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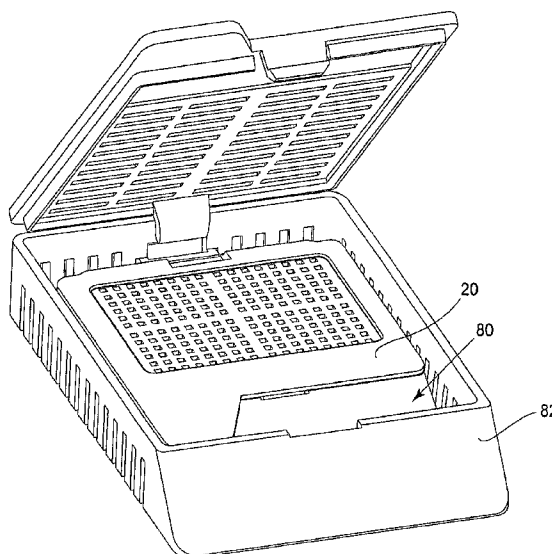
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(54) Title: HISTOLOGICAL SPECIMEN CASSETTE AND ASSOCIATED METHOD OF USE



(57) Abstract: A tissue cassette for use during histological examination of tissue preferably comprises a receptacle and a lid. The lid is preferably pivotally attached to the receptacle about a pivot axis. The cavity preferably has a maximum width measurable anywhere parallel to the pivot axis that is greater than its maximum length measurable in any plane perpendicular to the pivot axis. The lid preferably has maximum width measurable anywhere parallel to the pivot axis that is greater than its length measurable in a plane that bisects the maximum width of the lid and that is perpendicular to the pivot axis. The cassette, with its lid closed against the receptacle, preferably has a maximum width measurable anywhere parallel to the pivot axis that is less than the maximum length of the cassette measurable in any plane perpendicular to the pivot axis.

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## HISTOLOGICAL SPECIMEN CASSETTE AND ASSOCIATED METHOD OF USE

5

### Field of the Invention

The present invention pertains to the field of histological examination. More particularly, this invention pertains to cassettes for treating tissue samples in preparation of microscopic histological examination.

10

### Background of the Invention

Cassettes of the type disclosed in United States Patent Numbers 5,928,934 and 5,665,398, the disclosures of which are incorporated herein by reference in their entireties, are used to store, treat, and hold tissue samples in preparation of performing microscopic histological examination of such tissue. Typically, a cassette comprises a receptacle portion that forms a cavity and a lid. The receptacle and lid each typically have numerous small apertures that allow the fluid to pass through the cassette and into the cavity. The lid is often attached to the receptacle by a hinge in manner such that the lid can be used to selectively open and close the cavity of the receptacle.

20

25           During the treatment of a tissue sample in preparation of  
microscopic examination, the tissue sample is typically placed  
in the cavity of a cassette with the lid of the cassette  
closed to prevent the tissue sample from inadvertently falling  
out of the cavity. The cassette is then typically immersed in  
30 any number of various fluids such as ethanol, xylene,  
formaldehyde, and water. The apertures in the receptacle and  
lid of the cassette allow such fluids to pass into the cavity  
of the cassette and make contact with the tissue sample. In  
addition to these steps, a tissue sample may be dried and  
35 stained within the cassette. Multiple tissue samples in  
multiple cassettes can be treated in this manner  
simultaneously.

          The treatment procedures typically conclude by immersing  
the cassette and tissue sample in molten paraffin. The lid of  
40 the cassette is thereafter opened and tissue sample is removed  
from the cassette prior to the complete solidification of the  
paraffin. Following this step, the tissue sample is placed in  
a cavity formed in an embedding mold. The cassette is then  
placed above the tissue sample in the embedding mold and  
45 additional paraffin is used to secure the tissue sample to the  
exterior of the cassette adjacent the bottom surface of the  
cassette. This additional paraffin is allowed to solidify in  
and around the apertures of the receptacle and thereby

provides a firm attachment of the tissue sample to the  
50 cassette. As such, the cassette can then be used hold the  
tissue sample when the tissue sample is sliced by a microtome.

#### Summary of the Invention

The present invention is directed to an improved  
55 histological examination cassette. In one aspect of the  
invention, a histological specimen cassette is configured and  
adapted for use in connection with a larger specimen cassette  
that has an internal chamber that creates a parallelepiped  
void that has a length of 1.25 inches, a width of 1.00 inches,  
60 and a height of 0.2 inches. The histological specimen  
cassette comprises a receptacle and a lid. The receptacle has  
a bottom wall, opposite side walls, opposite front and back  
walls, and a cavity. The cavity is positioned between the  
sidewalls and between the front and back walls of the  
65 receptacle and is partially bound by the bottom wall. The  
bottom wall has a plurality of apertures that extend through  
the bottom wall and that create fluid passageways into the  
cavity. The lid also has a plurality of apertures that extend  
through the lid and that create additional fluid passageways  
70 into the cavity. The lid is movable between an opened  
position and a closed position relative to the receptacle.  
When the lid is in the closed position, the lid engages the

receptacle and the cavity is partially bound by the lid. The histological specimen cassette is dimensioned such that the  
75 histological specimen cassette can fit entirely within the void of the larger specimen cassette when the lid is in the closed position.

In another aspect of the invention, a histological examination specimen preparation cassette comprises a  
80 receptacle and a lid. The receptacle has a bottom wall, opposite side walls, opposite front and back walls, and a cavity. The cavity is positioned between the sidewalls and between the front and back walls and is partially bound by the bottom wall. The bottom wall has a plurality of apertures  
85 that extend through the bottom wall and that create fluid passageways into the cavity. Similarly, the lid has a plurality of apertures that extend through the lid and that create additional fluid passageways into the cavity. The lid is pivotally attached to the receptacle generally about a  
90 pivot axis in a manner such that the lid is pivotable between an opened position and a closed position relative to the receptacle. When the lid is in the closed position, the lid engages the receptacle and the cavity is partially bound by the lid. The cavity has a maximum width measurable anywhere  
95 parallel to the pivot axis and a maximum length measurable in any plane perpendicular to the pivot axis. The maximum width

of the cavity is greater than the maximum length of the cavity.

In yet another aspect of the invention, a histological examination specimen preparation cassette comprises a  
100 receptacle and a lid. The receptacle has a bottom wall, opposite side walls, opposite front and back walls, and a cavity. The cavity is positioned between the sidewalls and between the front and back walls and is partially bound by the  
105 bottom wall. The bottom wall has a plurality of apertures that extend through the bottom wall and that create fluid passageways into the cavity. Similarly, the lid has a plurality of apertures that extend through the lid and that create additional fluid passageways into the cavity. The lid  
110 is pivotally attached to the receptacle generally about a pivot axis in a manner such that the lid is pivotable between an opened position and a closed position relative to the receptacle. The pivot axis is oriented generally perpendicular to each of the side walls of the receptacle.  
115 When the lid is in the closed position, the lid engages the receptacle and the cavity is partially bound by the lid. The cassette has a maximum length measurable in any plane perpendicular to the pivot axis when the lid is in the closed position. This maximum length defines a lengthwise direction.  
120 The front wall is inclined relative to the bottom wall in a

manner such that the front wall extends a lengthwise distance that is at least two tenths of the maximum length of the cassette.

While the principal advantages and features of the invention have been described above, a more complete and thorough understanding of the invention may be obtained by referring to the drawings and the detailed description of the preferred embodiment, which follow.

#### 130 Brief Description of the Drawings

Figure 1 is a perspective view of the preferred embodiment of a histological examination specimen preparation cassette in accordance with the invention.

Figure 2 is top plan view of the cassette shown in Figure 1.

Figure 3 is a bottom plan view of the cassette shown in Figures 1 and 2.

Figure 4 is a front elevation view of the cassette shown in Figures 1-3.

Figure 5 is a rear elevation view of the cassette shown in Figures 1-4.

Figure 6 is a right-side elevation view of the cassette shown in Figures 1-5.



Figure 7 is a view of an assembly comprising the cassette  
145 shown in Figures 1-6 positioned within the internal chamber of  
a prior art cassette.

Reference characters in the written specification  
indicate corresponding items shown throughout the drawing  
figures.

150

Detailed Description of the Preferred Embodiment of the  
Invention

The preferred embodiment of a histological examination  
155 specimen preparation cassette in accordance with the invention  
is shown by itself in Figures 1-6. The cassette 20 comprises  
a receptacle 22 and a lid 24. The lid 24 and the receptacle  
22 are preferably injection molded together out of polymeric  
material as a single monolithic part in the configuration  
160 shown in Figures 2-6. The lid 24 is attached to the  
receptacle 22 via a thin bridge portion 26 that acts as a  
hinge and allows the lid and receptacle to pivot thereabout  
relative each other. However, the bridge portion 26 is  
configured and adapted to be frangible so that, if desired,  
165 the lid can be easily separated from the receptacle by ripping  
the bridge portion in half along the pivot axis.

The receptacle 22 comprises opposite front 28 and back 30 walls, opposite side walls 32, and a bottom wall 34. The receptacle 22 also comprises a cavity 36 that extends down  
170 into the receptacle and that is partially bound by the bottom wall 38 of the receptacle. The cavity 36 is further bound by four intermediate walls 38 that slope from the bottom wall 34 to the top perimeter edge 40 of the cavity. Two of the four intermediate walls 38 are generally perpendicular to the back  
175 wall 30 of the receptacle 22 and diverge from each other as they extend upward. These two intermediate walls 38 eventual merge into the side walls 32 adjacent the top perimeter edge 40 of the cavity 36. The other two intermediate walls 38 are generally perpendicular to the side walls 32 of the  
180 receptacle 22 and also diverge from each other as they extend upward. One of these two intermediate walls 38 eventual merges into the back wall 30 adjacent the top perimeter edge 40 of the cavity 36, and the other of these two intermediate walls eventual merges into the front wall 28 adjacent the top  
185 perimeter edge of the cavity 36. The front wall 28 slopes toward to the back wall 30 as it extends upward and is preferably oriented between fifteen and twenty-three degrees from the bottom wall 34 of the receptacle 22. More preferably, the front wall 28 is preferably oriented between  
190 sixteen and eighteen degrees from the bottom wall 34 of the

receptacle 22. More preferably still, the front wall 28 is preferably oriented seventeen degrees from the bottom wall 34 of the receptacle 22. As such, the front wall 28 extends front to back more than two tenths of the front to back maximum length of the entire receptacle 22. Each of the sidewalls 32, the bottom wall 34, and the intermediate walls 38 preferably comprises a plurality of apertures 42 to allow fluid to pass through such walls. The front wall 28 is preferably devoid of apertures. A first larger rectangular opening 44 preferably extends through the rear intermediate wall 38 and the lower portion of the back wall 30. A second rectangular opening 46 preferably extends down through the intersection of the front intermediate wall 38 and the front wall 30. Each of the first and second openings is centrally positioned between the side walls 32.

The lid 24 of the cassette 20 preferably comprises a main rectangular portion 50, a thumb release tab 52, a rectangular ring protrusion 54, a locking tab 56, and a arcuate guiding protrusion 58. The main rectangular portion 50 of the lid 24 is preferably thin and planar and comprises a plurality of apertures 60 that extend therethrough. The thumb release tab 52 preferably extends from the front edge 64 of the main rectangular portion 50 in a coplanar manner adjacent one of the side edges 62 of the main rectangular portion. The

215 rectangular ring protrusion 54 preferably extends downwardly  
(assuming the lid 24 is in its closed position as described  
below) from the main rectangular portion 50 in a direction  
generally perpendicular to the plane of the main rectangular  
portion. The locking tab 56 also extends downwardly from the  
220 main rectangular portion 50 adjacent the front edge 64 of the  
main rectangular portion and forms a locking tang 66 that  
extends forward of the front edge. The locking tab 56 is  
preferably centrally positioned between the side edges 62 of  
the main rectangular portion 50. The arcuate guiding  
225 protrusion 58 preferably extends downward from the rectangular  
ring protrusion 54 and curves aft as it extends therefrom.

As mentioned above, the lid 24 is able to pivot about the  
receptacle 22 by flexing the bridge portion 26. Thus, the  
bridge portion 26 creates a pivot axis that is parallel to and  
230 aft of the back wall the receptacle 22, and about which the  
lid 24 is able to pivot relative to the receptacle. When the  
lid 24 is in an open position relative to the receptacle 22,  
such as shown in Figures 2-6 or as shown in Figure 1, the  
cavity 36 of the receptacle 22 is open from above.

235 Alternatively, when the lid 24 is in a closed position  
relative to the receptacle 22, such as shown in Figure 7, the  
rectangular portion 50 of the lid covers the top of the cavity  
36. As the lid 24 is pivoted from an opened position to the

closed position, the locking tab 56 of lid moves into the  
240 second opening 46 of the receptacle 22 where the locking tang  
66 of the locking tab engages the front wall 28 of the  
receptacle and resiliently deflects the locking tab rearward  
until the locking tang reaches a position beneath the front  
wall. Thereafter, the locking tab 56 resiliently deflects  
245 back to its neutral position where the locking tang 66 engages  
against underside of the front wall 28 in a manner preventing  
the lid 24 from moving back to its opened position unless more  
than a threshold force is exerted between the lid and the  
receptacle 22. Additionally, as the lid 24 is pivoted from an  
250 opened position to the closed position, the guiding protrusion  
58 of the lid moves into the first opening 44 of the  
receptacle 22. If the bridge portion 26 is severed, the  
guiding protrusion 58 of the lid 24 can be inserted into the  
first opening 44 and used to create an alternative hinge  
255 connecting the lid to the receptacle 22. In such a case, the  
guiding protrusion 58 of the lid 24 interlocks with the  
receptacle 22 and prevents the lid from separating from the  
receptacle when the lid is in its closed position. When the  
lid 24 is in the closed position, the rectangular ring  
260 protrusion 54 of the lid extends into the cavity 36 of the  
receptacle 22 where it prevents tissue samples from slipping  
out of the cavity between the lid and receptacle.

Additionally, when the lid 24 is in the closed position, the thumb release tab 52 extends above the front wall 28 of the receptacle 22 in a spaced apart manner. This allows a person to exert a prying force upward on the thumb release tab 52 while also pressing downward on the front wall 28 of the receptacle 22 in a manner overcoming the threshold force that otherwise prevents the lid 24 from moving back into an opened position.

The lid 24 and receptacle 22 are dimensioned such that the entire cassette 20, with its lid in the closed position, can be positioned within the cavity 80 of another larger cassette 82, as shown in Figure 7. More specifically, lid 24 and receptacle 22 are dimensioned to fit within a parallelepiped void having a length of 1.25 inches, a width of 1.00 inches, and a height of 0.2 inches. Furthermore, the distance between the side edges 62 of the rectangular portion 50 of the lid 24 is greater than the front to back length of the rectangular portion of the lid. Additionally, the side to side width of the cavity 36 of the receptacle 22 is greater than the front to back length of the cavity. However, the overall side to side width of the cassette 20 is less than the front to back length of the entire cassette.

The above mentioned configuration the cassette 20 allows the cassette to serve the same purpose as a standard prior art

cassette, without occupying as much physical space as such a prior art cassette. Additionally, the configuration the cassette 20 allows the cassette to be placed within the cavity of another prior art cassette in a manner such that the cassette can be used in tissue treatment devices that are specifically configured for prior art standard size cassettes.

While the present invention has been described in reference to a specific embodiment, in light of the foregoing, it should be understood that all matter contained in the above description or shown in the accompanying drawings is intended to be interpreted as illustrative and not in a limiting sense and that various modifications and variations of the invention may be constructed without departing from the scope of the invention defined by the following claims. Thus, other possible variations and modifications should be appreciated.

Furthermore, it should be understood that when introducing elements of the present invention in the claims or in the above description of the preferred embodiment of the invention, the terms "comprising," "including," and "having" are intended to be open-ended and mean that there may be additional elements other than the listed elements. Similarly, the term "portion" should be construed as meaning some or all of the item or element that it qualifies.

What Is Claimed Is:

1. A histological specimen cassette for use in connection with a larger specimen cassette that has an internal chamber that creates a parallelepiped void that has a length of 1.25  
115 inches, a width of 1.00 inches, and a height of 0.2 inches, the histological specimen cassette comprising:

a receptacle and a lid, the receptacle having a bottom wall, opposite side walls, opposite front and back walls, and a cavity, the cavity being positioned between the sidewalls  
120 and between the front and back walls, the cavity being partially bound by the bottom wall, the bottom wall having a plurality of apertures that extend through the bottom wall and that create fluid passageways into the cavity, the lid having a plurality of apertures that extend through the lid and that  
125 create additional fluid passageways into the cavity, the lid being movable between an opened position and a closed position relative to the receptacle, the lid engaging the receptacle when the lid is in the closed position and the cavity being partially bound by the lid when the lid is in the closed  
130 position, the histological specimen cassette being dimensioned such that the histological specimen cassette can fit entirely within the void of the larger specimen cassette when the lid is in the closed position.



2. A cassette in accordance with claim 1 wherein the lid is  
335 pivotally attached to the receptacle generally about a pivot  
axis in a manner such that the lid is pivotable between the  
opened position and the closed position relative to the  
receptacle, the cavity has a maximum width measurable anywhere  
parallel to the pivot axis and a maximum length measurable in  
340 any plane perpendicular to the pivot axis, and the maximum  
width of the cavity is greater than the maximum length of the  
cavity.

3. A cassette in accordance with claim 2 wherein the  
cassette has a maximum width measurable anywhere parallel to  
345 the pivot axis and a maximum length measurable in any plane  
perpendicular to the pivot axis when the lid is in the closed  
position, and the maximum width of the cassette is less than  
the maximum length of the cassette.

4. A cassette in accordance with claim 3 wherein the lid has  
350 a maximum width measurable anywhere parallel to the pivot axis  
and a length measurable in a plane that bisects the maximum  
width of the lid and that is perpendicular to the pivot axis,  
and the maximum width of the lid is greater than the length of  
the lid.

355 5. A cassette in accordance with claim 1 wherein the lid is  
pivotally attached to the receptacle generally about a pivot

axis in a manner such that the lid is pivotable between the opened position and the closed position relative to the receptacle, the pivot axis is oriented generally perpendicular to each of the side walls, the cassette has a maximum length measurable in any plane perpendicular to the pivot axis when the lid is in the closed position, the maximum length of the cassette defines a lengthwise direction, and the front wall is inclined relative to the bottom wall in a manner such that the front wall extends a lengthwise distance that is at least two tenths of the maximum length of the cassette.

6. A cassette in accordance with claim 1 wherein the lid is pivotally attached to the receptacle generally about a pivot axis in a manner such that the lid is pivotable between the opened position and the closed position relative to the receptacle, the cassette has a maximum width measurable anywhere parallel to the pivot axis and a maximum length measurable in any plane perpendicular to the pivot axis when the lid is in the closed position, and the maximum width of the cassette is less than the maximum length of the cassette.

7. A cassette in accordance with claim 6 wherein, the pivot axis is oriented generally perpendicular to each of the side walls, the maximum length of the cassette defines a lengthwise direction, and the front wall is inclined relative to the

80 bottom wall in a manner such that the front wall extends a  
lengthwise distance that is at least two tenths of the maximum  
length of the cassette.

8. A cassette in accordance with claim 1 wherein the lid is  
pivotally attached to the receptacle generally about a pivot  
85 axis in a manner such that the lid is pivotable between the  
opened position and the closed position relative to the  
receptacle, the lid has a maximum width measurable anywhere  
parallel to the pivot axis and a length measurable in a plane  
that bisects the maximum width of the lid and that is  
90 perpendicular to the pivot axis, and the maximum width of the  
lid is greater than the length of the lid.

9. An assembly comprising:

a first cassette in accordance with claim 1 and a second  
cassette, the second cassette having an internal chamber that  
95 creates a parallelepiped void that has at least a length of  
1.25 inches, at least a width of 1.00 inches, and at least a  
height of 0.2 inches, the first cassette being positioned  
entirely within the void of the second cassette with the lid  
of the first cassette being in the closed position.

00 10. A histological examination specimen preparation cassette  
comprising:

a receptacle and a lid, the receptacle having a bottom

wall, opposite side walls, opposite front and back walls, and  
a cavity, the cavity being positioned between the sidewalls  
105 and between the front and back walls, the cavity being  
partially bound by the bottom wall, the bottom wall having a  
plurality of apertures that extend through the bottom wall and  
that create fluid passageways into the cavity, the lid having  
a plurality of apertures that extend through the lid and that  
110 create additional fluid passageways into the cavity, the lid  
being pivotally attached to the receptacle generally about a  
pivot axis in a manner such that the lid is pivotable between  
an opened position and a closed position relative to the  
receptacle, the lid engaging the receptacle when the lid is in  
115 the closed position and the cavity being partially bound by  
the lid when the lid is in the closed position, the cavity  
having a maximum width measurable anywhere parallel to the  
pivot axis and a maximum length measurable in any plane  
perpendicular to the pivot axis, the maximum width of the  
120 cavity being greater than the maximum length of the cavity.

11. A cassette in accordance with claim 10 wherein the pivot  
axis is oriented generally perpendicular to each of the side  
walls, the cassette has a maximum length measurable in any  
plane perpendicular to the pivot axis when the lid is in the  
125 closed position, the maximum length of the cassette defines a  
lengthwise direction, and the front wall is inclined relative

to the bottom wall in a manner such that the front wall extends a lengthwise distance that is at least two tenths of the maximum length of the cassette.

30 12. A cassette in accordance with claim 10 wherein the cassette has a maximum width measurable anywhere parallel to the pivot axis and a maximum length measurable in any plane perpendicular to the pivot axis when the lid is in the closed position, and the maximum width of the cassette is less than  
35 the maximum length of the cassette.

13. A cassette in accordance with claim 12 wherein the pivot axis is oriented generally perpendicular to each of the side walls, the maximum length of the cassette defines a lengthwise direction, and the front wall is inclined relative to the  
40 bottom wall in a manner such that the front wall extends a lengthwise distance that is at least two tenths of the maximum length of the cassette.

14. A cassette in accordance with claim 10 wherein the lid has a maximum width measurable anywhere parallel to the pivot  
45 axis and a length measurable in a plane that bisects the maximum width of the lid and that is perpendicular to the pivot axis, and the maximum width of the lid is greater than the length of the lid.

15. A cassette in accordance with claim 14 wherein the  
cassette has a maximum width measurable anywhere parallel to  
the pivot axis and a maximum length measurable in any plane  
perpendicular to the pivot axis when the lid is in the closed  
position, and the maximum width of the cassette is less than  
the maximum length of the cassette.

16. A histological examination specimen preparation cassette  
comprising:

a receptacle and a lid, the receptacle having a bottom  
wall, opposite side walls, opposite front and back walls, and  
a cavity, the cavity being positioned between the sidewalls  
and between the front and back walls and being partially bound  
by the bottom wall, the bottom wall having a plurality of  
apertures that extend through the bottom wall and that create  
fluid passageways into the cavity, the lid having a plurality  
of apertures that extend through the lid and that create  
additional fluid passageways into the cavity, the lid being  
pivotally attached to the receptacle generally about a pivot  
axis in a manner such that the lid is pivotable between an  
opened position and a closed position relative to the  
receptacle, the pivot axis being oriented generally  
perpendicular to each of the side walls, the lid engaging the  
receptacle when the lid is in the closed position and the  
cavity being partially bound by the lid when the lid is in the

closed position, the cassette having a maximum length measurable in any plane perpendicular to the pivot axis when the lid is in the closed position, the maximum length of the cassette defining a lengthwise direction, the front wall being inclined relative to the bottom wall in a manner such that the front wall extends a lengthwise distance that is at least two tenths of the maximum length of the cassette.

17. A cassette in accordance with claim 16 wherein the cassette has a maximum width measurable anywhere parallel to the pivot axis when the lid is in the closed position, and the maximum width of the cassette is less than the maximum length of the cassette.

18. A cassette in accordance with claim 16 wherein the lid has a maximum width measurable anywhere parallel to the pivot axis and a length measurable in a plane that bisects the maximum width of the lid and that is perpendicular to the pivot axis, and the maximum width of the lid is greater than the length of the lid.

19. A cassette in accordance with claim 18 wherein the cassette has a maximum width measurable anywhere parallel to the pivot axis when the lid is in the closed position, and the maximum width of the cassette is less than the maximum length of the cassette.

20. A cassette in accordance with claim 19 wherein the cavity has a maximum width measurable anywhere parallel to the pivot axis and a maximum length measurable in any plane perpendicular to the pivot axis, and the maximum width of the  
500 cavity is greater than the maximum length of the cavity.



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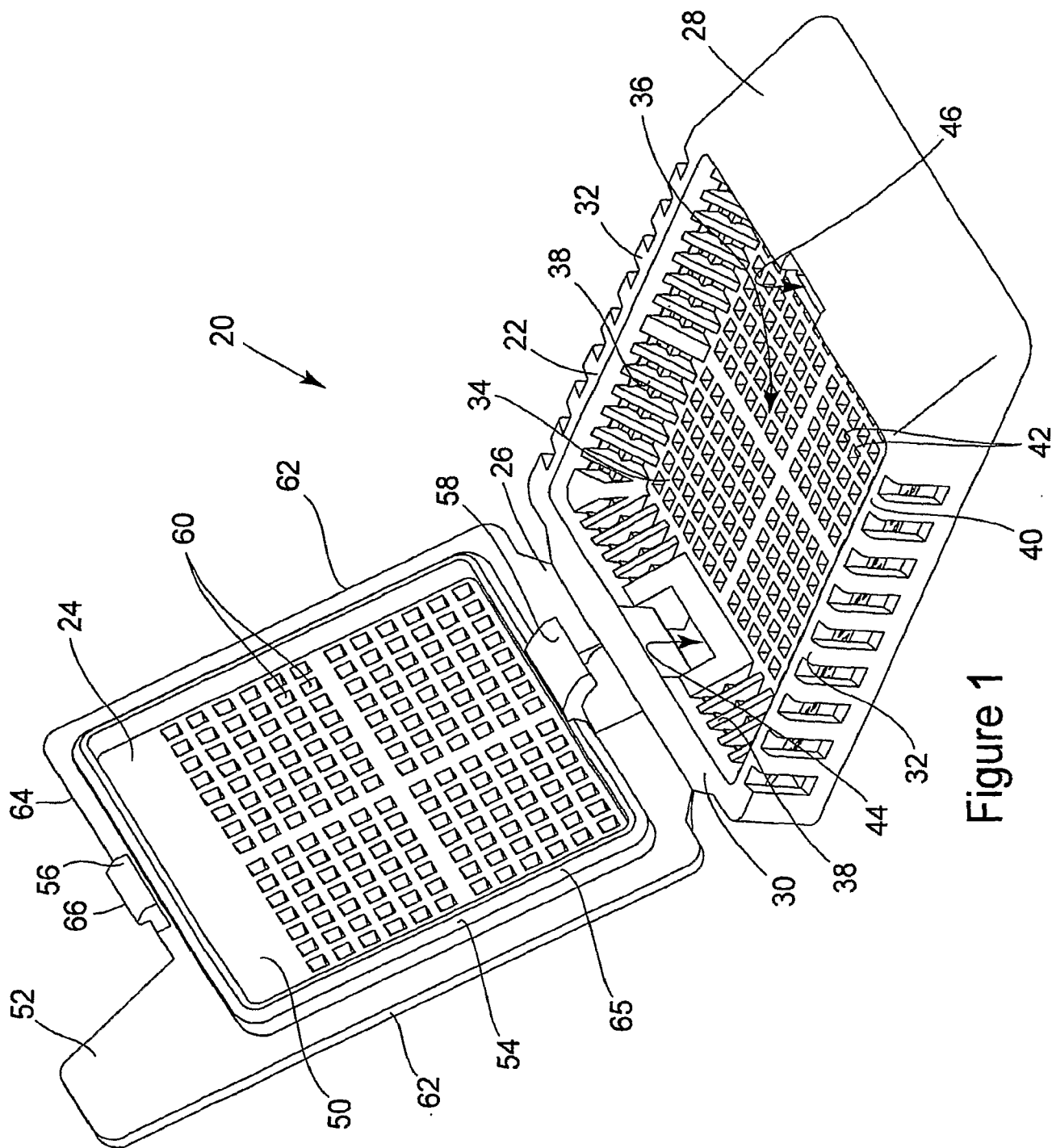


Figure 1

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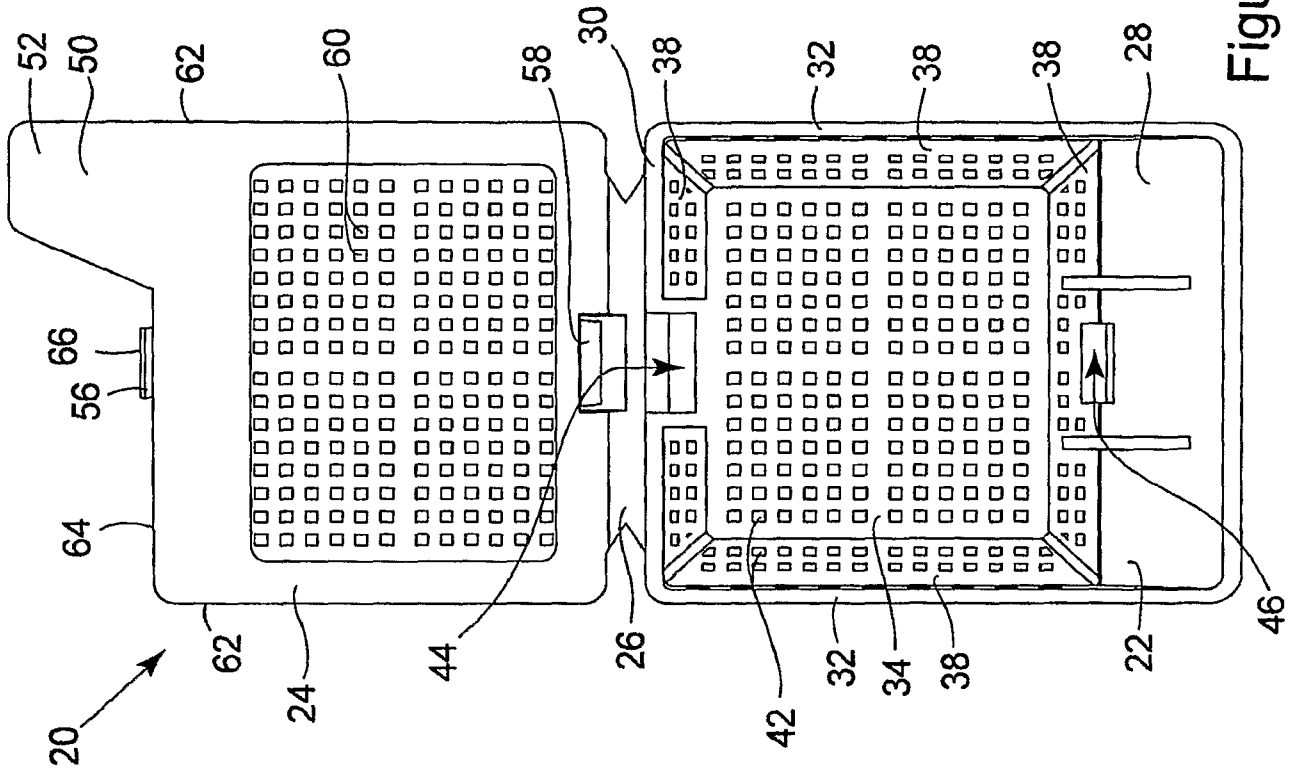


Figure 3

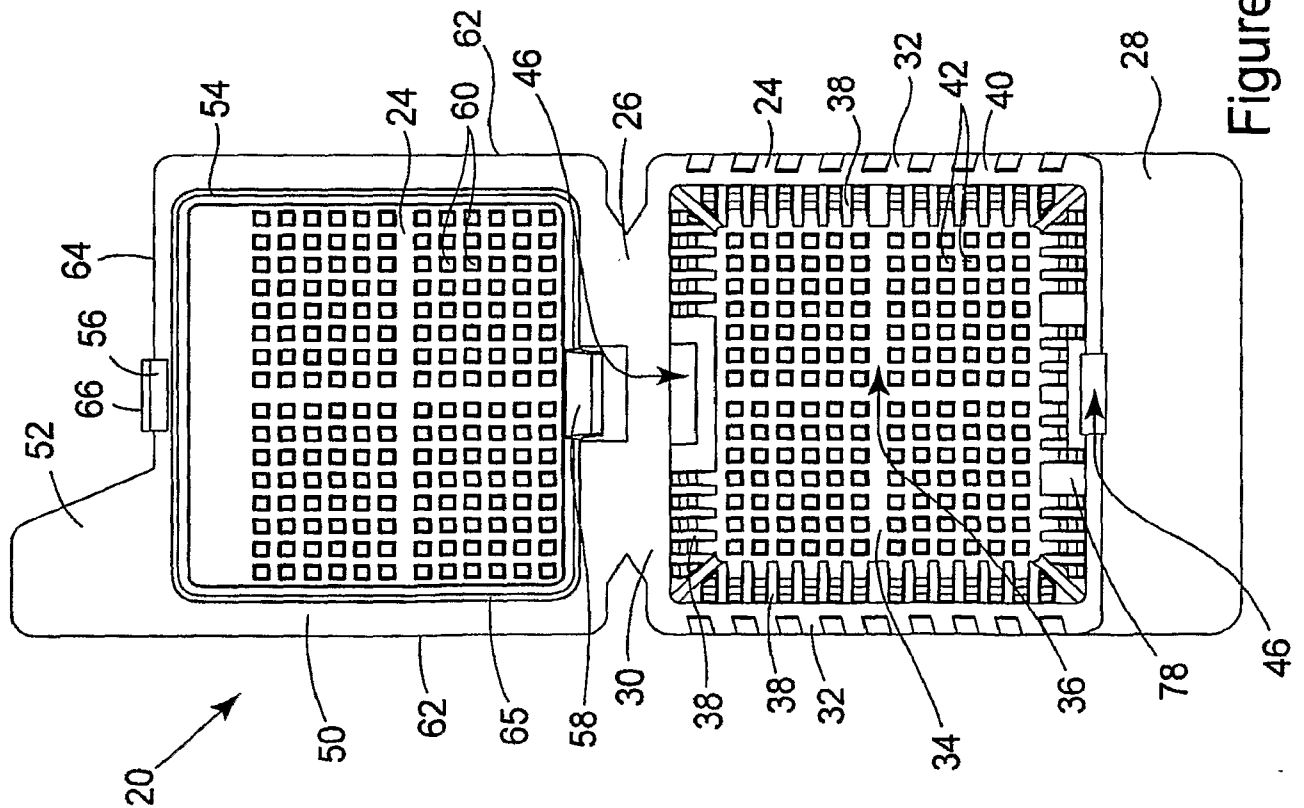
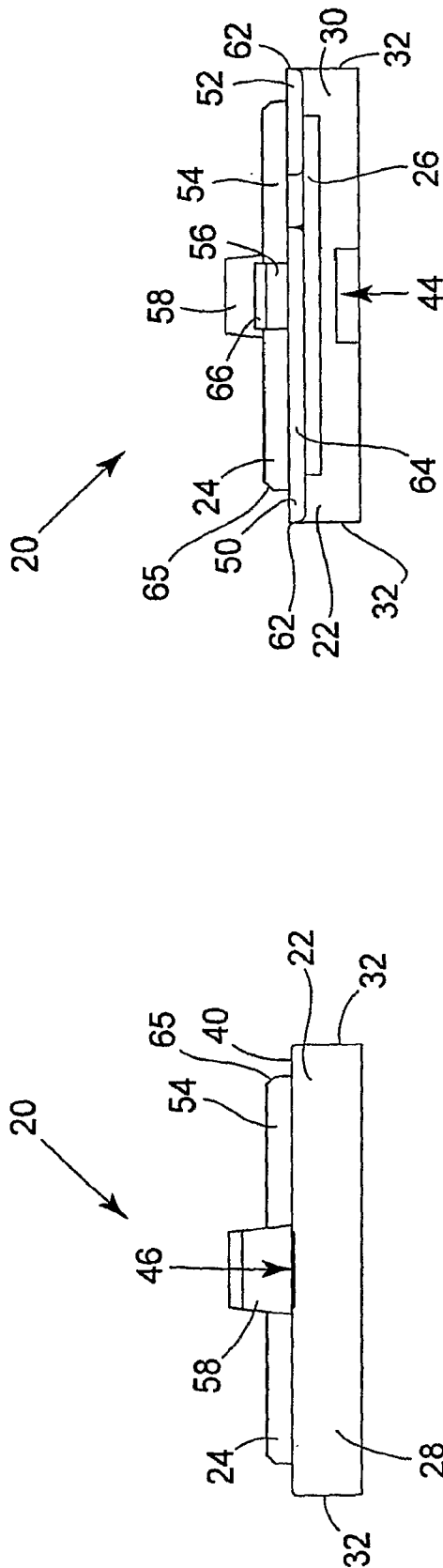
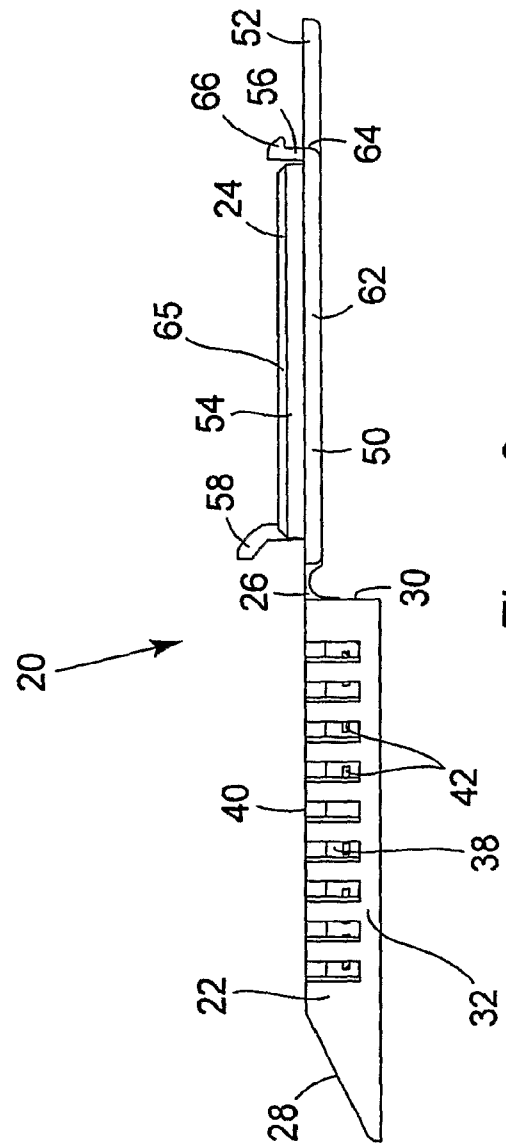


Figure 2



### Figure 4



## Figure 6

## Figure 5

4 of 4

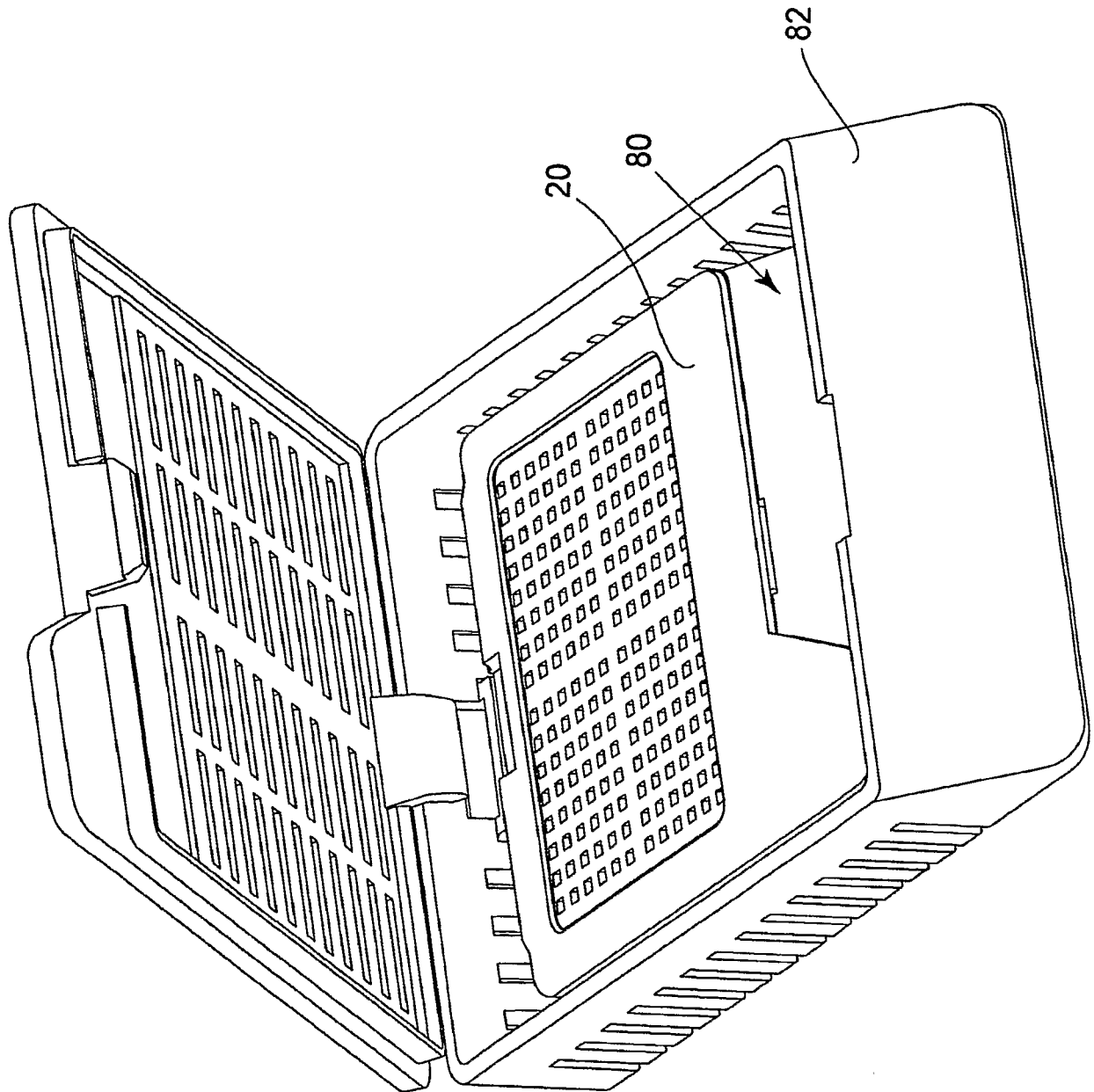


Figure 7

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2006/048480

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. G01N1/36		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) G01N		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, INSPEC, COMPENDEX, BIOSIS		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
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<div style="display: flex; justify-content: space-between;"> <span><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</span> <span><input checked="" type="checkbox"/> See patent family annex.</span> </div>		
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Date of the actual completion of the international search  <div style="text-align: center; font-weight: bold;">17 April 2007</div>		Date of mailing of the international search report  <div style="text-align: center; font-weight: bold;">02/05/2007</div>
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  <div style="text-align: center; font-weight: bold;">Timonen, Tuomo</div>

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International application No  
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