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# Datasheet for the decision of 10 October 2023

**Case Number:** T 2095/21 - 3.3.08

**Application Number:** 12776570.9

**Publication Number:** 2702175

**IPC:** C12Q1/68

**Language of the proceedings:** EN

**Title of invention:**
Methods and compositions for nucleic acid analysis

**Patent Proprietor:**
Bio-Rad Laboratories, Inc.

**Opponent:**
Bardehle Pagenberg Partnerschaft mbB
Patentanwälte, Rechtsanwälte

**Headword:**
Methods for nucleic acid analysis/BIO-RAD LABORATORIES

**Relevant legal provisions:**
EPC Art. 56, 99(1)
EPC R. 76, 77

**Keyword:**
Admissibility of opposition - acting on behalf of a third party
Main request and auxiliary requests 1 to 23 - Inventive step - (no)

**Decisions cited:**
G 0003/97, G 0004/97, T 0219/83, T 0270/90, T 0084/19

**Catchword:**

Europäisches Patentamt
European Patent Office
Office européen des brevets

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**Case Number: T 2095/21 - 3.3.08**

# D E C I S I O N
# of Technical Board of Appeal 3.3.08
# of 10 October 2023

| | |
|---|---|
| **Appellant:**<br>(Patent Proprietor) | Bio-Rad Laboratories, Inc.<br>1000 Alfred Nobel Drive<br>Hercules, CA 94547 (US) |
| **Representative:** | Helbing, Jörg<br>dompatent von Kreisler Selting Werner -<br>Partnerschaft von Patent- und Rechtsanwälten mbB<br>Deichmannhaus am Dom<br>Bahnhofsvorplatz 1<br>50667 Köln (DE) |
| **Respondent:**<br>(Opponent, opposition withdrawn) | Bardehle Pagenberg Partnerschaft mbB<br>Patentanwälte, Rechtsanwälte<br>Postfach 86 06 20<br>81633 München (DE) |
| **Representative:** | Berger, Axel Bernhard<br>Bardehle Pagenberg Partnerschaft mbB<br>Patentanwälte, Rechtsanwälte<br>Prinzregentenplatz 7<br>81675 München (DE) |
| **Decision under appeal:** | **Decision of the Opposition Division of the European Patent Office posted on 9 July 2021 revoking European patent No. 2702175 pursuant to Article 101(3)(b) EPC** |

**Composition of the Board:**

| | |
|---|---|
| **Chairwoman** | T. Sommerfeld |
| **Members:** | M. Montrone |
| | A. Bacchin |

## Summary of Facts and Submissions

I. The appeal of the patent proprietor ("appellant") lies from the decision of the opposition division revoking the European patent No. 2 702 175. This patent is based on European patent application No. 12 776 570.9 which was filed as an International patent application published as WO 2012/149042.

II. An opposition was filed against the patent in suit which was *inter alia* based on the grounds for opposition in Article 100 (a) EPC, in relation to inventive step (Article 56 EPC). The opposition division decided that the patent as granted (main request) and the subject-matter of auxiliary requests 1 to 23 lacked an inventive step over the disclosure of documents D14 and D15.

III. The opponent withdrew their opposition with the letter dated 30 July 2021 and thus ceased to be a party to the proceedings.

IV. With the statement of grounds of appeal, the appellant submitted arguments in relation to the inadmissibility of the opposition and in support of inventive step of the subject-matter of the claims as granted and of the claims of auxiliary requests 1 and 18.

V. In a communication pursuant to Article 15(1) RPBA, the appellant was informed of the board's preliminary opinion.

VI. In reply, the appellant resubmitted auxiliary requests 1 to 23 which had already been submitted with the letter dated 7 August 2020 and admitted into the

proceedings during oral proceedings before the opposition division (see minutes, points 7, 10 and 14).

VII. Oral proceedings were held in the presence of the appellant.

VIII. Claim 1 as granted (main request) reads:

"1. A method comprising:

a. subdividing a plurality of adaptors into a plurality of first partitions, wherein each of said first partitions has on average a first volume and wherein said adaptors comprise unique barcodes;

b. subdividing a sample comprising multiple polynucleotides into a plurality of second partitions, wherein each of said second partitions has on average a second volume, wherein said second volume is greater than said first volume;
wherein said first partitions are first droplets and said second partitions are second droplets; and wherein said second droplets comprises said first droplets;

c. merging at least one of said first partitions with at least one of said second partitions to form a merged partition; and

d. tagging one of said multiple polynucleotides, or fragment thereof at least 25 base pairs long, with at least one of said adaptors".

IX. Compared to claim 1 as granted (main request, see section VIII, above), all claims 1 of auxiliary requests 1 to 23 include one or more of the following additional features (see appellant's submission dated

19 March 2021, pages 2 and 3, numbering as referred to by the appellant):

- Amendment A ("feature A"): the feature "*where one first partition is fused to one second partition*" has been added to step c.;
- Amendment B ("feature B"): the feature "*wherein polynucleotides with barcode adaptors can be sequenced and the barcodes can be used to determine if two or more sequence reads were generated from one or more polynucleotides in the same partition*" has been added to step a.;
- Amendment C ("feature C"): the feature "*to form adaptor-tagged polynucleotides*" has been added to step d.; while the features "*analyzing the adaptor-tagged polynucleotides by sequencing*" and "*determining whether the adaptor-tagged polynucleotides were located in the same partitions, wherein the barcodes are used to identify which sequence reads came from the same partition*" have been added as further process steps;
- Amendment D ("feature D"): This amendment is identical to amendment C except that the feature "*performing library preparation in each of the plurality of partitions by pooling the contents of the partitions*" has been added as further process step;
- Amendment E ("feature E"): the feature "*greater than said first volume*" in step b. of claim 1 of the main request has been replaced by the feature "*at least two times said volume of said first volume*".

The following chart (submitted with the same submission) provides an overview of which auxiliary

request (AR) includes which additional feature(s) in claim 1:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| AR1 | X | | | | |
| AR2 | | X | | | |
| AR3 | | | X | | |
| AR4 | | | | X | |
| AR5 | | X | X | | |
| AR6 | | X | | X | |
| AR7 | | | | | X |
| AR8 | | X | | | X |
| AR9 | | | X | | X |
| AR10 | | | | X | X |
| AR11 | | X | X | | X |
| AR12 | | X | | X | X |
| AR13 | X | X | | | |
| AR14 | X | | X | | |
| AR15 | X | | | X | |
| AR16 | X | X | X | | |
| AR17 | X | X | | X | |
| AR18 | X | | | | X |
| AR19 | X | X | | | X |
| AR20 | X | | X | | X |
| AR21 | X | | | X | X |
| AR22 | X | X | X | | X |
| AR23 | X | X | | X | X |

X. The following documents are referred to in this decision:

D14: US 2011/033 854 A1

D15: US 2011/053 798 A1

XI. The appellant's submissions, insofar as relevant to the present decision, may be summarised as follows:

*Admissibility of the opposition*

The opposition was inadmissible. The opponent Bardehle Pagenberg Partnerschaft mbB ceased to be the legitimate opponent because during the oral proceedings before the opposition division the representative revealed the existence of a client when requesting an interruption of the oral proceedings "*for consultation with their client*". This behaviour created confusion as to the opponent's actual identity. Since the opponent openly admitted that they acted as straw man, the representative’s acting as an opponent became an abuse of due process within the meaning of decisions G 3/97 and G 4/97. According to these decisions, an opposition was inadmissible when there was evidence that a representative was acting on behalf of a third party.

*Main request*

*Inventive step - claim 1*

Document D14 represented the closest prior art. This document did not disclose a droplet-in-droplet emulsion before merging inner and outer droplets. Instead emulsions of individual and separate droplets were disclosed. Furthermore, while Figure 28 of document D14 disclosed some kind of unique labelling of one of its droplets, the document did not confer a unique labelling of the resulting droplet after merging.

Nor was a unique labelling of the resulting merged droplet disclosed in document D15. This document used codes for distinguishing droplet types from each other

(paragraph [0028]), rather than individual droplets. Furthermore document D15 disclosed no nucleic acid barcodes for tagging polynucleotide sequence samples or other means for barcoding droplets.
In light thereof the skilled person had no motivation to combine the teaching of documents D14 and D15.
Even if documents D14 and D15 were combined, the skilled person did not arrive at the subject-matter of claim 1. The use of codes as disclosed in document D15 in combination with document D14 did not result in a barcoding of droplets as defined in claim 1. This was derivable from paragraph [0027] in document D15 which disclosed that droplets after fusion lost their individuality.

*Auxiliary request 1*

*Inventive step - claim 1*

The presence of feature A in claim 1 (see section IX, above) required that all droplets merged in a one to one ratio, i.e. the feature excluded the merging of multiples droplets. Thereby the individual merged droplets kept their uniqueness due to their uniquely tagged contents. This was different from document D14. Although Figure 28 of document D14 disclosed a one to one merging of droplets this was - in the absence of a proper control - a theoretical result only. Document D14 disclosed also no experimental evidence for one to one droplet fusions. Therefore document D14, at best, disclosed on average a one to one droplet fusion which necessarily included the fusion of multiple droplets. This was corroborated by document D15 (paragraph [0009]) that reported technical difficulties in merging separate droplets in a controlled manner.

The one to one fusion of droplets as defined in claim 1 provided thus a more accurate labelling of merged droplets when compared to document D14.

*Auxiliary request 18*

*Inventive step - claim 1*

Claim 1 was amended by adding features A and E (see section IX, above). The claimed method thus required that solely two droplets merged with each other and that the second droplet which contained the polynucleotides had a volume of at least two times the volume of the first droplet containing the adaptors.

Feature E was not arbitrarily selected because it had technical effects. It controlled the droplets' sizes to be fused by defining a minimum volume ratio. By merging droplets of different volumes as defined in claim 1, desired adaptor dilutions were obtained while undesired dilutions of sample polynucleotides were avoided. For example, by merging larger polynucleotide droplets with smaller adaptor droplets, the adaptor concentration was more diluted relative to that of polynucleotides. This prevented undesired self-attachments of adaptors. In addition the use of different droplet sizes allowed the use of different amounts of polynucleotides and adaptors. The teaching of documents D14 and D15 neither disclosed nor pointed at the ability of controlling the fusion of polynucleotide and adaptor droplets by using defined minimum droplet volume sizes.
Irrespective thereof, a person skilled in the art was aware that when droplets of different sizes were merged, fluid dynamics and motility differences negatively affected a control of the droplets' merging. In view thereof the skilled person would have rather

merged droplets of equal sizes. That droplets of different sizes by using a droplet-in-droplet system as defined in claim 1 were nevertheless mergeable without encountering problems was surprising and not obvious in light of the teaching of documents D14 and D15.

*Auxiliary requests 2 to 17 and 19 to 23*

*Inventive step - claim 1*

Claims 1 of auxiliary requests 2 to 17 and 19 to 23 comprised permutations of features A to E (see section IX, above). The finding of the opposition division that these auxiliary requests did not involve an inventive step had to be overturned in view of the reasons provided for the main request, auxiliary requests 1 and 18. The introduction of features B to D defined the claimed method further which addressed the opponent's objection of a lack of essential features.

XII. The appellant requested:

- that the decision under appeal be set aside and that a patent be maintained as granted (main request), or in the alternative on the basis of the claims of one of auxiliary requests 1 to 23 as submitted with the letter dated 7 August 2020 and re-submitted with letter dated 11 September 2023;
- that the opposition of the opponent be held inadmissible.

## Reasons for the Decision

*Admissibility of the opposition (Article 99(1) in conjunction with Rules 76 and 77 EPC)*

1. With their statement of grounds of appeal, the appellant raised an objection to the admissibility of the opposition. It was submitted that the opposition filed in the name of Bardehle Pagenberg Partnerschaft mbB constituted a circumvention of the law by abuse of process in the sense of decisions G 3/97 (OJ EPO 1999, 245) and G 4/97 (OJ 1999, 270). The appellant submitted that the representative firm was no longer the legitimate opponent because during the oral proceedings before the opposition division they openly admitted that they acted on behalf of a third party. This open admittance not only constituted clear evidence that the opposition was inadmissible, but also created confusion as to the opponent's actual identity. Whereas the motives for filing an opposition were irrelevant, pursuant to Article 99(1) EPC the opponent's identity was of fundamental procedural importance, and any doubt about it resulted in the inadmissibility of the opposition.

2. The board does not agree with this argumentation. As clarified by decisions G 3/97 and G 4/97 an opposition is not inadmissible purely because the entity named as opponent is acting on behalf of a third party. An opponent status is a procedural status and the basis on which it is obtained is a matter of procedural law, i.e. any person, who files an opposition in compliance with the provisions under Article 99 EPC in conjunction with Rules 76 and 77 EPC, acquires the status of an opponent. The fact that the existence of a "hypothetical client" is openly confirmed in the course

of opposition proceedings does not affect the opponent's identity and cannot create any confusion in this regard. On the same vein, the question whether the actual existence of a client is confirmed has no bearing on the admissibility of the opposition. The situation is not different from the case in which no such open confirmation is given: both when a professional representative acts as opponent and when an opposition is filed by a legal entity named "straw man", everybody is aware that the entity which has assumed the procedural status of an opponent is acting on behalf of a third party.

3. In addition, as it was clarified in G 3/97 and G 4/97 (Headnote 1(d)): "*...a circumvention of the law by abuse of process does not arise purely because: a professional representative is acting in his own name on behalf of a client...*". The filing of an opposition by a straw man is not *as such* an abuse of process, but it would require additional facts and evidence, as for instance if it were shown that the representative was acting on behalf of the patent proprietor, or was lacking entitlement to act as a European professional representative. None of these situations appear to be present in this case. Nor can an opponent cease to be the legitimate opponent once the existence of a client instructing the representative acting as opponent is confirmed or identified, as the appellant argued. The opponent does not have a right of disposition over his status as a party. If he has met the requirements for an admissible opposition, he is an opponent and remains such until the end of the proceedings or of his involvement in them (cf. G 3/97 and G 4/97, Reasons 2.2). Accordingly the internal legal relationship between the opponent and any instructing party has no legal significance for external purposes (see also

T 84/19, Reasons 5.3 issued by the present board in a different composition).

4. Thus in the present case Bardehle Pagenberg Partnerschaft mbB was the true opponent having acquired the relevant procedural status and there cannot be another true opponent apart from the formally authorised one (cf. G 3/97, Reasons 2.1 and 2.2).

5. The opposition was therefore admissibly filed (Article 99(1) in conjunction with Rules 76 and 77 EPC).

*Claims as granted (main request)*

*Claim construction - claim 1*

6. The claimed method involves tagging of one of multiple polynucleotides of at least 25 base pairs with at least one adaptor that comprises a unique barcode (see steps a. and d., section VIII above).

6.1 The tagging is achieved by using a droplet-in-droplet system as first and second partition wherein the adaptors containing the barcodes are located within the first (smaller) droplet while the polynucleotides and the first droplet are contained in the second larger droplet. Thus, the first droplet is encapsulated within the second larger droplet. Since step b. of claim 1 specifies that "*said second droplets comprises said first droplets*", further compounds, including other droplets may be present in the second droplet.

6.2 The concentration of "*adaptors*" and "*polynucleotides*" as referred to in steps a. and b. of claim 1, respectively, is not defined. However, due to the use of the terms *"plurality*" in conjunction with "*adaptors*"

in step a. and "*multiple*" in conjunction with "*polynucleotides*" in step b., each first and second partition (i.e. droplet) contains at least two adaptor molecules or two polynucleotide molecules respectively.

6.3 After merging the two droplets, polynucleotides are tagged by adaptors mediated through undefined means. Since tagging is not further defined in claim 1, any method suitable for adding adaptors with unique barcodes to polynucleotides is encompassed by claim 1, including, for example, ligation.

6.4 Furthermore, the terms "*barcodes*" and "*adaptors*" are not further defined in claim 1. These terms therefore include any barcode and adaptor molecule suitable for that purpose, for example, a unique set of nucleotides within a primer sequence.

6.5 The method of claim 1 may comprise further process steps due to the use of the term "*comprising*".

*Inventive step*

7. The opposition division held that the method of claim 1 lacked an inventive step (Article 56 EPC) over the teaching of document D14 combined with that of document D15 (see decision under appeal, section 17). The board shares the opposition division's finding.

8. As correctly found in the decision under appeal (see point 17.2.1), the method as defined in claim 1 differs from the method disclosed in document D14 (see in particular Example 2 and Figure 28) solely in that "*second droplets comprise first droplets*", i.e. a feature derived from step b. of claim 1 (see also claim construction above).

9. The appellant submitted that aside this first difference a further difference existed because document D14 did not mention a unique labeling of the resulting droplets after merging.

10. This is not convincing. Step d. of claim 1 specifies "*tagging one of said multiple polynucleotides, or fragment thereof at least 25 base pairs long, with at least one of said adaptors*". In other words claim 1 defines that the polynucleotides within the merged droplet are uniquely labeled by the barcoded adaptor. This means that the merged droplet's content and hence indirectly the droplet itself is uniquely labelled.

11. This is likewise disclosed in paragraph [0461] in conjunction with Figure 28 of document D14 wherein merged droplets are shown that contain uniquely tagged/ labeled polynucleotides mediated through barcoded adaptors. Since document D14 discloses that the content of the merged droplets is uniquely labelled, the same must (indirectly) apply to the merged droplet itself.

12. Thus the method as defined in claim 1 differs from that of document D14 solely in using a droplet-in-droplet system for merging instead of merging two droplets side-by-side (see document D14, Figure 28d). The board agrees with the opposition division that this difference has the effect that the merging of first and second droplets is less complex (see decision under appeal, point 17.3).

13. The technical problem to be solved resides thus in the provision of a method for simplified droplet merging wherein the merged droplets contain uniquely tagged polynucleotides.

14. As regards obviousness, the appellant argued that since the method of document D14 did not disclose merged droplets being uniquely labeled, a feature likewise not disclosed in document D15, the skilled person had no motivation to combine the teaching of both documents. Moreover, even if these documents were combined, the skilled person would not have arrived at the subject-matter claimed.

15. This is not convincing. As set out above, document D14 already discloses merged droplets that are uniquely tagged by barcoded polynucleotides, i.e. indirectly by their content. The fact that document D15 uses codes for distinguishing droplet types (see paragraphs [0027] and [0028]) rather than for labelling single droplets is thus irrelevant for the present case. The skilled person starting from the method disclosed in document D14 and being faced with the problem defined above would have turned to documents that describe ways of merging droplets within fluids (see also decision under appeal, points 17.5.1 and 17.5.3). A motivation to consult such documents was therefore given.

16. Document D15 belongs to this technical field since it describes *inter alia* methods for mixing small volumes of a fluid by coalescence of multiple emulsions (see title, and paragraph [0011]). The term "*coalescence*" in this context means fusion (see paragraph [0066]). Such methods are required for high-throughput assays in the biomedical field wherein samples need to be mixed with reagents (see paragraph [0003]).

16.1 Furthermore, document D15 describes in paragraph [0009] technical challenges for emulsion-based assays using separate droplets containing different compounds. These

challenges include the controlled merging of separate droplets that for that purpose must be brought into spatial proximity. Document D15 states in this context that this "*generally requires precise timing of trains of sample droplets and reagent droplets, active feedback loops, and smooth flow, thereby increasing complexity and cost*". Document D15 further reports in paragraph [0031] that the new systems disclosed therein provide various advantages "*over other approaches*" that mix small volumes of fluids, including, for example, "*an activation step that can initiate mixing of small volumes and that does not require complex timing of droplet streams using precision instrumentation*" and "*accommodation of many test reagents and samples with a simplified instrument architecture with minimized fluidic complexity (such as by reducing the number of fluidic connections, valves, etc.)*".

16.2 Document D15 discloses that *inter alia* a droplet-in-droplet system provides these advantages (see Figures 1 and 7, paragraphs [0012], [0018], [0025], [0064] [0105], [0106] and [0108]).

16.3 Since the droplet-in-droplet system of document D15 offers as substantial advantage a simplified droplet merging (see paragraph [0031]) over systems based on merging separate droplets with different contents (e.g. the side-by-side system of document D14), the skilled person combining the teaching of documents D14 and D15 would have arrived at the subject-matter of claim 1 in a straightforward and obvious manner.

17. The method of claim 1 and hence the claims as granted contravene therefore the requirements of Article 100(a) EPC in conjunction with Article 56 EPC.

*Auxiliary request 1*

18. Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that feature A (see section IX, above) has been added.

*Inventive step*

19. The appellant submitted that the merging of first and second partitions (droplets) as defined by amended step c. of claim 1 excluded a fusion of multiple droplets. Although Figure 28 of document D14 disclosed a side-by-side fusion of two droplets only, Figure 28 did not show means for controlling such a fusion. Nor did document D14 disclose experimental evidence for one to one droplet fusions. Since it was thus very likely that multiple droplet fusions happened in the set up shown in Figure 28, feature A in claim 1, by excluding multiple droplet fusions, increased the accuracy in uniquely labelling droplets compared to document D14.

20. The board does not agree.

20.1 As correctly found by the opposition division in points 21.1 and 21.3 of the decision under appeal, paragraph [0461] and Figure 28c and 28d of document D14 disclose the fusion of a single first and a single second droplet only, i.e. a fusion of two droplets and not a fusion of multiple droplets. These are the facts on file and the appellant has not provided any evidence to the contrary. Their assertions remain thus unsubstantiated. It is established case law that each of the parties to opposition-appeal proceedings carries the burden of proof for the facts it alleges (see e.g. T 219/83, Reasons 12 and T 270/90, Reasons 2.1).

20.2 The board has also no doubts that a skilled person would derive from Figure 28 of document D14 that fusions of two single droplets occur only. The technical feasibility of this is, for example, supported by paragraph [0031] of document D15. This paragraph mentions *inter alia* that one of the advantages associated with the use of droplet-in-droplet systems is that a "*complex timing of droplet streams using precision instrumentation*" is no longer required. In other words, document D15 discloses that the skilled person by using precision instrumentation is able to precisely control droplet fusion. This includes one to one droplet fusions. Since no indications are available that multiple droplet fusions occur by applying the system disclosed in Figure 28 of document D14, the claimed method cannot be more accurate in labelling droplets than document D14.

21. Since feature A in claim 1 of auxiliary request 1 adds no technical effect to the method of claim 1 of the main request, the reasons set out above under lack of inventive step for claim 1 of the main request likewise apply for the method of claim 1 of auxiliary request 1 (Article 56 EPC).

*Auxiliary request 18*

22. Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that features A and E (see section IX above) have been added.

*Inventive step*

23. The opposition division found that the incorporation of features A and E into claim 1 did not render the method inventive for the reasons given for auxiliary request

1. This was so because feature E was held to be "*arbitrary*" (see decision under appeal, point 25.1).

24. The board agrees with the conclusions of the opposition division for the following reasons:

25. As indicated above (see point 21), feature A adds no technical effect to the method of the main request. It does not therefore have to be considered in the discussion of inventive step.

26. As regards feature E, the appellant submitted two lines of arguments in support of their case.

Firstly, the appellant argued that feature E allowed the droplets' sizes to be controlled which had various advantages.

Secondly, the appellant argued that the skilled person had expected that the fusion of droplets of significantly different sizes was negatively affected by certain physical effects. The absence of these effects was surprising.

27. The board is not convinced by these arguments.

28. As regards the first line of argument, feature E merely defines a minimum limit of the volume size of the second droplet in relation to the first droplet without defining an upper limit of the relative volume ratio. Already for this reason it is doubtful that the volume size of the second droplet can be regarded as controlled in relation to the first droplet over the whole breadth of claim 1. Furthermore, an improved control of adaptor versus polynucleotide dilution as asserted by the appellant by merging droplets of

different sizes relates in fact to a control of polynucleotide concentration relative to adaptor concentration after merging (see decision under appeal, points 25.2 and 25.3).

28.1 As set out above under claim construction (see point 6.2), claim 1 does not define the concentration of adaptors and polynucleotides within the droplets but only their minimum number. Claim 1 steps a. and b. comprise thus as embodiment a droplet-in-droplet system wherein the second larger droplet as well as its inner smaller droplet contain each two polynucleotides and two adaptor molecules only. This embodiment of claim 1 will be considered in the following.

28.2 Since in the embodiment under consideration two adaptor molecules per droplet are present only, i.e. a very low number, undesired adaptor self-attachments will not take place. The at least double size of the second polynucleotide droplet for merging is therefore irrelevant for the embodiment under consideration. Identical considerations apply for the asserted higher or lower dilutions of adaptors and polynucleotides, respectively. Likewise the theoretical ability of using higher polynucleotide concentrations in larger droplets is irrelevant since in the embodiment under consideration only two such molecules are present.

28.3 Thus the asserted size control of the two droplets to be merged by feature E has no technical effect for the embodiment under consideration because the droplets' volume is not necessarily linked to the adaptor and polynucleotide concentrations within the droplets.

29. In the second line of argument, the appellant in essence argued that the skilled person was deterred

from merging droplets of different size due to expected problems of fluid dynamics and motility.

29.1 As indicated above it is established case law that each of the parties to opposition-appeal proceedings carries the burden of proof for the facts it alleges. Since this principle applies to all facts and matters in relation to all grounds of opposition, asserted prejudices of the skilled person are included.

29.2 As regards the facts on file, the patent does not mention or suggest potential problems of merging droplets of different sizes, let alone because of fluid dynamics and/or droplet motility. Instead the patent discloses that partitions (droplets) containing the polynucleotide *"may be, on average, greater than 1.5-fold, 2-fold, ..., or 100,000-fold the average size the [size] of the partitions containing the adaptors*" (see paragraph [0023]). Thus the patent teaches that droplet-in-droplets can be merged although their sizes/ volumes differ by factor $10^5$. In the absence of any teaching to the contrary, the skilled person would take this information in the patent at face value and conclude that any of the different size ratios can be equally selected. In view of this free choice, the skilled person would not ascribe a technical effect to any of the different droplet size ratios, let alone spotted potential problems under fluid dynamics and/or motility if merging droplets of different sizes.

29.3 Furthermore none of the available prior art documents mentions problems of fluid dynamics and/or motility in merging droplets. Document D14 on the contrary shows in Figures 28c and 28d a merging of droplets of different sizes. Nor has the appellant - although carrying the burden of proof - submitted evidence, for example

textbooks, that the skilled person would have expected problems when merging droplets of different sizes. The appellant's mere assertion that the skilled person was well aware of these problems does not meet the strict standards of proof for recognising the existence of a technical prejudice (see Case Law of the Boards of Appeal, 10th edition 2022 ("Case Law"), I.D.10.2).

29.4 In view of these considerations, the board arrives at the conclusion that the skilled person did not have any prejudice in merging droplets of different sizes, irrespective of their size differences.

30. Therefore the selection of the minimum size ratio "*wherein said second volume is at least two times the volume of said first volume*" (feature E ) in claim 1 has no technical effect on the embodiment under consideration.

31. The skilled person starting from document D14 and knowing from Figures 28c and 28d that droplets of different sizes can be merged would be aware of a large number of equivalent size distributions of droplets to be merged. The selection of "*at least two times the volume*" as indicated in claim 1 does therefore not amount to more than an arbitrary choice from a number of different solutions each of which would be obvious to the skilled person (see Case Law, I.D.9.21.9).

32. The method of claim 1 and hence auxiliary request 18 lacks an inventive step (Article 56 EPC).

*Auxiliary requests 2 to 17 and 19 to 23*

33. Auxiliary requests 2 to 17 and 19 to 23 comprise permutations of features A to E (see section IX above).

34. The opposition division held in the decision under appeal that none of these auxiliary requests was inventive over the combined teaching of documents D14 and D15 (see decision under appeal, point 26.3). The appellant has not submitted any reason why the opposition division erred in this respect, other than referring to those reasons submitted for the main request and for auxiliary requests 1 and 18. As regards auxiliary requests 2 to 17 and 19 to 23, the appellant merely submitted that the amendments made in these auxiliary requests (features B to D) were directed at overcoming objections of lack of essential features. Nor can the board *prima facie* find a substantiation under Article 56 EPC that would be straightforward in view of the large number of permutations of features A to E in auxiliary requests 2 to 17 and 19 to 23. Accordingly, the board sees no reason to deviate from the opposition division's conclusions.

35. Auxiliary requests 2 to 17 and 19 to 23 therefore lack an inventive step (Article 56 EPC) too.

## Order

## For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairwoman:


L. Malécot-Grob T. Sommerfeld

Decision electronically authenticated