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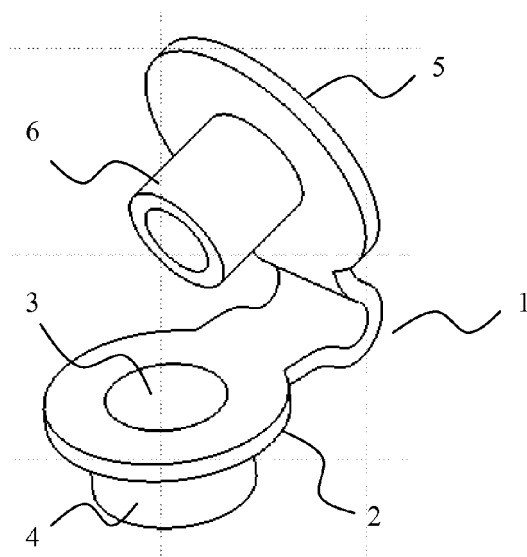
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(54) **Reclosable cap for reaction vessels**

(57) The present invention provides a reclosable cap to be applied to vessels arranged in a microtiter plate

format that is especially beneficial when used in work-flows requiring processing steps for all vessels in parallel as well as for vessels individually.

Fig. 1



Description

Background of the Invention

[0001] In the technical field of liquid handling two different approaches exist that are difficult to combine. The first approach is an automated high throughput approach for multiplexing using devices for parallel processing, whereas the second approach is a manual approach sufficient for low throughput.

[0002] To perform multiplexed liquid handling, the state of the art provides at least two different setups, namely microtiter plates or an arrangement of single vessels. If the parallel processing of the liquids is not desired for the entire workflow and a separation is required at some point in time, the use of an arrangement of single vessels is suitable. Here, it is reasonable to arrange the plurality of vessel with a spacing that is equal to the spacing of the wells within microtiter plates such that standard liquid handling devices using multi pipetting heads are applicable.

[0003] With respect to closures for liquid handling vessels there are solutions optimized for automated approaches as well as solutions optimized for manual approaches.

[0004] In the field of automated fluid handling the company *Micronic* (Lelystad, The Netherlands) offers solutions to seal all vessels of an arrangement at a time (e.g. *TPE Capmat* to seal 96 wells or tubes at a time). These sealings of *Micronic* even allow the separation of the vessels afterwards (*TPE Capcluster*), but the sealings are not suitable for convenient reclosing.

[0005] In the field of manual fluid handling the well known *Eppendorf* tubes exist that allow for multiple reclosing (*Eppendorf AG*, Hamburg Germany). On the other hand, these *Eppendorf* tubes are not suitable for multiplexing using pipetting robots, because the cap of the tube in open state will hinder the accessibility of neighboring vessels.

[0006] It is the task of the present invention to provide a sealing solution for vessels that is reclosable and that is applicable for workflows that have multiplexed, parallel liquid handling steps as well as individual pipetting steps.

Summary of the Invention

[0007] One aspect of the present invention is a reclosable cap (1) to be applied to vessels (7) arranged in a microtiter plate format, said reclosable cap comprises

- a) a first component (2) having a through hole (3) and a first lug (4), said first lug (4) is arranged for attaching said first component (2) to the opening of a vessel (7) in such a way that the interior of said vessel is accessible only via said through hole (3), and
- b) a second component (5) having a second lug (6), said second lug (6) is arranged for reversibly closing

the through hole (3) of said first component (2),

whereas said first component (2) and said second component (5) are linked to each other in such a way that both components are movable relative to each other to enable an open state of said through hole (3) as well as a closed state with said through hole (3) closed by said second lug (6).

[0008] In the field of multiplexed liquid handling using a plurality of single vessels (7) it is reasonable to arrange these vessels in such a way that the vessels are spaced to match the spacing of the wells within standard microtiter plates (SBS standard). Providing such an arrangement, it is possible to use standard pipetting equipment available on the market.

[0009] In order to have the interior of the vessel accessible by pipetting equipment via the opening of said vessel, especially by pipetting robots with multipipetting heads, it is not possible to use vessel comprising attached caps, because said caps will hinder the accessibility of neighboring vessels when opened.

[0010] Therefore, the reclosable caps of the present invention can be applied to vessels after the parallel liquid handling within the plurality of vessels is finalized and it is desired to temporarily close said vessels.

[0011] Afterwards, the closed vessel can be separated and further processed individually. E.g. some of the vessels can be stored in a refrigerator, whereas other are used immediately. Since the caps of the present invention are reclosable, it is also possible to withdraw only parts of the liquid from a respective vessel and reclose the cap for subsequent storage.

[0012] The reclosable caps for vessels in a multiwell arrangement of the present invention provide a significant advantage when compared with the state of the art closures for this purpose, namely the cap is fixed to the vessel even in the open state. This reduces the risk of contaminations that may occur compared to state of the art solutions using e.g. screwed caps, because these state of the art closure need to be placed temporarily e.g. on a bench prior to reclosing the vessel.

[0013] As mentioned before, other state of the art solutions have other problems, e.g. the sealing foils are not reclosable and caps with a permanently fixed cap are not suitable for parallel, automated handling.

[0014] Another aspect of the present invention is an arrangement of reclosable caps (8) according to the present invention, whereas a plurality of reclosable caps are linked to each other via a plurality of connectors (9) to form a grid, the spacing of said grid is adapted such that each reclosable cap is capable of closing a vessel of a respective arrangement of vessels.

[0015] Especially if a large amount of vessel is arranged to perform a high throughput liquid handling, it is preferable to apply all reclosable caps to the arrangement in one step. This can be done by providing a grid of reclosable caps, whereas of course the spacing of the caps needs to be adjusted to the spacing of the vessels. Con-

sequently, each microtiter format of vessel needs its own grid of reclosable caps.

[0016] Yet another aspect of the present invention is a method to handle a plurality of liquids, said method comprises the steps

- a) providing a plurality of vessels arranged in a multiwell format,
- b) adding liquids to said vessels,
- c) closing said vessels using reclosable caps according to the present invention,
- d) separating the closed vessels, and
- e) opening the reclosable cap to add liquid to and/or to extract liquid from said separated vessels.

[0017] As mentioned before, the reclosable caps of the present invention are especially useful in a workflow comprising automated high throughput steps as well as manual individual steps.

Detailed Description of the Invention

[0018] One aspect of the present invention is a reclosable cap (1) to be applied to vessels (7) arranged in a microtiter plate format, said reclosable cap comprises

- a) a first component (2) having a through hole (3) and a first lug (4), said first lug (4) is arranged for attaching said first component (2) to the opening of a vessel (7) in such a way that the interior of said vessel is accessible only via said through hole (3), and
- b) a second component (5) having a second lug (6), said second lug (6) is arranged for reversibly closing the through hole (3) of said first component (2),

whereas said first component (2) and said second component (5) are linked to each other in such a way that both components are movable relative to each other to enable an open state of said through hole (3) as well as a closed state with said through hole (3) closed by said second lug (6).

[0019] The reclosable caps of the present invention comprise two components linked to each other in such a way that both components are movable relative to each other. There are several ways to set up such a cap, namely a set up with a single piece or a set up comprising two or three pieces. In all cases the link between the two components need to be flexible in order to move them relative to each other.

[0020] A preferred link between the two components is e.g. a hinge.

[0021] A set up comprising at least two pieces offers the opportunity to use different material for the compo-

nents and the link. A preferable embodiment of the reclosable cap is e.g. that a rigid plastic material is used for the components and another flexible material for the link.

[0022] A preferred reclosable cap according to the present invention is a cap, whereas said removable cap is integrally formed.

[0023] Another preferred reclosable cap according to the present invention is a cap, whereas said removable cap is integrally formed from one material.

[0024] Yet another preferred reclosable cap according to the present invention is a cap, whereas said removable cap is integrally molded.

[0025] Still another preferred reclosable cap according to the present invention is a cap, whereas said removable cap is integrally molded from plastic material.

[0026] Molding of plastic disposables is a well known technique that provides for fast and cheap production. As an alternative, such disposables are producible by milling, too.

[0027] The reclosable caps of the present invention are designed to be used for liquid handling workflows as part of biological or chemical reactions that should be performed multiple times, e.g. in screening applications to test a plurality of compounds with respect to a certain property. Consequently, the material should be resistant to certain chemicals.

[0028] With respect to the material for the reclosable caps of the present invention no restrictions exist. A suitable material can be chosen from state of the art known to the person skilled in the art depending on the liquids to be used (material should be resistant to chemicals), the desired workflow (material should be stable regarding temperature and/or mechanical stress, transparent to light for analysis) or the material of the respective vessels (contact of the materials should be water- or air-tight).

[0029] Consequently, a preferred reclosable cap according to the present invention is a cap, whereas said vessels (7) are reaction vessels.

[0030] Another preferred reclosable cap according to the present invention is a cap, whereas said vessels (7) are sample containers or storage vessels.

[0031] As mentioned before, the reclosable caps of the present invention are designed to be used to temporarily close vessels that are arranged in a multiwell format. Said multiwell formats are defined via the spacing of the wells like in case of the standard 96 well microtiter plates (SBS standard). Additionally, other multiwell plates with defined geometry exist having different number of wells.

[0032] A preferred reclosable cap according to the present invention is a cap, whereas said vessels (7) are arranged in a 4-, 6-, 8-, 16- or 24- well format, more preferred in a 96-, 384- or 1536- well format.

[0033] The person skilled in the art will understand that the reclosable caps of the present invention will become beneficial especially for arrangements having a large amount of vessels, because for arrangements with a small amount of vessels it may still be reasonable to use

manual approaches.

[0034] The reclosable caps of the present invention are designed for vessels that hold and store liquids and consequently, a preferred reclosable cap according to the present invention is a cap, whereas said closed state with said through hole (3) closed by said second lug (6) is water-tight.

[0035] Especially for the purpose of storing liquids it is advantageous that the reclosable caps close the vessels in such a way that evaporation is prevented.

[0036] Consequently, another preferred reclosable cap according to the present invention is a cap, whereas said closed state with said through hole (3) closed by said second lug (6) is air-tight.

[0037] As mentioned before, the interior of said vessel with an applied reclosable cap is only accessible via said through hole in order to reach the containing liquids. Since the caps of the present invention are applied to the vessels for subsequent manual processes, a preferred reclosable cap according to the present invention is a cap, whereas said open state of said through hole is configured in such a way that the interior of said vessel is accessible via said through hole by a pipette tip.

[0038] In case that the vessels should be used after some manual, individual processing steps within a subsequent automated, parallel workflow it is desired that the reclosable cap can be removed again.

[0039] Therefore, yet another preferred reclosable cap according to the present invention is a cap, whereas said attaching of said first component (2) to the opening of a vessel (7) is reversible.

[0040] Another aspect of the present invention is an arrangement of reclosable caps (8) according to the present invention, whereas a plurality of reclosable caps are linked to each other via a plurality of connectors (9) to form a grid, the spacing of said grid is adapted such that each reclosable cap is capable of closing a vessel of a respective arrangement of vessels.

[0041] Such an arrangement of reclosable caps is preferred to apply a plurality of caps to vessels in one step. It is possible to apply an arrangement of reclosable caps that only closes a certain part of an arrangement of vessels and therefore, to close all vessels of the arrangement more than one arrangement of reclosable caps is necessary. On the other hand, it is possible to apply an arrangement of reclosable caps to an arrangement of vessels such that each vessel is closed by one cap.

[0042] As mentioned before, the reclosable caps of the present invention are designed to be used preferably in workflows having both automated, parallelized as well as manual, individual steps. Consequently, it is preferred that the vessels of the arrangement are separable after the caps are applied and therefore, the linkage between the caps needs to be disconnected at some time.

[0043] A preferred arrangement of reclosable caps according to the present invention is an arrangement, whereas said connectors (9) are refrangible.

[0044] A more preferred arrangement of reclosable

caps according to the present invention is an arrangement, whereas said connectors (9) each have a predetermined breaking point such that said reclosable caps are separable.

[0045] With respect to the material setup of the arrangement of reclosable caps several designs are reasonable. One possibility is that the material of the caps and of the connectors is the same, whereas another possibility is to use a different material for the connectors. Since the connectors are preferably refrangible, it is reasonable to use a soft material for the connectors, but to use a solid, chemically resistant material for the caps.

[0046] Another preferred arrangement of reclosable caps according to the present invention is an arrangement, whereas said arrangement of reclosable caps is integrally formed.

[0047] Yet another preferred arrangement of reclosable caps according to the present invention is an arrangement, whereas said arrangement of reclosable caps is integrally formed from one material.

[0048] Still another preferred arrangement of reclosable caps according to the present invention is an arrangement, whereas said arrangement of reclosable caps is integrally molded.

[0049] As mentioned before with respect to the reclosable caps, molding of plastic disposables is a well known technique that provides for fast and cheap production. As an alternative, such disposables are producible by milling, too. Moreover, the discussion regarding suitable materials for the reclosable caps applies for the arrangement of reclosable caps, too.

[0050] Yet another aspect of the present invention is a method to handle a plurality of liquids, said method comprises the steps

- a) providing a plurality of vessels arranged in a multiwell format,
- b) adding liquids to said vessels,
- c) closing said vessels using reclosable caps according to the present invention,
- d) separating the closed vessels, and
- e) opening the reclosable cap to add liquid to and/or to extract liquid from said separated vessels.

[0051] The method of the present invention is a workflow comprising both parallelized as well as individual processing steps, whereas the vessels can be closed after the parallel processing steps and separated for further individual processing.

[0052] A preferred method according to the present invention is a method, whereas said vessels are closed in step c) using an arrangement of reclosable caps according to the present invention.

[0053] To use an arrangement of reclosable caps for

the method to handle a plurality of liquids according to the present invention, it is necessary that the vessels are still separable after the closing and there are several possibilities to disconnect the connectors of the arrangement of reclosable caps.

[0054] A more preferred method according to the present invention is a method, whereas said vessels are separated in step d) by breaking said connectors (9).

[0055] Another more preferred method according to the present invention is a method, whereas said vessels are separated in step d) by breaking said connectors (9) at predetermined breaking points.

[0056] As mentioned before, the present invention is especially suitable for workflows that have both automated, parallelized as well as manual, individual steps.

[0057] Therefore, another preferred method according to the present invention is a method, whereas step b) and step c) are performed using an automated set-up.

[0058] A more preferred method according to the present invention is a method, whereas step b) is performed simultaneously using a multi pipetting device.

[0059] Yet another preferred method according to the present invention is a method, whereas step e) is performed using a manual set-up.

[0060] Depending on the application of the method according to the present invention, additional processing steps can be applied to the workflow.

[0061] In a preferred method according to the present invention, said method further comprises the step

f) closing the reclosable cap.

[0062] A preferred method according to the present invention is a method, whereas additional steps are performed after step b) and prior to step c), said additional steps are adding additional liquids, mixing said liquids and/or withdrawing part of the mixture.

Description of the Figures

[0063]

Figure 1 Reclosable cap.

Figure 2 Vessel without reclosable cap (a) and with reclosable cap (b).

Figure 3 Vessel with reclosable cap in open configuration (a) and closed configuration (b).

Figure 4 Vessel arrangement (a) and a plurality of connected reclosable caps in bottom view (b).

Figure 5 Top view of a plurality of connected reclosable caps (b).

Example - Automated isolation of nucleic acid from blood in the field of cancer research

[0064] A batch of 96 blood samples is purified in a 96 well format using an automated workflow to provide 96

purified nucleic acids eluates. Afterwards, said eluates need to be divided in order to give different users the possibility to perform a plurality of analysis (e.g. PCR) as well as to store the vessels (e.g. in a freezer). Consequently, it is preferable that the vessels comprising the eluate are closed after the automated nucleic acid purification workflow has been finalized.

[0065] For this purpose, each vessel is closed using a reclosable cap. The attached reclosable cap can be opened with one hand, whereas liquid can be withdrawn or added using a manual pipette using the other hand.

[0066] This has at least two advantages as compared to e.g. a screwed cap that may be used to close the vessels of an arrangement after the automated, parallel processing, too. First of all, the cap will remain attached to the vessel and this will significantly reduce the risk of contaminations. A screwed cap must be placed e.g. on a bench in order to access the liquid within a vessel with a pipette tip, whereas contamination may occur or whereas the risk of cross-contaminations is increased due to the possibility of mixing the caps. This kind of contaminations may of course be avoided by using new caps after each processing step, but this will increase the costs of the experiments.

[0067] Moreover, the reclosable caps of the present invention will speed up the workflow, because several hand movements can be avoided. Since the time a vessel is open needs to be as short as possible in order to reduce the risk of contaminations, an increase in workflow speed will be of benefit for this topic as well.

Claims

1. Reclosable cap (1) to be applied to vessels (7) arranged in a microtiter plate format, said reclosable cap comprises

a) a first component (2) having a through hole (3) and a first lug (4), said first lug (4) is arranged for attaching said first component (2) to the opening of a vessel (7) in such a way that the interior of said vessel is accessible only via said through hole (3), and
b) a second component (5) having a second lug (6), said second lug (6) is arranged for reversibly closing the through hole (3) of said first component (2),

whereas said first component (2) and said second component (5) are linked to each other in such a way that both components are movable relative to each other to enable an open state of said through hole (3) as well as a closed state with said through hole (3) closed by said second lug (6).

2. The reclosable cap according to claim 1, whereas said removable cap is integrally molded from plastic

material.

3. The reclosable cap according to claims 1-2, whereas said vessels (7) are arranged in an 8-, 16-, 24-, 96-, 384- or 1536- well format.
4. The reclosable cap according to claims 1-3, whereas said closed state with said through hole (3) closed by said second lug (6) is air-tight.
5. The reclosable cap according to claims 1-4, whereas said open state of said through hole is configured in such a way that the interior of said vessel is accessible via said through hole by a pipette tip.
6. Arrangement of reclosable caps (8) according to claims 1-5, whereas a plurality of reclosable caps are linked to each other via a plurality of connectors (9) to form a grid, the spacing of said grid is adapted such that each reclosable cap is capable of closing a vessel of a respective arrangement of vessels.
7. The arrangement of reclosable caps according to claim 6, whereas said connectors (9) each have a predetermined breaking point such that said reclosable caps are separable.
8. The arrangement of reclosable caps according to claims 6-7, whereas said arrangement of reclosable caps is integrally molded.
9. A method to handle a plurality of liquids, said method comprises the steps
 - a) providing a plurality of vessels arranged in a multiwell format,
 - b) adding liquids to said vessels,
 - c) closing said vessels using reclosable caps according to claims 1-5,
 - d) separating the closed vessels, and
 - e) opening the reclosable cap to add liquid to and/or to extract liquid from said separated vessels.
10. The method according to claim 9, whereas said vessels are closed in step c) using an arrangement of reclosable caps according to claims 6-8.
11. The method according to claim 10, whereas said vessels are separated in step d) by breaking said connectors (9).
12. The method according to claims 9-11, whereas step b) and step c) are performed using an automated set-up.
13. The method according to claims 9-12, whereas step e) is performed using a manual set-up.
14. The method according to claims 9-13, said method further comprises the step f) closing the reclosable cap.
15. The method according to claims 9-14, whereas additional steps are performed after step b) and prior to step c), said additional steps are adding additional liquids, mixing said liquids and/or withdrawing part of the mixture.

Fig. 1

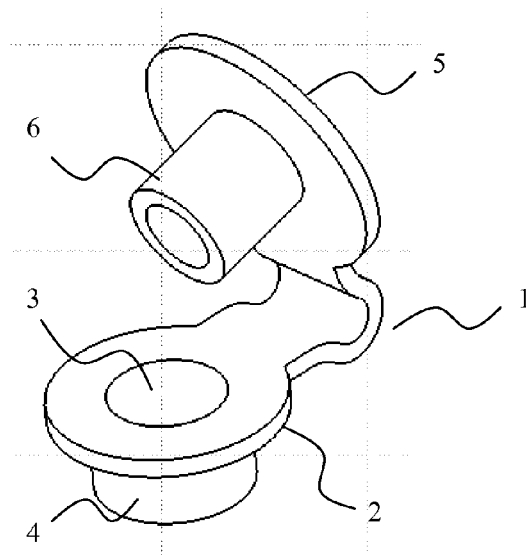
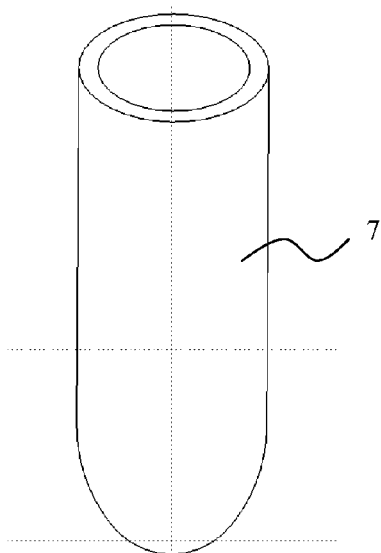


Fig. 2

a)



b)

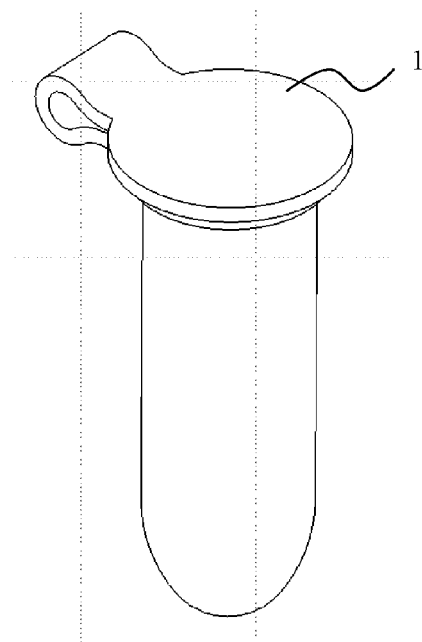


Fig. 3

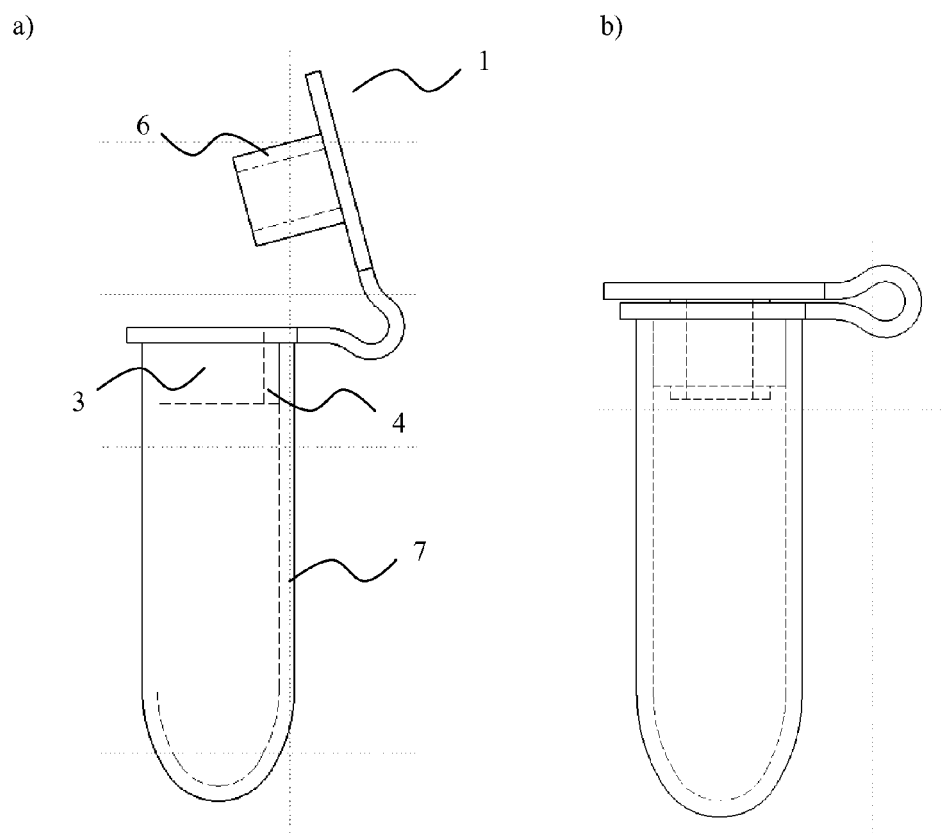
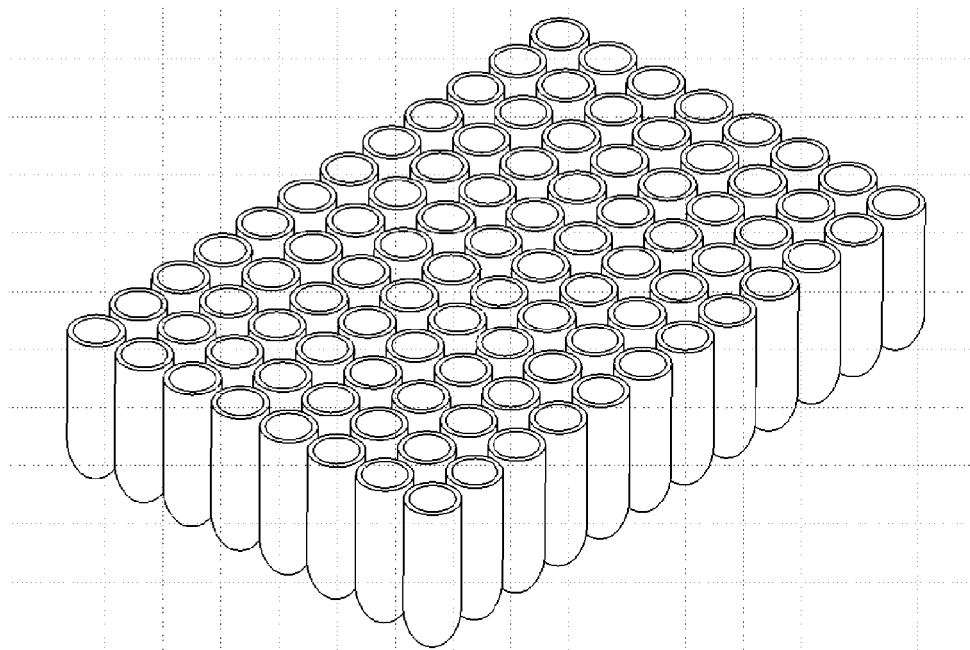


Fig. 4

a)



b)

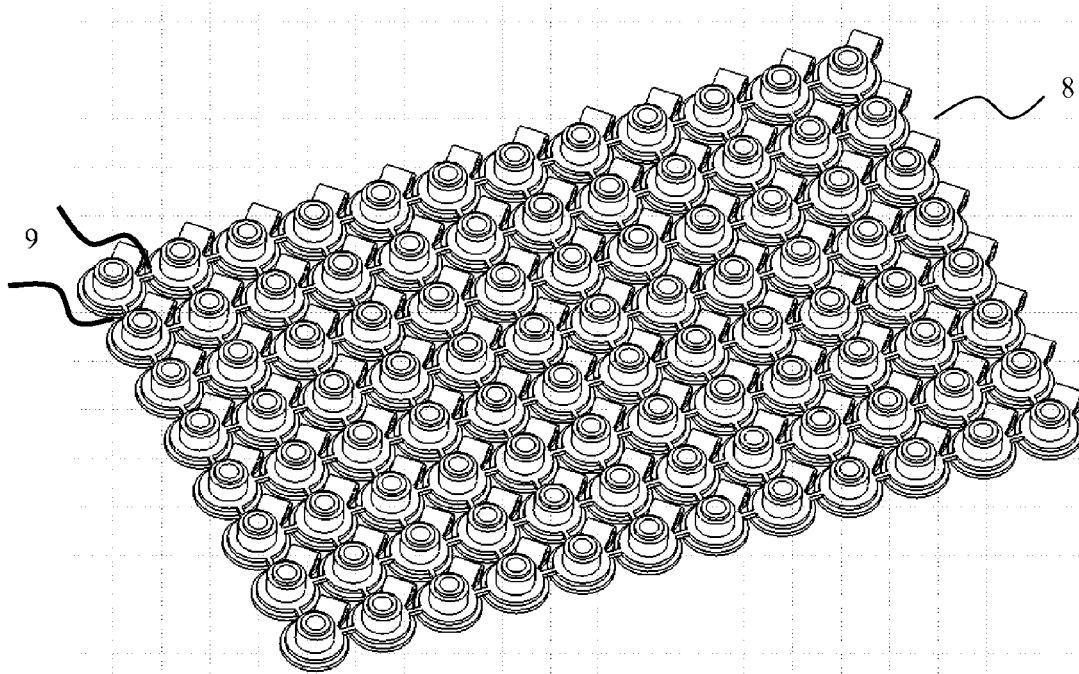
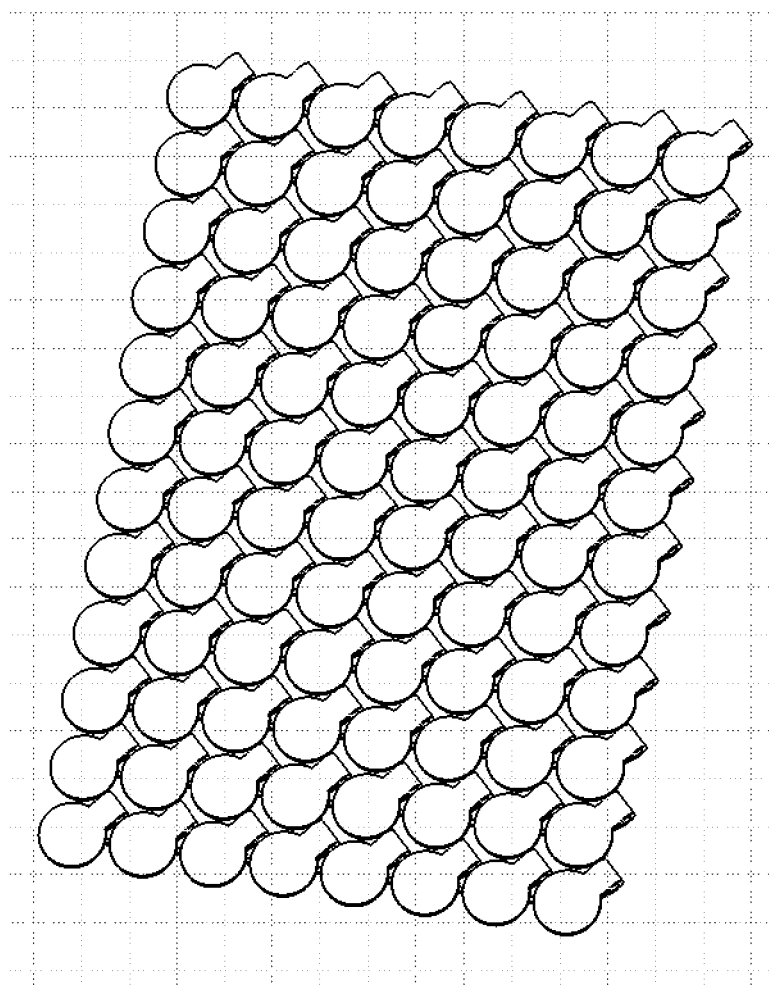


Fig. 5





EUROPEAN SEARCH REPORT

Application Number
EP 10 16 0322

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2006/169708 A1 (CHANG RONALD [US]) 3 August 2006 (2006-08-03)	1-5	INV. B01L3/00 B01L3/14
Y	* paragraph [0066]; figures 1-9,12-13,19-22 *	6-15	

X	EP 1 731 443 A1 (PRESCRIBE GENOMICS CO [JP]) 13 December 2006 (2006-12-13)	1-5	
Y	* paragraph [0001]; figures 11A,11B *	6-15	

X	WO 2010/020043 A1 (DNA GENOTEK INC [CA]; CURRY IAN [CA]; SUNSTRUM ROY [CA]; JACKSON ADELE) 25 February 2010 (2010-02-25)	1-5	
Y	* claims 1,8; figures 1,2 *	6-15	

X	US 6 145 688 A (SMITH JAMES C [US]) 14 November 2000 (2000-11-14)	1-5	
Y	* figures 1-5,15-22 *	6-15	TECHNICAL FIELDS SEARCHED (IPC) B01L

Y	US 5 112 574 A (HORTON NIKKI [US]) 12 May 1992 (1992-05-12)	6-15	
* column 2, line 45 - column 2, line 49; claim 2; figures 1,5,9 *			

Y	US 6 202 878 B1 (COOK CHARLES DAVID [GB]) 20 March 2001 (2001-03-20)	6,10	
* figures 1-4 *			
* column 2, line 8 - column 2, line 15 *			

Y	EP 0 834 729 A2 (BECTON DICKINSON CO [US]) 8 April 1998 (1998-04-08)	7-15	
* column 5, line 44 - column 5, line 53; figures 1-3 *			

Y	US 2009/011401 A1 (SATTLER STEPHAN [DE] ET AL) 8 January 2009 (2009-01-08)	7-15	
* paragraphs [0016], [0040]; figures 1-4 *			

-/--			
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 August 2010	Examiner de Biasio, Arnaldo
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 1
EPO FORM 1503 03.02 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 10 16 0322

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 5 683 659 A (HOVATTER KENNETH R [US]) 4 November 1997 (1997-11-04) * figures 1-3 * -----	6,10	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 August 2010	Examiner de Biasio, Arnaldo
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 16 0322

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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18-08-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006169708 A1	03-08-2006	US 2010084402 A1	08-04-2010
EP 1731443 A1	13-12-2006	CN 1942371 A	04-04-2007
		EP 2138235 A1	30-12-2009
		WO 2005087603 A1	22-09-2005
		JP 4049800 B2	20-02-2008
		US 2007272689 A1	29-11-2007
WO 2010020043 A1	25-02-2010	NONE	
US 6145688 A	14-11-2000	US 2008228163 A1	18-09-2008
		US 6375028 B1	23-04-2002
US 5112574 A	12-05-1992	NONE	
US 6202878 B1	20-03-2001	AU 739801 B2	18-10-2001
		AU 2630699 A	20-09-1999
		CA 2322542 A1	10-09-1999
		DE 69902235 D1	29-08-2002
		DE 69902235 T2	14-11-2002
		EP 1060024 A1	20-12-2000
		WO 9944745 A1	10-09-1999
		JP 2002505183 T	19-02-2002
EP 0834729 A2	08-04-1998	AU 719489 B2	11-05-2000
		AU 3927897 A	02-04-1998
		BR 9704776 A	29-12-1998
		CA 2215650 A1	26-03-1998
		JP 10127268 A	19-05-1998
		US 5795748 A	18-08-1998
US 2009011401 A1	08-01-2009	CA 2635129 A1	26-07-2007
		CN 101370587 A	18-02-2009
		DE 102006001882 A1	19-07-2007
		EP 1973659 A1	01-10-2008
		WO 2007082697 A1	26-07-2007
		JP 2009523238 T	18-06-2009
US 5683659 A	04-11-1997	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82