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Datasheet for the decision of 14 September 2020

Case Number: T 0943/15 - 3.2.02

Application Number: 08797151.1

Publication Number: 2188003

IPC: A61M37/00, B05B1/14, B05C5/00, B41J2/175, B67D5/00

Language of the proceedings: EN

Title of invention:
FLUID TRANSFER DEVICE

Applicant:
Hewlett-Packard Development Company, L.P.

Headword:

Relevant legal provisions:
EPC Art. 54(1), 54(2), 56, 84, 123(2)
RPBA 2020 Art. 13(2)

Keyword:

Claims - clarity - main request and auxiliary request 1 - (no)
Late-filed auxiliary request 2 - admitted (no)
Amendments - extension beyond the content of the application as filed (no)
Novelty - auxiliary request 3 - (yes)
Inventive step - auxiliary request 3 - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 0943/15 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 14 September 2020

Appellant: (Applicant)	Hewlett-Packard Development Company, L.P. 10300 Energy Drive Spring TX 77389 (US)
Representative:	Haseltine Lake Kempner LLP Redcliff Quay 120 Redcliff Street Bristol BS1 6HU (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 4 December 2014 refusing European patent application No. 08797151.1 pursuant to Article 97(2) EPC**

Composition of the Board:

Chairman	M. Alvazzi Delfrate
Members:	D. Ceccarelli
	C. Schmidt

Summary of Facts and Submissions

I. The applicant has appealed against the Examining Division's decision, posted on 4 December 2014, to refuse European patent application No. 08 797 151.1.

The application was refused for added subject-matter and lack of novelty.

II. In a communication dated 27 January 2020 the Board raised a clarity objection against claim 1 of each of the pending requests.

III. By letter dated 19 March 2020 the appellant submitted arguments and further auxiliary requests to address the clarity objection.

IV. In a telephone conversation on 8 April 2020 the rapporteur informed the appellant that in the Board's view New Auxiliary request 14, filed by letter dated 19 March 2020 (and re-filed by letter dated 10 August 2020 as auxiliary request 3), met the requirements of the EPC but the higher-ranking requests did not.

V. The Board summoned the appellant to oral proceedings by letter dated 4 June 2020. The oral proceedings took place on 14 September 2020.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request, filed by letter dated 19 March 2020, or on the basis of one of auxiliary

requests 1 to 3, filed by letter dated 10 August 2020.

VI. The following documents are expressly mentioned in the present decision:

D1: US-A-2006/0051250
D5: EP-A-1 205 247

VII. Claim 1 of the **main request** reads as follows:

"A fluid transfer device (10, 10', 10"), comprising:
a die (12) having first and second opposed surfaces (22, 24);
at least one nozzle (26) formed in the first opposed surface (22);
a fluid slot (28) formed in the second opposed surface (24), the fluid slot (28) having an inlet (30) in the second opposed surface (24), and a separate outlet (32) through which fluid exits to the at least one nozzle (26); and
a member (36) having a second fluid slot (38) defined therein, the member (36) being placed on the second opposed surface (24) of the die (12) such that an outlet of the second fluid slot (38) is directly aligned with the inlet of the fluid slot (28), such that the second fluid slot (38) is fluidly connected to the fluid slot (28) thereby expanding a capillary volume of the fluid slot (28), wherein the at least one nozzle (26), the inlet (30) of the fluid slot (28) and the secondary fluid slot (38) are configured to enable fluid to wick into the fluid slot (28) via capillarity."

Claim 1 of **auxiliary request 1** reads as claim 1 of the main request except that it specifies that the fluid transfer device is "for transferring aqueous fluids".

Claim 1 of **auxiliary request 2** corresponds to claim 1 of auxiliary request 1 with the addition of the following feature at the end of the claim:

"a fluid ejection device (34) in fluid communication with the fluid slot (28) and the at least one nozzle (26), wherein the fluid ejection device (34) is selected from a thermal inkjet dispenser and a piezoelectric inkjet dispenser".

Claim 1 of **auxiliary request 3** reads as follows:

"A method of transferring fluid using a fluid transfer device (10, 10', 10") comprising:
a die (12) having first and second opposed surfaces (22, 24);
at least one nozzle (26) formed in the first opposed surface (22);
a fluid slot (28) formed in the second opposed surface (24), the fluid slot (28) having an inlet (30) in the second opposed surface (24), and a separate outlet (32) through which fluid exits to the at least one nozzle (26); and
a member (36) having a second fluid slot (38) defined therein, the member (36) being placed on the second opposed surface (24) of the die (12) such that an outlet of the second fluid slot (38) is directly aligned with the inlet of the fluid slot (28), such that the second fluid slot (38) is fluidly connected to the fluid slot (28) thereby expanding a capillary volume of the fluid slot (28), wherein the at least one nozzle (26), the inlet (30) of the fluid slot (28) and the second fluid slot (38) are configured to enable fluid to wick into the fluid slot (28) via capillarity, the method comprising:

at least partially immersing the die (12) of the fluid transfer device (10, 10', 10") in a well of a well plate,

wicking fluid into the fluid slot (28) by capillarity via the at least one nozzle (26), the inlet (30) of the fluid slot (28), and the second fluid slot (38), and

using the device (10, 10', 10") to transfer the wicked fluid from the well to another location."

Claims 2 to 10 are dependent claims.

VIII. The appellant's arguments, where relevant to the present decision, may be summarised as follows:

Main request - clarity

The person skilled in the art knew the types of materials typically used to manufacture devices as defined in claim 1 and the types of fluids that were intended to be transferred using such devices.

Having selected a material to use in the manufacture of a device, and knowing the intended application, i.e. the fluid to be used, the person skilled in the art would have no difficulty in determining the capillary pressure of the device and adjusting its dimensions to enable the fluid to be wicked into the fluid slot by capillarity.

Specific technical information on how to achieve the capillary pressure was provided on page 7 of the application as filed, which stated that capillarity depended on the surface tension of the fluid, the contact angle of the fluid to the solid, and the capillary radius. Limiting the claim further would

unduly narrow the scope of protection compared with that which the appellant was entitled to claim.

Auxiliary request 1 - clarity

Claim 1 additionally specified that the fluids able to wick into the fluid slot via capillarity were aqueous fluids. Page 7, lines 25 to 27 disclosed that for aqueous fluids the contact angle was less than 90° without additional treatment. This made it clear which technical features the claimed device had to comprise to enable fluid to wick into the fluid slot via capillarity.

Auxiliary request 2 - admissibility

Auxiliary request 2 had been filed in response to a clarity objection raised by the Board, which had been brought to the appellant's attention for the first time with the Board's preliminary opinion. The filing of this request could not be considered an amendment to the appellant’s case within the meaning of Article 12(4) or Article 13(1) or (2) RPBA 2020 since the decision under appeal did not discuss clarity. Moreover, the subject-matter of claim 1 was derived from a combination of claims present in the requests already on file, so filing the request was not detrimental to procedural economy. The clarity objection was also *prima facie* overcome.

Hence, the Board should admit auxiliary request 2 into the appeal proceedings.

Auxiliary request 3

The subject-matter of claim 1 of auxiliary request 3

was based on the claims and, in particular, pages 6 and 10 and Figures 2A to 4 of the application as filed.

This subject-matter was novel and inventive in view of D1 since D1 neither disclosed nor taught the feature of the inlet of the fluid slot and the secondary fluid slot being configured to enable fluid to wick into the fluid slot via capillarity.

Reasons for the Decision

1. The invention

The invention relates to fluid transfer devices, typically of the kind used in research applications, for transferring precise and minute volumes of a fluid sample from a source to a destination. A schematic cross-section of a fluid transfer device of this kind is shown in Figure 4, reproduced below.

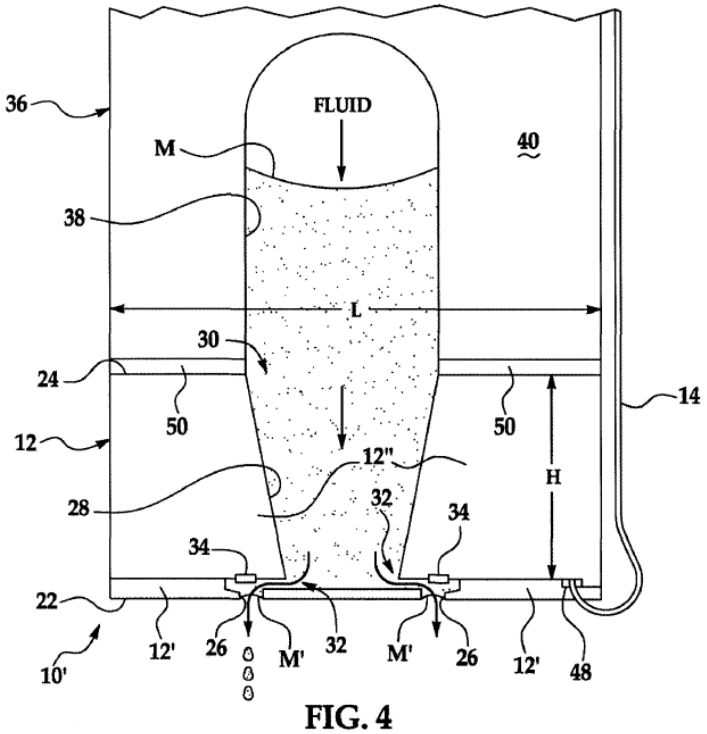

FIG. 4

According to claim 1 of each request, the fluid transfer device comprises a die (12) with two opposed surfaces (22, 24). The die has a fluid slot (28) with an inlet (30) in one of the surfaces (24) and an outlet (32), through which fluid can reach a nozzle (26), in the other surface (22). The fluid transfer device further comprises a member (36) having a second fluid slot (38). The member is placed on the surface of the die with the inlet such that an outlet of the fluid slot of the member is directly aligned with the inlet of the fluid slot of the die. The nozzle, the inlet of the fluid slot of the die and the fluid slot of the member are configured to enable fluid to wick into the fluid slot of the die via capillarity.

This configuration makes it possible to transfer fluid by immersing the die in a fluid-filled well-plate such that the fluid slot is loaded with fluid via capillarity, as defined in claim 1 of auxiliary request 3. The fluid can then be dispensed at a desired destination, for example using inkjet dispensing technology (page 2, line 23 to page 3, line 8 of the description).

According to page 10, lines 24 to 31, of the description, the member with the second fluid slot enables the fluid transfer device to hold and subsequently dispense a higher volume of fluid, if desired.

2. Main request - clarity

Claim 1 of the main request is directed to a fluid transfer device with a fluid slot, defines a "capillary volume of the fluid slot", and recites that a nozzle,

the fluid slot inlet and a secondary fluid slot "are configured to enable fluid to wick into the fluid slot (28) via capillarity".

As explained in the application as filed (page 7, lines 14 to 17) capillary pressure, which is responsible for the capillary effect and, hence, for the wicking of fluid into the fluid slot, depends not only on the geometry of the fluid path leading to the fluid slot, but also on properties of the fluid, in particular its surface tension and the contact angle with the solid.

However, the subject-matter of claim 1 does not state any specific fluid, but merely includes a reference to fluid in general. Claim 1 does not specify which fluid or fluids is/are able to wick into the fluid slot via capillarity.

The claimed functional definition of the nozzle, the fluid slot inlet and the secondary fluid slot is therefore unclear, as it depends on the undefined properties of the specific fluid intended to wick into the fluid slot.

It follows that claim 1 does not comply with Article 84 EPC.

The appellant's argument that the person skilled in the art would know which fluids were intended to be transferred using a fluid transfer device as claimed is not convincing as the application itself contemplates a large variety of surface tensions of such fluids, which can even be obtained by adding surface active agents to the fluid (page 7, lines 25 to 30, of the application as filed).

The Board does not dispute that the person skilled in the art, having selected a material to use in the manufacture of the claimed device and knowing the fluid to be transferred, would be able to adjust the dimensions of the device to enable fluid to be wicked into the fluid slot by capillarity as claimed. However, this presupposes knowledge of the fluid, which is not derivable from claim 1.

Whether the appellant feels that limiting the claim further would unduly narrow the scope of protection is of little relevance if the requirements of Article 84 EPC are not fulfilled.

In conclusion, the main request is not allowable for lack of compliance with Article 84 EPC.

3. Auxiliary request 1 - clarity

Claim 1 of auxiliary request 1, which corresponds to auxiliary request 13 filed by letter dated 19 March 2020, additionally specifies that the fluid transfer device is for transferring aqueous fluids.

Aqueous fluids in general, however, may still have a large variety of surface tensions, especially in view of the disclosure in the application as filed (page 7, lines 27 to 30) that "a desirable level of wetting may be achieved by adding surface active agents to the fluid". Whether page 7, lines 25 to 27, also discloses that for aqueous fluids the contact angle with the solid is less than 90° without additional treatment, as argued by the appellant, is of little relevance, as an angle of less than 90° is merely a prerequisite for the capillary effect. Moreover, this effect is directly dependent on the undefined surface tension of the fluid

too.

It follows that claim 1 of auxiliary request 1 is not clear either.

As a consequence, auxiliary request 1 is not allowable for lack of compliance with Article 84 EPC.

4. Auxiliary request 2 - admissibility

Auxiliary request 2 was filed for the first time by letter dated 10 August 2020, i.e. after the notification of the summons to oral proceedings.

The Board acknowledges that auxiliary request 2 was filed in an attempt to address the Board's clarity objection. However, this objection was first raised in the communication dated 27 January 2020. In response to the objection the appellant chose to make its case by filing written arguments in support of the main request (and other auxiliary requests) by the letter dated 19 March 2020.

Contrary to the appellant's assertion, auxiliary request 2 constitutes an amendment to the appellant's case after notification of the summons to oral proceedings.

Under Article 13(2) RPBA 2020, such an amendment "shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned".

The appellant did not provide any reasons why auxiliary request 2 could not have been filed by the letter dated 19 March 2020. Moreover, even after having been

informed in the telephone conversation of 8 April 2020 that the Board still did not consider the main request to be allowable, the appellant chose not to react. Had it wished to do so, the appellant could also have amended its case after this conversation.

The Board therefore concludes that there are no exceptional circumstances, justified by cogent reasons, why the appellant decided not to amend its case until after the notification of the summons to oral proceedings.

Consequently, under Article 13(2) RPBA, auxiliary request 2 shall not be taken into account by the Board.

Under these circumstances it is of little relevance whether auxiliary request 2 may, *prima facie,* address the Board's clarity objection, or whether the subject-matter of claim 1 is derived from a combination of claims present in the requests already on file, as argued by the appellant.

In conclusion, auxiliary request 2 is not admitted into the proceedings under Article 13(2) RPBA.

5. Auxiliary request 3

5.1 Claim 1 of auxiliary request 3, which corresponds to auxiliary request 14 filed on 19 March 2020, is directed to a method of transferring fluid. Consequently, the fluid is specifically part of the subject-matter of claim 1. This overcomes the clarity objection which applies to the higher-ranking requests. Hence, auxiliary request 3 complies with Article 84 EPC.

5.2 The subject-matter of claim 1 of auxiliary request 3 is based on claims 1, 5 and 6, as well as page 2, lines 16 to 29, page 6, lines 29 to 31, and page 10, lines 10 to 14 and 24 to 31, of the application as originally filed.

Under point 1.1.1 of the reasons for the decision the Examining Division held that there was no basis for an outlet of the second fluid slot being directly aligned with the inlet of the fluid slot (of the die).

However, page 10 of the application as filed expressly discloses that, in one embodiment, "the member fluid slot 38 is directly aligned with the fluid slot 28". Figure 4 shows a configuration according to this passage in which the fluid slot of the member is placed above the fluid slot of the die, as a result of which the two slots communicate via their overlapping outlet and inlet. This amounts to a direct and unambiguous disclosure of a direct alignment of the outlet and the inlet within the meaning of claim 1. Whether or not the claim defines the geometry of the slots, as considered by the Examining Division, is a matter of claim scope rather than extension of subject-matter. At no point does the application as filed stress the importance of a particular geometry of the fluid slots. It is also irrelevant whether Figure 4 can be considered to show that the outlet and the inlet overlap completely (as considered by the Examining Division). This is not necessarily the meaning of the claimed direct alignment, nor does the application as filed stress the importance of such a complete overlap.

The Examining Division considered (point 1.1.2 of the reasons for the decision) that the feature of "at least one nozzle (26), the inlet (30) of the fluid slot (28)

and the second fluid slot (38) are configured to enable fluid to wick into the fluid slot (28) via capillarity" extended beyond the content of the application as originally filed.

The fluid slot inlet being configured to enable fluid to wick into the fluid slot via capillarity is directly derivable from claim 1 as originally filed.

Having the nozzle configured in that way too is disclosed on page 6, lines 29 to 31, for an embodiment. In view, *inter alia*, of the teaching on page 2, lines 23 to 29, of the application as filed, and for want of any disclosure to the contrary for other embodiments, the person skilled in the art understands that the disclosed configuration of the nozzle applies to all embodiments. There is no need to specify that the wicking takes place without external back-pressure either, as this is implied by the feature of the wicking taking place via capillarity.

As regards the second fluid slot and its claimed configuration enabling fluid to wick into the fluid slot (of the die) via capillarity, this is directly and unambiguously disclosed on page 10, lines 24 to 26. If fluid enters the second fluid slot via capillarity the same effect will be present from the second fluid slot towards the first fluid slot as a consequence of the capillary effect described with reference to the equation on page 7, lines 14 to 17, of the application as filed. Moreover, if this were not the case, providing the second fluid slot would be technically nonsensical as the fluid within the second fluid slot would no longer be able to be delivered.

It follows that claim 1 of auxiliary request 3 has a

basis in the application as originally filed.

5.3 Claims 2 to 7 are based on dependent claims 2 to 4, 7, 10 and 11 of the application as filed, respectively.

Claim 8 is based on page 5, lines 12 to 19 of the application as filed. Claim 9 is based on page 10, lines 16 to 20 of the application as filed. Claim 10 is based on page 6, lines 25 to 27 of the application as filed.

5.4 In conclusion, auxiliary request 3 complies with Article 123(2) EPC.

5.5 The Examining Division found that the subject-matter of claim 1 of the main request then on file lacked novelty over D1.

D1 discloses a fluid transfer device for applications similar to those of the invention in this case. The fluid transfer device comprises a fluid holding structure and a fluid ejection structure (Figure 10 reproduced below).

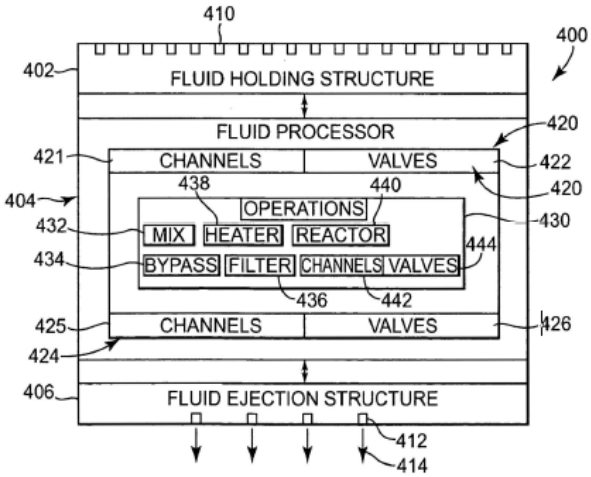

Fig. 10

Fluid to be delivered is first filled into the fluid

holding structure (paragraph [0068]). From there, the fluid is transferred to the fluid ejection structure, from which it is delivered.

There is no disclosure in D1 of a nozzle (of the fluid ejection structure) as defined in claim 1 of auxiliary request 3, configured to enable fluid to wick into a fluid slot of a die.

D1 discloses back-pressure mechanisms for preventing unwanted dripping from the fluid ejection structure, which may use a capillary effect to create such back-pressure (paragraph [0053]). Fluid is prevented from reaching (from the fluid holding structure) the drop ejection devices of the fluid ejection structure. However, no such capillary effect is disclosed in relation to the nozzles of the fluid ejection structure. The need for a back-pressure mechanism as described actually seems to rule out a nozzle configuration as defined in claim 1 since that claimed configuration alone would prevent dripping from the nozzles.

In conclusion, the subject-matter of claim 1 is novel over D1.

5.6 As regards inventive step starting from D1, it has to be noted that the fluid transfer device of this document is filled from the fluid holding structure i.e. from the top, so to speak (Figure 10 of D1). The fluid transfer device as defined in claim 1 of auxiliary request 3 is filled from the opposite direction, i.e. the bottom in Figure 4 of the application as filed, by wicking.

The distinguishing feature of claim 1 of auxiliary

request 3 is therefore considered to address the objective technical problem of facilitating fluid transfer from a fluid-filled well-plate.

D1 stresses that the fluid holding structure could hold different fluids which can be mixed and delivered via the fluid ejection structure (paragraph [0031], for example). In view of this disclosure it would not make technical sense to provide the possibility of filling via capillarity as claimed, since this would result in the fluid holding structure being filled by one and the same fluid.

It follows that the subject-matter of claim 1 is inventive when starting from D1.

5.7 No other document cited in the international or supplementary European search reports was considered by the Examining Division, nor is any one more relevant. In particular, D5 (cited as relevant for claims 5 and 6 as originally filed in the supplementary European search report) does not disclose filling a fluid holding structure via capillarity either (as derivable from paragraph [0045]).

5.8 In conclusion, the subject-matter of claim 1 and, a fortiori, of dependent claims 2 to 10 of auxiliary request 3 is novel (Article 54(1) and (2) EPC) and inventive (Article 56 EPC) over the cited prior art.

5.9 The description has been adapted to the amended claims.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division with the order to grant a patent in the following version:

   - claims 1 to 10 of auxiliary request 3, filed with letter dated 10 August 2020,
   - pages 1 to 9 and 11 to 15 of the description, filed with letter dated 19 March 2020, and page 10 filed during the oral proceedings before the Board of Appeal,
   - Figures 1A to 6 of the application as published.

The Registrar: The Chairman:

D. Hampe M. Alvazzi Delfrate

Decision electronically authenticated