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**Datasheet for the decision  
of 1 July 2015**

**Case Number:** T 1961/11 - 3.3.05

**Application Number:** 09161382.8

**Publication Number:** 2087935

**IPC:** B01L3/14, B01L3/00

**Language of the proceedings:** EN

**Title of invention:**

Apparatus and method for handling fluids for analysis

**Applicant:**

ABBOTT LABORATORIES

**Headword:**

Reaction vessel/ABBOTT LABORATORIES

**Relevant legal provisions:**

EPC Art. 54, 56

**Keyword:**

Novelty - main request (yes)

Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
Boards of Appeal  
Chambres de recours**

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Case Number: T 1961/11 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 1 July 2015**

**Appellant:** ABBOTT LABORATORIES  
(Applicant) 100 Abbott Park Road  
Abbott Park, IL 60064-3500 (US)

**Representative:** Modiano, Micaela Nadia  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 18 April 2011  
refusing European patent application No.  
09161382.8 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** J.-M. Schwaller  
**Members:** H. Engl  
O. Loizou

## Summary of Facts and Submissions

- I. The European patent application 09161382.8 is a divisional application of European application 04755308.1. It is concerned with the use of a reaction vessel having an open top end and a drain opening at the bottom, and a nonwetable surface around the drain opening on the outside of the vessel, for testing an analyte in a fluid inside said vessel.
- II. The documents cited in the examination procedure include the following:
- D1: US 4 041 995
  - D2: US 2003/017349 A1
  - D3: US 6 063 282 A
  - D4: EP 0 508 530 A
  - D5: WO 01/70402 A
  - D7: EP 1 025 902 A2
- III. In the decision posted with letter dated 18 April 2011 the examining division considered that the subject-matter of claim 1 of the main request lacked novelty having regard to document D2, the subject-matter of claim 2 of the first auxiliary request did not meet the requirements of Article 123(2) EPC and the subject-matter of claim 2 of the second auxiliary request lacked novelty having regard to document D7. The application was thus refused.
- IV. With the statement of grounds of appeal, dated 29 August 2011, the applicant (henceforth: appellant) submitted new claims as a main request and as auxiliary requests 1 to 4.

- V. In the annex to the summons for oral proceedings, the board raised objections under Article 123(2) EPC against particular claims of the main and auxiliary requests.
- VI. Under cover of a letter dated 12 June 2015 the appellant submitted further arguments and a new main request consisting of a sole patent claim, reading:  
*"1. Use of a reaction vessel (26a) comprising a vessel having an open top and a drain opening (92a) in its bottom, said drain opening being adapted to support a selected head of fluid and to drain fluid therethrough when a selected pressure differential exists between the top of the fluid and the bottom of the vessel, and further comprising a nonwetable surface (96) around the drain opening on the outside of the vessel, for testing an analyte in a fluid inside said reaction vessel."*
- VII. The appellant argued essentially as follows:

It was apparent from the minutes of the oral proceedings that the use claim 1 amended by addition of the wording *"for testing an analyte in a fluid inside said reaction vessel"* would meet the requirements of novelty and inventive step over document D2, the closest prior art.

D1 disclosed a container having the structure and operation of a pipette that metered and delivered drops of fluid on a test surface. Claim 1 was thus inventive over D1 in view of D2, at least because neither D1 nor D2 disclosed the *"use of a reaction vessel ... with a non-wetable surface around the drain opening on the outside of the vessel"*, as claimed, *"for testing an analyte in a fluid inside said reaction vessel"*.

## VIII. Requests

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claim according to the main request filed with letter dated 12 June 2015 or, in the alternative, on the basis of one of the sets of claims in accordance with one of the auxiliary requests 1 to 4, filed with the statements of grounds of appeal.

### **Reasons for the Decision**

#### 1. Amendments

Claim 1 of the main request is based on original claim 1, Figure 4c, and the description, page 14, lines 4 to 10, of the divisional application and the parent application as originally filed.

The claimed subject-matter thus meets the requirements of Articles 76(1) and 123(2) EPC.

#### 2. Novelty (main request)

##### 2.1 Document D7 relates to an apparatus using arrays for the synthesis of a polymer chain by sequentially adding monomer units to at least one solid support for growing and immobilizing a polymer chain thereon in a liquid reagent solution.

The method includes the step of depositing a liquid reagent in a reaction well 26 in contact with at least one solid support and at least one monomer unit of the polymer chain affixed to the solid support. The well 26

includes at least one orifice 74 extending into the well 26, and is of a size and dimension to form a capillary liquid seal to retain the reagent solution in the well 26 to enable polymer chain growth on the solid support. The method further includes the step of expelling the reagent solution from the well 26, while retaining the polymer chain therein.

In accordance with the embodiment shown in Figures 5 and 6, the polymer synthesis apparatus 20 is provided with reaction wells 26 having at least one orifice 74 extending into the well and a solid support 75 disposed in the well for growing and immobilising a polymer chain thereon. Reagent solution 76 in well 26 is in contact with solid support 75 and at least one polymer unit of the polymer chain affixed to the solid support. Orifice 74 has an entrance 77 into well 26 from the common chamber side and an exit 80 out of the well into a lower catch basin 81 below. The orifice is of a size and dimension to form a capillary liquid seal with reagent solution 76 contained therein to retain the reagent solution in the well enabling polymer chain growth therein. To further retain solution 76 in wells 26, a pressure differential between a common chamber gas pressure exerted on the reagent solution in reaction wells 26 and a second gas pressure exerted on orifice exits 80 (arrows 79 in Figure 5) must be less than a predetermined amount. A pressure regulating device 82 controls the pressure differential such that upon the pressure differential exceeding the predetermined amount, the reagent solution 76 is expelled from well 26 through orifice 74.

D7 does not disclose a non-wettable surface around the drain opening on the outside surface of the vessel or well. Therefore, the claimed subject-matter is novel

having regard to D7, irrespective of whether or not D7 describes the use of a vessel for testing an analyte in a fluid inside said reaction vessel.

- 2.2 Document D2 is concerned with hydrophobic coating compositions and articles coated with the compositions. Such articles include vessels for handling, measuring, storing and transporting liquids which have previously been rendered less wettable and less adherent to fluids by application of silicone compounds to the vessel surfaces which come in contact with the fluid (see paragraph [0006]). More specifically, D2 discloses in paragraph [0037] laboratory vessels having at least one interior wall defining a reservoir portion for containing a volume of liquid, and at least one opening in communication with the reservoir portion. The laboratory vessels can be coated, on the interior wall and on the area surrounding and forming the opening, with a hydrophobic polymer coating according to D2.

In paragraph [0133] there is disclosed a tubular laboratory vessel such as a micro-centrifuge tube or a test tube, having an interior sidewall and a closed lower end. A hydrophobic coating is applied to the interior sidewall, but not to the closed lower end. The described embodiment thus fails to show a vessel having an opening in the bottom surrounded by a non-wettable area.

Finally, Example 1 of D2 (see columns 15 and 16) discloses the manufacture of polypropylene pipette tips surface-coated with a hydrophobic coating on its interior and exterior surfaces, including those at and around the tip opening. Such a pipette tip is considered to differ from the coated reaction vessel used in accordance with claim 1 in that the tip (or

bottom) opening is not adapted to support a selected head of fluid. Also, D2 does not disclose using said coated pipette tip as a reaction vessel for testing an analyte in a fluid inside said pipette tip.

In summary, D2 does not clearly and unambiguously disclose reaction a vessel having a non-wettable material disposed on an outer surface of the vessel around the opening that is a drain opening in the bottom of the vessel.

2.3 D1 discloses an apparatus and a process for the drop-by-drop metering of fluids. The apparatus comprises a container 30 having an open top and an opening at the bottom (internal aperture 36 and another aperture 50 on an outer platform spaced away from the bottom 34) (see Figures 2 to 4; column 5, lines 39 to column 6, line 33). In contrast to the application under appeal, the exterior surface of the platform surrounding the aperture is wettable, or rendered wettable, by the drop to be dispensed from the vessel (see column 7, lines 27 to 45).

2.4 D3 discloses extraction well plates 12 having extraction wells 29 designed to receive a fluid material to be extracted in a filtration process. Each well has a proximal (lower) chamber 40 defined by walls, a distant channel 44 and a special filter 48 fitted into said distal channel 44. As shown in Figure 3, the filter comprises a plurality of cylindrical microfibers all oriented along a common axis and positioned as adjoining columns so that they do not tangle about each other. The microfibers are preferably hydrophobic. Each filter is fitted into the distal channel of a filtration well such that the microfibers are oriented vertically with regard to the filtration



well. Upper ends of micro fibers form an upper end of filter and the lower surfaces of micro fibers form a lower end of filter 48.

In short, D3 does not disclose a non-wettable surface around the drain opening of the well or vessel.

2.5 D5 is concerned with an apparatus for processing substances in a single container. The container is preferably a vessel having an open end, a closed end and filtering means. After performing the desired reactions, an aperture is created in the vessel (e.g. by piercing) and the processed substances are removed through the aperture by applying positive or negative pressure (see page 9, line 22 to page 14, line 14; Figures 13 and 14; claim 1). In accordance with another embodiment, the aperture is sized such that the surface tension of the fluid within the aperture is sufficient to prevent leakage through the aperture (page 14, lines 3 to 5, and page 16, lines 8 and 9). However, D5 does not disclose a non-wettable surface around the drain opening of the well or vessel. The claimed use is therefore novel having regard to D5.

2.6 The subject-matter of claim 1 of the main request thus meets the requirements of Article 54 EPC.

3. Inventive step (main request)

3.1 The application under appeal is concerned with the use of a particular reaction vessel having an open top and a drain opening in its bottom, for testing an analyte in a fluid inside the reaction vessel. The drain opening is adapted to support a selected head of fluid and to drain fluid therethrough when a selected pressure differential exists between the top of the

fluid and the bottom of the vessel.

- 3.2 D7 is considered to represent the closest prior art, because it is concerned with the use of a reaction vessel similar to the present application having a bottom orifice of a size and dimension adapted to form a capillary liquid seal. D7 also discloses maintaining a pressure differential between a common chamber gas pressure exerted on the reagent solution in reaction wells 26 and a second gas pressure exerted on orifice exits 80 (arrows 79 in Figure 5) must be less than a predetermined amount.
- 3.3 The problem to be solved is to maintain a desired height of fluid to be supported while using a larger size drain opening (see description, page 14, first full paragraph, in connection with Figure 4c).
- 3.4 As a solution to the above problem, the application under appeal proposes the use of a reaction vessel in accordance with claim 1, for testing an analyte in a fluid inside said reaction vessel, characterised in that a non-wettable surface is provided around the drain opening onto the outer surface of the vessel.
- 3.5 It is plausible to the board that a non-wettable surface surrounding the drain opening on the outside of the vessel may help preventing the fluid bead from spreading out onto the outer surface of the vessel, such that a larger drain size opening 92a may be used while still maintaining the ability of the surface tension of the fluid to support a desired height of fluid in the vessel 26a.

The board is thus satisfied that the problem posed is successfully solved.

3.6 It remains to be decided whether the claimed solution is obvious having regard to the prior art.

3.6.1 As already discussed before, D7 is silent about providing a non-wettable surface surrounding the bottom aperture and cannot, therefore, render the claimed subject-matter obvious.

3.6.2 None of documents D1, D2, D3 or D4 addresses the problem of maintaining a desired height of fluid to be supported depending on the drain size. There is no suggestion in these documents that providing a non-wettable surface around the drain opening onto the outer surface of the vessel would offer a solution to such a problem.

D1 even teaches away from the invention in that it proposes a wettable surface surrounding the drain opening.

As regards D2, the board is not convinced that the skilled person would consider using coated pipette tips as a reaction vessel for testing an analyte in a fluid inside said pipette tip.

In the method and apparatus of D5, no purpose would be served by making the outer surface of the vessel surrounding the yet to be pierced opening non-wettable. Therefore, D5 cannot, in combination with D7, render the claimed subject-matter obvious.

Therefore, none of these prior art documents, taken alone or in combination with D7, can render obvious the

claimed use.

3.6.3 In summary, the board is satisfied that the claim of the main request meets the requirements of Article 56 EPC.

3.7 In view of the above, there is no need to consider the auxiliary requests.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to grant a patent on the basis of the claim of the main request, filed with letter dated 12 June 2015, and a description and figures to be adapted thereto.

The Registrar:

The Chairman:



C. Vodz

J.-M. Schwaller

Decision electronically authenticated