealer Weise geeignet ist."*).

Detector 91 had a circular shape with a central opening for passing the primary electron beam coming from cathode 99 (figure 8, [0100]) and comprised at least two detector segments for detecting secondary particles ([0100]). It corresponded to detector 15 of figure 2 of the opposed patent and to the first detector within the meaning of feature d1 of claim 1, contrary to the opposition division's view. Although not explicitly mentioned in E2, the opening of detector 91 was arranged so that secondary electrons moving close to the optical axis of the primary electron beam passed detector 91, these secondary electrons forming the "first group" according to claim 1, whereas detected secondary electrons formed the second group. This was due to the fact that the opening was arranged centrally so that primary electrons of the first group of secondary electrons (moving close to the optical axis) were let through. Reference was made to figure 8 of E2 and figure 2 of the opposed patent. There was no reason why opening 16 of detector 15 (figure 2 of the opposed patent) would be arranged in accordance with features d1 to d3 of claim 1 and the opening of detector 91 would not.

According to the appellant, paragraph [0100] described a mode of operation of the electron microscope with secondary electrons being focused on opening 77 of detector 74, constituting a crossover within the meaning of feature e of claim 1.

An aperture was a hole or an opening in an optical system or detector through which radiation or matter passed, see Dictionary of Microscopy, page 33. Detector 74 was thus an aperture having an opening 77 and was located between the objective lens and the detector 91

(figures 8 and 9) in the vicinity of the common crossover 77.

According to paragraphs [0025], [0026], [0045] and [0046], stray electrons were generated when electrons impinged on electrode surfaces. It was further unavoidable that stray electrons were also generated by electrons impinging on electrodes 50 or 55 of E2. Such stray electrons were blocked by detector 74 in figure 8 of E2.

The appellant further argued that feature f2 of claim 1 was shown in figures 1, 8 and 9 of E2. According to decision T 748/91, size ratios could be inferred even from a schematic drawing. Moreover, paragraph [0100] taught the skilled person to reduce the size of the opening of detector 74 so as to reduce the number of secondary electrons passing therethrough. In any case, there were no more than two possibilities: opening 77 was either larger or smaller than the opening of detector 91. Feature f2 of claim 1 was thus obvious in view of the skilled person's common general knowledge.

Hence the subject-matter of independent claims 1 and 8 lacked inventive step (Article 56 EPC).

- 4.3 According to the respondent, claim 1 clearly defined two groups of secondary electrons, the first group being emitted at a starting angle close to the optical axis, and the second group at a starting angle far from the optical axis. The respondent argued that there was no indication that detector 91 in E2 would let pass any secondary electrons. Each secondary electron passing through opening 77 of detector 74 would be detected by detector 91, see paragraph [0095] and as indicated by reference sign 86 in figure 8 of E2. Detector 91 could



not be a detector configured for letting pass a first group and detecting a second group of secondary electrons.

Moreover, the skilled person would know that the term "aperture" has two possible meanings. Either it was used as a synonym of "opening", see page 33 of the Dictionary of Microscopy and also paragraphs [0027] and [0036] of the application as originally filed, i.e. paragraphs [0023] and [0032] of the opposed patent, ("aperture 16 of the detector", "the central aperture/opening 16"), or it was used for an element with an opening for letting pass light or particles. In view of the formulation of feature f1 ("a first aperture ... having an opening") and paragraphs [0029], [0030] and [0034] of the application as originally filed, i.e. paragraphs [0025], [0026] and [0030] of the opposed patent, this was the meaning to be given to feature f1 in claim 1. Hence an aperture with an opening was an entity for blocking stray electrons, i.e. a beam blocking device in which an opening is formed. A detector (e. g. detector 74 with opening 77) was not an aperture in accordance with feature f1. It manifestly did not block electrons as it was arranged for detecting electrons.

The respondent furthermore contested that paragraph [0100] disclosed a common crossover (feature e of claim 1), as it described unfavourable operating conditions that were to be avoided, and that feature f2 could be derived from figure 8 of E2. In any case, there was no prompt for the skilled person to select the claimed relationship between the sizes of the two openings in E2. On the contrary, the diameter of the opening of detector 91 should be as small as possible, at least smaller than the opening of detector 74.

The respondent furthermore questioned that electrodes 50 and 55 in E2 would provide an electric field such that secondary electrons were accelerated in a region close to the specimen, as required by feature c1 of claim 1.

Finally, the respondent pointed out that the aim of the present invention was to improve the topology contrast, which was not an aim in E2.

- 4.4 First, the board notes that claim 1 is not limited to any specific values of the "low" and "high" starting angles. In particular, it cannot be said that a "low starting angle" necessarily is an angle between  $0^\circ$  and  $45^\circ$  relative to the plane of the specimen and that a "high starting angle" necessarily is an angle between  $45^\circ$  and  $90^\circ$  relative to the plane of the specimen as mentioned in paragraph [0022] of the patent for the trajectories 17a and 17b of secondary electrons. Although claim 1 uses reference signs 17a and 17b, the electrons moving along or between trajectories 17a and 17b shown in figure 2 of the opposed patent are not the first and second groups of secondary electrons according to features c2 and d3. Instead, paragraph [0023] makes it clear that secondary electrons between trajectories 17a and 17b are electrons detected by detector 15 of figure 8 ("... electrons with trajectories in the angular range from 17a to 17b ... are detected by detector 15"), whereas claim 1 requires that the first group of secondary electrons (with "high" starting angles) pass through the opening of the detector, and leaves it open what happens with the second group of secondary electrons (with "low" starting angles).

It follows that claim 1 merely requires that the "low starting angle" be lower than the "high starting angle" and that secondary electrons emitted at the higher starting angle pass through the opening of the detector.

Turning to figure 8 of document E2, the board concurs with the appellant that detector 91 with its opening is arranged such that secondary electrons moving along a trajectory very close to the optical axis (i.e. the trajectory 79 of the primary electrons) pass through the opening. These secondary electrons form the "first group" according to claim 1. During the oral proceedings before the board, the respondent stated that it was not excluded in E2 that secondary electrons pass through the opening of detector 91.

It must therefore be assumed that the central opening of detector 91 is "configured for letting pass the primary charged particle beam coming from the charged particle beam source and for letting pass the first group of the secondary charged particles". It is undisputed that detector 91 has at least two detector segments for detecting secondary electrons as described in paragraph [0100] of E2, said secondary electrons forming the "second group". Thus no structural differences between detector 15 claimed in the opposed patent and detector 91 of E2 can be identified, as also pointed out by the appellant, and detector 91 of E2 could be a "first detector" within the meaning of features d1, d2 and d3 of claim 1.

However, the board accepts the respondent's arguments in relation to the term "aperture", in particular that the skilled person would not understand an "aperture with an opening" to be an "opening with an opening".

Instead, the wording of feature f1 and paragraphs [0025] and [0026] of the opposed patent imply that the aperture claimed is a structural element with an opening configured to block stray electrons, see also independent method claim 8, and that it cannot be equated with the opening 77 of a detector 74. The board does not share the appellant's view that the relative dimensions of the openings could be directly and unambiguously derived from figure 8 of E2 either.

In other words, document E2 does not disclose a first aperture located between the objective lens and the detector, having an opening with a diameter equal to or smaller than the central opening in the detector device, and which is provided in a position which fulfills at least one of the properties (i) or (ii).

Hence the board does not agree with the appellant's feature mapping provided in the statement setting out the grounds of appeal and during oral proceedings. As a consequence, the subject-matter of claim 1 differs from the disclosure of E2 at least by features f1, f2 and g. It also follows that the appellant's argument that there were only two possibilities for the size ratio of opening 77 and the opening of detector 91 is not relevant in view of the board's feature mapping.

Neither in the statement setting out the grounds of appeal nor during the oral proceedings did the appellant present arguments as to why the skilled person would provide a first aperture according to features f1, f2 and g in the scanning electron microscope of E2.

As pointed out by the respondent, the appellant did not provide any arguments with respect to alternative (ii)

at all, and thus accepted the opposition division's findings regarding alternative (ii).

During the oral proceedings, the respondent argued that an aperture in accordance with the distinguishing features f1, f2 and g provided the effects described in paragraph [0026] and illustrated in figure 3 of the opposed patent. For example, feature f2 provided an improved contrast. Without any counter-arguments, the board has no reason to call into question these explanations.

Hence the ground for opposition under Article 100(a) EPC in combination with Article 56 EPC does not prejudice maintenance of the patent as granted. The board sees no reason to overturn the opposition division's decision. Consequently, the appeal must fail.

## **Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



B. Atienza Vivancos

M. Stenger

Decision electronically authenticated