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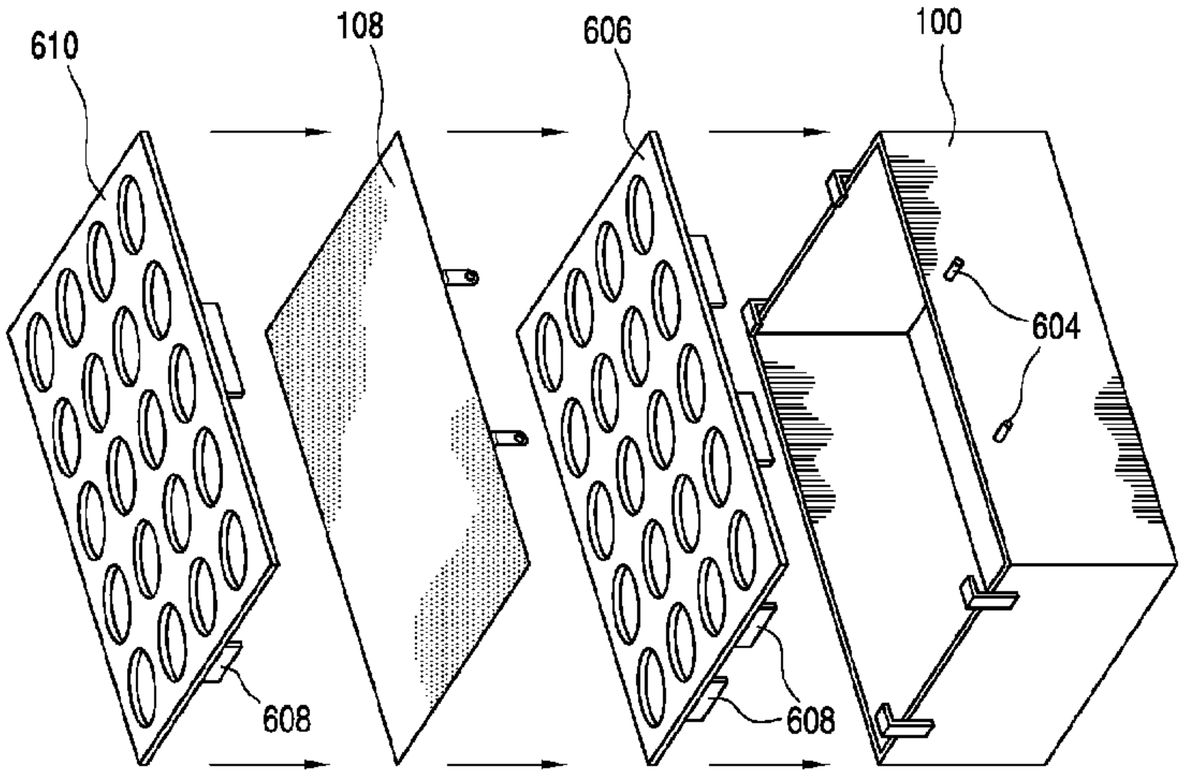

(57) Abrégé/Abstract:
Methods and apparatus for sterilization are presented. An exemplary embodiment includes a sterilizing cabinet assembly. The sterilizing cabinet includes a cabinet having an access port, a door connected to the cabinet, the door moveable between an open position permitting passage through the access port to an interior of the cabinet and a closed position precluding passage through the access port. The sterilizing cabinet assembly also includes at least one of the cabinet and the door having a vent port. The sterilizing cabinet has a primary filter overlying the vent port and forming a sealed interface with an adjacent portion of the one of the cabinet and the door and a secondary filter overlying at least a portion of the primary filter.

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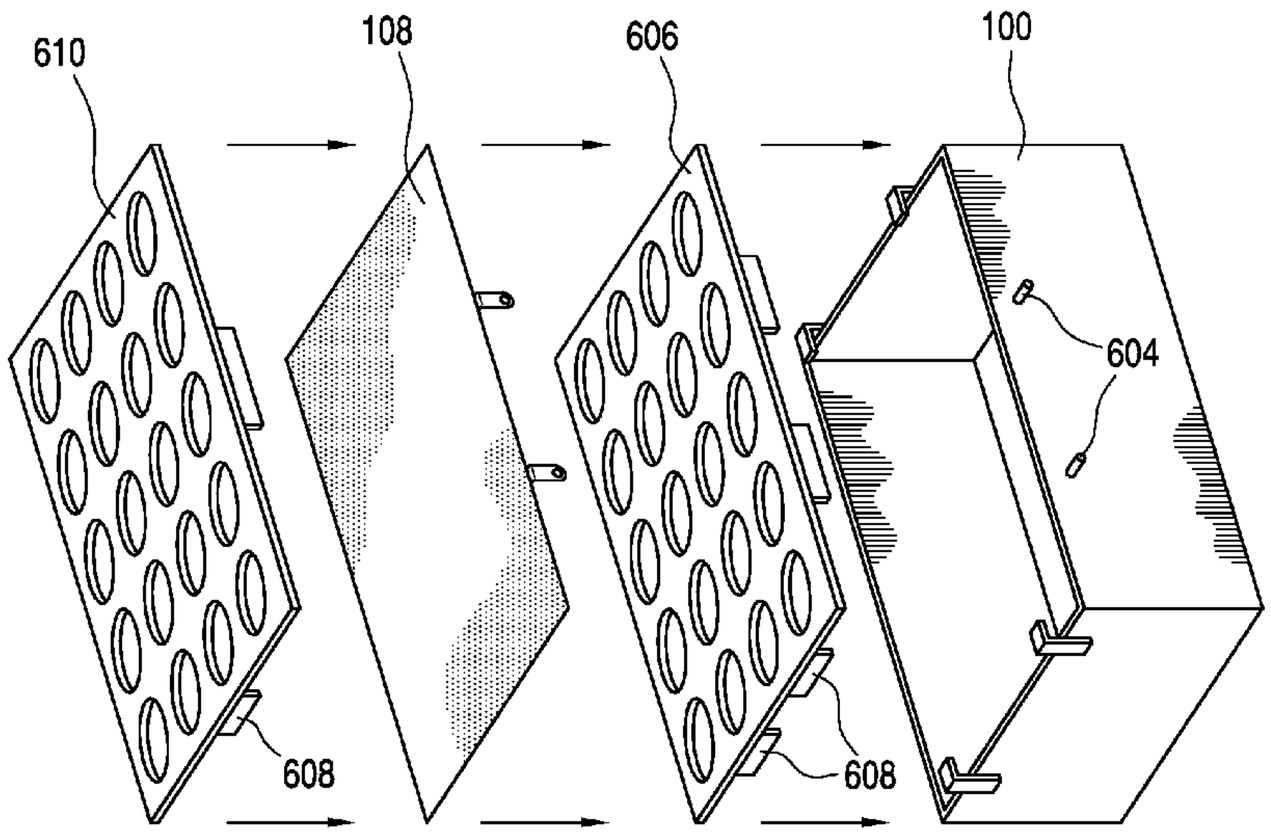

FIG. 7b

(57) Abstract: Methods and apparatus for sterilization are presented. An exemplary embodiment includes a sterilizing cabinet assembly. The sterilizing cabinet includes a cabinet having an access port, a door connected to the cabinet, the door moveable between an open position permitting passage through the access port to an interior of the cabinet and a closed position precluding passage through the access port. The sterilizing cabinet assembly also includes at least one of the cabinet and the door having a vent port. The sterilizing cabinet has a primary filter overlying the vent port and forming a sealed interface with an adjacent portion of the one of the cabinet and the door and a secondary filter overlying at least a portion of the primary filter.

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STERILIZING METHOD AND APPARATUS

TECHNICAL FIELD

[0001] Exemplary embodiments of the present invention relate to a method and apparatus for sterilization and more particularly to a method and apparatus for sterilization of instruments.

BACKGROUND OF THE INVENTION

[0002] Sterilization is a term referring to any process that eliminates (removes) or kills microbial life, including transmissible agents (such as fungi, bacteria, viruses, or spore forms) present on a surface, or contained in a fluid, or in medication, or in a compound such as biological culture media. Sterilization can be achieved by applying heat, chemicals, irradiation, high pressure, and filtration or combinations thereof.

[0003] In general, surgical instruments and medications that enter an already aseptic part of the body (such as the bloodstream, or penetrating the skin) must be sterilized to a high sterility assurance level. Examples of such instruments include scalpels, hypodermic needles and implantable medical devices (IMD), such as artificial pacemakers.

[0004] A widely used method for heat sterilization is the autoclave, sometimes referred to as a converter. Autoclaves commonly use steam heated to 121-134 °C. To achieve a degree of sterility, a holding time of at least 15 minutes at 121 °C at 100 kPA, or 3 minutes at 134 °C at 100 kPa is required. Additional sterilizing time is usually required for liquids and instruments packed in layers of cloth, as they may take longer to reach the required temperature.

[0005] One method of sterilization involves passing steam through a cabinet. For effective sterilization, steam needs to penetrate the cabinet load uniformly. Accordingly, the cabinet must not be overcrowded, and the lids of bottles and containers must be left ajar. During the initial heating of the chamber, residual air must be removed. Indicators should be placed in the most difficult places for the steam to reach to ensure that steam actually penetrates there.

[0006] A filter is typically placed over the vent to keep particles or extraneous materials from entering the cabinet before, during or after the sterilizing process. Once the sterilizing process is completed the filter needs to be removed and inspected by medical professionals to verify the integrity of the sterilizing process was maintained. If it is discovered during inspection that the filter did not remain intact, the sterilizing process has to be repeated with a new filter.

SUMMARY OF THE INVENTION

[0007] In view of the foregoing, it is an object of the present invention to provide a method and apparatus for sterilization.

[0008] A first exemplary embodiment of the present invention provides a sterilizing cabinet assembly. The sterilizing cabinet assembly includes a cabinet having an access port and a door connected to the cabinet, the door moveable between an open position permitting passage through the access port to an interior of the cabinet and a closed position precluding passage through the access port. This embodiment further includes at least one of the cabinet and the door having a vent port and a primary filter overlying the vent port and forming a sealed interface with an adjacent portion of the one of the cabinet and the door. This embodiment further includes a secondary filter overlying at least a portion of the primary filter. In this embodiment, the secondary filter forms an independent sealed interface with the sterilizing cabinet or the primary filter.

[0009] A second exemplary embodiment of the present invention provides a method for placing filters. The method includes disposing a primary filter to occlude a vent port of a sterilizing cabinet forming a first sealed interface with the sterilizing cabinet. The method further includes forming a second sealed interface between a confirmatory filter and at least a portion of one of the sterilizing cabinet and the primary filter, a portion of the confirmatory filter overlying a portion of the primary filter. In this embodiment, the second sealed interface is independent of the first sealed interface.

[0010] A third exemplary embodiment of the present invention provides a sterilizing assembly. The sterilizing assembly includes a sterilizing cabinet and a first tray and a second tray sized to be retained within the cabinet. The sterilizing assembly further includes at least one removable spacer intermediate the first tray and the second tray, the

spacer being sterilizable and vertically separating the first tray and the second tray by a given height, the spacer inhibiting lateral displacement of the first tray relative to the second tray, wherein the given height is sufficient to permit a passage of a sufficient amount of a sterilizing agent between the first tray and the second tray for a predetermined time.

[0011] A fourth exemplary embodiment of the present invention provides a method of loading a sterilizing cabinet. The method includes loading a sterilizable first pan and a sterilizable second pan within the sterilizing cabinet. The method further includes placing a removable and sterilizable spacer between the first pan and the second pan, the spacer (i) providing at least one of a predetermined vertical spacing between the first pan and the second pan and (ii) inhibiting horizontal displacement of the first pan relative to the second pan.

[0012] A fifth exemplary embodiment of the present invention provides a method of sterilizing. The method includes loading a tray retaining a surgical instrument in a sterilization cabinet and sealing a primary filter relative to a vent port in the sterilization cabinet. The method further includes sealing a secondary filter relative to the vent port and independent of the sealed primary filter and passing a sterilizing agent through the secondary filter and the primary filter.

[0013] A sixth exemplary embodiment of the present invention provides a sterilizable pan assembly. The sterilizable pan assembly includes a first sterilizable pan having an open top, a closed bottom and a pair of projecting spacer legs and a second sterilizable pan having an open top and closed bottom. The sterilizable pan assembly further includes the spacer legs configured to releasably engage a portion of the second pan and maintain a predetermined vertical spacing between the bottom of the first pan and the top of the second pan.

[0014] A seventh exemplary embodiment of the present invention provides a filtering assembly. The filtering assembly including a primary filter holding portion for holding a primary filter for overlying a vent port and forming a sealed interface with a sterilizing cabinet. The filter assembly further includes a secondary filter holding portion for holding a secondary filter, moveably attached to the primary holding portion for overlying the

primary filter holding portion and forming a sealed interface with the primary filter holding portion.

[0015] An eighth exemplary embodiment of the present invention provides a method for verifying sterilization. The method includes performing a sterilization cycle in a sterilization device. The method further includes removing a secondary filter that is overlying a primary filter with a second sealed interface with the primary filter from the sterilizing device such that the primary filter maintains a sealed interface with a vent port of the sterilizing device and examining the secondary filter to verify the integrity of the sterilization cycle in the sterilizing device.

[0016] A ninth exemplary embodiment of the present invention provides a sterilizing cabinet assembly. The sterilizing cabinet assembly includes a cabinet having an access port and a door connected to the cabinet, the door moveable between an open position permitting passage through the access port to an interior of the cabinet and a closed position precluding passage through the access port. The sterilizing cabinet assembly further includes at least one of the cabinet and the door having a vent port and a filter overlying the vent port and forming a sealed interface with an adjacent portion of the one of the cabinet and the door.

[0017] A tenth exemplary embodiment of the present invention provides a method of placing filters. The method includes disposing a primary door to occlude a vent port of a sterilizing cabinet, the primary door comprising an edge portion and an internal portion, the internal portion comprising a plurality of openings. The method further includes disposing a filter over the primary door to occlude the vent port of the sterilizing cabinet and disposing a secondary door over the filter and the primary door to occlude the vent port of the sterilizing cabinet forming a sealed interface with the filter, the primary door and the sterilizing cabinet.

[0018] An eleventh exemplary embodiment of the present invention provides a method of verifying sterilization. The method includes performing a sterilization cycle in a sterilizing device. The method further includes removing a secondary door that is overlying a filter with a second sealed interface with the filter from the sterilizing device. The method still further includes examining the filter to verify the integrity of the sterilization cycle in the sterilizing device.

[0019] The following will describe embodiments of the present invention, but it should be appreciated that the present invention is not limited to the described embodiments and various modifications of the invention are possible without departing from the basic principle. The scope of the present invention is therefore to be determined solely by the appended claims.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

[0020] Figure 1a is a front view of a configuration of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0021] Figure 1b is a top view of a configuration of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0022] Figure 1c is a side view of a configuration of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0023] Figure 2a is a perspective view of an alternative configuration of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0024] Figure 2b is a top view of an alternative configuration of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0025] Figure 3a is a top view of a vent of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0026] Figure 3b is a perspective view of a filter arrangement of a sterilizing cabinet for use in practicing exemplary embodiments of this invention.

[0027] Figure 4a is a perspective view of the movement of a filter arrangement of a sterilizing cabinet for use in practicing exemplary embodiments of this invention.

[0028] Figure 4b is a perspective view of the movement of an alternative filter arrangement of a sterilizing cabinet for use in practicing exemplary embodiments of this invention.

[0029] Figure 5a is a perspective view of an alternative configuration of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0030] Figure 5b is a perspective view of bottom section of a filter arrangement of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0031] Figure 5c is a perspective view of a middle section of a filter arrangement of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0032] Figure 5d is a perspective view of top section of a filter arrangement of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0033] Figure 6a is a perspective view of an alternative sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0034] Figure 6b is a front view of an alternative filter arrangement of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0035] Figure 6c is a front view of the top portion of an alternative filter arrangement of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0036] Figure 7a is a perspective view of the separated elements of an alternative filter arrangement of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0037] Figure 7b is a perspective view of the separated elements of another filter arrangement of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0038] Figure 8a is a top view of a spacer suitable for use in practicing exemplary embodiments of this invention.

[0039] Figure 8b is a side view of a spacer suitable for use in practicing exemplary embodiments of this invention.

[0040] Figure 8c is another side view of a spacer suitable for use in practicing exemplary embodiments of this invention.

[0041] Figure 9a is a top view of an alternative spacer suitable for use in practicing exemplary embodiments of this invention.

[0042] Figure 9b is a side view of an alternative spacer suitable for use in practicing exemplary embodiments of this invention.

[0043] Figure 9c is another side view of an alternative spacer suitable for use in practicing exemplary embodiments of this invention.

[0044] Figure 10 is a perspective view of a sterilizing tray suitable for use in practicing exemplary embodiments of this invention.

[0045] Figure 11 is a perspective view of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this invention.

[0046] Figure 12 is a perspective view of a pan assembly suitable for use in practicing exemplary embodiments of this invention.

[0047] Figure 13a is a perspective view of a filter suitable for use in practicing exemplary embodiments of this invention.

[0048] Figure 13b is a side view of a filter suitable for use in practicing exemplary embodiments of this invention.

[0049] Figure 14a is a perspective view of an alternative filter suitable for use in practicing exemplary embodiments of this invention.

[0050] Figure 14b is a side view of an alternative filter suitable for use in practicing exemplary embodiments of this invention.

[0051] Figure 15a is a perspective view of another filter suitable for use in practicing exemplary embodiments of this invention.

[0052] Figure 15b is a side view of another filter suitable for use in practicing exemplary embodiments of this invention.

[0053] Figure 16 is a perspective view of a filter cartridge suitable for use in practicing exemplary embodiments of this invention.

[0054] Figure 17 is a perspective view of an alternative filter cartridge suitable in practicing exemplary embodiments of this invention.

[0055] Figure 18 is a perspective view of an alternative filter cartridge suitable in practicing exemplary embodiments of this invention.

[0056] Figure 19 is a perspective view of another filter cartridge suitable in practicing exemplary embodiments of this invention.

[0057] Figure 20 is a filter cartridge holder suitable in practicing exemplary embodiments of this invention.

[0058] Figure 21 is a magnified cross-sectional view of sterilizing cabinet and a filter door suitable for use in practicing exemplary embodiments of this disclosure.

[0059] Figure 22 is a perspective view of an exemplary sterilizing cabinet and filter door suitable for use in practicing exemplary embodiments of the present disclosure.

[0060] Figure 23 is a perspective view of an exemplary sterilizing cabinet and filter door suitable for use in practicing exemplary embodiments of the present disclosure.

[0061] Figure 24 is a bottom perspective view of an exemplary sterilizing cabinet suitable for use in practicing exemplary embodiments of the present disclosure.

[0062] Figure 25 is a perspective view of an alternative embodiment of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this disclosure.

[0063] Figure 26 is a perspective view of a separated alternative embodiment of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this disclosure.

DETAILED DESCRIPTION OF THE INVENTION

[0064] In the medical field, it is of the utmost importance that medical instruments are sterilized prior to any medical procedure. This drastically helps prevent the spread of infectious materials. In the marketplace, there are a wide variety of devices that provide for sterilization of medical instruments through the use of a sterilizing agent, such as steam. Instrument trays can be wrapped in a cloth or paper that acts as a filter, allowing the

tray to be sterilized, then delivered to the operating room. Alternatively, a rigid container can contain the instrument tray. Typically, the device (e.g., a rigid container) contains a vent for venting the steam used to sterilize the contents of the device. A disposable filter usually covers these vents. The filters have two major purposes. First, they prevent extraneous materials from entering the sterilizing device during and after the sterilization cycle. Second, they allow sterilizing steam to enter and exit the sterilizing device.

[0065] However, in order to check that the integrity of the sterilization cycle has been maintained a person (usually a medical technician) must verify that there are no holes or other types of rips in the filter. This is done by removing the filter from the sterilizing device and visually inspecting the filter. This creates an inherent time period wherein the sterilized instruments can be contaminated by extraneous materials that enter the sterilizing device through the now open and uncovered vents. An object of exemplary embodiments of this disclosure provide a solution to this problem.

[0066] Referring to Figure 1a, is a front view of sterilizing cabinet 100. It should be noted that embodiments of the present invention are not limited to the particular configuration of sterilizing cabinet 100.

[0067] The term sterilizing cabinet 100 encompasses any device capable of sterilizing. The term also includes sterilizing cabinets for sterilizing medical instruments, surgical devices and the like.

[0068] Sterilizing cabinet 100 includes door or doors 102, vents 104, filter holder 106, primary filter 108, secondary filter 110, sterilizing cabinet frame 112 and legs 114. Door or doors 102 are able to open and close for access to the interior of sterilizing cabinet 100. Door or doors 102 are physically connected to sterilizing cabinet frame 112. Door or doors 102 can be attached through the use of a hinge or hinges which allows the doors to swing open. Alternatively, door or doors 102 can be removable from sterilizing cabinet 100 through the use of clamps (not shown in Figure 1). It should be appreciated that exemplary embodiments of door or doors 102 include any mechanism that allows for door or doors 102 to move from an open position to a closed position to provide access to the interior of sterilizing cabinet 100.

[0069] Sterilizing cabinet 100 in this embodiment provides for four vents 104. However, it should be appreciated that exemplary embodiments of sterilizing cabinet 100 are not limited to four vents. Exemplary embodiments of sterilizing cabinet 100 can include one or more vents. Two vents 104 on the top of sterilizing cabinet 100 and two vents 104 on the bottom of sterilizing cabinet 100. Vents 104 provide numerous small openings for the passage of sterilizing steam. The small openings in vents 104 can be holes or slits. Alternatively, vents 104 can be fenestrated.

[0070] Primary filter 108 in conjunction with filter holder 106 covers vent 104. Primary filter 108 with filter holder 106 forms a seal with the adjacent portions of sterilizing cabinet 100 such that during the operation of a sterilizing cycle, any sterilizing steam that passes through the vent 104 must then pass through primary filter 108. Primary filter 108 can be made of a very thin paper. Exemplary embodiments provide that primary filter 108 can be made of any porous material that (1) allows for the passage of sterilizing steam from sterilizing cabinet 100 and (2) prevents extraneous materials from passing through primary filter 108 and entering vent 104. Primary filter 108 is removable from sterilizing cabinet 100 and is typically replaced with a new filter following each sterilizing cycle.

[0071] Secondary filter 110 resides on top of primary filter 108 in filter holder 106. Secondary filter 110 covers primary filter 108 and forms a seal with primary filter 108 through filter holder 106 such that any sterilizing steam that passes through the vent 104 must then pass through primary filter 108 and secondary filter 110. Secondary filter 110 can be made of a very thin paper. Secondary filter 110 can be made of any porous material that (1) allows for the passage of sterilizing steam from sterilizing cabinet 100 and primary filter 108 and (2) prevents extraneous materials from passing through secondary filter 108.

[0072] Exemplary embodiments of this disclosure provide for secondary filter 110 to form a sealed periphery with primary filter 108. In another exemplary embodiment the sealed interface between the primary filter 108 and the adjacent portion of either the sterilizing cabinet 100 is independent of an interface between secondary filter 110 and primary filter 108. One exemplary arrangement provides for primary filter 108 and secondary filter 110 to be coextensive. In another exemplary embodiment primary filter 108 and secondary filter 110 have different filter properties. For instance, primary filter

108 and secondary filter 110 may filter different elements of the sterilizing agent which exits sterilizing cabinet 100 during a sterilization cycle. In an alternative exemplary embodiment primary filter 108 and secondary filter 110 have similar filter properties. Another exemplary embodiment provides that primary filter 108 and secondary filter 110 are different colors.

[0073] In yet another exemplary embodiment, primary filter 108 may be the only filter that covers vent 104. Here, primary filter 108 is removeably held or maintained in place over vent 104 by filter holder 106. In this embodiment, there is no secondary filter. Primary filter 108 forms a seal with the adjacent portions of sterilizing cabinet 100 such that during the operation of a sterilizing cycle, any sterilizing steam that passes through the vent 104 must then pass through primary filter 108. Again, in this embodiment, primary filter 108 can be made of any porous material that (1) allows for the passage of sterilizing steam from sterilizing cabinet 100 and (2) prevents extraneous materials from passing through primary filter 108 and entering vent 104. Primary filter 108 is removable from sterilizing cabinet 100 and is typically replaced with a new filter following each sterilizing cycle.

[0074] Legs 114 reside on the bottom of sterilizing cabinet 100 and provide spacing between the surface which sterilizing cabinet 100 rests and the bottom primary filter 108, secondary filter 110 and filter holder 106.

[0075] Figure 1b provides a top view of sterilizing cabinet 100 showing vent 104 covered by filter holder 106, primary filter 108, secondary filter 110, sterilizing cabinet frame 112 and hinge 116 of filter holder 106. Hinge 116 with filter holder 106 allows a portion of filter holder 106 to swing open about hinge 116 such that primary filter 108 and secondary filter 110 can be removed independent of one another. In other words, filter holder 106 allows for secondary filter 110 to be released and removed from filter holder 106 while simultaneously maintaining primary filter's 108 seal with sterilizing cabinet 100 over vent 104.

[0076] Figure 1c shows a side view of sterilizing cabinet 100 including sterilizing cabinet frame 112, vent 104, primary filter 108, secondary filter 110, filter holder 106 and hinge 116.

[0077] In exemplary embodiments sterilizing cabinet 100 may include a steam exposure indicator on either the primary filter 108 or the secondary filter 110 which designates when steam from sterilizing cabinet 100 has passed through one of the filters. An example of one such steam exposure indicator is a tape that changes colors when exposed to steam.

[0078] Figure 2a provides a perspective view of sterilizing cabinet 100 with two vents 104 on the top and two vents 104 on the bottom of sterilizing cabinet 100. Figure 2a also includes primary filters 108 occluding vents 104 and secondary filters 110 overlaying primary filters 108 with primary filters 108 and secondary filters 110 each in filter holders 106.

[0079] Figure 2b provides a top view of sterilizing cabinet 100 with an alternative exemplary embodiment of filter holder 106. Shown in Figure 2b are two vents 104 occluded by primary filters 108 which are also covered by secondary filters 110. In this exemplary embodiment filter holders 106 do not have a swinging hinge which allows for the individual attachment and release of primary filters 108 and secondary filters 110. In this exemplary embodiment filter holders 106 allow for independently removing primary filter 108 and secondary filter 110 through the use of a sliding mechanism. Secondary filter 110 can be removed by sliding it out of filter holder 106 while maintaining primary filter's 108 seal with sterilizing cabinet 100 around vent 104.

[0080] In another alternative exemplary embodiment, filter holder 106 again does not include a swinging hinge, but allows for the placement and removal of only primary filter 108 by a sliding mechanism. In this embodiment, there is no secondary filter 110. Only primary filter 108 in conjunction with filter holder 106 forms a sealed interface with sterilizing cabinet 100 occluding vents 104. Primary filter 108 can then be placed or removed by sliding into and out of filter holder 106.

[0081] In practice, an exemplary embodiment of a process of placing primary filter 108 and secondary filter 110 includes disposing primary filter 108 to occlude a vent 104 of sterilizing cabinet 100 and forming a first sealed interface with the sterilizing cabinet 100. The process continues by forming a second sealed interface between secondary filter 110 (or confirmatory filter) and at least a portion of one of sterilizing cabinet 100 and primary filter 108, a portion of the secondary filter 110 overlying a portion of the primary filter

108. The process can continue by passing a sterilizing agent (typically steam) through primary filter 108 and secondary filter 110 and vent 104.

[0082] Also in practice, an exemplary embodiment of a process of placing only a primary filter 108 includes disposing primary filter 108 with filter holder 106 to occlude vent 104 of sterilizing cabinet 100 creating a sealed interface with the sterilizing cabinet 100. The process can continue by passing a sterilizing agent (typically steam) through primary filter 108 and vent 104. The process can then conclude with verifying the integrity of primary filter 108 by either inspecting primary filter 108 while it covers vent 104 in filter holder 106 or after it is removed from filter holder 106. The process may be repeated if it is determined that the integrity of primary filter 108 was compromised during the sterilizing process.

[0083] Exemplary embodiments of inspecting primary filter 108 and/or secondary filter 110 can include visual inspection by either medical or non-medical personnel, inspecting by an electronic device or machine, or inspecting through mechanical means. Exemplary embodiments of inspecting by an electronic device or machine includes any type of device that is able to scan or image the primary filter 108 and/or secondary filter 110 such that the scanned or imaged picture of the primary filter 108 and/or secondary filter 110 can be digitally viewed or examined for imperfections such as rips or cuts that would impact the integrity of the sterilization cycle. Exemplary embodiments of mechanical inspection includes any type of inspection means that physically test that the integrity of the primary filter 108 and/or secondary filter 110 has been maintained.

[0084] It should be noted that exemplary embodiments of a sterilizing agent include any substance that provides for the destruction or elimination of living organisms, which often include heat, steam, pressure, gas, plasma, irradiation, chemical compounds, and chemical vapor.

[0085] Exemplary embodiments of this process provide that the first sealed interface is separate from the second sealed interface. Additionally, failure of the second sealed interface is independent of the first sealed interface. For example, if the second sealed interface fails and leaks sterilizing steam during a sterilization cycle, the first sealed interface should remain intact and should not be affected by the failure of the second sealed interface.

[0086] Referring to Figure 3a, a top view of an exemplary vent 104 is shown. Provided is a fenestrated surface with numerous openings that allow for the passage of a sterilizing agent, such as steam from sterilizing cabinet 100 during a sterilization cycle. It can be appreciated that Figure 3a merely represents one embodiment of vent 104 and that exemplary embodiments of vent 104 include any arrangement of holes or openings that allow for the passage of a sterilizing agent.

[0087] Figure 3b provides a top view of a filtering arrangement covering vent 104. Shown in Figure 3b is the top portion of secondary filter 110, filter holder 106 with hinges 116 and pin 118. Exemplary embodiments of this arrangement provide for a silicon seal between filter holder 106 and primary filter 108, between filter holder 106 and secondary filter 110 and sterilizing cabinet 100. This seal serves two primary purposes. First, it forces all of the sterilizing agent that enters and exits the sterilizing cabinet 100 to pass through the filters. Second, it keeps extraneous materials from entering the sterilizing cabinet 100 through vents 104, which are covered by primary filter 108 and secondary filter 110.

[0088] It can be appreciated that exemplary embodiments of the sealed interface between the primary filter 108 and the sterilizing cabinet 100 includes both direct contact between primary filter 108 and sterilizing cabinet 100 as well as indirect contact between primary filter 108 and sterilizing cabinet 100 through the use of a sealing agent, such as caulk or an adhesive. Likewise, the sealed interface between the secondary filter and the primary filter 108 or filter holder 106 includes both direct contact between primary filter 108 or filter holder 106 as well as indirect contact through the use of a sealing agent, such as caulk or an adhesive.

[0089] Referring to Figure 4a, provided is a side view of the different elements and the type of movement allowed for filter holder 106 in exemplary embodiments of this invention. Shown in Figure 4a is the outside face of sterilizing cabinet 100, vent 104, primary filter 108, secondary filter 110, hinge 116, filter holder 106 section 402 which secures primary filter 108, and filter holder 106 section 404 which secures secondary filter 110. In this exemplary embodiment sections 402 and 404 are able to rotate about hinge 116 and can be moved from the closed position (covering vent 104) to the open position (not covering vent 104) independent of each other. For instance section 404 can be moved

to the open position while section 402 remains in the closed position. However, in order for section 402 to move to the open position, section 404 must also be in the open position since it overlays section 402. Also shown in Figure 4a are holes 406 on section 402, section 404 and on sterilizing cabinet 100. When section 402 and 404 are in the closed position, the holes 406 line-up such that a pin 118 or locking key can be inserted through the holes 406. This prevents sections 402 and 404 from opening during a sterilization cycle or at any other time when opening would be undesirable.

[0090] In alternative exemplary embodiments sections 402 and 404 are maintained or locked in the closed position through the use of a clamp or latch. It can be appreciated that exemplary embodiments of these teachings provide for any mechanism that allows sections 402 and 404 of filter holder 106 to be maintained securely in the closed position and then opened when desired.

[0091] Figure 4b provides a perspective view of the movement of an alternative filter arrangement of a sterilizing cabinet for use in practicing exemplary embodiments of this invention. Shown in Figure 4b is the outside face of sterilizing cabinet 100, vent 104, primary filter 108, hinge 116, and filter holder 106 section 402, which secures primary filter 108. It should be noted that in this exemplary embodiment, there is only one filter (i.e., primary filter 108) and one filter holder 106 section 402. Here, filter holder 106 section 402 is able to rotate about hinge 116. It can be moved from the closed position (covering vent 104) to the open position (not covering vent 104). Also shown in Figure 4b are holes 406 on section 402. When section 402 is in the closed position, the holes 406 line-up such that a pin 118 or locking key can be inserted through the holes 406. This prevents section 402 from opening during a sterilization cycle or at any other time when opening would be undesirable.

[0092] In alternative exemplary embodiments, section 402 is maintained or locked in the closed position through the use of a clamp or latch. It can be appreciated that exemplary embodiments of these teachings provide for any mechanism that allows section 402 of filter holder 106 to be maintained securely in the closed position and then opened when desired

[0093] Figure 5a provides a perspective view of an alternative arrangement of sterilizing cabinet 100 with vents 104 on the sides of the cabinet. In this embodiment filter

holders 110 are located on the sides of sterilizing cabinet 100 with primary filter 108 and secondary filter 110. Also shown in Figure 5a are hangers 502 from which filter holder 106, primary filter 108 and secondary filter 110 attach to sterilizing cabinet 100. It can be appreciated that exemplary embodiments of sterilizing cabinet 100 include vents 104, primary filter 108, secondary filter 110 and filter holder 106 on the side of sterilizing cabinet 100.

[0094] Figure 5b shows a front facing view of vent 104 with filter holder 106 overlaying vent 104 on sterilizing cabinet 100. In this embodiment filter holder 106 is sized such its edges completely cover the portions surrounding vent 104. Figure 5c shows primary filter 108 and filter holder 106 overlaying vent 104. Primary filter 108 as shown hangs from hangers 502 and attaches to filter holder 106 by clamps 504.

[0095] Figure 5d shows secondary filter 110 in filter holder 106 overlaying primary filter 108 and vent 104. In this embodiment the portion of filter holder 106 which holds secondary filter 110 can be opened and closed through the use of hinged gasket 504 once pin 118 is removed from hole 406 maintaining the portion of filter holder 106 that holds secondary filter 110. This allows for secondary filter 110 to be removed from filter holder 106 while maintaining the position and seal of primary filter 108 over vent 104.

[0096] Figure 6a provides a perspective view of an alternative sterilizing cabinet 100. Shown in figure 6a is sterilizing cabinet frame 112, bars 602 and hooks 604. In this embodiment there is no front side of sterilizing cabinet 100 in front of bars 602. It should be appreciated that exemplary embodiments of sterilizing cabinet 100 also include embodiments of sterilizing cabinet 100 that do not contain bars 602. In yet another exemplary embodiment of sterilizing cabinet 100, bars 602 are removeable such that bars 602 can be removeably affixed to sterilizing cabinet 100 when desired. Figure 6b illustrates filter door 606 which contains primary filter 106. In exemplary embodiments filter door 606 covers the front opening of sterilizing cabinet 100 in Figure 6a. Filter door 606 clamps onto sterilizing cabinet 100 with clamps 608. Bars 602 prevent the contents of sterilizing cabinet 100 (typically a tray containing instruments for sterilization) from ripping or breaking primary filter 108 and secondary filter 110.

[0097] Figure 6c illustrates filter door 610 which attaches to filter door 606 and sterilizing cabinet 100 with the use of clamps 608. In this embodiment it can be

appreciated that clamps 608 on filter door 610 fit into the spacing between clamps 608 on filter door 606. This arrangement prevents the clamps 608 from filter door 606 from interfering with clamps 608 from filter door 610. Additionally, since filter door 610 is attached independently from filter door 606, secondary filter 110 can be removed with filter door 610 after a sterilization cycle has completed without disturbing filter door's 606 seal with sterilizing cabinet 100. In this embodiment filter door 606 forms a seal with sterilizing cabinet 100 at the edges of the open portion of the sterilizing cabinet frame 112, such that any sterilizing steam that enters or exits sterilizing cabinet 100 during a sterilization cycle must pass through filter door 606 and primary filter 106. Likewise, filter door 610 forms a seal with filter door 606 such that any sterilizing steam that exits sterilizing cabinet 100 and primary filter 108 must pass through filter door 610 and secondary filter 110.

[0098] Figure 7a depicts a perspective view of the construction of the alternative arrangement sterilizing cabinet 100 from Figures 6a, 6b and 6c. As shown filter door 606 with clamps 608 attach around the frame of sterilizing cabinet 100. Primary filter 108 is placed on top of filter door 606 and attaches to sterilizing cabinet 100 at hooks 604. Secondary filter 110 is placed on top of primary filter 108 and also attaches to sterilizing cabinet 100 at hooks 604. Filter door 610 is then placed on top of secondary filter 110 and attached to sterilizing cabinet 100 with clamps 608. As illustrated in Figure 7a, exemplary embodiments of filter doors 606 and 608 contain numerous holes or openings along their surface, and allow for the passage of sterilizing steam. Exemplary embodiments of filter doors 606 and 608 are able to be fully or partially separable from sterilizing cabinet 100. It should also be appreciated that filter doors 606 and 608 can optionally employ the use of a hinge, clamp, clasp or the like as the mechanism for removing and replacing filter doors 606 and 608 on sterilizing cabinet 100.

[0099] Figure 7b depicts an alternative perspective view of the construction of another alternative arrangement sterilizing cabinet 100. As shown filter door 606 with clamps 608 attach around the frame of sterilizing cabinet 100. Primary filter 108 is placed on top of filter door 606 and attaches to sterilizing cabinet 100 at hooks 604. In this embodiment, there is only a single filter and no secondary filter. Primary filter 108 creates a sealed interface with filter door 606 such that extraneous materials cannot enter sterilizing cabinet 100. Filter door 610 is then placed on top of primary filter 108 and attached to sterilizing

cabinet 100 with clamps 608. In another exemplary embodiment, primary filter 108 does not create a sealed interface with filter door 606 until filter door 610 is placed on top of primary filter 108 and filter door 606. In this embodiment, a sealed interface between filter door 610 and primary filter 108, and a sealed interface between filter door 606 or sterilizing cabinet 100 and primary filter 108 is only created when filter door 610 is attached or affixed to sterilizing cabinet 100. As illustrated in Figure 7b, exemplary embodiments of filter doors 606 and 608 which contain numerous holes or openings along their surface, which allow for the passage of sterilizing steam.

[0100] It should be noted that exemplary embodiments of Figure 7b provide that filter door 610 can be removed from sterilizing cabinet 100, primary filter 108 and filter door 606 without disturbing or disrupting the sealed interface between primary filter 108 and filter door 606. This will prevent the possibility of extraneous materials from entering sterilizing cabinet 100 after a sterilizing cycle when filter door 610 is removed in order to either allow primary filter 108 and filter door 606 to be removed as well or for primary filter 108 to be inspected to verify that it maintained its integrity during the sterilizing cycle.

[0101] In an alternative exemplary embodiment, the sealed interface between filter door 610 and primary filter 108, and the sealed interface between filter door 606 or sterilizing cabinet 100 and primary filter 108 is broken or can be broken when filter door 610 is removed from sterilizing cabinet 100, primary filter 108, and filter door 606. In yet another exemplary embodiment, the sealed interface between filter door 610 and primary filter 108, and the sealed interface between filter door 606 or sterilizing cabinet 100 and primary filter 108 is only created and thereafter maintained when sterilizing cabinet 100 along with filter door 610, filter door 606 and primary filter 108 are exposed to a sterilization cycle. Exemplary embodiments of sterilizing cabinet 100 as depicted in FIG. 7b are able to maintain the sealed interface between filter door 610 and primary filter 108, and the sealed interface between filter door 606 or sterilizing cabinet 100 and primary filter 108 for an extended period of time following being exposed to a sterilization cycle, such as sterilizing steam. For example, the sealed interface may be able to remain intact for as long as 30-90 days. In other exemplary embodiments the sealed interface may only remain intact for a matter of hours.

[0102] Referring to Figures 8a, 8b and 8c, provided are different views of a spacer 802 for use in exemplary embodiments of sterilizing cabinet 100. In this embodiment spacer 802 has a wire frame and is sized such that when it is placed inside sterilizing cabinet 100 it does not move. The length and width of spacer 802 closely matches the dimensions (i.e., the depth and width) of the inside of sterilizing cabinet 100. This prevents spacer 802 from sliding or moving inside sterilizing cabinet 100 during a sterilization cycle or while sterilizing cabinet 100 is being moved. It should be appreciated that spacer 802 is shaped such that there are dividers or lips 804 along the edges of spacer 802 and at spacer's 802 midsection. The dividers or lips 804 are illustrated most clearly in Figures 8b and 8c. In practice, sterilizing trays can be placed on top of spacer 802 prior to a sterilization cycle. In order to ensure that all of the contents of sterilizing cabinet 100 are sterilized, it is advantageous to prevent sterilizing trays from touching. This can obscure portions of the sterilizing trays or their contents from the sterilizing steam. As such, the dividers or lips 804 provide a physical barrier between sterilizing trays creating a minimum separation between the trays. This allows the passage sterilizing steam during a sterilization cycle throughout sterilizing cabinet 100. Additionally, the dividers or lips 804 of spacer 802 are sized such that they accommodate the shape and size of sterilizing trays and thus substantially prevent lateral movement (e.g., sliding) of sterilizing trays when not desired before, during or following a sterilization cycle.

[0103] Figures 9a, 9b and 9c illustrate an alternative spacer 902 for use inside exemplary embodiments of sterilizing cabinet 100. In this embodiment spacer 902 is made of thin sheets (e.g., metal or aluminum alloys) with holes 906 throughout the length of the sheets. In this embodiment spacer 902 is sized such that when it is placed inside sterilizing cabinet 100 it does not move. The length and width of spacer 902 closely matches the dimensions (i.e., the depth and width) of the inside of sterilizing cabinet 100. This prevents spacer 902 from sliding or moving inside sterilizing cabinet 100 during a sterilization cycle or while sterilizing cabinet 100 is being moved. Spacer 902 is shaped such that there are dividers or lips 904 along the edges of spacer 902 and throughout spacer's 902 mid-section. The dividers or lips 904 can be viewed most clearly in Figures 9b and 9c. In practice, sterilizing trays can be placed on top of spacer 902 prior to a sterilization cycle. In order to ensure that all of the contents of sterilizing cabinet 100 are sterilized, it is advantageous to prevent sterilizing trays from touching. This can obscure

portions of the sterilizing trays or their contents from the sterilizing steam. As such, the dividers or lips 904 provide a physical barrier between sterilizing trays creating a minimum separation between the trays. This allows the passage sterilizing steam during a sterilization cycle throughout sterilizing cabinet 100. Holes 906 encompasses any variation of openings that allow for the passage of sterilizing steam during a sterilization cycle yet maintaining structural integrity of spacer 902 to carry the weight of the sterilizing trays and their contents.

[0104] Exemplary embodiments of spacers 802 and 902 provide for the spacer to be fenestrated. In another exemplary embodiment spacers 802 and 902 are not reusable but are disposable and can only be sterilized once. In another exemplary embodiment spacers 802 and 902 provide vertical spacing between trays by at least 0.1 to 5 inches. In yet another exemplary embodiment, spacers 802 and 902 provide vertical spacing between trays by at least 10 to 26 inches.

[0105] Figure 10 provides an exemplary embodiment of a sterilizing tray for practicing exemplary embodiments of this disclosure. For the purposes of this disclosure, the terms tray and pan are interchangeable and refer to an instrument with a closed rigid bottom and sides and an open top. Illustrated in Figure 10 is sterilizing tray 1000 with an open top and a closed rigid bottom and sides. Sterilizing tray 1000 can be made of any material that can be sterilized (sterilizable) and is rigid enough such that it can hold items to be sterilized. For example sterilizing tray 1000 can be made of metals or metal alloys. Exemplary embodiments of sterilizing tray 1000 provide for a tray that has dimensions that make it suitable for use with spacers 802 and 902 and sterilizing cabinet 100. Exemplary embodiments of sterilizing tray 1000 also includes trays with holes, slits, fenestrations or other openings that allow for the passage of a sterilizing agent during a sterilization cycle.

[0106] In an exemplary embodiment in accordance of the present disclosure, spacers 802 or 902 can be used in conjunction with sterilizing cabinet 100 and one or more sterilizing trays 1000 during a sterilization cycle. In this embodiment the one or more sterilizing trays 1000 are of the shape and size so that they can be retained within sterilizing cabinet 100 and fit between the dividers 904 in spacers 902.

[0107] In practice, as shown in Figure 11, a first tray is placed in sterilizing cabinet 100 on a spacer 902. On top of the first tray 1000 spacer 902 is then placed. Next, a second

tray 1000 is placed in sterilizing cabinet 100 on top of spacer 902. The spacer 902 vertically separates the first tray 1000 from the second tray 1000 in sterilizing cabinet 100. Spacer 902 also inhibits lateral displacement of the first and second tray 1000 through the use of the dividers and lips 904. The spacers 902 play the important role of allowing sterilizing steam to pass between the sterilizing trays 1000 during a sterilization cycle. It can be appreciated that exemplary embodiments include the addition of more sterilizing trays 1000 and spacers 902 arranged in accordance with the first and second sterilizing trays described. Exemplary embodiments of spacers 902 provide space between the first and second tray 1000 by at least 10 to 26 inches.

[0108] Exemplary embodiments of these teachings also provide for a sterilizable pan assembly for sterilization within sterilizing cabinet 100. The sterilizable pan assembly as shown in Figure 12 illustrates a first sterilizable pan 1202 with an open top and a closed bottom. Protruding from the top of the first sterilizable pan 1202 are four legs 1204. Exemplary embodiments of the first sterilizable pan 1202 also includes legs 1204 that protrude from the bottom of the first sterilizable pan 1202. These legs are configured to releaseably attach to a portion of a second sterilizable pan 1206. Legs 1204 when attached to the second sterilizable pan 1206 maintain a vertical spacing between the bottom of the first sterilizable pan 1202 and the top of the second sterilizable pan 1206. In one exemplary embodiment the vertical spacing is at least 0.1 to 5 inches. In another exemplary embodiment, the vertical spacing is such that it allows for the passage of a sterilizing steam from a sterilization cycle of sterilizing cabinet 100. Exemplary embodiments of this pan assembly are configured such that they can be used within sterilizing cabinet 100 during a sterilization cycle.

[0109] Referring to Figure 13a, provided is an exemplary embodiment of a filter suitable for use in practicing exemplary embodiments of this disclosure. Shown in Figure 13a is filter 1302 with a beaded edge 1304. Filter 1302 can be made of any type of porous paper or cellulose type material. In other embodiments, filter 1302 is made of polymeric substances, such as polypropylene. Filter 1302 is required to be both porous and dense enough to allow the passage of a sterilizing agent, such as steam, through its membrane, but also resilient enough to not rip or tear during a sterilizing cycle or during insertion/clamping into a filter holder. In another embodiment, filter 1302 is both porous and less resilient such that filter 1302 can be ripped or torn during use in a sterilizing cycle

or with filter holder 106. The beaded edge 1304 creates a raised portion along the edges of the filter 1302 as shown in Figure 13b. This enables filter 1302 to create a sealed interface when used with sterilizing cabinet 100 and filter holder 106 over vents 104. In an alternative embodiment, beaded edge 1304 is placed inside the edge of filter 1302 rather than on the edge of filter 1302 such that there is a space between the edge of filter 1302 and beaded edge 1304.

[0110] Exemplary embodiments of filter 1302 provide for filter 1302 to have different densities along given cross-sections of the face of filter 1302. For instance, filter 1302 may have a higher density along its periphery and a lower density towards its center. Exemplary embodiments of filter 1302 also provide for filter 1302 to have different thicknesses throughout its cross-section. The different thicknesses of filter 1302 provide different lengths of travel for sterilizing agents, which pass through filter 1302.

[0111] Exemplary embodiments of filter 1302 have a length and width that corresponds to the size of vents 104 of sterilizing cabinet 100 and filter holder 106. Additionally, the thickness of beaded edge 1304 corresponds to a size that is able to fit between sterilizing cabinet 100 and filter holder 106 or between the different sections of filter holder 106. The thickness of beaded edge 1304 is also such that the sealed interface between sterilizing cabinet 100 and filter holder 106 or between the different sections of filter holder 106 prevents extraneous materials from entering sterilizing cabinet 100 and forces all of the sterilizing agent that enters and exits sterilizing cabinet 100 to pass through filter 1302.

[0112] The beaded edge 1304 can be made of a silicone based material or any other material that can create a sealed interface between sterilizing cabinet 100 or filter holder 106 and filter 1302. The beaded edge 1304 also is required to be able to withstand high temperatures in excess of 275 degrees without compromising its structural or chemical integrity. Exemplary embodiments of filter 1502 have a length and width that corresponds to the size of vents 104 of sterilizing cabinet 100 and filter holder 106.

[0113] Figure 14a provides an alternative exemplary embodiment of a filter suitable for use in practicing exemplary embodiments of this disclosure. Shown in Figure 14a is filter 1402 with folded edge 1404. Filter 1402 can be made of any type of porous paper or cellulose type material. In other embodiments filter 1402 is made of polymeric substances,

such as polypropylene. Filter 1402 is required to be porous enough to allow the passage of a sterilizing agent, such as steam through its membrane, but also resilient enough to not rip or tear during a sterilizing cycle or during insertion/clamping into a filter holder 106. In another embodiment filter 1402 is both porous and less resilient such that filter 1402 can be ripped or torn during use in a sterilizing cycle or with filter holder 106.

[0114] The folded edge 1404 is created by the edges of filter 1402 folded onto itself thereby creating a thicker membrane along the edges of filter 1402 as shown in Figure 14b. The thicker membrane of folded edge 1404 provides for a better-sealed interface between sterilizing cabinet 100 and filter holder 106 as there is less likelihood that spaces can be created between filter 1402 and sterilizing cabinet 100 which would allow for the passage of sterilizing steam or extraneous materials. Exemplary embodiments of filter 1402 have a length and width that corresponds to the size of vents 104 of sterilizing cabinet 100 and filter holder 106.

[0115] Additionally, the thickness of folded edge 1404 corresponds to a size that is able to fit between sterilizing cabinet 100 and filter holder 106 or between the different sections of filter holder 106. The thickness of edge 1404 is also such that the sealed interface between sterilizing cabinet 100 and filter holder 106 or between the different sections of filter holder 106 prevents extraneous materials from entering sterilizing cabinet 100 and forces all of the sterilizing agent that enters and exits sterilizing cabinet 100 to pass through filter 1402.

[0116] Referring to Figure 15a, provided is another exemplary embodiment of a filter suitable for use in exemplary embodiments of this disclosure. Shown in Figure 15a is filter 1502, filter edge 1504 and filter center 1506. Filter 1502 can be made of any type of porous paper or cellulose type material. In other embodiments filter 1502 is made of polymeric substances, such as polypropylene. Filter 1502 is required to be porous enough to allow the passage of a sterilizing agent, such as steam through its membrane, but also resilient enough to not rip or tear during a sterilizing cycle or during insertion/clamping into a filter holder 106. In another embodiment filter 1502 is both porous and less resilient such that filter 1502 can be ripped or torn during use in a sterilizing cycle or with filter holder 106.

[0117] Filter edge 1504 provides for a thicker portion of filter 1502 as shown in Figure 15b. The thickness of filter edge 1504 enables filter 1502 to make a better compressed sealed interface with sterilizing cabinet 100 and filter holder 106. Exemplary embodiments of filter 1502 have a length and width that corresponds to the size of vents 104 of sterilizing cabinet 100 and filter holder 106. Additionally, the thickness of edge 1504 corresponds to a size that is able to fit between sterilizing cabinet 100 and filter holder 106 or between the different sections of filter holder 106. The thickness of edge 1504 is also such that the sealed interface between sterilizing cabinet 100 and filter holder 106 or between the different sections of filter holder 106 prevents extraneous materials from entering sterilizing cabinet 100 and forces all of the sterilizing agent that exits sterilizing cabinet 100 to pass through center 1506 of filter 1502.

[0118] Center 1506 of filter 1502 includes all of the area of filter 1502 other than edge 1504 that is of normal or customary thickness for a filter that allows the passage of sterilizing steam, but prevents the passage of other extraneous materials.

[0119] Shown in Figure 16 is an exemplary filter cartridge 1600 suitable for use in practicing exemplary embodiments of this disclosure. Figure 16 includes a separated view and a side view of filter cartridge 1600 in which the different elements have been separated. Filter cartridge 1600 includes a frame 1602 and filter 1604. Frame 1602 provides a substantially rigid frame that is substantially resistant from ripping or tearing. Frame 1602 is typically made out of a cardboard or like material. Frame 1602 can be made out of any type of material that is both substantially rigid and is able to maintain its integrity during and after undergoing a sterilization cycle. Exemplary embodiments of frame 1602 can be made out of polymer based materials or cellulose based materials. In other exemplary embodiments, frame 1602 is flexible and less rigid and may become deformed or shrink during a sterilization cycle. In another exemplary embodiment, frame 1602 can be made out of any type of material that is both flexible, less rigid and is able to maintain its integrity during and after undergoing a sterilization cycle. In one exemplary embodiment, frame 1602 is composed of medical grade light board. In another exemplary embodiment, frame 1602 is composed of a silicone material. Filter 1604 can be made of any type of porous paper or cellulose type material. In other embodiments filter 1604 is made of polymeric substances, such as polypropylene. Filter 1604 is required to be porous enough to allow the passage of a sterilizing agent, such as steam through its membrane, but

also resilient enough to not rip or tear during a sterilizing cycle. Exemplary embodiments of filter cartridge 1600 are able to provide sufficient integrity to form a sealed interface with a confronting surface, such as a sterilizing cabinet and/or a filter door or doors, and is able to maintain its integrity during and after undergoing a sterilization cycle.

[0120] Exemplary embodiments of filter cartridge 1600 provide that frame 1602 and filter 1604 are removeably coupled to each other through the use of an adhesive. In another exemplary embodiment frame 1602 and filter 1604 are not removeably coupled, but are permanently affixed to one another or are integral with one another. In yet another exemplary embodiment, frame 1602 and filter 1604 are removeably coupled to each other through the use of an intermediary adhesive, such as double sided tape or the like. Exemplary adhesives are able to create a sealed interface between frame 1602 and filter 1604 and maintain the sealed interface between frame 1602 and filter 1604 prior to, during and following a sterilization cycle. One exemplary adhesive suitable for use in filter cartridge 1600 is that found is U.S. Patent 3,691,140. Exemplary adhesives between frame 1602 and filter 1604 create a seal between frame 1602 and filter 1604 such that extraneous materials are not able to pass between the sealed interface of frame 1602 and filter 1604. Exemplary adhesives between frame 1602 and filter 1604 allow for filter 1604 to be removeable when desired, typically after undergoing sterilizing cycle, such that substantially all of filter 1604 can be removed in a single piece. That is, the adhesive and materials of frame 1602 and filter 1604 are selected to provide for non-destructive separation of frame 1602 and filter 1604.

[0121] Referring to Figure 17, illustrated is filter cartridge 1700 suitable to use in practicing exemplary embodiments of this disclosure. Figure 17 includes a separated view and a side view of filter cartridge 1700 in which the different elements have been separated. Filter cartridge 1700 includes a frame 1702, filter 1704, and filter 1706. Frame 1702 provides a substantially rigid frame that is substantially resistant from ripping or tearing. In other exemplary embodiments, frame 1702 is flexible and less rigid and may become deformed or shrink during a sterilization cycle. Frame 1702 is typically made out of a cardboard or like material. Frame 1702 can be made out of any type of material that is both rigid and is able to maintain its integrity during and after undergoing a sterilization cycle. Exemplary embodiments of frame 1702 can be made out of polymer based materials or cellulose based materials. In another exemplary embodiment, frame 1702 can

be made out of any type of material that is flexible, less rigid and is able to maintain its integrity during and after undergoing a sterilization cycle. In one exemplary embodiment, frame 1702 is composed of medical grade light board. In another exemplary embodiment, frame 1702 is composed of a silicone material.

[0122] Filter 1704 and filter 1706 can be made of any type of porous paper or cellulose type material. In other embodiments, filter 1704 and filter 1706 are made of polymeric substances, such as polypropylene. Filter 1704 and filter 1706 are required to be porous enough to allow the passage of a sterilizing agent, such as steam through its membrane, but also resilient enough to not rip or tear during a sterilizing cycle. Exemplary embodiments of filter cartridge 1700 are able to provide sufficient integrity to form a sealed interface with a confronting surface, such as a sterilizing cabinet and/or a filter door or doors, and is able to maintain its integrity during and after undergoing a sterilization cycle.

[0123] Exemplary embodiments of filter cartridge 1700 provide that frame 1702, is removeably coupled to filter 1704 and filter 1706 through the use of an adhesive. In another exemplary embodiment frame 1702, filter 1704, and filter 1706 are not removeably coupled, but are permanently affixed to one another or are integral with one another. In yet another exemplary embodiment, frame 1702 is removeably coupled to filter 1704 and filter 1706 through the use of an intermediary adhesive, such as double sided tape or the like. As shown in Figure 17, filter 1704 and filter 1706 are removeably coupled to frame 1702 such that they are located on opposing sides of frame 1702. Exemplary adhesives are able to create a sealed interface between frame 1702 and filter 1704, and between frame 1702 and filter 1706. One exemplary adhesive suitable for use in filter cartridge 1700 is that found is U.S. Patent 3,691,140. Exemplary adhesives are also able to maintain the sealed interface between frame 1702 and filter 1704 prior to, during and following a sterilization cycle, and between frame 1702 and filter 1706 prior to, during and following a sterilization cycle. Exemplary adhesives between frame 1702 and filter 1704 and between frame 1702 and filter 1706 create a seal between frame 1702 and filter 1704, and between frame 1702 and filter 1706 such that extraneous materials are not able to pass between frame 1702 and filter 1704 or between frame 1702 and filter 1706. Exemplary adhesives between frame 1702 and filter 1704, and between frame 1702 and filter 1706 allow for filter 1604 and filter 1706 to be removeable from frame 1702 when desired, typically after undergoing

sterilizing cycle, such that substantially all of filter 1704 and filter 1706 can be removed in a single piece.

[0124] Referring to Figure 18, shown is an exemplary filter cartridge 1800 suitable for use in practicing exemplary embodiments of this disclosure. Figure 18 includes a separated view and a side view of filter cartridge 1800 in which the different elements have been separated. Filter cartridge 1800 includes a frame 1802, frame 1804 and filter 1806. Frames 1802 and 1804 provide a substantially rigid frame that is substantially resistant from ripping or tearing. Frames 1802 and 1804 are typically made out of a cardboard or like material. Frames 1802 and 1804 can be made out of any type of material that is both substantially rigid and is able to maintain its integrity during and after undergoing a sterilization cycle. Exemplary embodiments of frames 1802 and 1804 can be made out of polymer based materials or cellulose based materials. In other exemplary embodiments, frames 1802 and 1804 are flexible and less rigid and may become deformed or shrink during a sterilization cycle. In another exemplary embodiment, frames 1802 and 1804 can be made out of any type of material that is flexible, less rigid and is able to maintain its integrity during and after undergoing a sterilization cycle. In one exemplary embodiment, frames 1802 and 1804 are composed of medical grade light board. In another exemplary embodiment, frames 1802 and 1804 are composed of a silicone material. Filter 1806 can be made of any type of porous paper or cellulose type material. In other embodiments filter 1806 is made of polymeric substances, such as polypropylene. Filter 1806 is required to be porous enough to allow the passage of a sterilizing agent, such as steam through its membrane, but also resilient enough to not rip or tear during a sterilizing cycle. Exemplary embodiments of filter cartridge 1800 are able to provide sufficient integrity to form a sealed interface with a confronting surface, such as a sterilizing cabinet and/or a filter door or doors, and is able to maintain its integrity during and after undergoing a sterilization cycle.

[0125] Exemplary embodiments of filter cartridge 1800 provide that frames 1802 and 1804 are removeably coupled to filter 1806 through the use of an adhesive. In another exemplary embodiment frames 1802 and 1804, and filter 1806 are not removeably coupled, but are permanently affixed to one another or are integral with one another. In yet another exemplary embodiment, frames 1802 and 1804 are removeably coupled to filter 1806 through the use of an intermediary adhesive, such as double sided tape or the like.

Exemplary adhesives are able to create a sealed interface between frame 1802 and filter 1806, and between 1804 and filter 1806 and maintain the sealed interface between frame 1802 and filter 1806, and between frame 1804 and filter 1806 prior to, during and following a sterilization cycle. One exemplary adhesive suitable for use in filter cartridge 1800 is that found is U.S. Patent 3,691,140. Exemplary adhesives create a seal between frame 1802 and filter 1806, and between frame 1804 and filter 1806 such that extraneous materials do not pass between frame 1802 and filter 1806, or between frame 1804 and filter 1806. Exemplary adhesives between frame 1802 and filter 1806, and between frame 1804 and filter 1806 allow for filter 1806 to be removeable when desired, typically after undergoing sterilizing cycle, such that substantially all of filter 1806 can be removed in a single piece.

[0126] Referring to Figure 19, shown is an exemplary filter cartridge 1900 suitable for use in practicing exemplary embodiments of this disclosure. Figure 19 includes a separated view and a side view of filter cartridge 1900 in which the different elements have been separated. Filter cartridge 1900 includes a frame 1902, frame 1904, filter 1906 and filter 1908. Frames 1902 and 1904 provide a substantially rigid frame that is substantially resistant from ripping or tearing. Frames 1902 and 1904 are typically made out of a cardboard or like material. Frames 1902 and 1904 can be made out of any type of material that is both substantially rigid and is able to maintain its integrity during and after undergoing a sterilization cycle. In other exemplary embodiments, frames 1902 and 1904 are flexible and less rigid and may become deformed or shrink during a sterilization cycle. Exemplary embodiments of frames 1902 and 1904 can be made out of polymer based materials or cellulose based materials. In another exemplary embodiment, Frame 1902 and 1904 can be made out of any type of material that is flexible, less rigid and is able to maintain its integrity during and after undergoing a sterilization cycle. In one exemplary embodiment, frames 1902 and 1904 are composed of medical grade light board. In another exemplary embodiment, frames 1902 and 1904 are composed of a silicone material. Filters 1906 and 1908 can be made of any type of porous paper or cellulose type material. In other embodiments filters 1906 and 1908 are made of polymeric substances, such as polypropylene. Filters 1906 and 1908 are required to be porous enough to allow the passage of a sterilizing agent, such as steam through its membrane, but also resilient enough to not rip or tear during a sterilizing cycle. Exemplary embodiments of filter

cartridge 1900 are able to provide sufficient integrity to form a sealed interface with a confronting surface, such as a sterilizing cabinet and/or a filter door or doors, and is able to maintain its integrity during and after undergoing a sterilization cycle.

[0127] Exemplary embodiments of filter cartridge 1900 provide that frames 1902 and 1904 are removeably coupled to filters 1906 and 1908 through the use of an adhesive. In another exemplary embodiment frames 1902 and 1904, and filters 1906 and 1908 are not removeably coupled, but are permanently affixed to one another or are integral with one another. In yet another exemplary embodiment, frames 1902 and 1904 are removeably coupled to filters 1906 and 1908 through the use of an intermediary adhesive, such as double sided tape or the like. Exemplary adhesives are able to create a sealed interface between frame 1902 and filter 1906, between frame 1904 and filter 1906, between frame 1904 and filter 1908 and also maintain the sealed interface between frames 1902 and 1904, and filters 1906 and 1908 prior to, during and following a sterilization cycle. One exemplary adhesive suitable for use in filter cartridge 1900 is that found is U.S. Patent 3,691,140. Exemplary adhesives between frames 1902 and 1904, and filters 1906 and 1908 create a seal between frames 1902 and 1904, and filter 1906 and 1908 such that extraneous materials do not pass between frames 1902 and 1904, and filters 1906 and 1908. Exemplary adhesives between frames 1902 and 1904, and filters 1906 and 1908 allow for filters 1906 and 1908 to be removeable from frames 1902 and 1904 when desired, typically after undergoing sterilizing cycle, such that substantially all of filters 1906 or 1908 can be removed in a single piece.

[0128] Referring to Figure 20, shown is an exemplary filter door for a filter cartridge suitable for use in practicing exemplary embodiments of this disclosure. Shown in Figure 20 is an exemplary outer filter door 2002. Filter door 2002 includes tabs or catches 2004, which protrude perpendicular from the back face of filter door 2002. Filter door 2002 as illustrated in Figure 20 contains numerous holes or openings along its surface, which allow for the passage of sterilizing steam. In the embodiment depicted in Figure 20, the tabs or catches 2004 are located in each of the four corners of filter door 2002. However, it should be noted that in other exemplary embodiments there can be more or less than four tabs or catches 2004. Additionally, tabs or catches 2004 can be located in different arrangements. Exemplary tabs or catches 2004 provide a mechanism for removeably locating or placing a filter cartridge on filter door 2002, such that a filter cartridge can be placed between tabs or

catches 2004 and is in contact with tabs or catches 2004 without bending, folding or otherwise compromising the integrity of a filter cartridge.

[0129] Referring to Figure 21, shown is a magnified cross-sectional view of an exemplary sterilizing cabinet and filter door suitable for use in practicing exemplary embodiments of this disclosure. Shown in Figure 21 is a cross-sectional view of sterilizing cabinet 2102 with trough section 2104, and filter door 2106 with trough section 2108. Exemplary embodiments of trough section 2104 and trough section 2106 run along the entire edge of sterilizing cabinet 2102 and filter door 2106. Trough section 2104 and trough section 2106 are shaped such that a sealed interface is maintained throughout the trough (i.e., between trough section 2104 and trough section 2106) when a single filter, multiple filters, or a filter cartridge is placed between trough section 2104 and trough section 2106. Exemplary embodiments of trough section 2104 and trough section 2106 have a size and depth such that the movement of extraneous materials through the sealed interface between sterilizing cabinet 2102 and filter door 2106 is substantially prevented. In practice, a filter cartridge may be placed and compressed between the sterilizing cabinet 2102 and filter door 2106 such that the filter cartridge is deformed into the shape of the trough in which it is compressed.

[0130] Referring to Figure 22, shown is a perspective view of an exemplary sterilizing cabinet and filter door suitable for use in practicing exemplary embodiments of the present disclosure. Illustrated in Figure 22 is sterilizing cabinet 2202, filter door 2204, trough section 2206, sterilizing cabinet tab 2208, filter door pin 2210, pin hole 2212, and clamp 2214. Exemplary embodiments of filter door pin 2210 are located on the top two corners of filter door 2204. In other exemplary embodiments, filter door pins 2210 are located at all four corners of filter door 2204. Filter door pins 2210 are of the size and shape to fit within pin hole 2212. Exemplary embodiments of filter door pin 2210 and pin hole 2212 are located such that filter door 2204 properly aligns and covers the open front of sterilizing cabinet 2202. Exemplary embodiments of filter door pin 2210 and pin hole 2212 maintain filter door 2204 is a loosely attached position to sterilizing cabinet 2202.

[0131] In other exemplary embodiments, filter door 2204 with filter door pin 2210 aligns with pin holes 2212 on sterilizing cabinet 2202 such that there is a small gap between the edge 2216 of sterilizing cabinet 2202 and filter door 2204. It can be

appreciated that pin hole 2212 is located on sterilizing cabinet tab 2208. Exemplary embodiments of sterilizing cabinet tab 2208 are located at least in the four corners of sterilizing cabinet 2202 along edge 2216. In other exemplary embodiments, a sterilizing cabinet tab 2208 is also located within the middle of the vertical and horizontal edge 2216 of sterilizing cabinet 2202 such that there are eight (8) sterilizing cabinet tabs 2208. In another exemplary embodiment sterilizing cabinet 2202 includes one or more sterilizing cabinet tab 2208. Exemplary embodiments of sterilizing cabinet tab 2208 overlap with filter door 2204 when placed over the front opening of sterilizing cabinet 2202 such that filter door 2204 is prevented from falling or moving into the interior of sterilizing cabinet 2202 when filter door 2204 is aligned with pin hole 2212.

[0132] Figure 22 also shows clamp 2214. Exemplary embodiments of clamp 2214 are located on the vertical sides of sterilizing cabinet 2202. However, exemplary embodiments of clamp 2214 can be placed in many different arrangements along the sides of sterilizing cabinet 2202 such that clamps 2214 are able to clasp and maintain filter door 2204 in a sealed position over the open front of sterilizing cabinet 2202. Exemplary embodiments of clamps 2214 are able to clasp and release filter door 2204 and an outer filter door from sterilizing cabinet 2202. Exemplary embodiments of clamp 2214 are sized such that a sealed interface is created between sterilizing cabinet 2202, a filter or filters, and the filter doors. The sealed interface prevents the passage of extraneous materials between the filter doors and sterilizing cabinet 2202.

[0133] With reference to Figure 23, shown is a perspective view of an exemplary sterilizing cabinet and filter door suitable for use in practicing exemplary embodiments of the present disclosure. Shown in Figure 23 are sterilizing cabinet 2302, filter door 2304, filter cartridge 2306, clamp trough 2308, and clamp 2310. As illustrated, filter door 2304 includes clamp trough 2308 around the outer edge of filter door 2304. Exemplary embodiments of clamp trough 2308 align with the trough section of sterilizing cabinet 2302 when filter door 2304 covers the opening of sterilizing cabinet 2302. Additionally, clamp trough 2308 is sized and located such that clamp 2310 is able to latch, clamp or otherwise hook onto filter door 2304 through clamp trough 2308. Exemplary embodiments of clamp trough 2308 provides a lip or trough that substantially prevents clamp 2310 from slipping when clamp 2310 clamps onto filter door 2304.

[0134] Referring to Figure 24, shown is a bottom perspective view of an exemplary sterilizing cabinet suitable for use in practicing exemplary embodiments of the present disclosure. Shown in Figure 24 are sterilizing cabinet 2402, sterilizing cabinet tabs 2404, clamp 2406 and legs 2408. Exemplary embodiments of legs 2408 reside on the bottom of sterilizing cabinet 2402 and provide a stable foundation for sterilizing cabinet 2402 to rest on a surface. Exemplary embodiments of legs 2408 further include holes 2410. Holes 2410 provide a means for attaching legs 2408 and thus sterilizing cabinet 2402 to a surface. For example, sterilizing cabinet 2402 through holes 2410 on legs 2408 can be screwed, bolted, attached, or nailed onto a table, counter, or other flat surface large and structurally sturdy enough to maintain sterilizing cabinet 2402.

[0135] Referring to Figure 25, shown is a perspective view of an alternative embodiment of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this disclosure. Shown in Figure 25 are sterilizing cabinet 2502, frame 2504, filter door 2506, latches 2508, and filter 2510. As illustrated, sterilizing cabinet 2502 is maintained within frame 2504. Frame 2504 provides a structurally reinforcing frame for sterilizing cabinet 2502. Exemplary embodiments of frame 2504 are able to securely maintain sterilizing cabinet 2502 such that all of the sides/corners of sterilizing cabinet 2502 are supported by frame 2504. Exemplary embodiments of frame 2504 are made of any type of metal, plastic, composite, or aluminum alloy. Exemplary embodiments of frame 2504 are able to repeatedly undergo sterilizing cycles (e.g., steam sterilizing cycles) and maintain its structural integrity.

[0136] Filter door 2506 attaches to frame 2504 through the use of latches 2508. However, it should be appreciated that latches 2508 can include any type of clamping, latching or clasping device known in the art that is able to releasable attach filter door 2506 to frame 2504 such that a sealed interface is created between filter door 2506 and sterilizing cabinet 2502.

[0137] Referring to Figure 26, shown is a perspective view of a separated alternative embodiment of a sterilizing cabinet suitable for use in practicing exemplary embodiments of this disclosure. Shown in Figure 26 are sterilizing cabinet 2602, frame 2604, filter door 2606, filter cartridge 2608, and latches 2610. In some embodiments, as shown in Figure 26, sterilizing cabinet 2602 can be removed from frame 2604 when filter door 2606 is

released from removable frame 2604 by latches 2610. In other exemplary embodiments, frame 2604 is not removable from sterilizing cabinet 2602, but is fixedly attached to sterilizing cabinet 2602. Filter door 2606 as depicted includes a fenestrated grid throughout its center. However, exemplary embodiments of filter door 2606 include any type of arrangement of holes, gaps, or grids such that sterilizing steam is free to pass through the center portion of filter door 2606.

[0138] During a sterilizing cycle filter cartridge 2608 is maintained between filter door 2606 and sterilizing cabinet 2602. As previously stated above, filter cartridge 2608 is placed between filter door 2606 and sterilizing cabinet 2602 creating a sealed interface around its edges such that sterilizing steam is not able to pass between the sealed interface, but can only pass through the center of filter cartridge 2608.

[0139] Further exemplary embodiments according to this disclosure include the following embodiments below. Embodiment 1: A sterilizing assembly, comprising: (a) a sterilizing cabinet; (b) a first tray and a second tray sized to be retained within the cabinet; and (c) at least one removable spacer intermediate the first tray and the second tray, the spacer being sterilizable and vertically separating the first tray and the second tray by a given height, the spacer inhibiting lateral displacement of the first tray relative to the second tray, wherein the given height is sufficient to permit a passage of a sufficient quantity of a sterilizing agent between the first tray and the second tray for a predetermined time.

[0140] Embodiment 2: The sterilizing assembly according to embodiment 1, wherein the at least one removable spacer is fenestrated.

[0141] Embodiment 3: The sterilizing assembly according to embodiment 1, further comprising a second removable spacer, the second removable spacer being sterilizable and located intermediate to one of the first tray and the second tray and the sterilizing cabinet.

[0142] Embodiment 4: The sterilizing assembly according to embodiment 1, wherein the given height is at least 0.1 inches.

[0143] Embodiment 5: The sterilizing assembly according to embodiment 1, wherein the given height is sufficient to permit passage of a sterilizing agent.

[0144] Embodiment 6: The sterilizing assembly according to embodiment 1, wherein the at least one removable spacer includes a shaped wire.

[0145] Embodiment 7: The sterilizing assembly according to embodiment 1, wherein the first tray defines an open top and the at least one removable spacer is sized to span the open top.

[0146] Embodiment 8: The sterilizing assembly according to embodiment 1, wherein the first tray is free of a lid.

[0147] Embodiment 9: The sterilizing assembly according to embodiment 1, wherein the at least one removable spacer and the second removable spacer are sterilizable only once.

[0148] Embodiment 10: A method of loading a sterilizing cabinet, the method comprising: (a) loading a sterilizable first pan and a sterilizable second pan within the sterilizing cabinet; and (b) placing a removable and sterilizable spacer between the first pan and the second pan, the spacer (i) providing at least one of a predetermined vertical spacing between the first pan and the second pan and (ii) inhibiting horizontal displacement of the first pan relative to the second pan.

[0149] Embodiment 11: The method according to embodiment 10, wherein at least one of the first pan and the second pan is lid free.

[0150] Embodiment 12: The method according to embodiment 10, wherein the vertical spacing is sufficient to permit passage of a sterilizing agent.

[0151] Embodiment 13: The method according to embodiment 10, wherein the predetermined vertical spacing is at least 0.1 inches.

[0152] Embodiment 14: The method according to embodiment 10, further comprising loading a sterilizable third pan and a sterilizable fourth pan within the sterilizing cabinet and placing a second sterilizable spacer to individually vertically space the sterilizable second pan relative to the sterilizable third pan and placing a third sterilizable spacer to individually vertically space the sterilizable third pan relative to the fourth pan independent of the first pan and the second pan.

[0153] Embodiment 15: The method according to embodiment 10, wherein the sterilizable spacer between the first pan and the second pan provides a predetermined vertical spacing between the first pan and the second pan.

[0154] Embodiment 16: A method of sterilizing, the method comprising: (a) loading a tray retaining a surgical instrument in a sterilization cabinet; (b) sealing a primary filter relative to a vent port in the sterilization cabinet; (c) sealing a secondary filter relative to the vent port and independent of the primary filter; and (d) passing a sterilizing agent through the secondary filter and the primary filter. For the purposes of this disclosure surgical instruments includes implantable materials or devices as well as instruments used for conducting surgeries and medical procedures.

[0155] Embodiment 17: The method according to embodiment 16, further comprising removing the secondary filter to retain the sealed primary filter and sterilization cabinet.

[0156] Embodiment 18: A sterilizable pan assembly, comprising: (a) a first sterilizable pan having an open top, a closed bottom and a pair of projecting spacer legs; and (b) a second sterilizable pan having an open top and a closed bottom, (c) the spacer legs configured to releasably engage a portion of the second pan and maintain a predetermined vertical spacing between the bottom of the first pan and the top of the second pan.

[0157] Embodiment 19: The sterilizable pan assembly according to embodiment 18, wherein the predetermined vertical spacing between the bottom of the first pan and the top of the second pan is at least 0.1 inches.

[0158] Embodiment 20: The sterilizable pan assembly according to embodiment 18, wherein the predetermined vertical spacing between the bottom of the first pan and the top of the second pan is sufficient to permit passage of a sterilizing agent.

[0159] Embodiment 21: A filtering assembly, comprising: (a) a primary filter holding portion for holding a primary filter for overlying a vent port and forming a sealed interface with a sterilizing cabinet; and (b) a secondary filter holding portion for holding a secondary filter, moveably attached to the primary filter holding portion for overlying the primary filter holding portion and forming a sealed interface with the primary filter holding portion.

[0160] Embodiment 22: The filtering assembly according to embodiment 21, wherein the primary filter and the secondary filter are different colors.

[0161] Embodiment 23: The filtering assembly according to embodiment 21, wherein the primary filter holding portion and the secondary filter holder portion are hingedly attached.

[0162] Embodiment 24: The filtering assembly according to embodiment 21, wherein the secondary filter and the primary filter are coextensive.

[0163] Embodiment 25: The filtering assembly according to embodiment 21, wherein the secondary filter and the primary filter have different filter properties.

[0164] Embodiment 26: The filtering assembly according to embodiment 21, wherein the secondary filter and the primary filter have similar filter properties.

[0165] Embodiment 27: A filter comprising: (a) a center portion of porous material with a predetermined density; and (b) an edge portion of porous material.

[0166] Embodiment 28: The filter according to embodiment 27, wherein the edge portion further comprises raised silicone beads.

[0167] Embodiment 29: The filter according to embodiment 27, wherein the edge portion is thicker than the center portion.

[0168] Embodiment 30: The filter according to embodiment 27, wherein the edge portion comprises at least two layers of folded material.

[0169] Embodiment 31: The filter according to embodiment 27, wherein the predetermined density of the center portion allows for passage of a sterilizing agent through the center portion and prevents passage of non-gaseous agents.

[0170] Embodiment 32: A filter cartridge, the filter cartridge comprising: (a) a frame, the frame comprising a rigid or flexible edge portion and defining a hollow center portion; and (b) a filter, the filter comprising a porous material and being affixed to the frame, the porous material being able to pass only gaseous materials through its surface, wherein the

filter cartridge provides sufficient integrity to form a sealed interface with a confronting surface.

[0171] Embodiment 33: The filter cartridge according to embodiment 32, the filter cartridge further comprising a second filter, the second filter comprising a porous material and being affixed to the frame, the porous material being able to pass only gaseous materials through its surface.

[0172] Embodiment 34: The filter cartridge according to embodiment 32, the filter cartridge further comprising a second frame, the second frame comprising a rigid or flexible edge portion and defining a hollow center portion, the second frame being affixed to the filter.

[0173] Embodiment 35: The filter cartridge according to embodiment 34, the filter cartridge further comprising a second filter, the second filter comprising a porous material and being affixed to the second frame and the filter, the porous material being able to pass only gaseous materials through its surface.

[0174] Embodiment 36: The filter cartridge according to embodiment 32, wherein the filter is removeably affixed to the frame.

[0175] Embodiment 37: The filter cartridge according to embodiment 32, wherein the frame and filter are coextensive.

[0176] Embodiment 38: The filter cartridge according to embodiment 32, wherein the frame and the filter are integral.

Claims

What is claimed is:

1. A sterilizing cabinet assembly, comprising:

(a) a sterilizing cabinet having an access port sized to pass a plurality of trays, each tray sized to retain a plurality of medical instruments;

(b) a door connected to and having confronting surfaces with the sterilizing cabinet, the door moveable between an open position permitting passage through the access port to an interior of the cabinet and a closed position precluding passage through the access port;

(c) at least one of the sterilizing cabinet and the door having a vent port; and

(d) a filter sized to approximately correspond to the size of the access port and overlie the access port, wherein the filter forms a sealed interface with at least one of the confronting surfaces of the sterilizing cabinet and the door.

2. The sterilizing cabinet assembly according to claim 1, wherein the filter is a first filter disposed on a rigid or flexible frame also having a second filter, and wherein the frame, first filter, and second filter form forms a sealed periphery with one of the sterilizing cabinet and the door.

3. The sterilizing cabinet assembly according to claim 1, wherein the door is removable.

4. The sterilizing cabinet assembly according to claim 3, wherein the removable door may be replaced.

5. The sterilizing cabinet assembly according to claim 5, wherein the door comprises a first separable door and a second separable door, the first separable door and the second separable door each comprising an edge section and an internal section, the internal section comprising a plurality of openings and wherein the filter can be retained between the first separable door and the second separable door.

6. The sterilizing cabinet assembly according to claim 5, wherein the sealed interface between the first filter and the adjacent portion of the one of the sterilizing cabinet and the first separable door is broken when the second separable door is removed.

7. The sterilizing cabinet assembly according to claim 6, wherein the sealed interface between the first filter and the adjacent portion of the one of the sterilizing cabinet and the first separable door is dependent on a sealed interface between the second filter and the second separable door.

8. A method for placing filters, the method comprising:

(a) disposing a primary door to occlude an access port of a sterilizing cabinet, the primary door comprising an edge portion and an internal portion, the internal portion comprising a plurality of openings;

(b) disposing a first filter over the primary door to occlude the access port of the sterilizing cabinet, the first filter affixed to a frame having a rigid or flexible edge portion defining a hollow center portion sized to correspond approximately to the access port; and

(c) disposing a secondary door over the filter to occlude the access port of the sterilizing cabinet forming a sealed interface with the filter, the primary door and the sterilizing cabinet.

9. The method according to claim 8, the method further comprising passing a sterilizing agent through the access port, the primary door, the filter and the secondary door.

10. A method for verifying sterilization, the method comprising:

(a) performing a sterilization cycle on a sterilizing device having a primary door, a filter and a secondary door, the secondary door overlying the filter and the primary door, wherein a first sealed interface exists between the filter and the primary door and a second sealed interface exists between the filter and the secondary door;

(b) removing a secondary door while retaining the first sealed interface; and

(c) examining the filter to verify the integrity of the sterilization cycle in the sterilizing device.

11. The method according to claim 10, wherein the sterilization cycle comprises passing a sterilizing agent through a vent port in the sterilizing device, the filter, the primary door and the secondary door.

12. A filter cartridge for use in a sterilization process, the filter cartridge comprising:

(a) a frame, the frame comprising a rigid or flexible edge portion and defining a hollow center portion; and

(b) a filter, the filter comprising a porous material and being affixed to the frame having a rigid or flexible edge portion defining a hollow center portion sized to correspond approximately to the access port, the porous material being able to pass only gaseous and liquid materials through its surface, wherein the filter cartridge provides sufficient integrity to form a sealed interface with a confronting surface.

13. The filter cartridge according to claim 12, the filter cartridge further comprising a second filter overlying the first filter, the second filter comprising a second porous material and being affixed to the frame, the second porous material being able to pass only gaseous and liquid materials through its surface.

14. The filter cartridge according to claim 12, the filter cartridge further comprising a second frame, the second frame comprising a rigid or flexible edge portion and defining a hollow center portion, the second frame being affixed to the filter.

15. The filter cartridge according to claim 14, the filter cartridge further comprising a second filter, the second filter comprising a second porous material and being affixed to the second frame and the filter, the second porous material being able to pass only gaseous and liquid materials through its surface.

16. The filter cartridge according to claim 12, wherein the filter is removeably affixed to the frame.

17. The filter cartridge according to claim 12, wherein the frame and filter are coextensive.

18. The filter cartridge according to claim 12, wherein the frame and the filter are integral.

19. The sterilizing cabinet assembly according to claim 2, wherein the frame is one of cellulose, polymeric or silicone.

20. The sterilizing cabinet assembly according to claim 2, wherein the frame, first filter and second filter form a disposable, single-use filter cartridge.

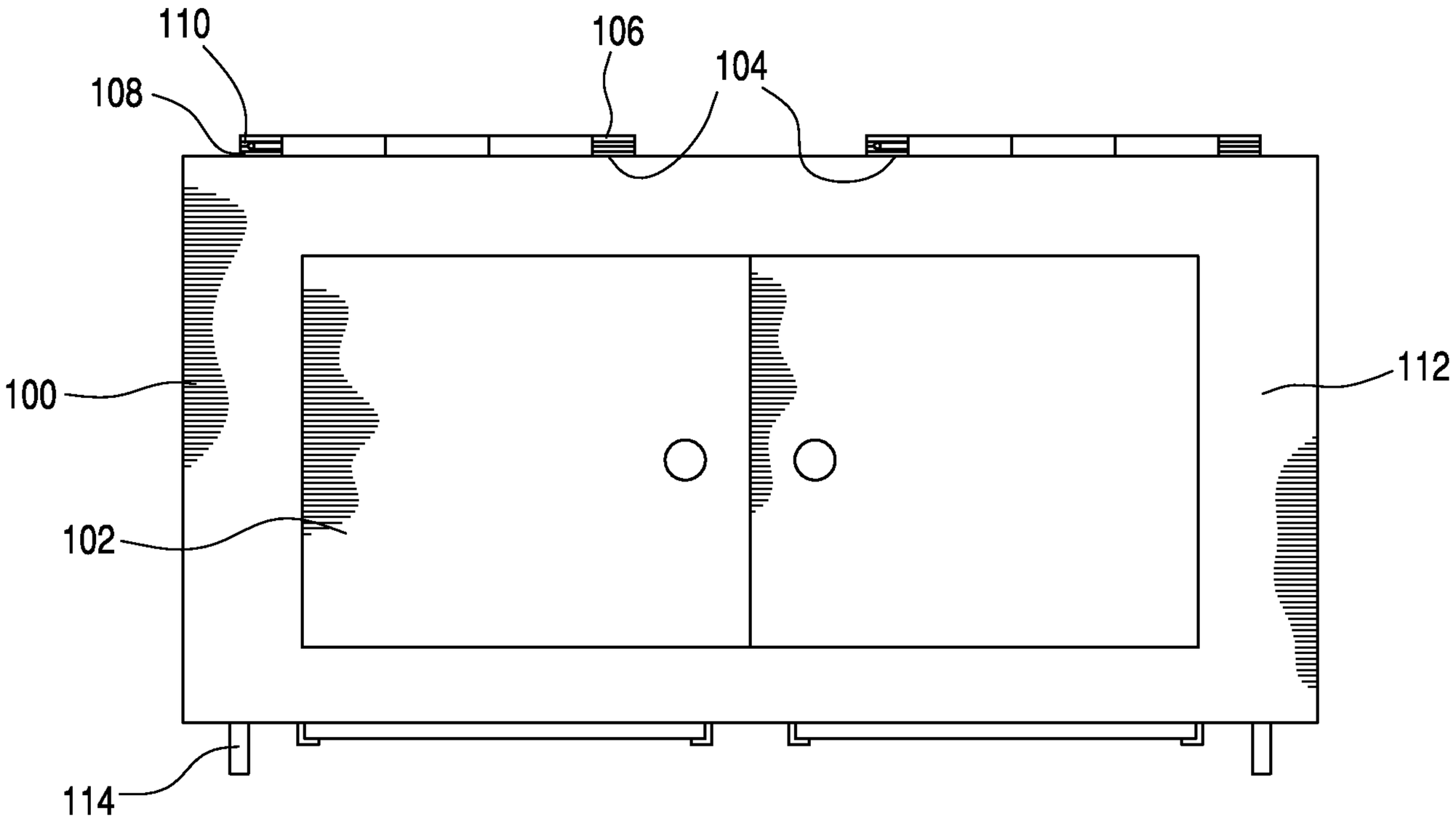


FIG. 1a

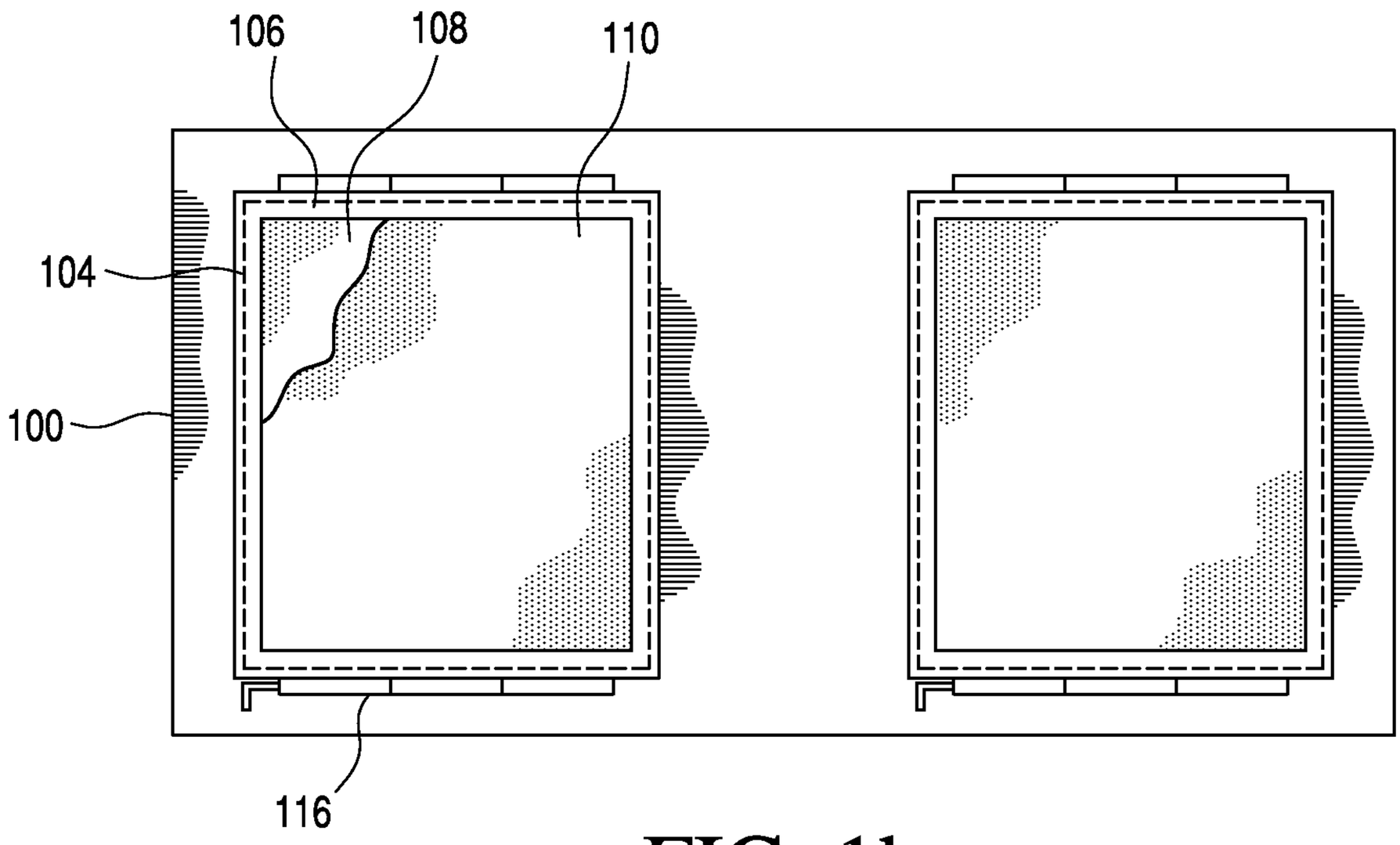


FIG. 1b

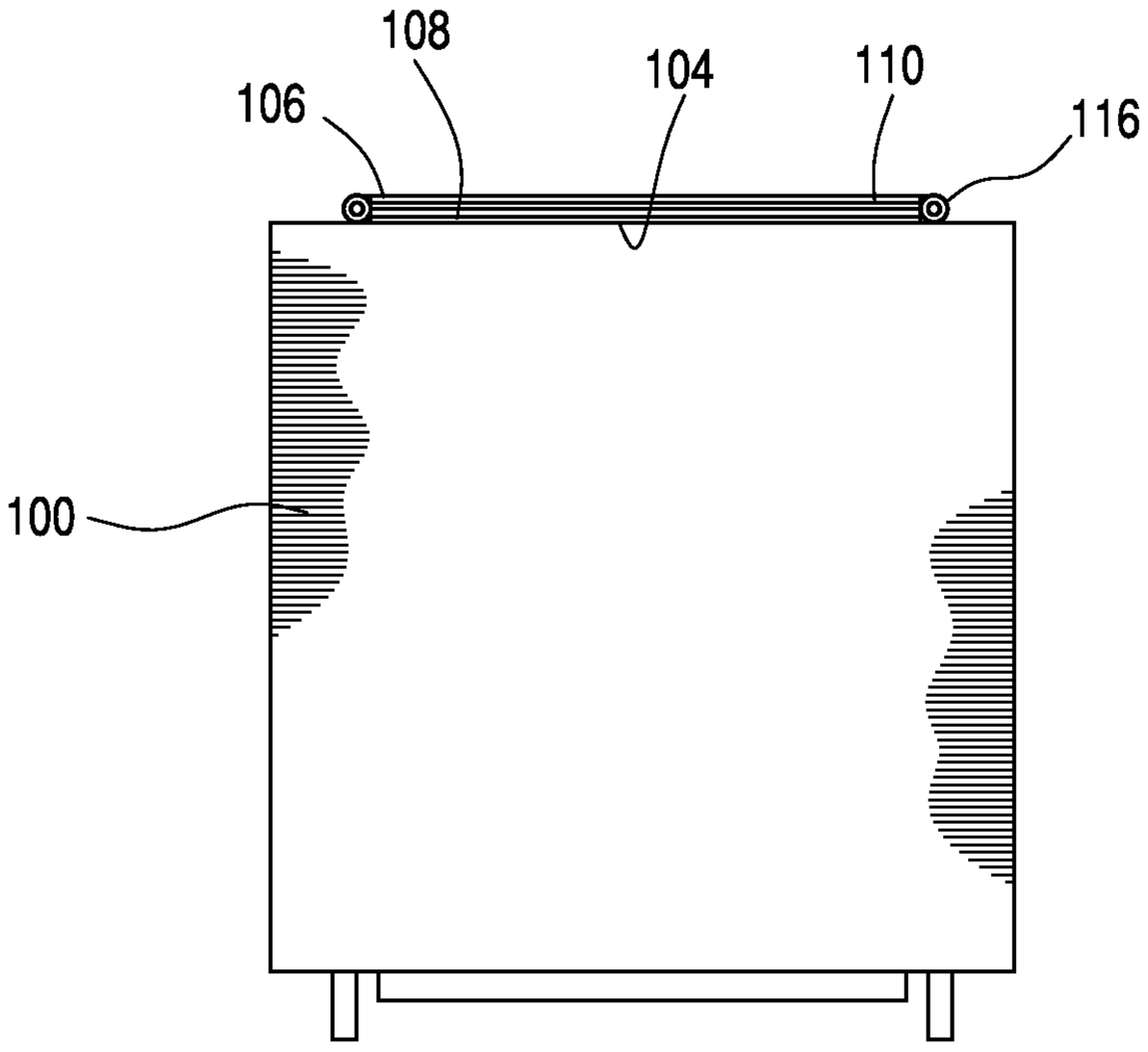


FIG. 1c

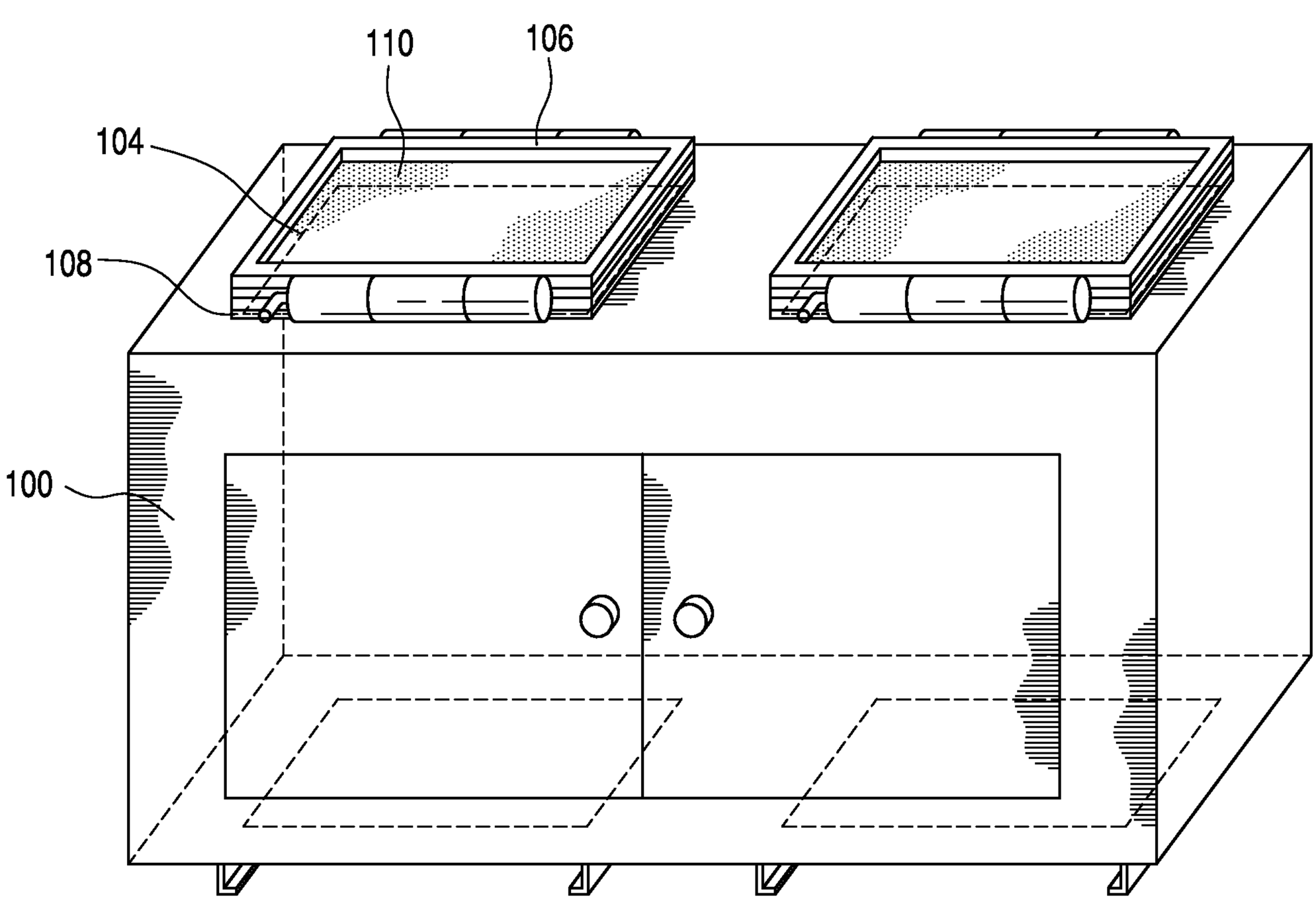


FIG. 2a

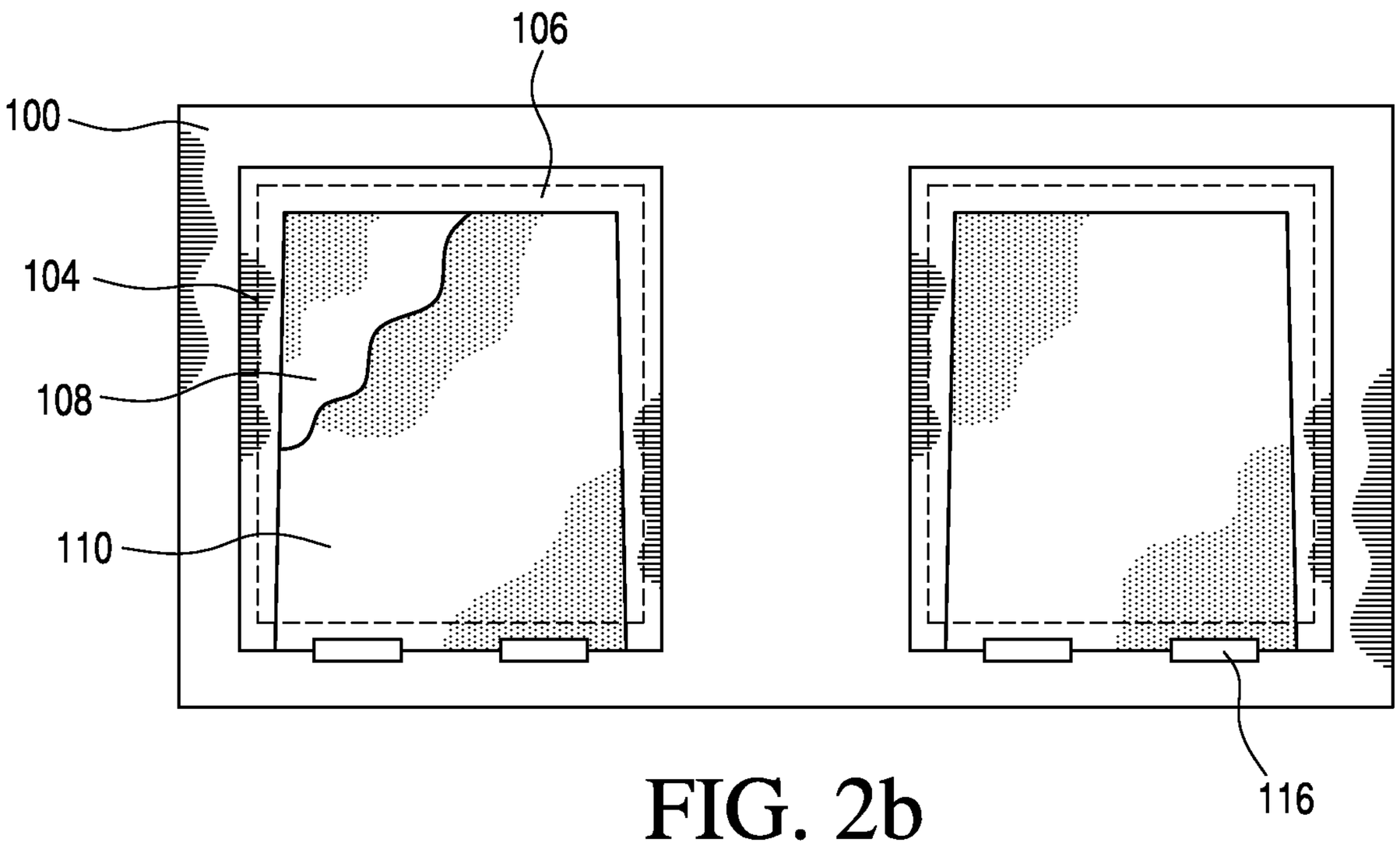


FIG. 2b

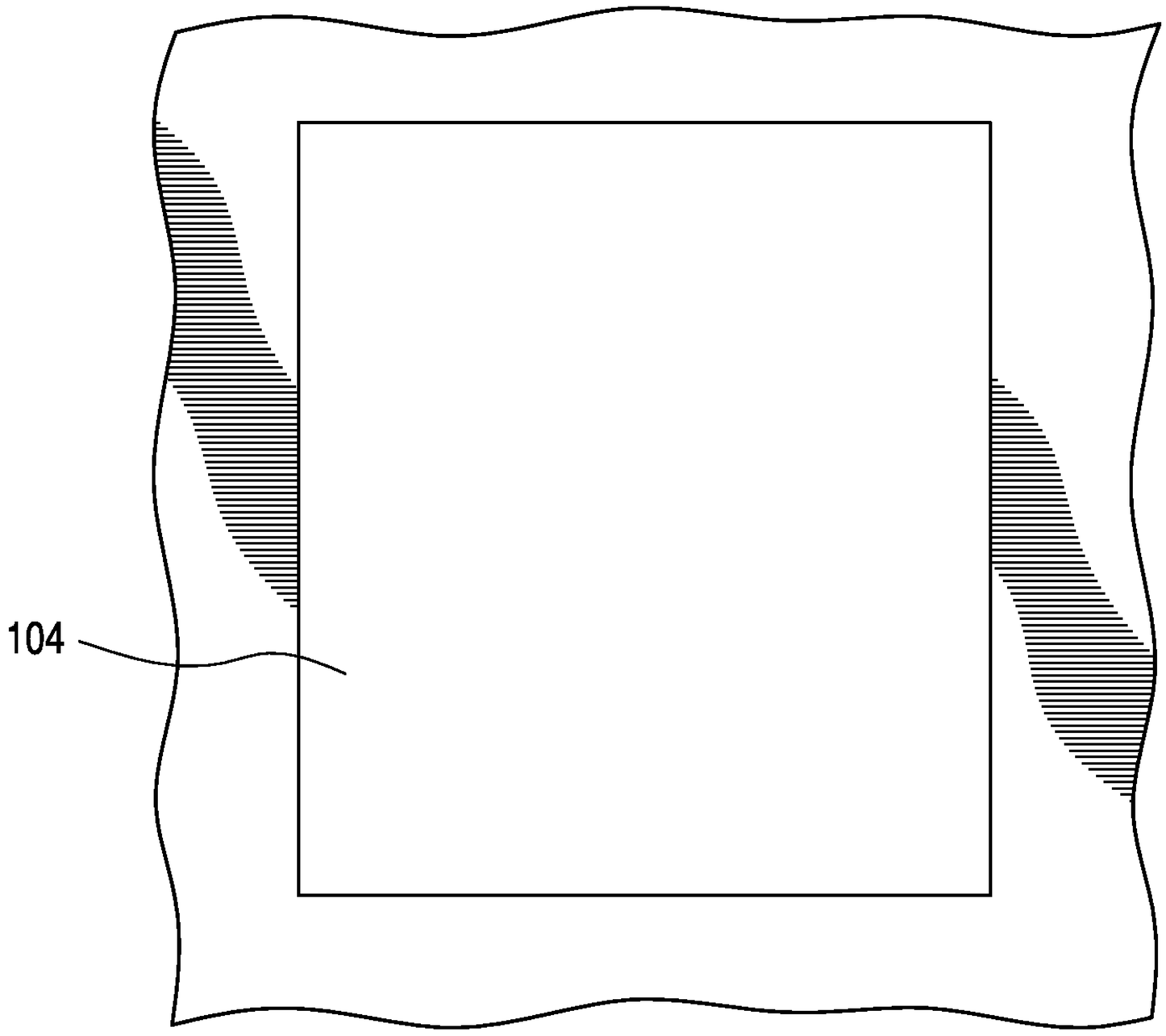


FIG. 3a

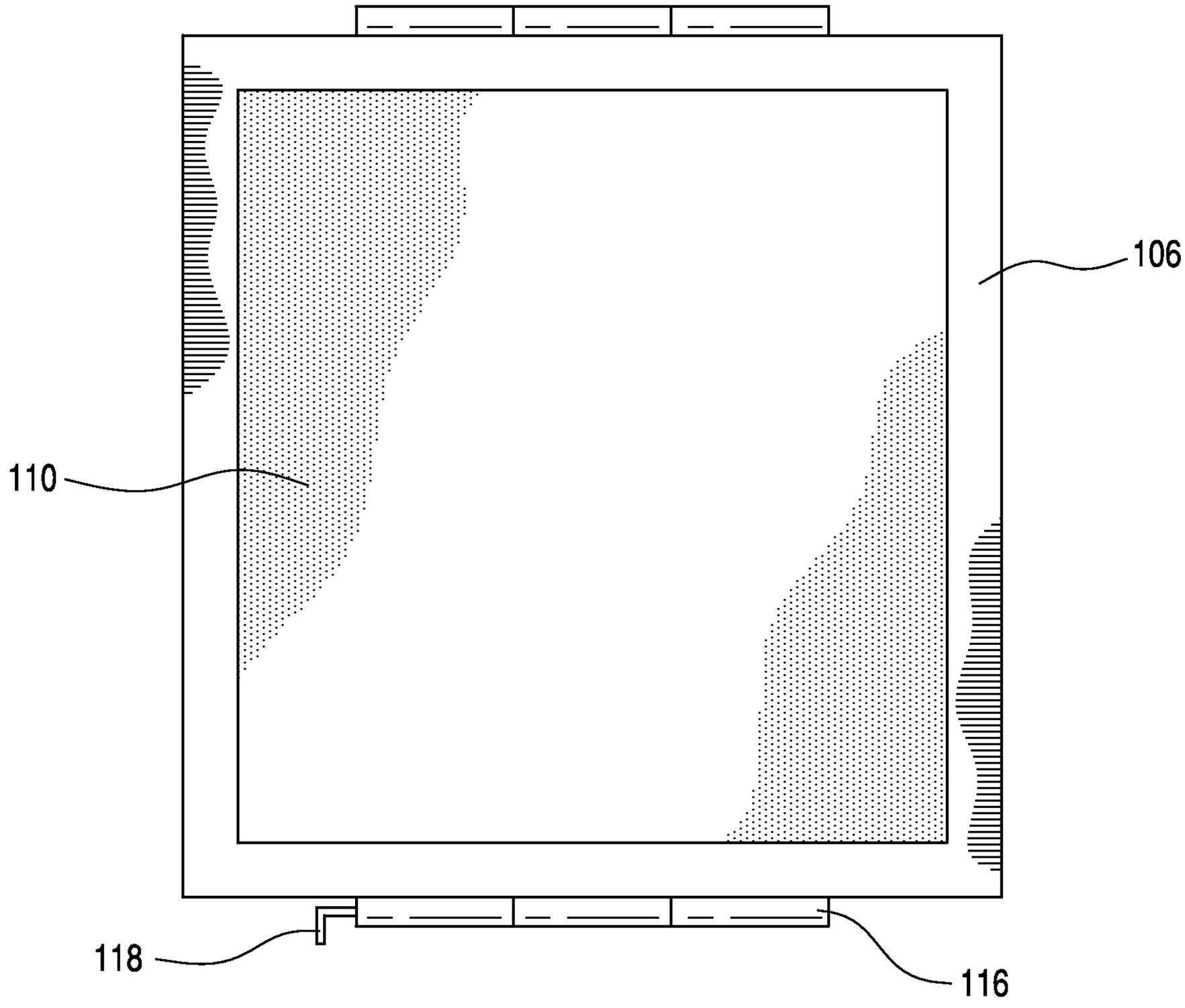


FIG. 3b

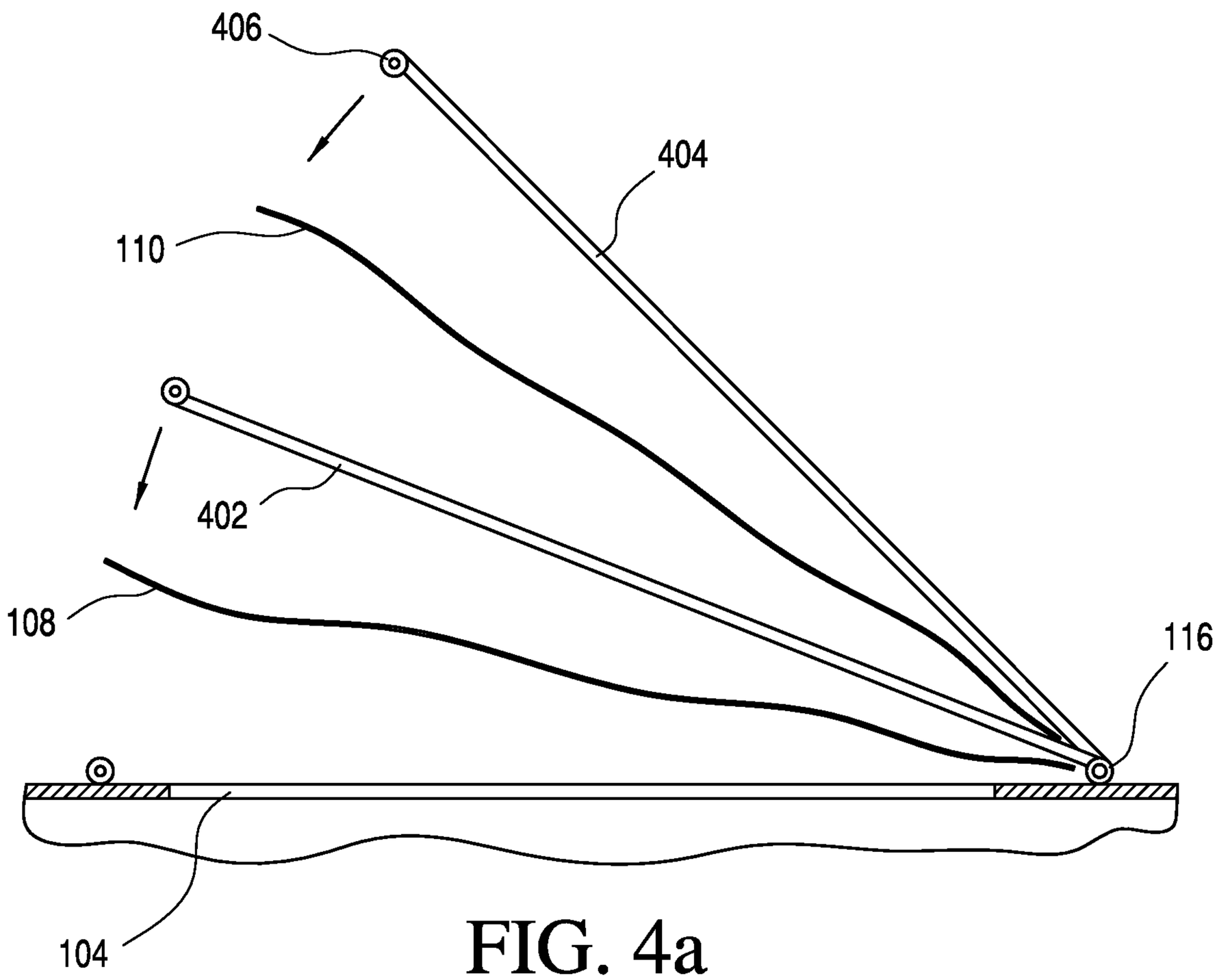


FIG. 4a

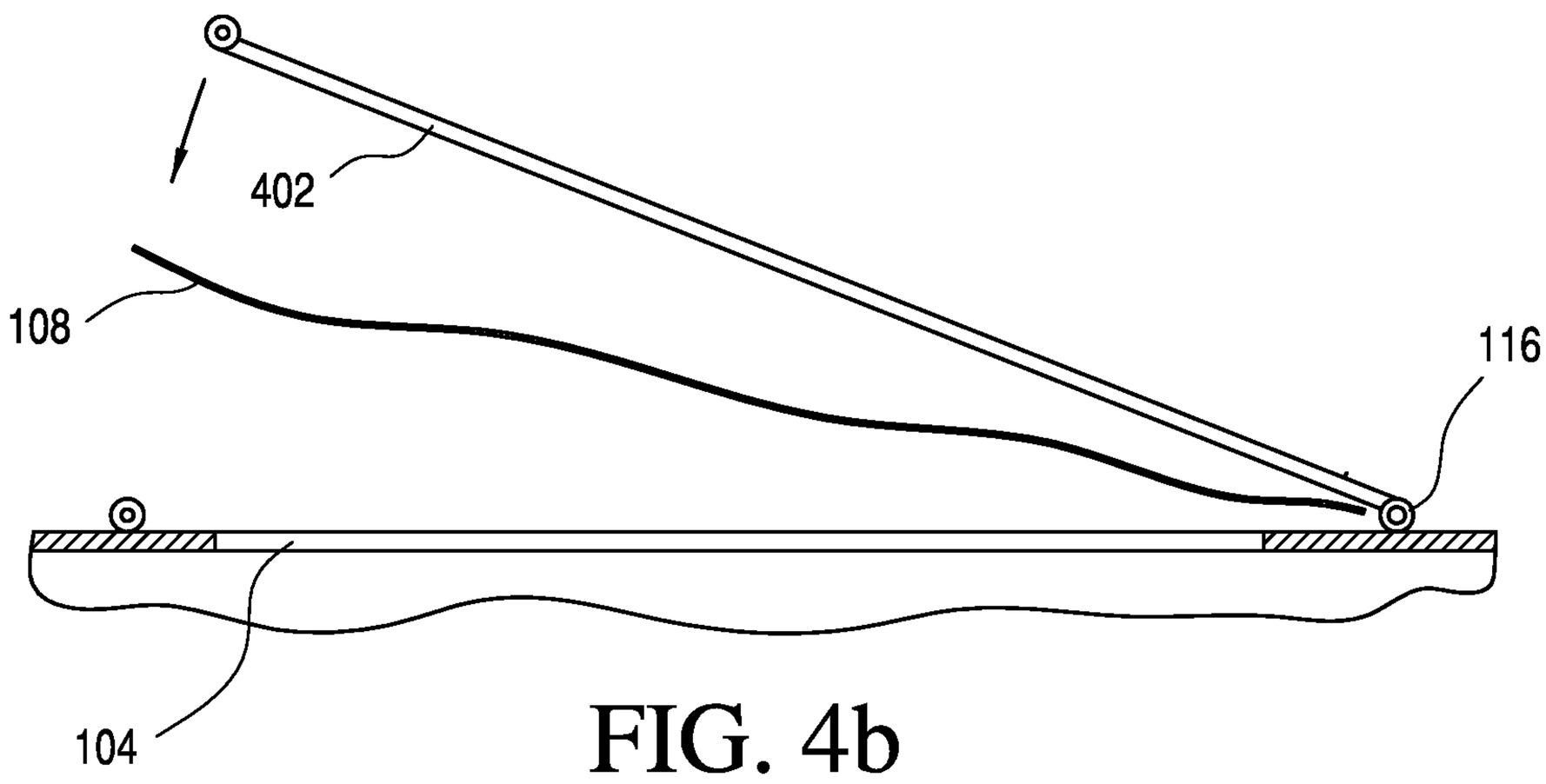


FIG. 4b

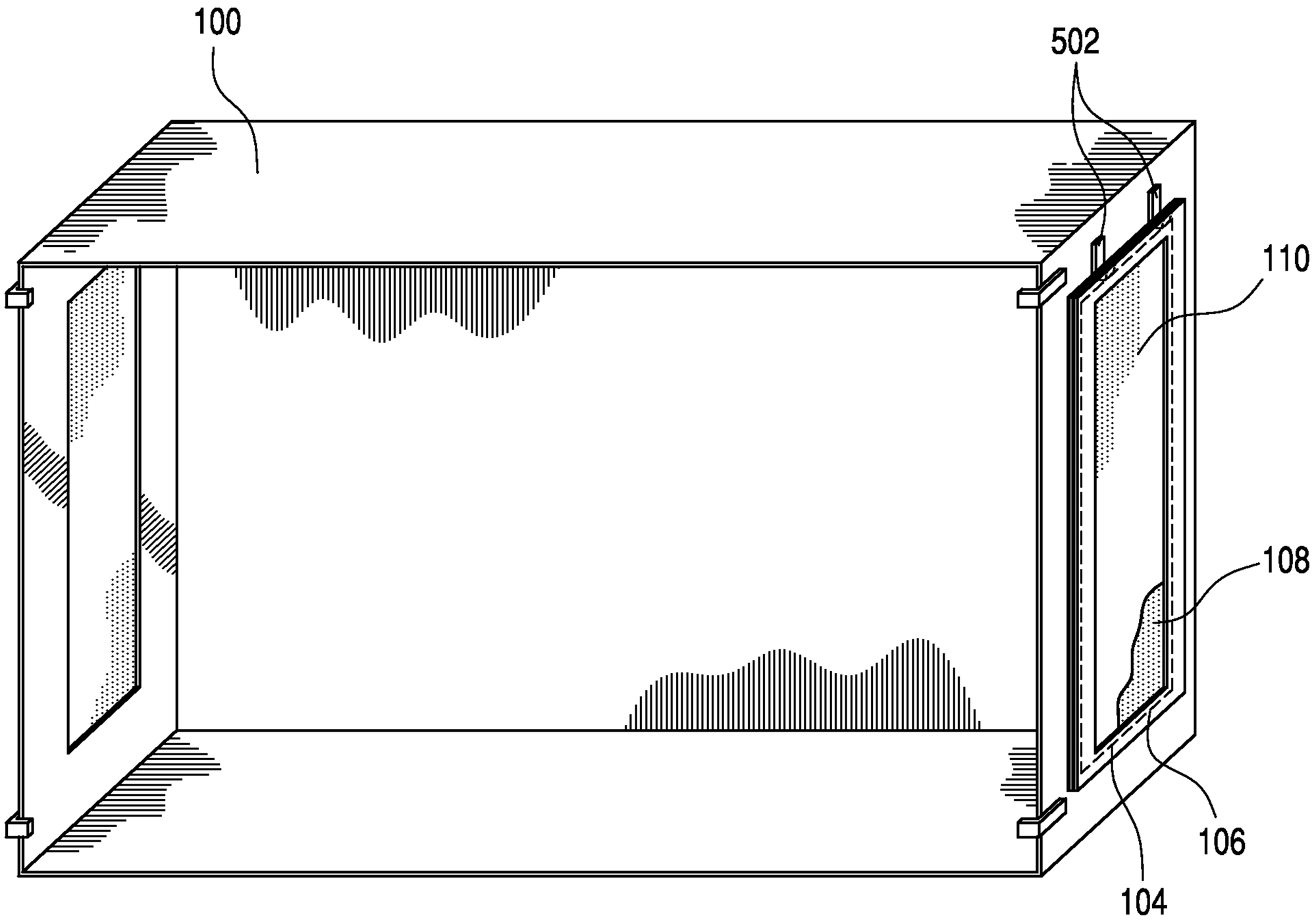


FIG. 5a

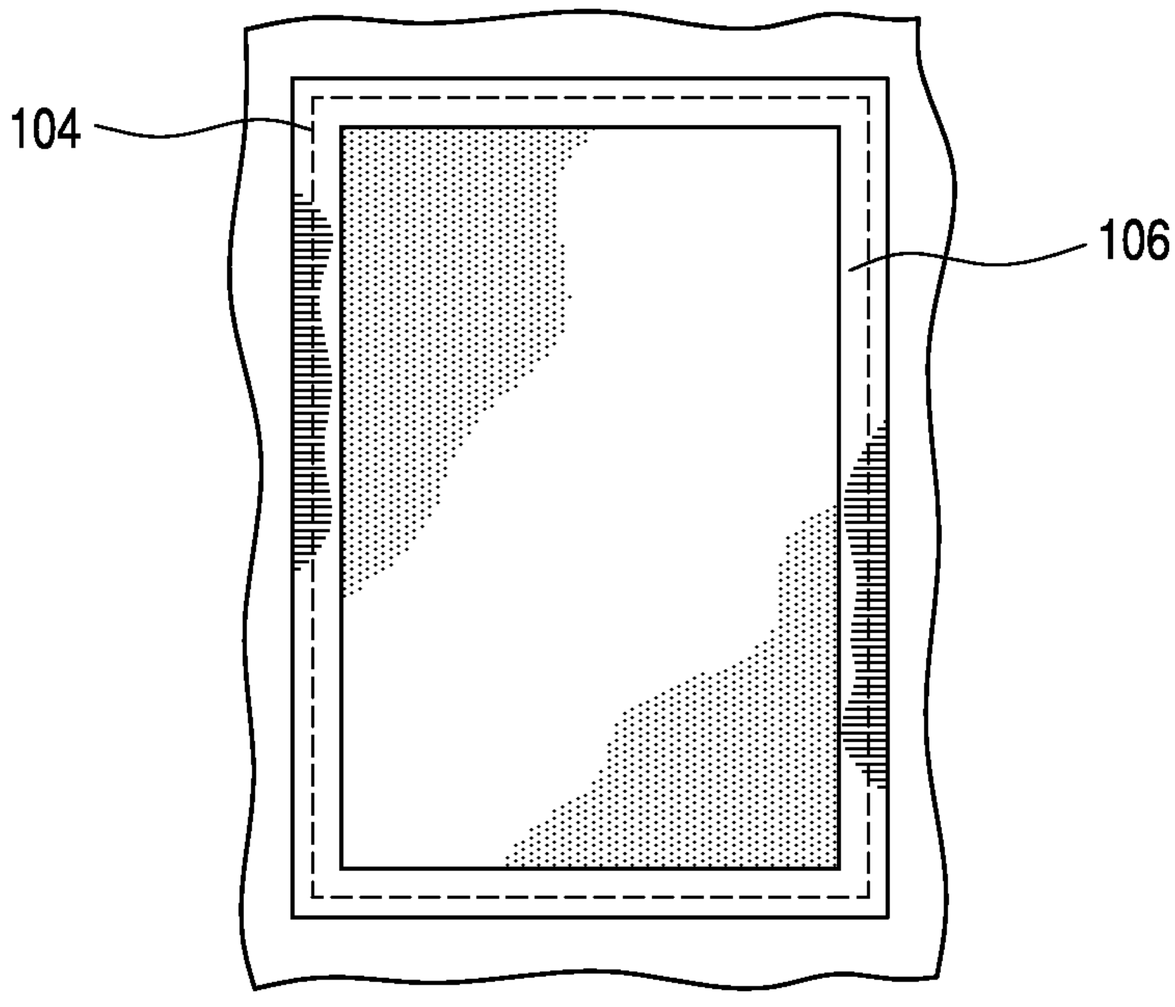


FIG. 5b

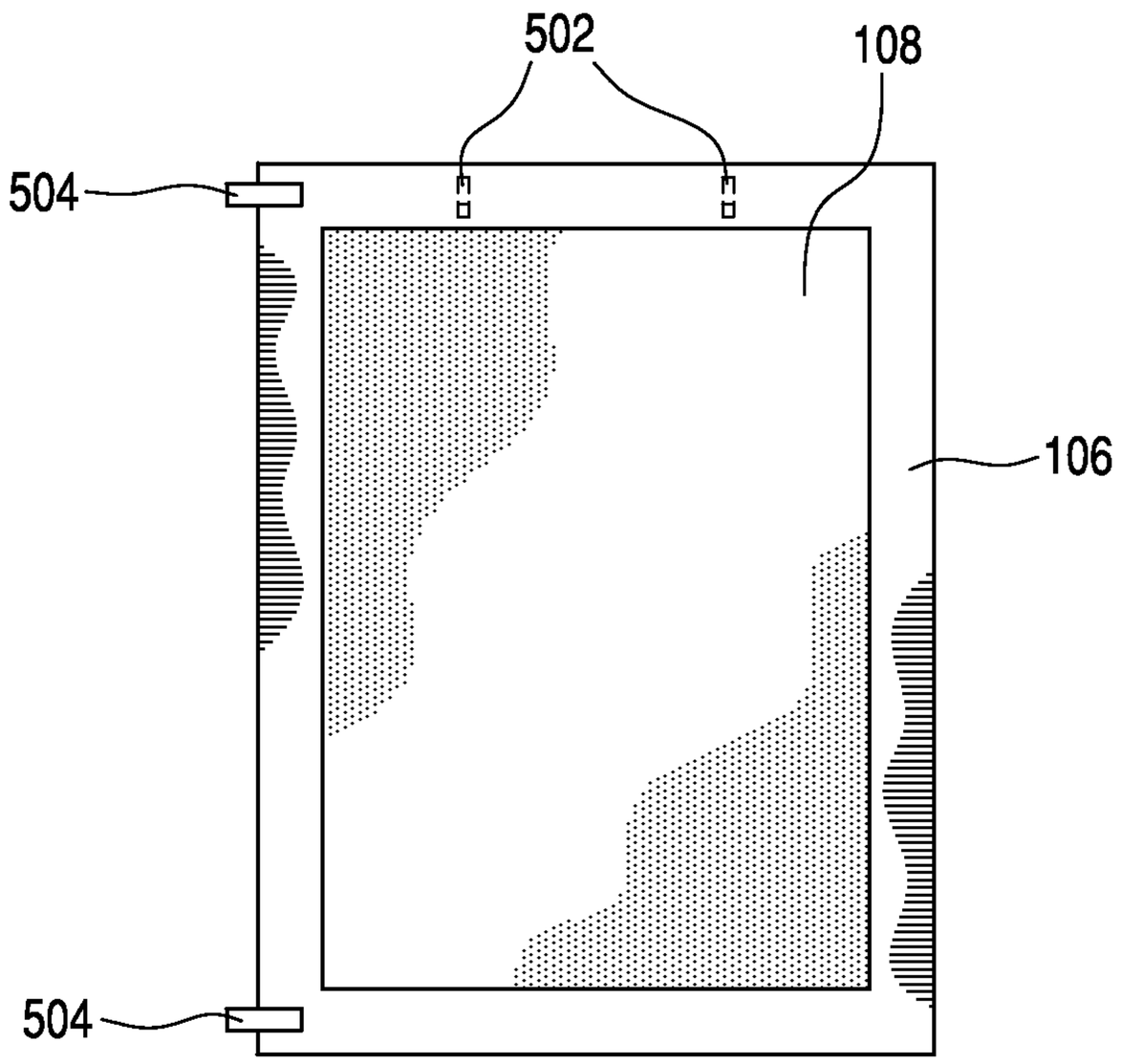


FIG. 5c

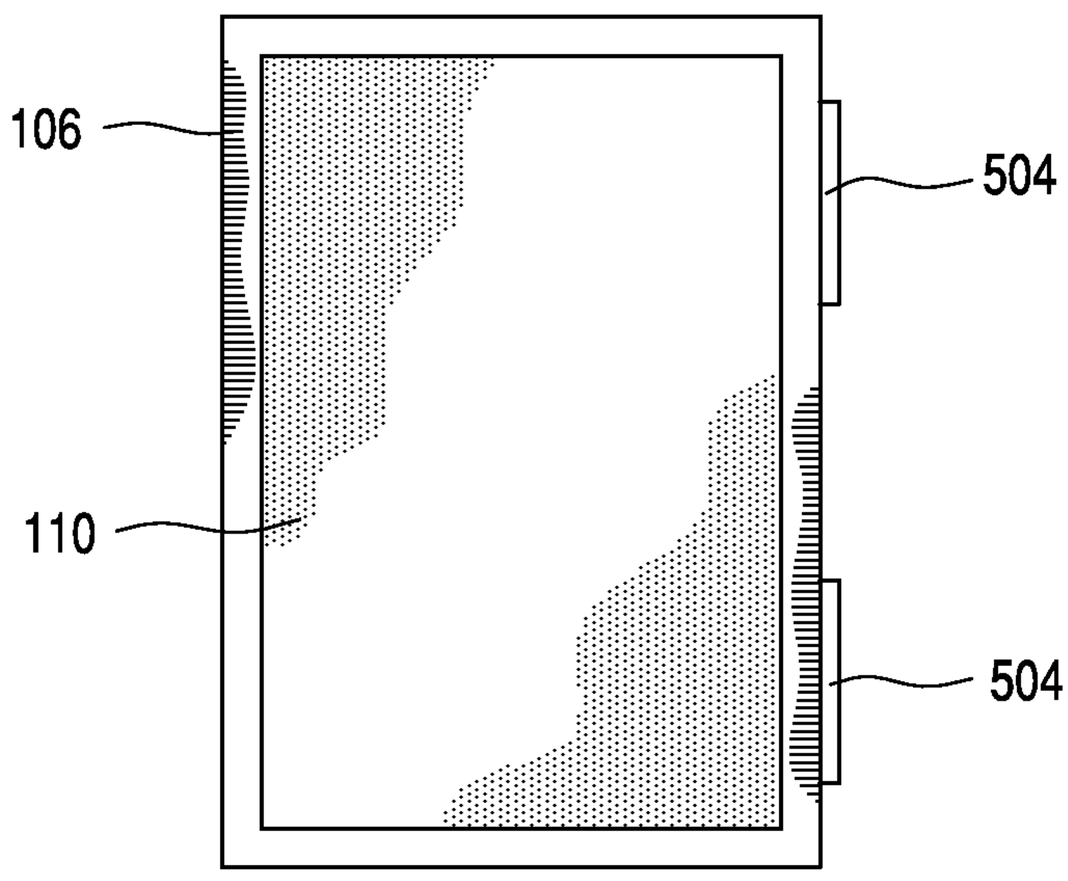


FIG. 5d

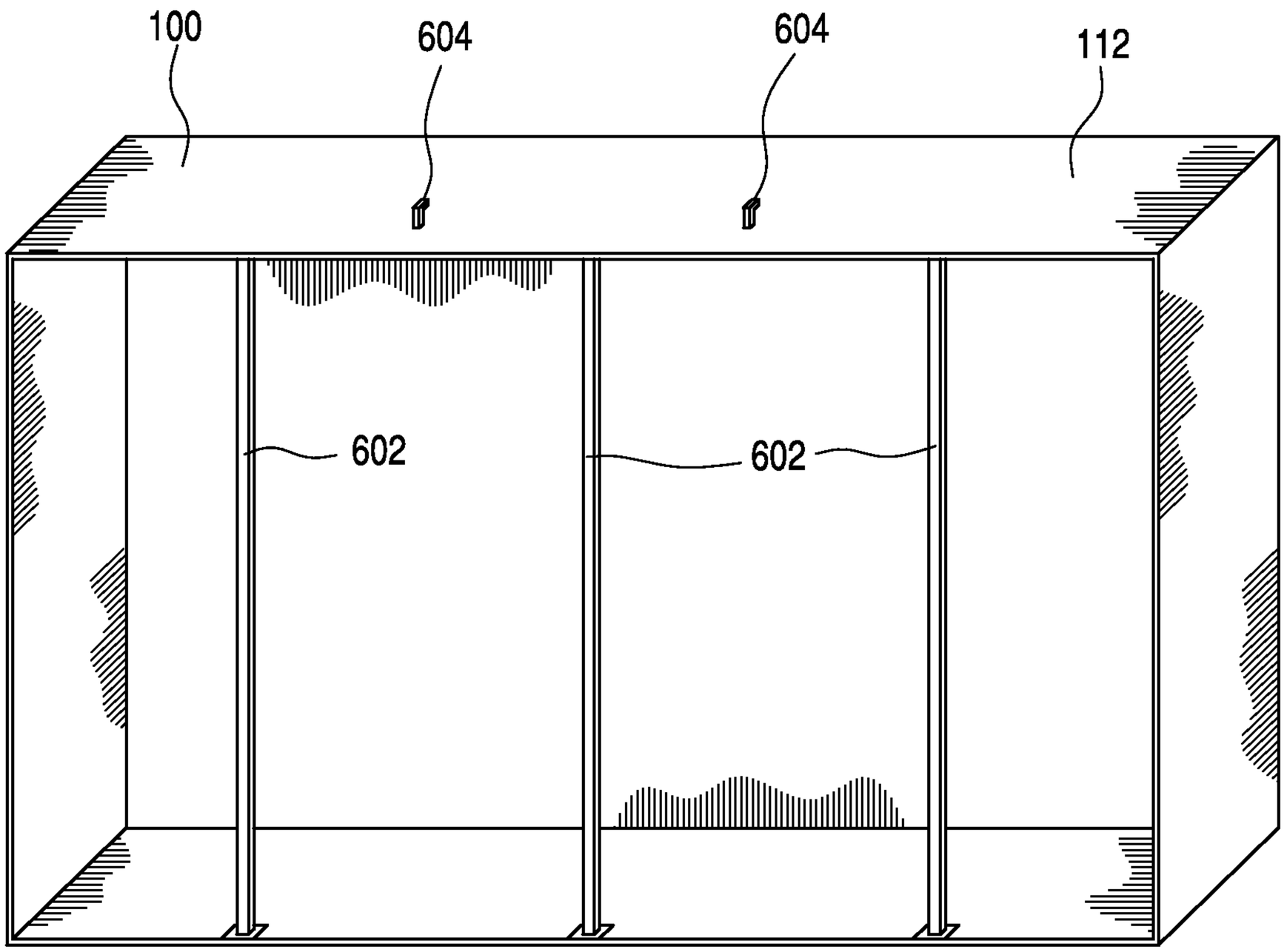


FIG. 6a

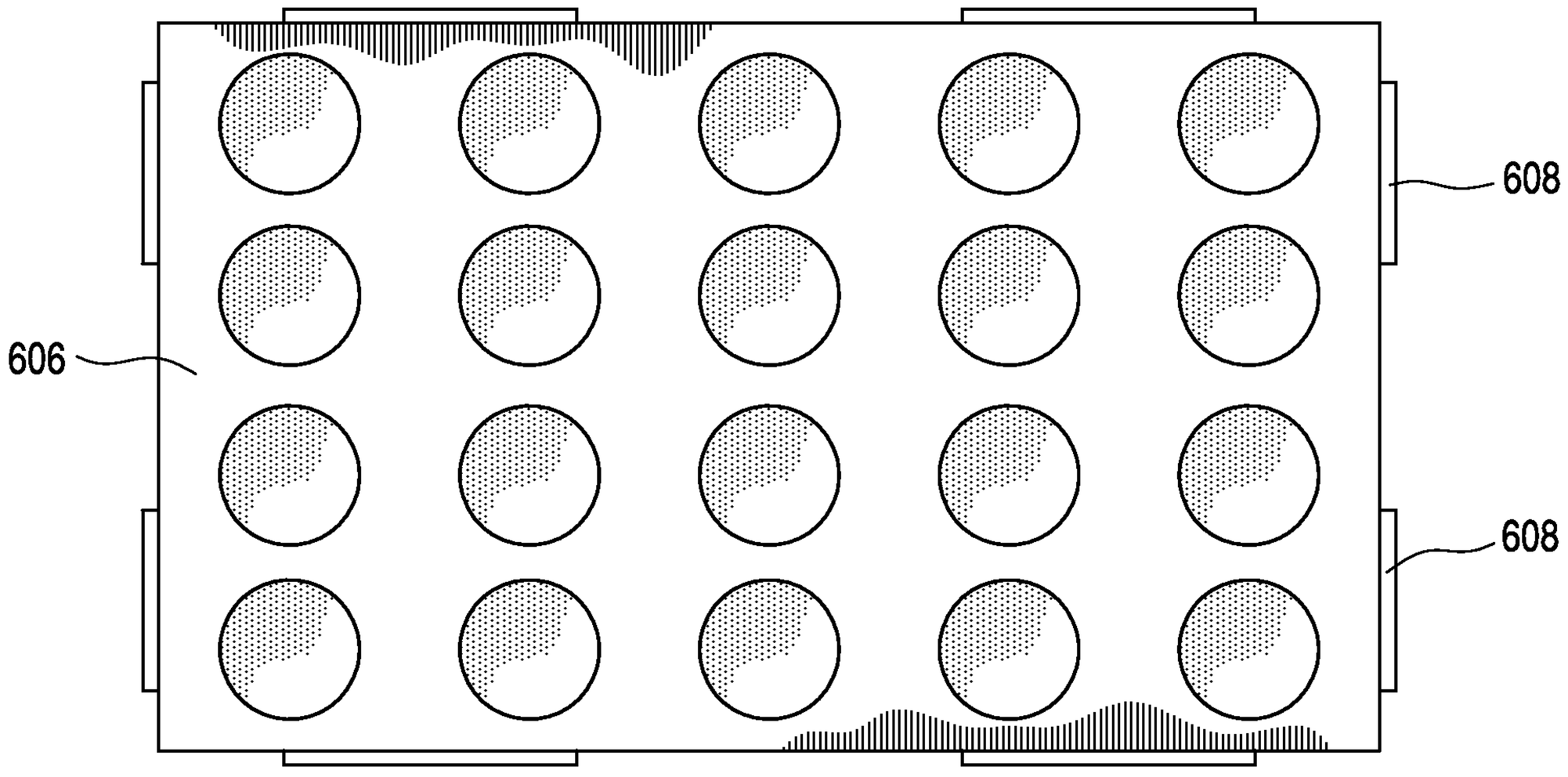


FIG. 6b

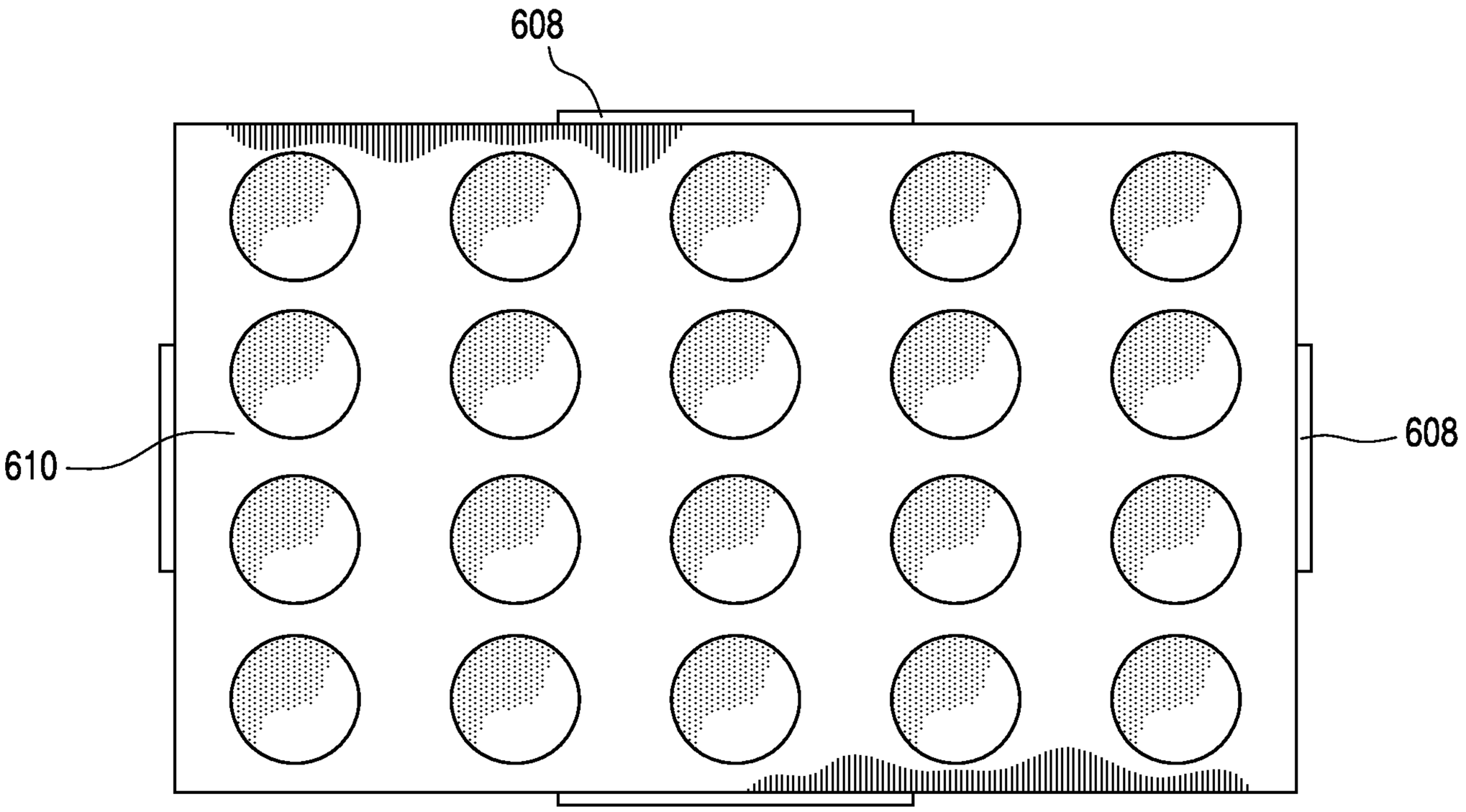


FIG. 6c

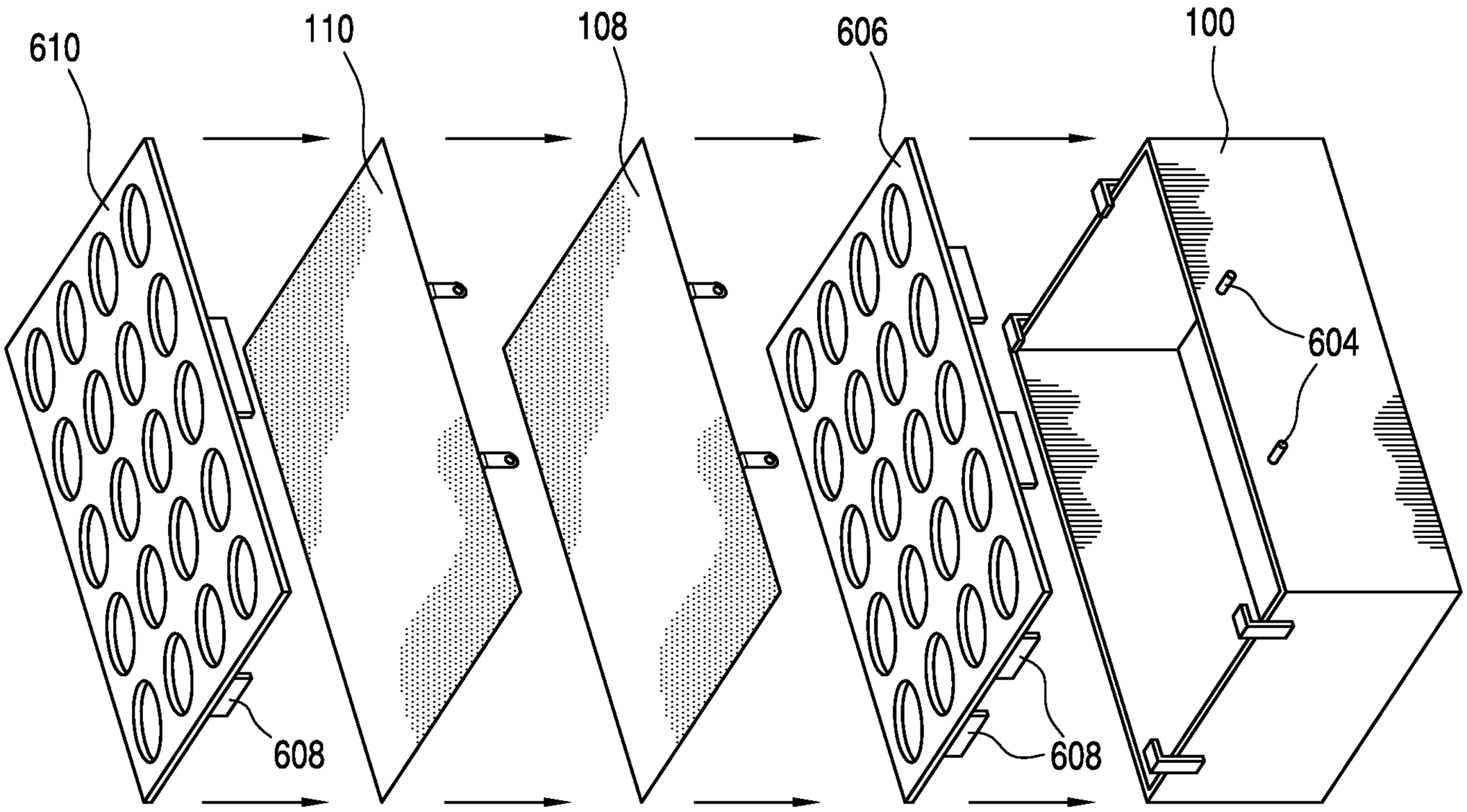


FIG. 7a

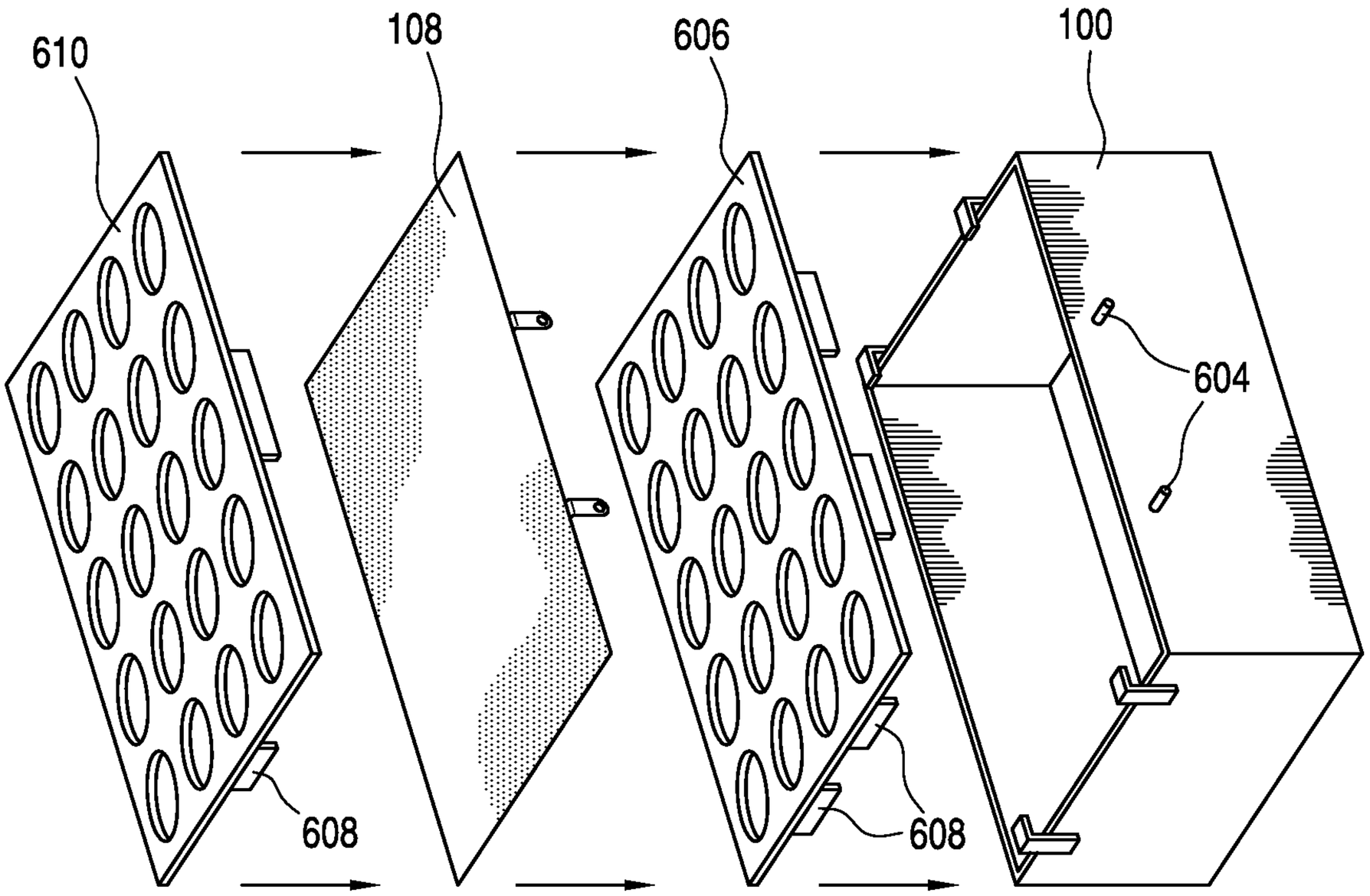


FIG. 7b

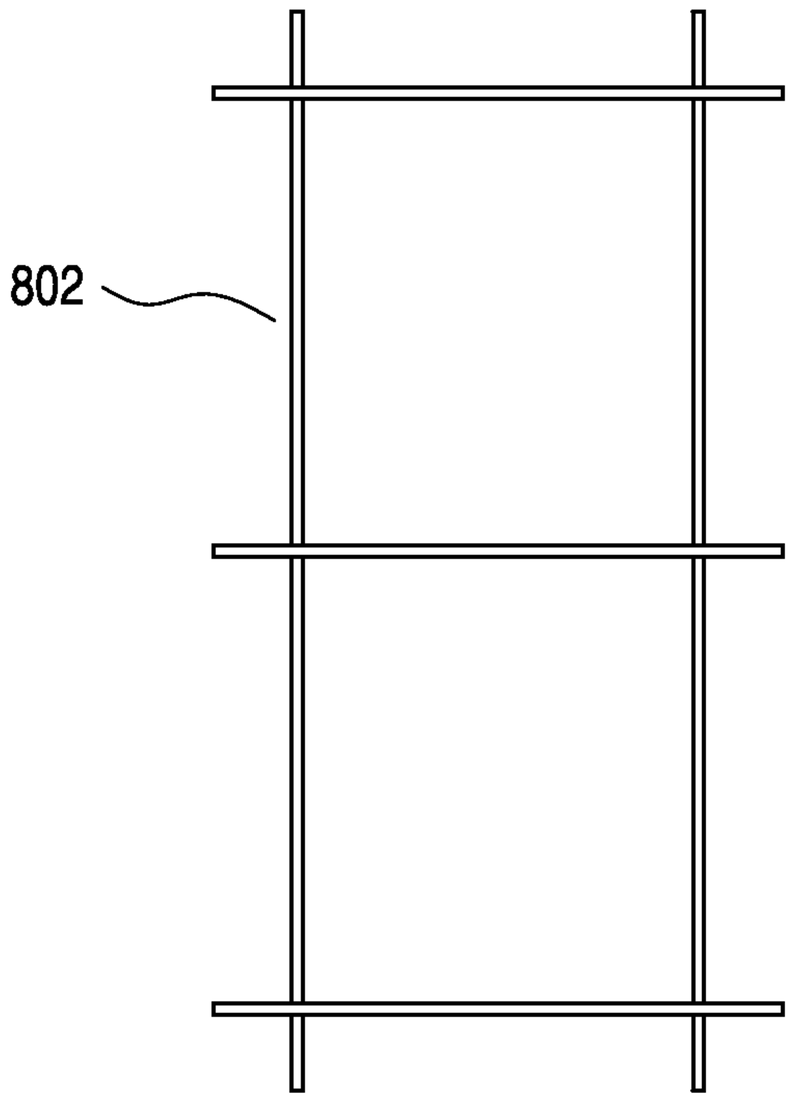


FIG. 8a

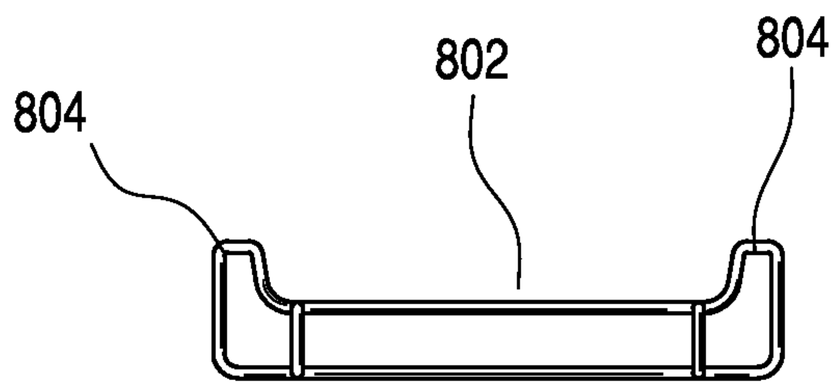


FIG. 8b

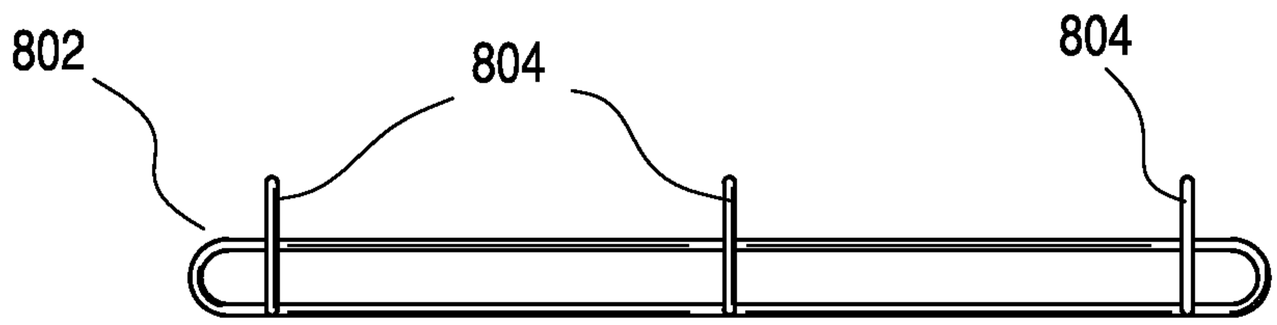


FIG. 8c

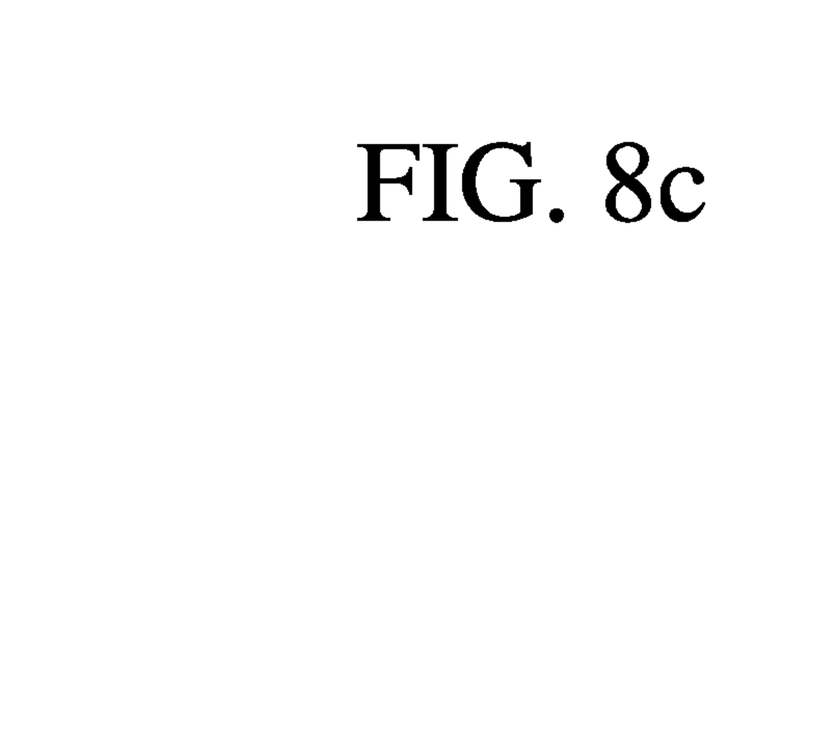


FIG. 9a

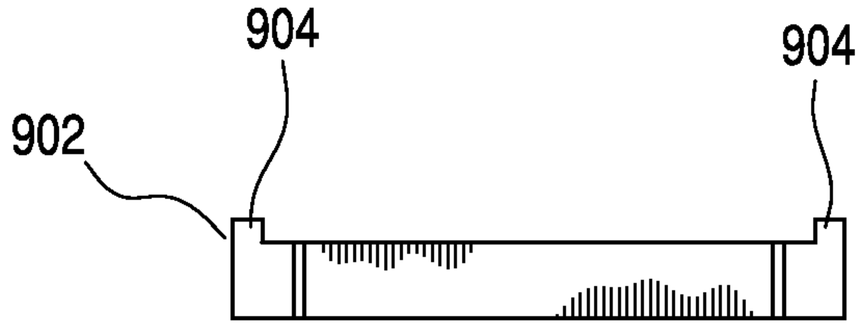


FIG. 9b

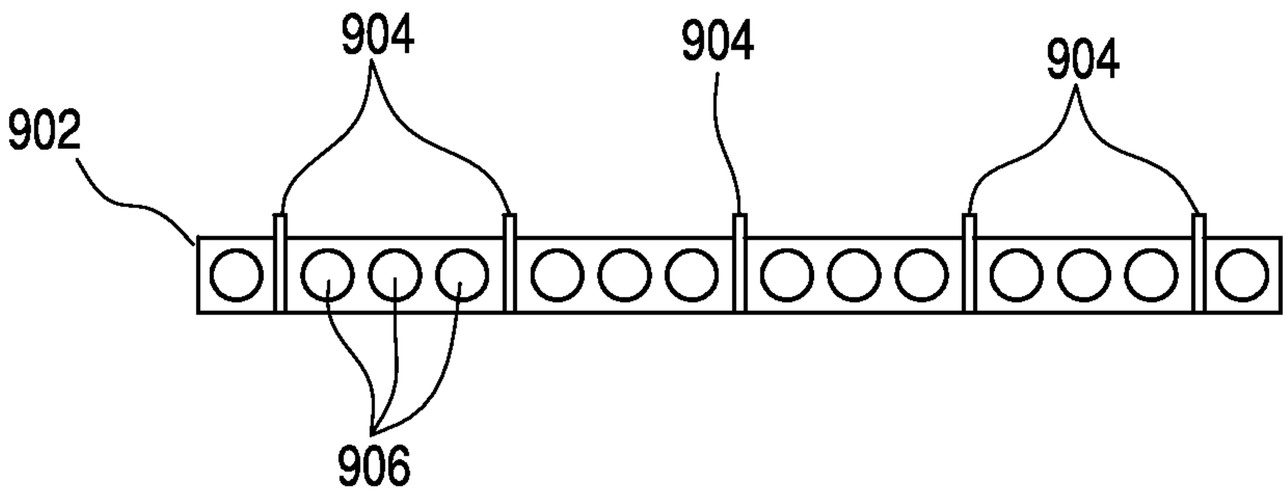


FIG. 9c

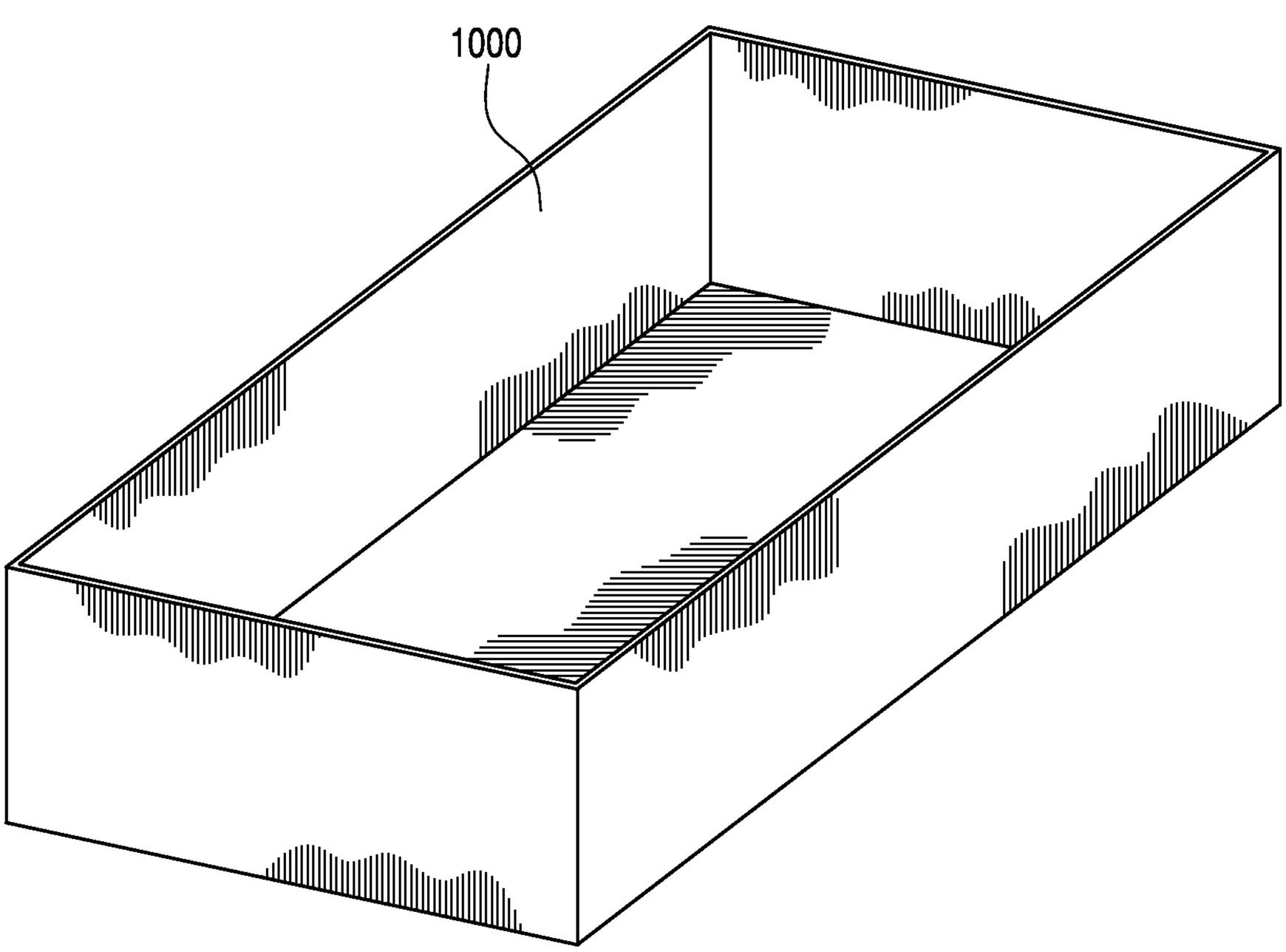


FIG. 10

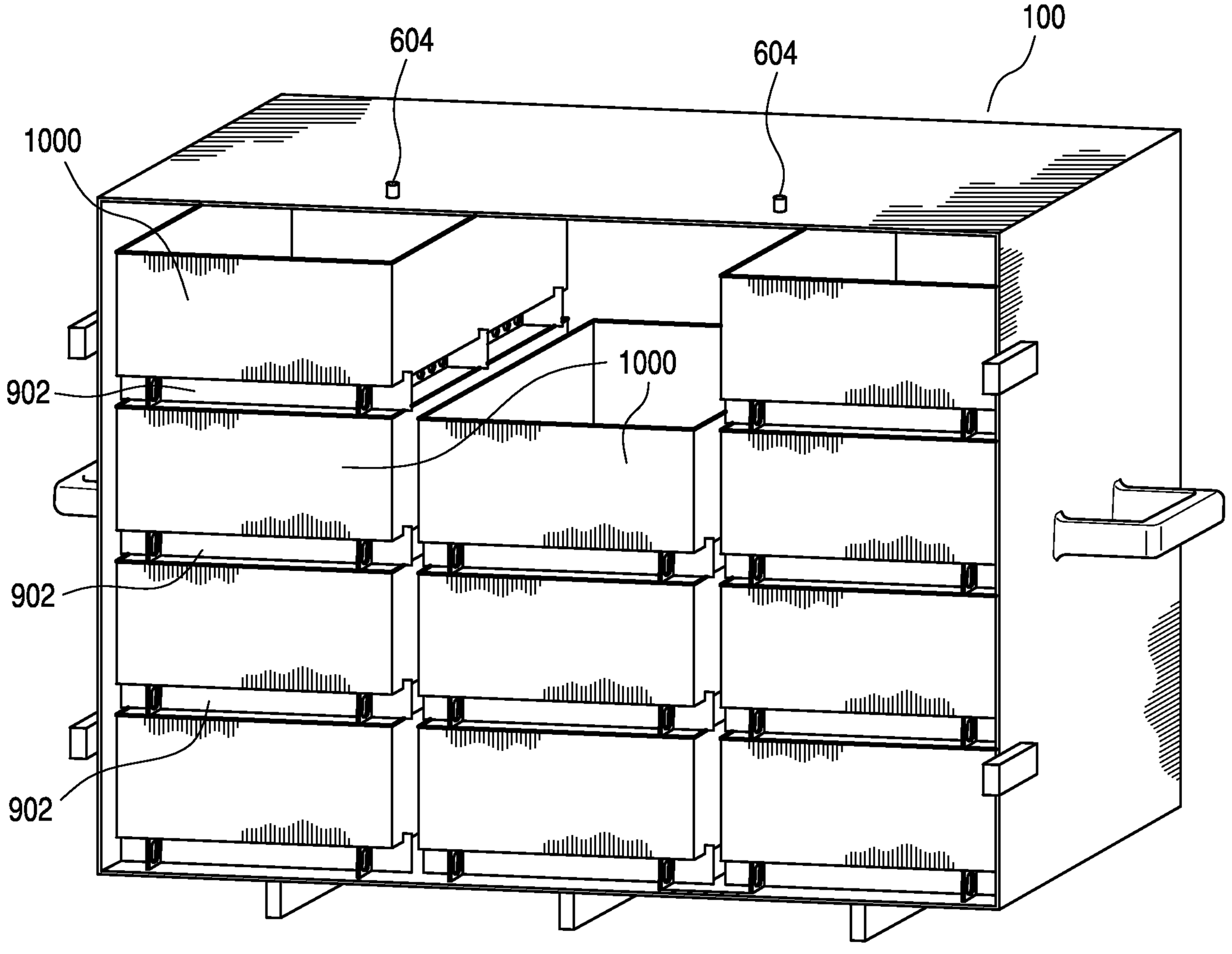


FIG. 11

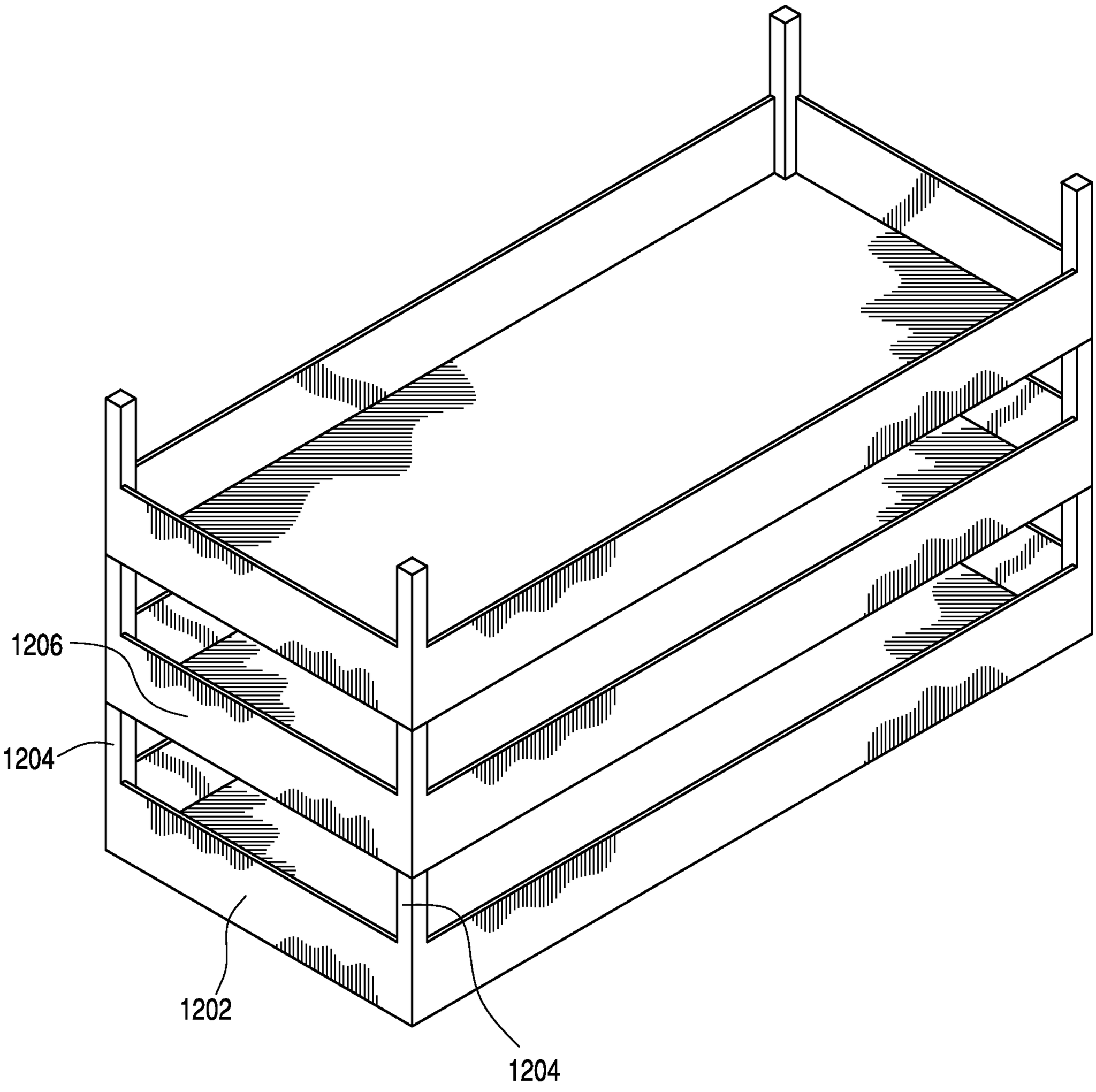


FIG. 12

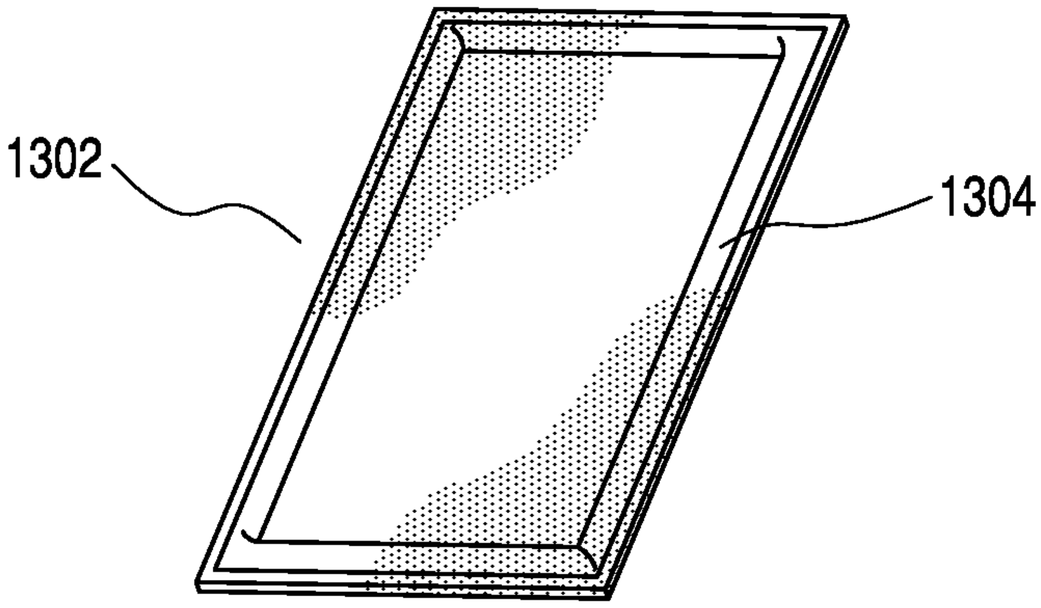


FIG. 13a

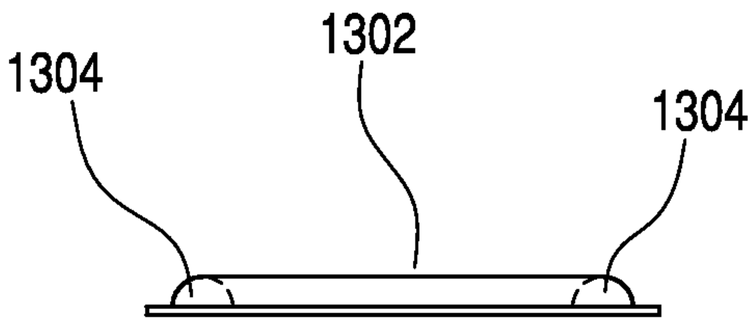


FIG. 13b

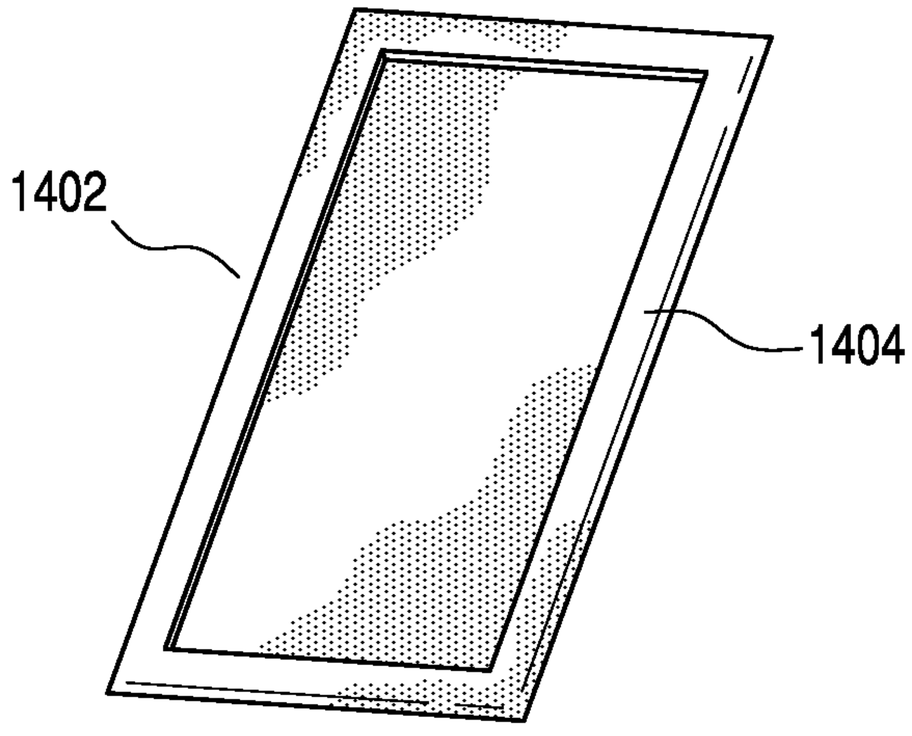


FIG. 14a

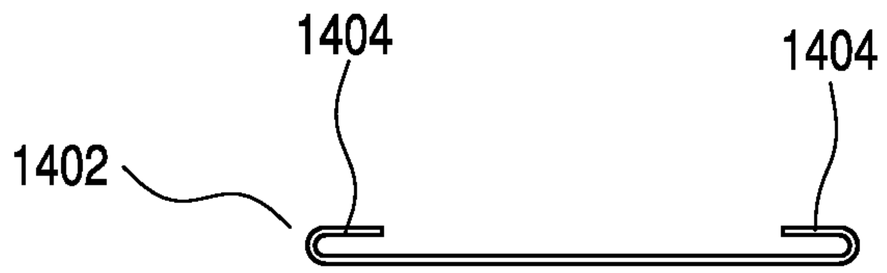


FIG. 14b

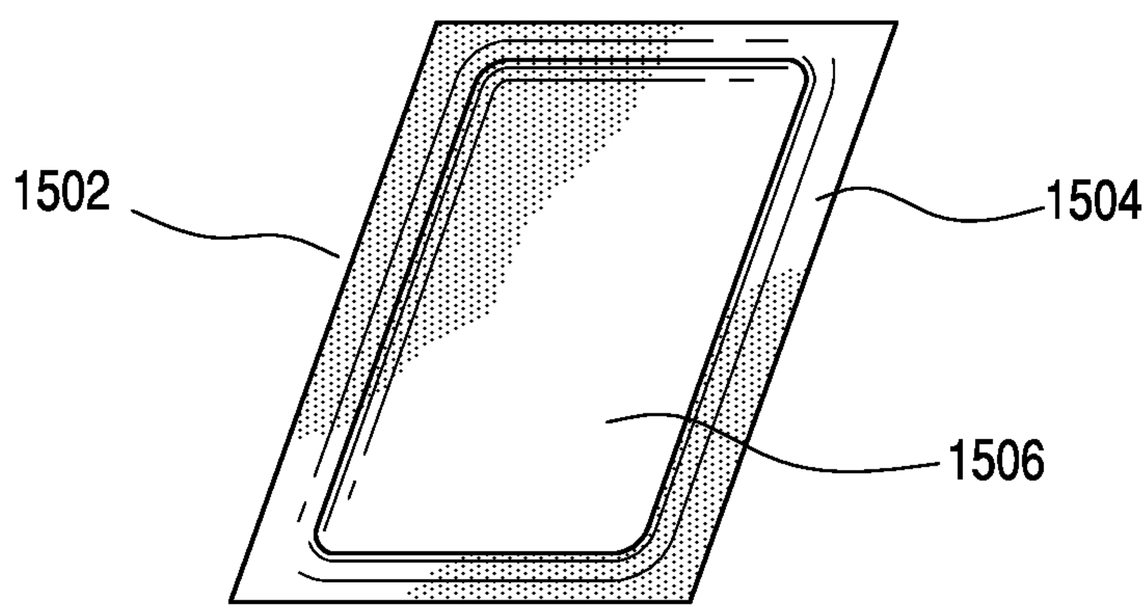


FIG. 15a

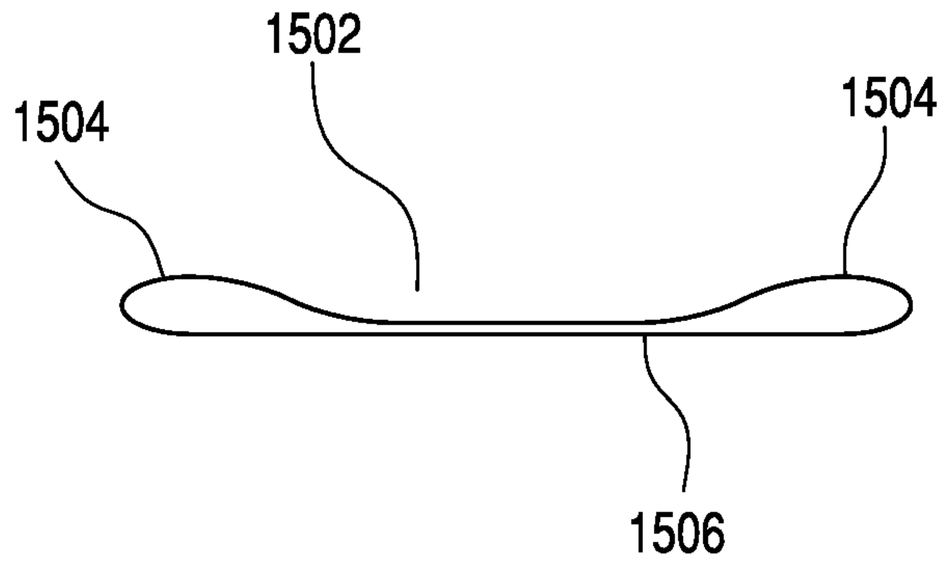


FIG. 15b

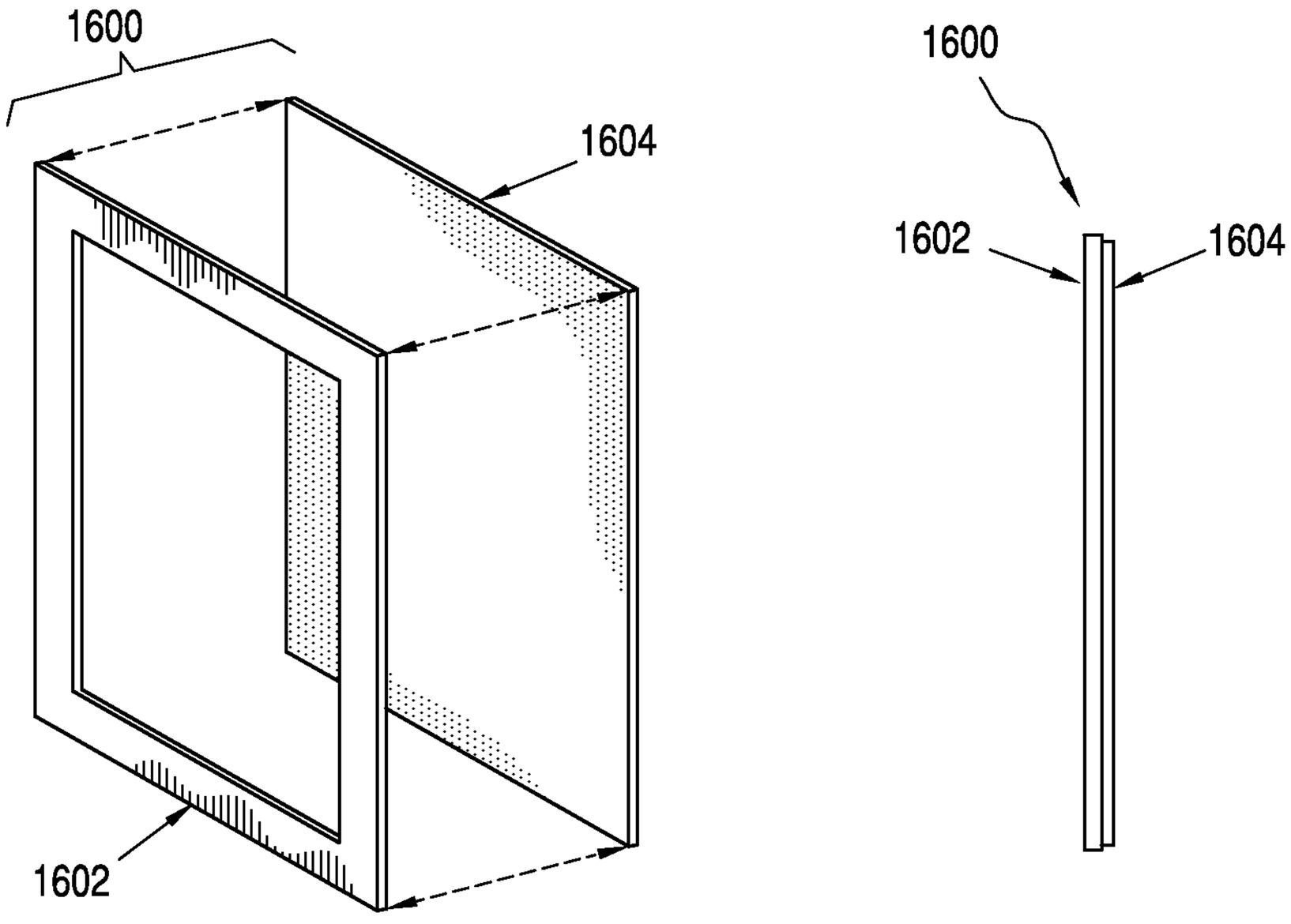


FIG. 16

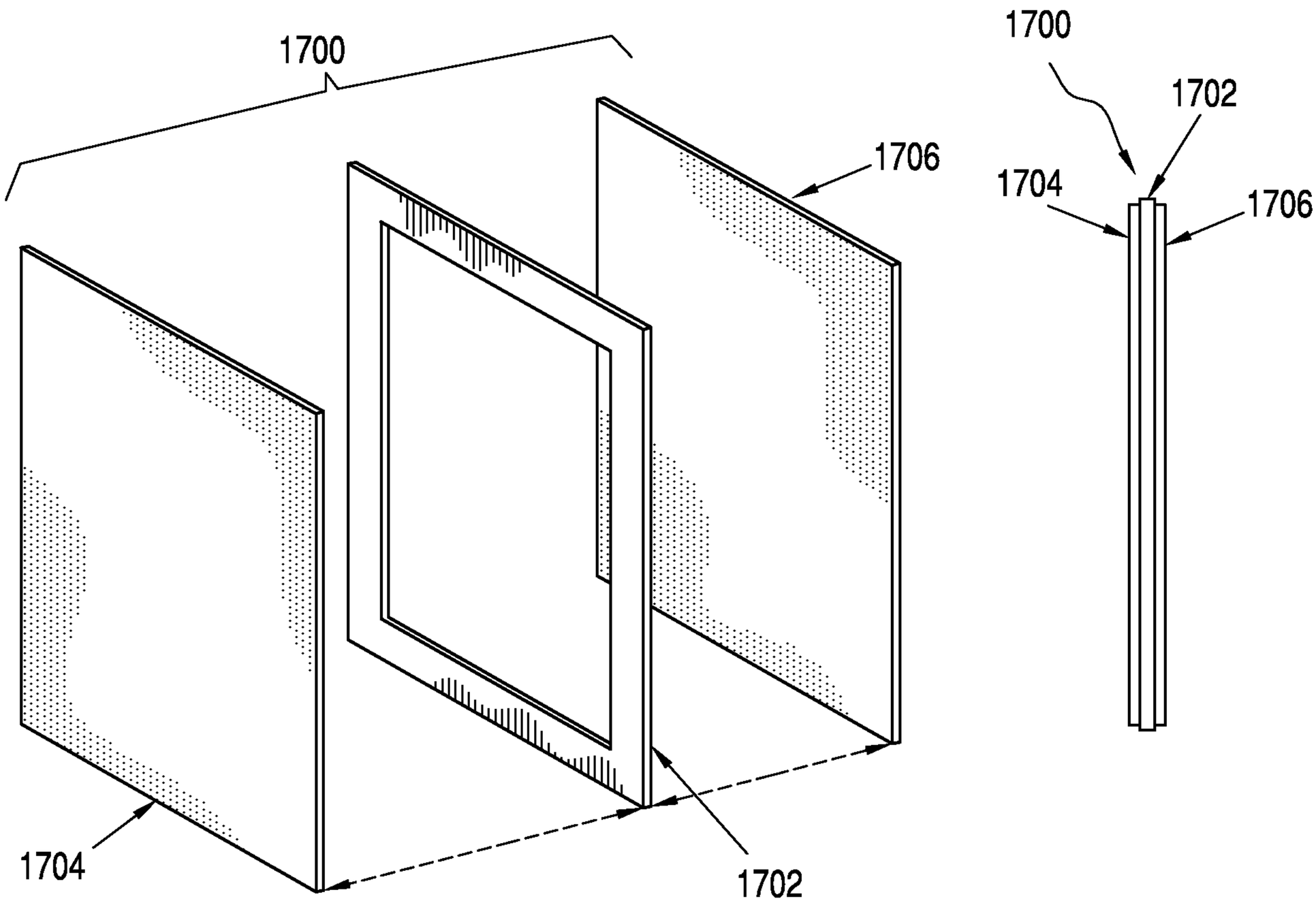


FIG. 17

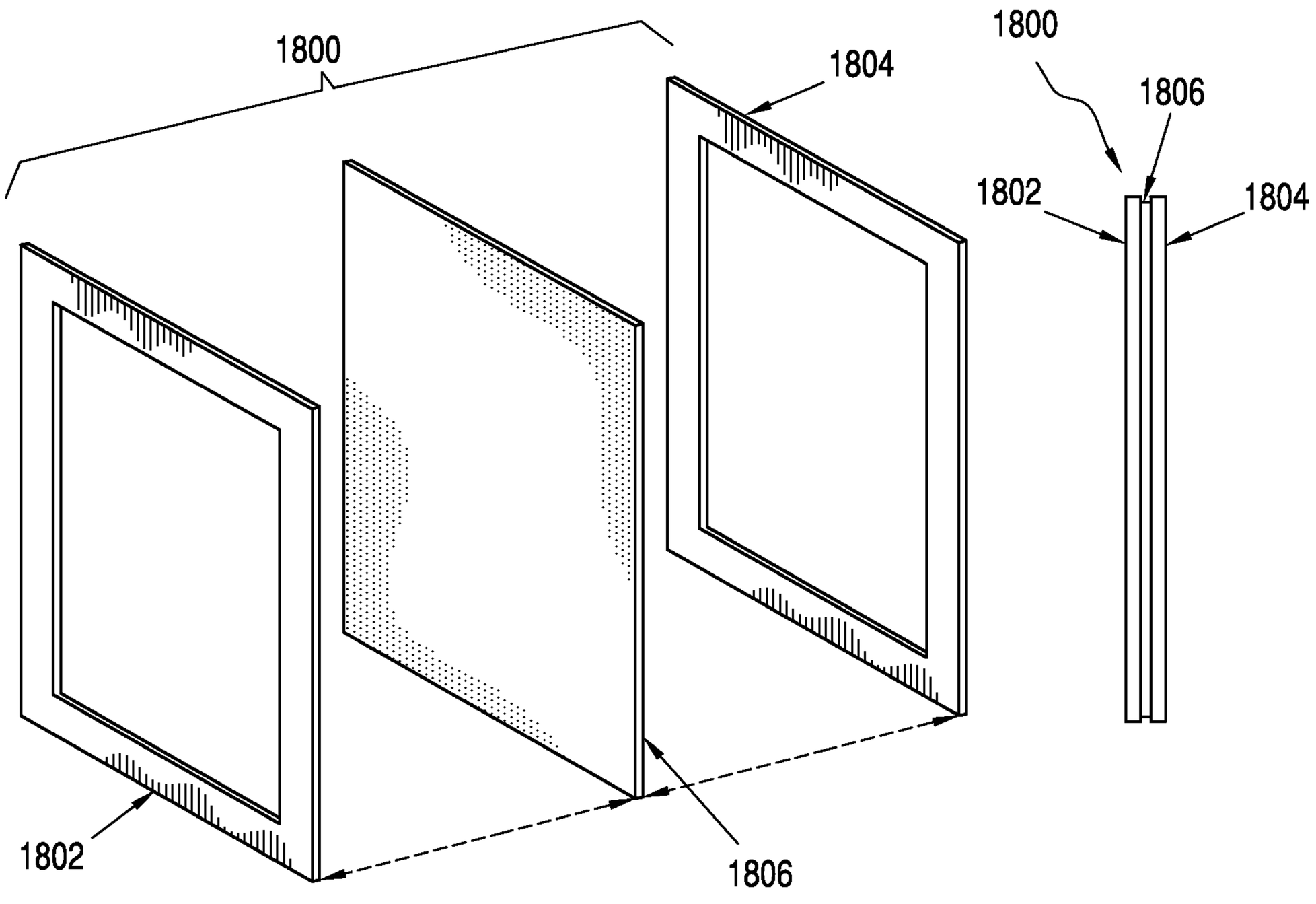


FIG. 18

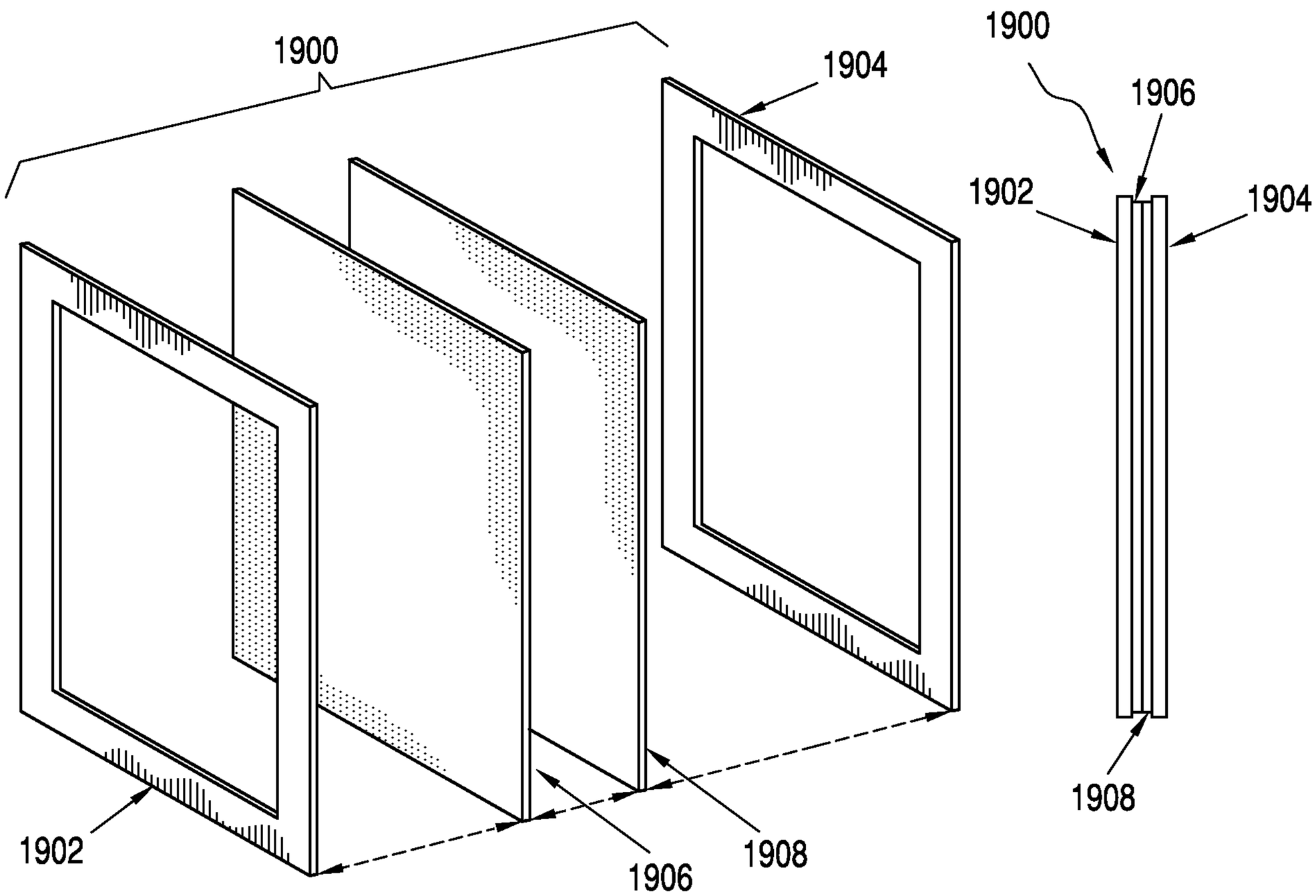


FIG. 19

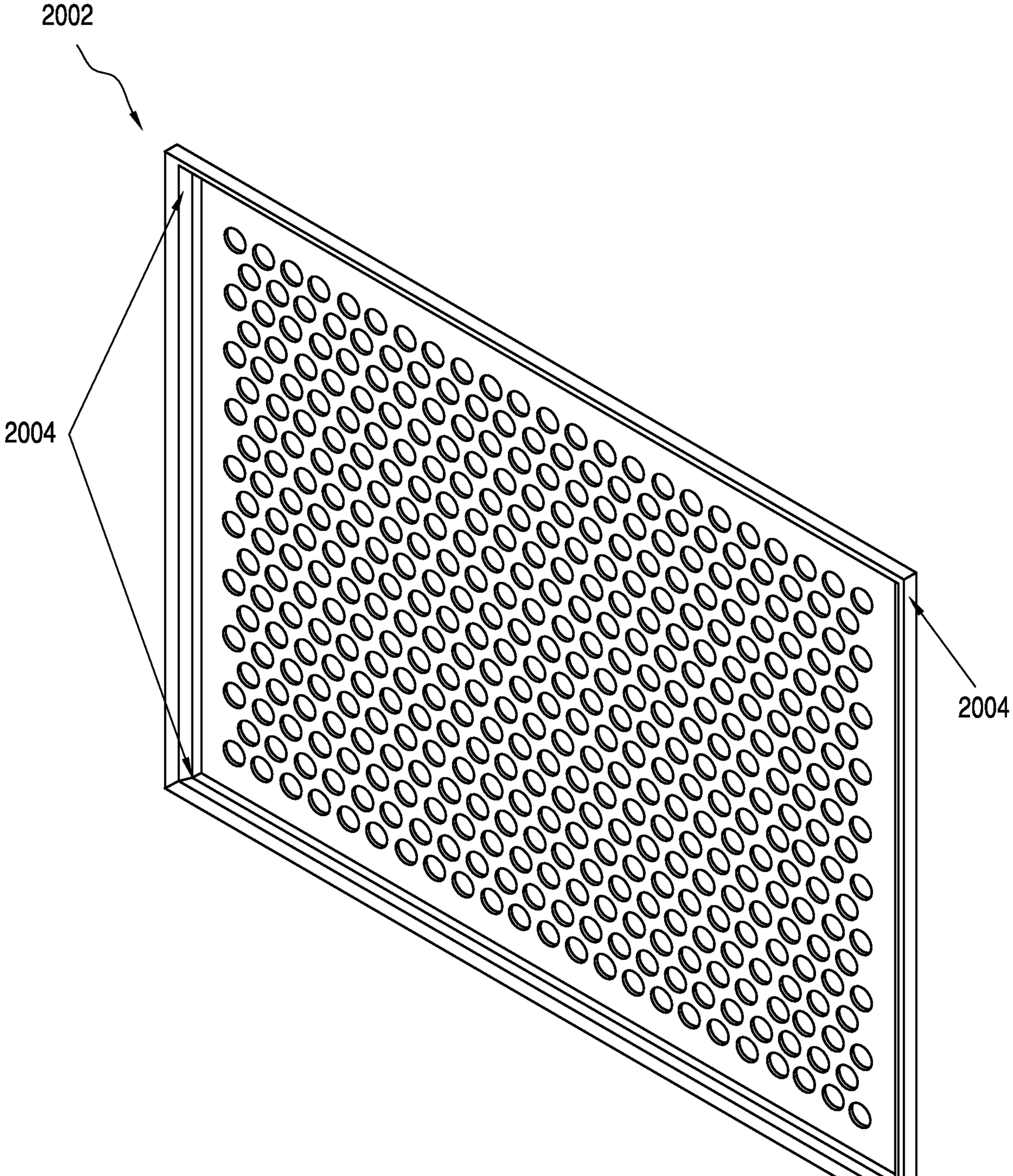


FIG. 20

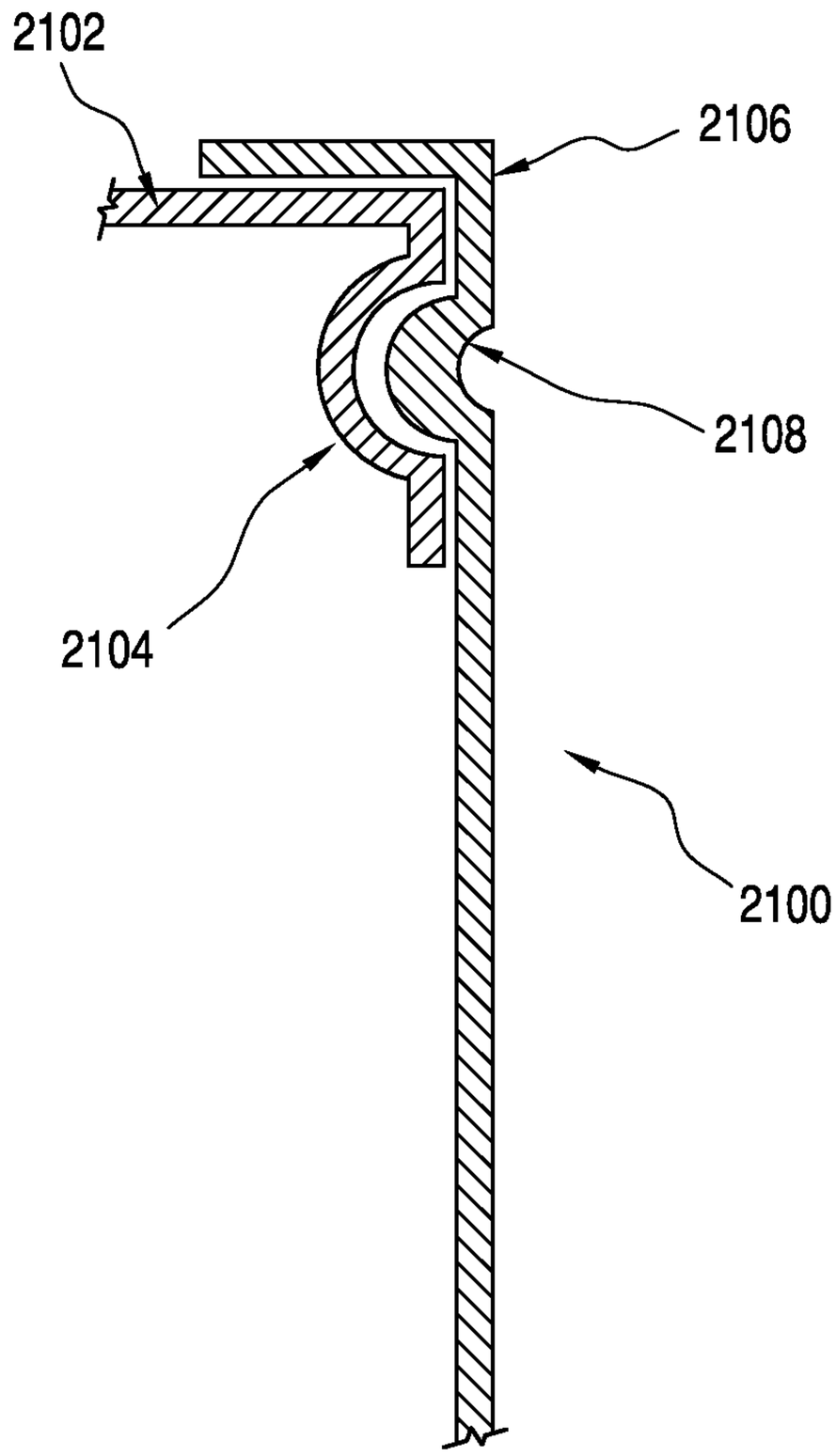


FIG. 21

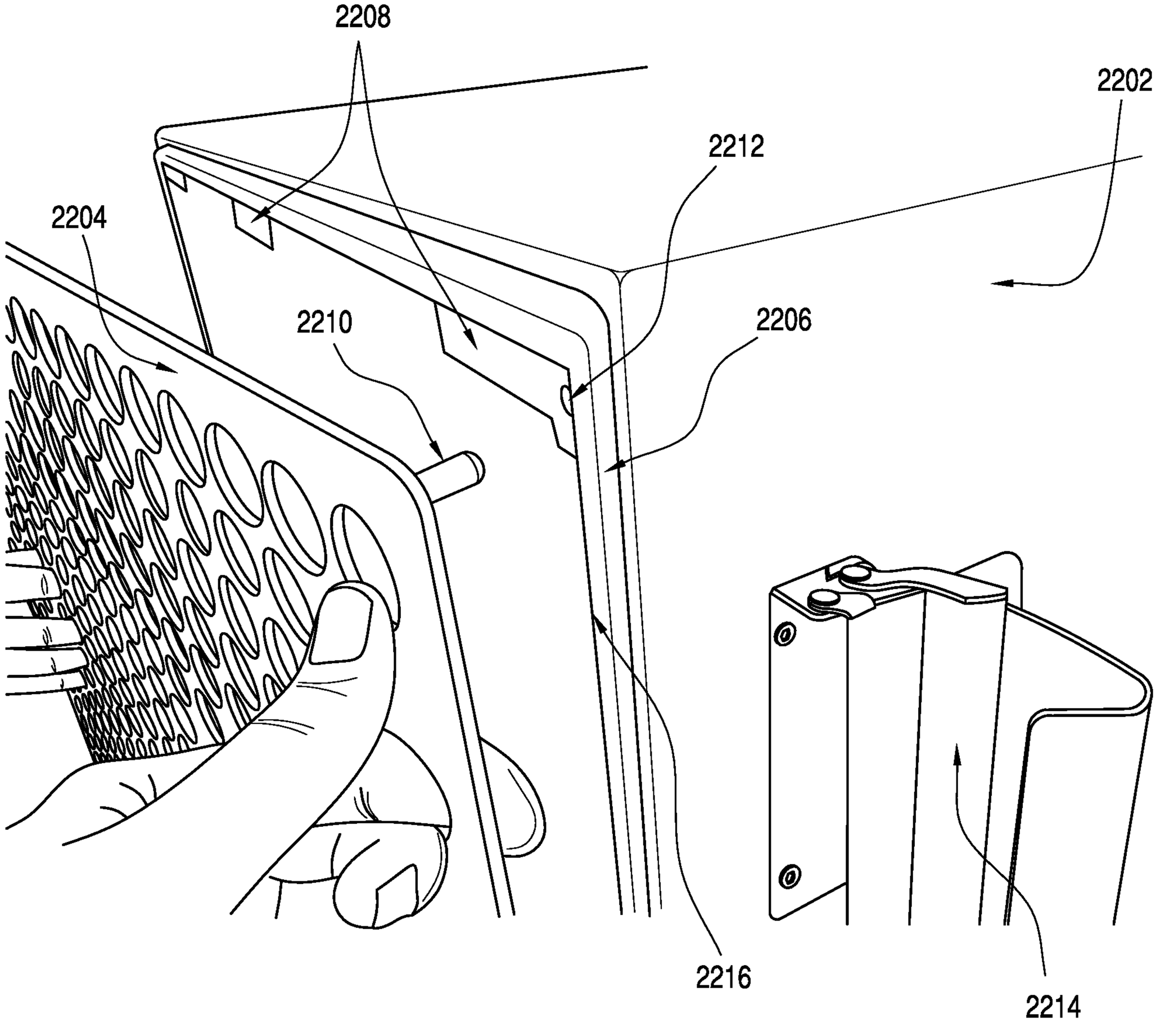


FIG. 22

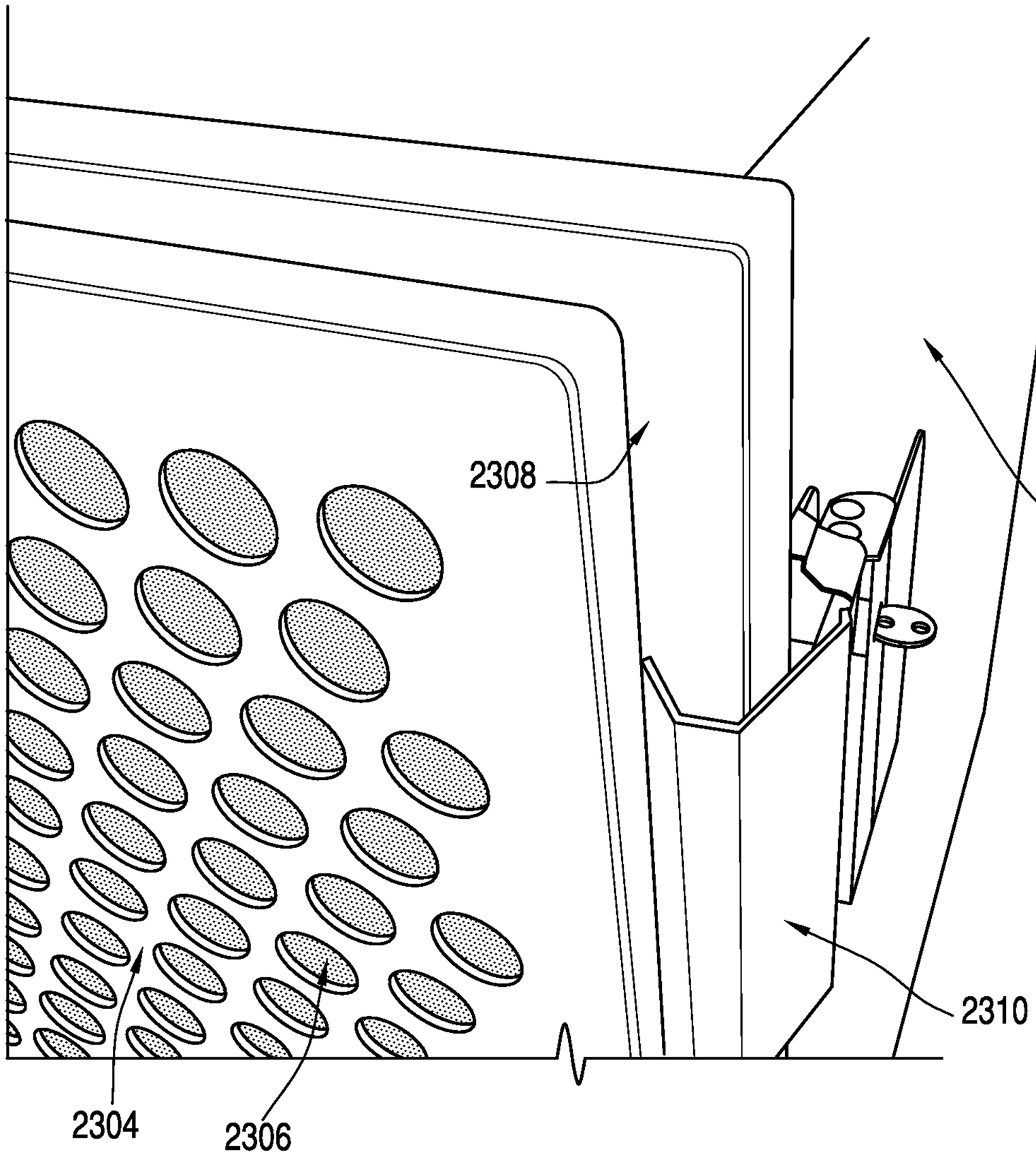


FIG. 23

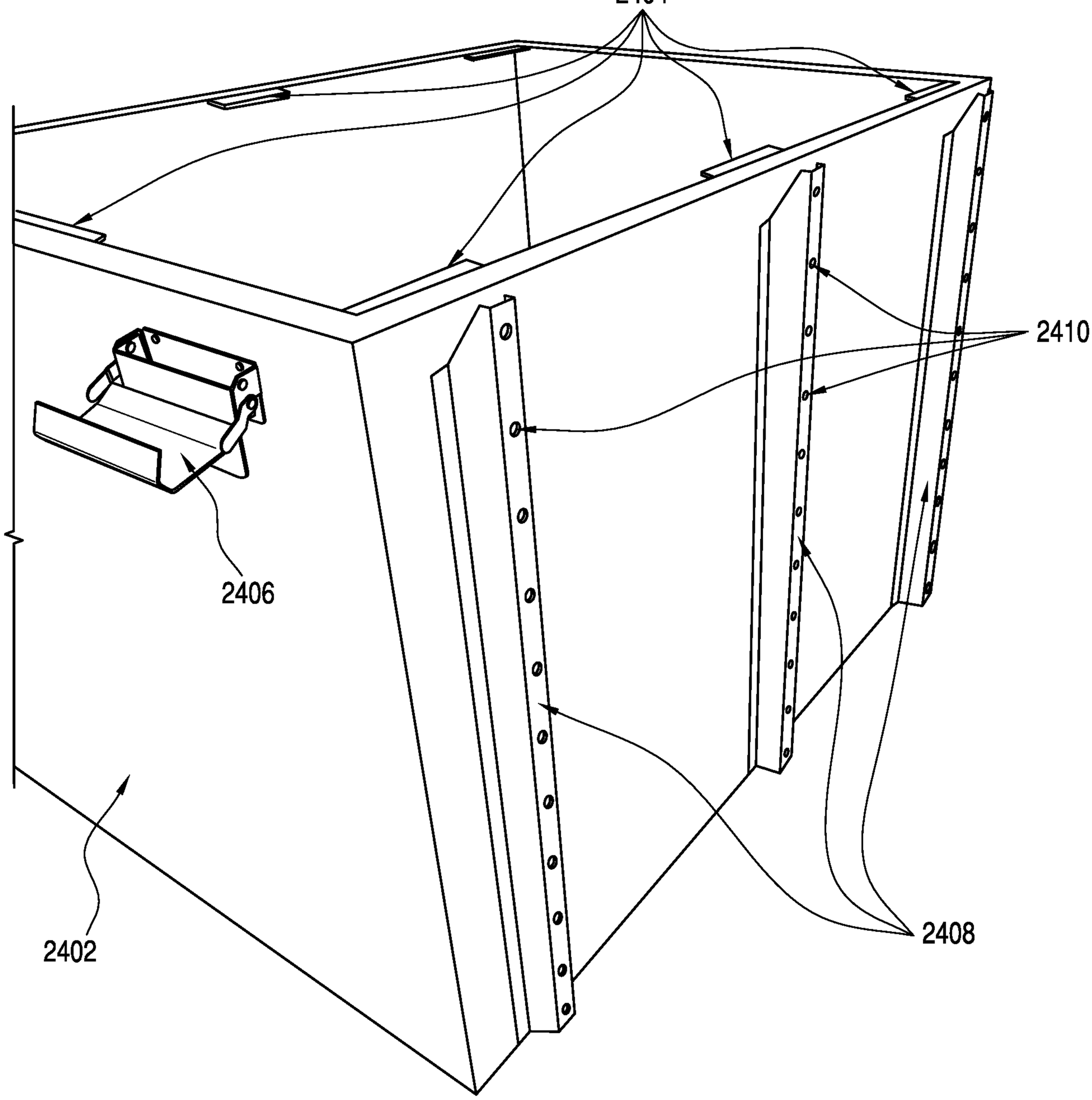


FIG. 24

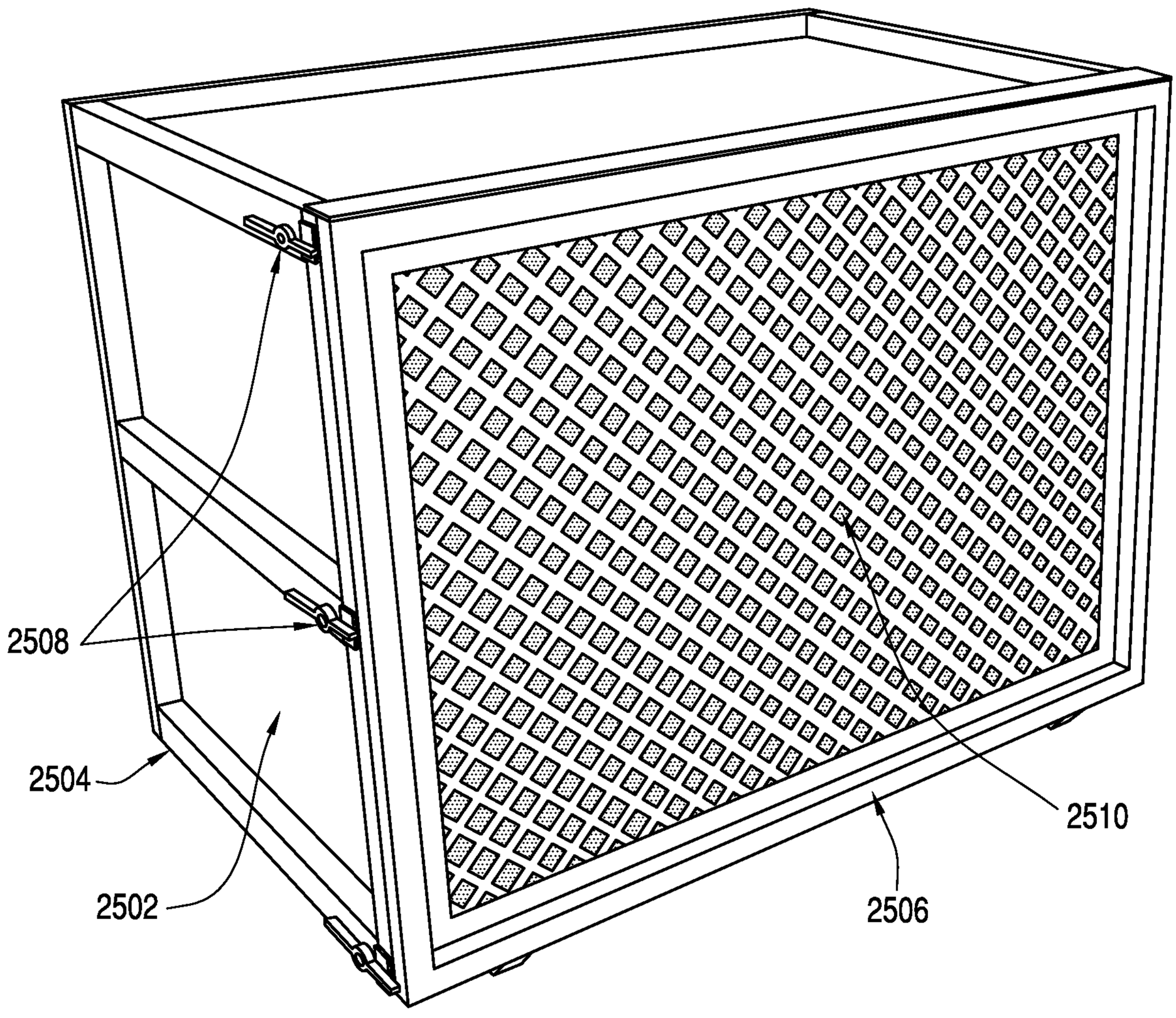


FIG. 25

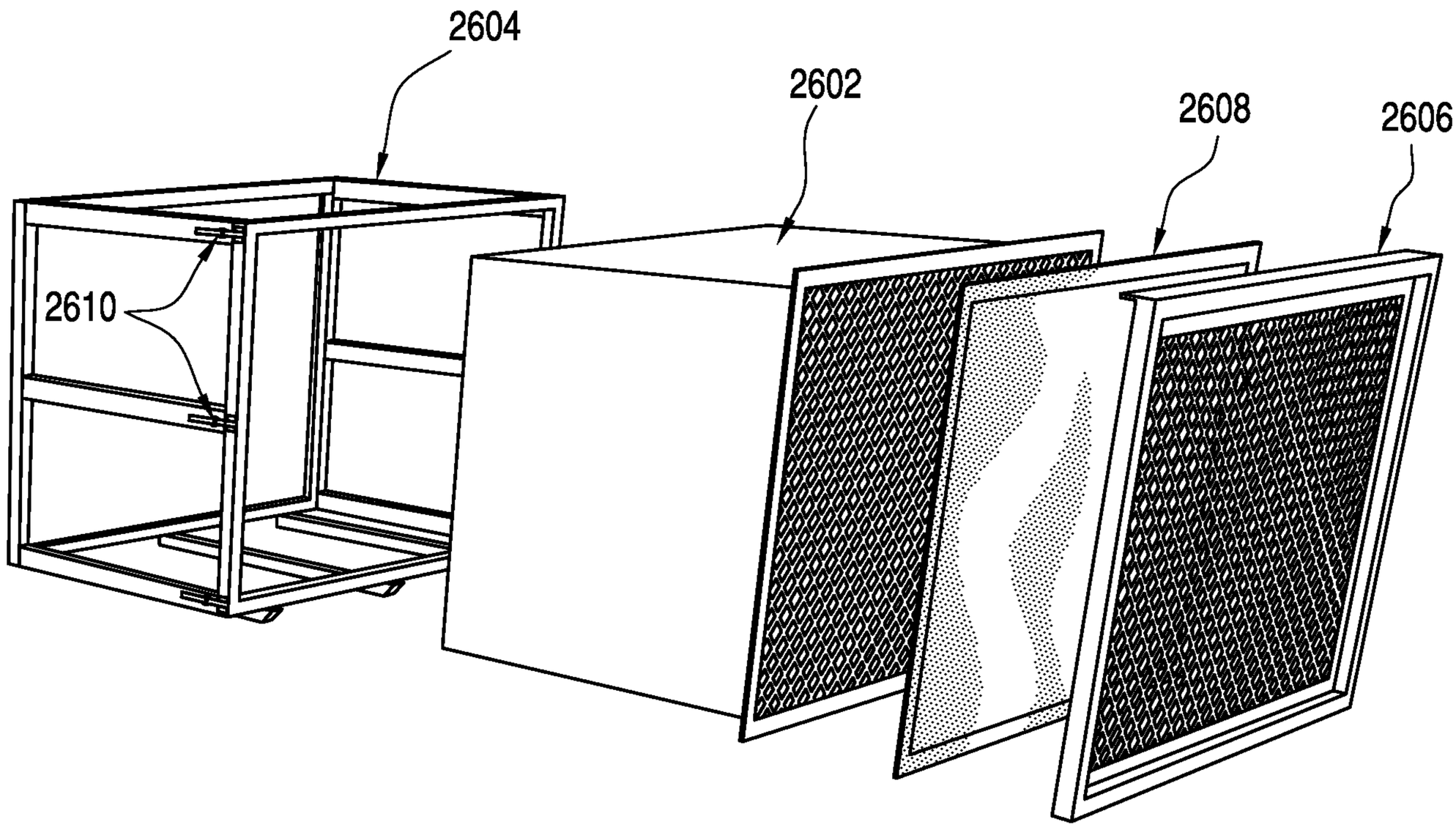
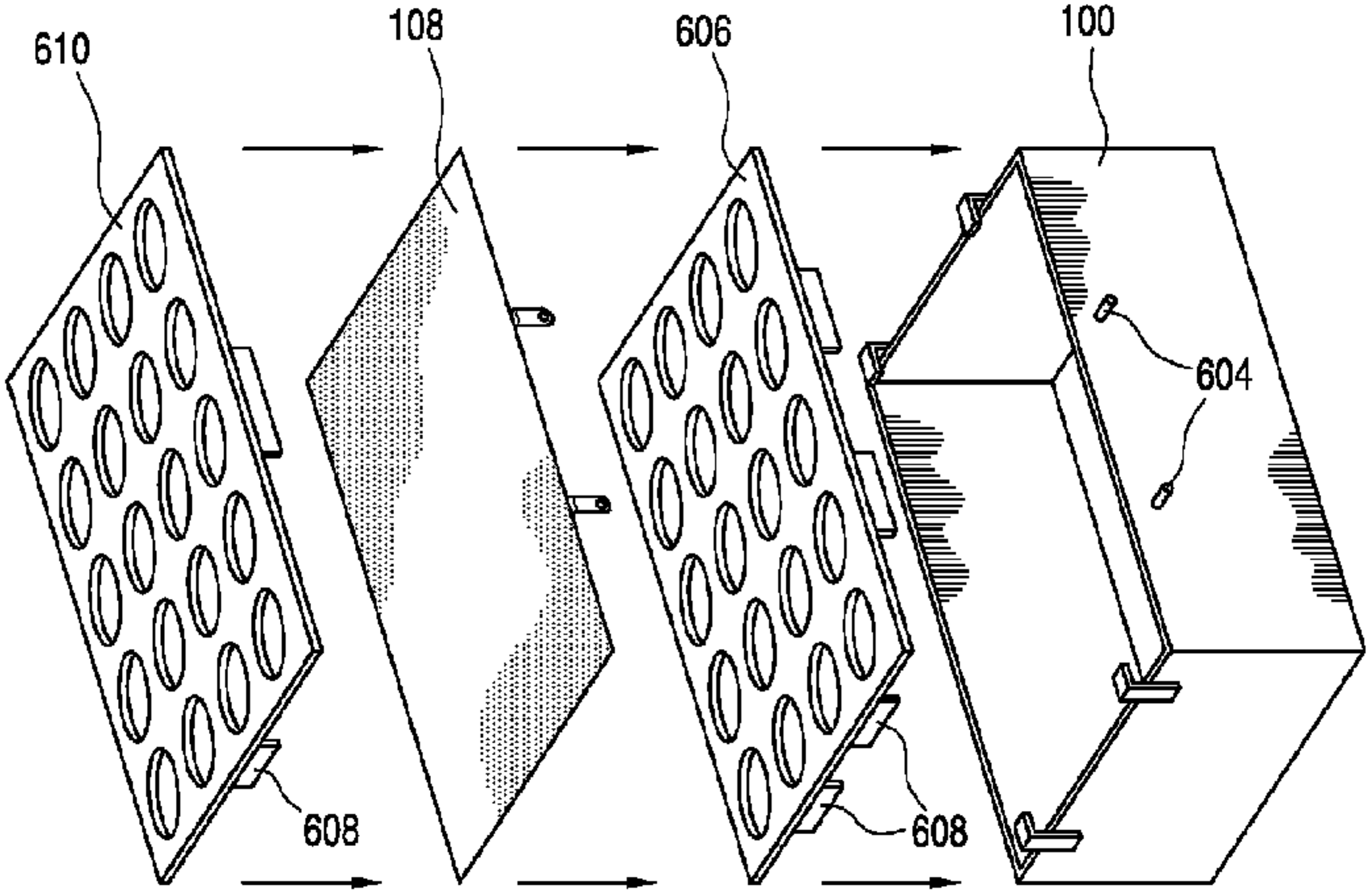


FIG. 26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