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(54) **RETURN AIR PRESSURE RELIEF VENT**

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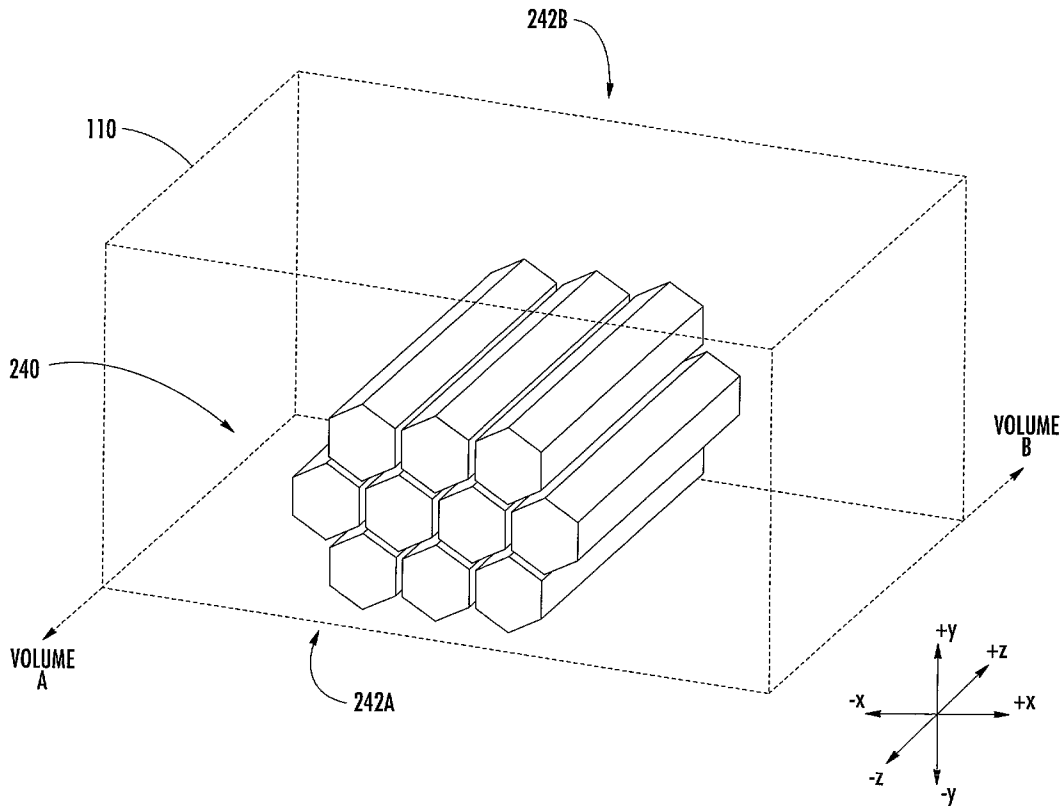
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(57) **ABSTRACT**

A return air pressure relief vent comprising a baffle structure having two ports, disposed in a partition between two volumes of air and including a plurality of passages that each encompass a straight line extending between the two volumes of air, the plurality of passages structured and arranged to accommodate a pressure balancing flow of air between the two volumes of air while restricting the passage of sound and light.



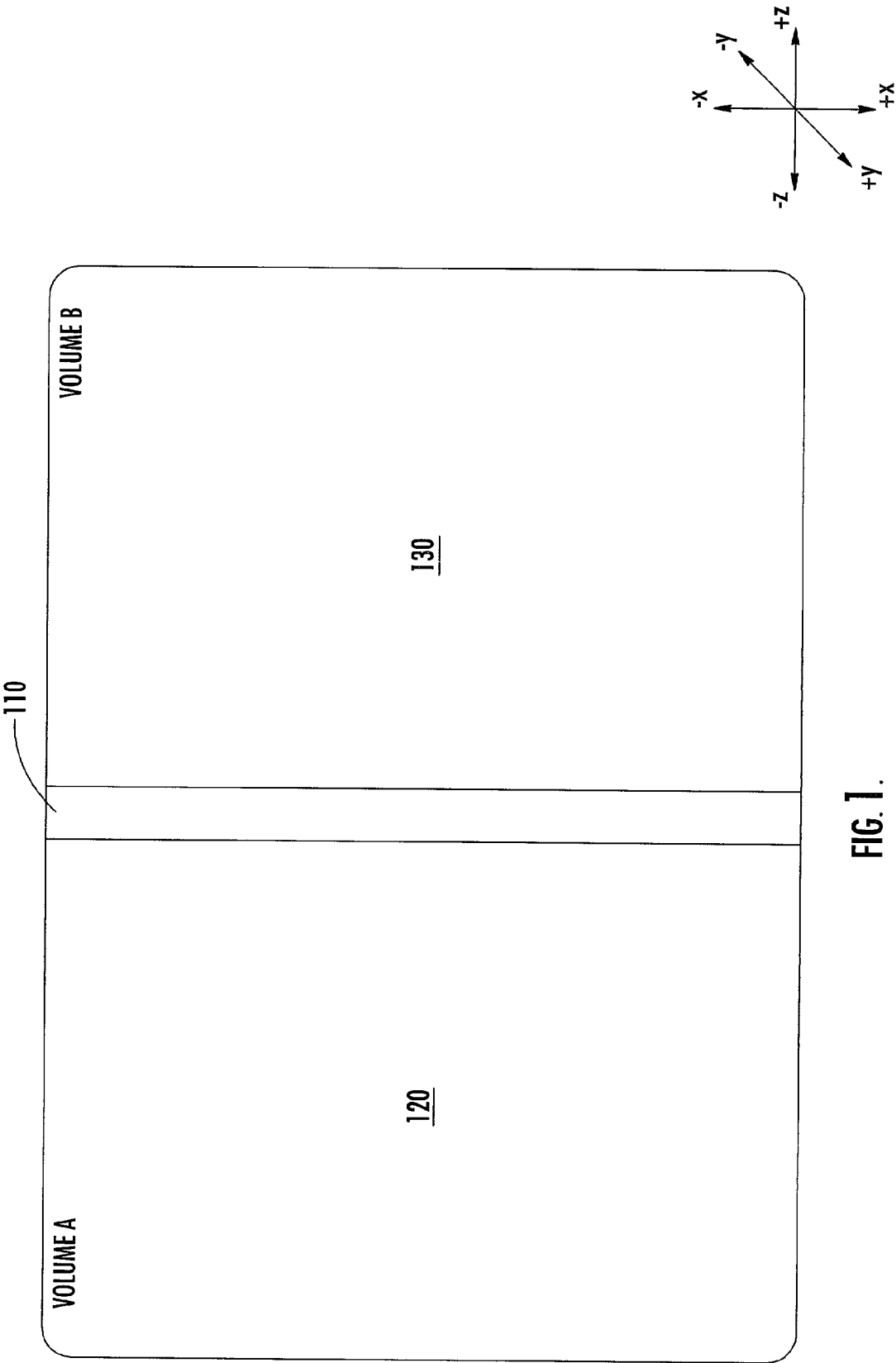
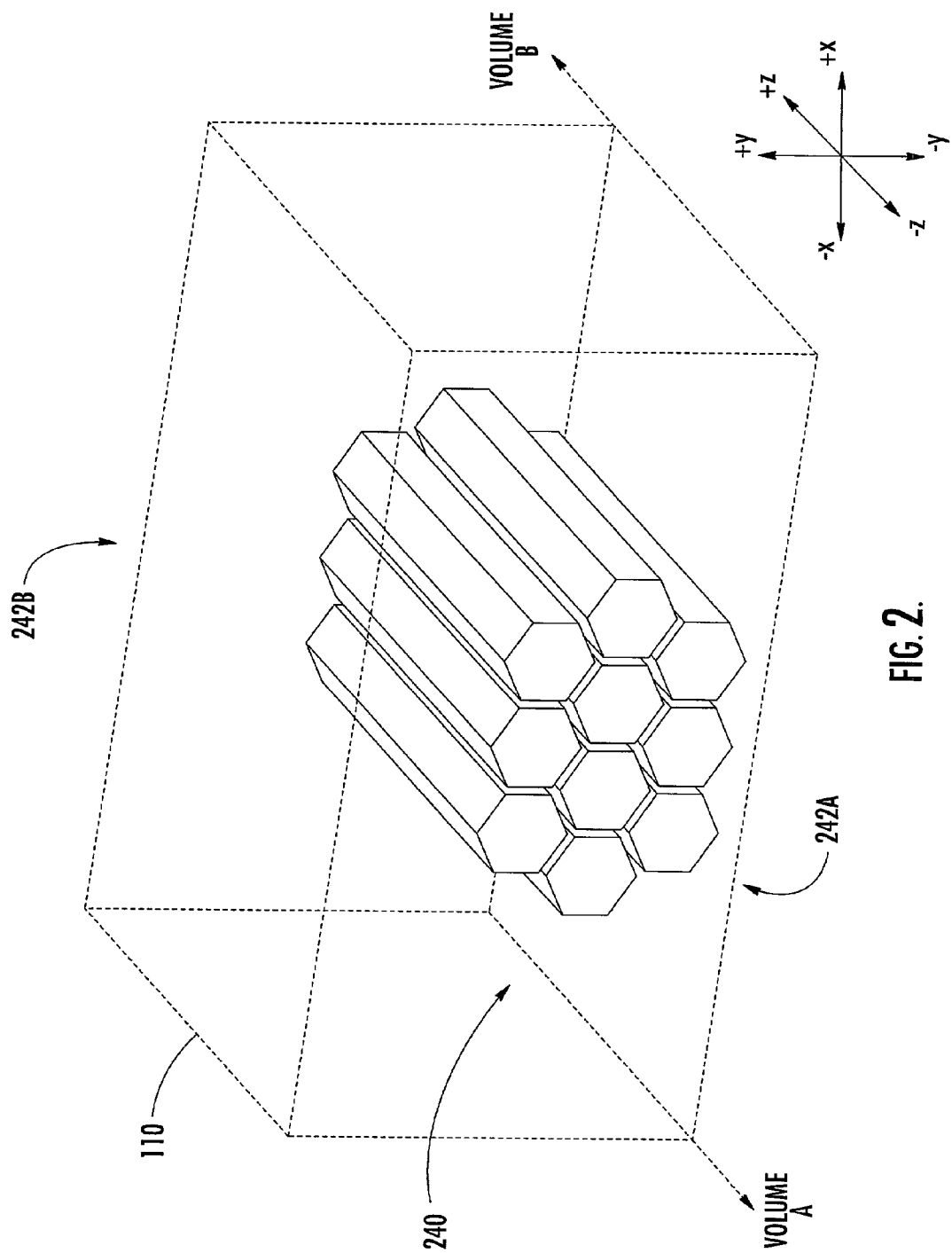


FIG. 1.



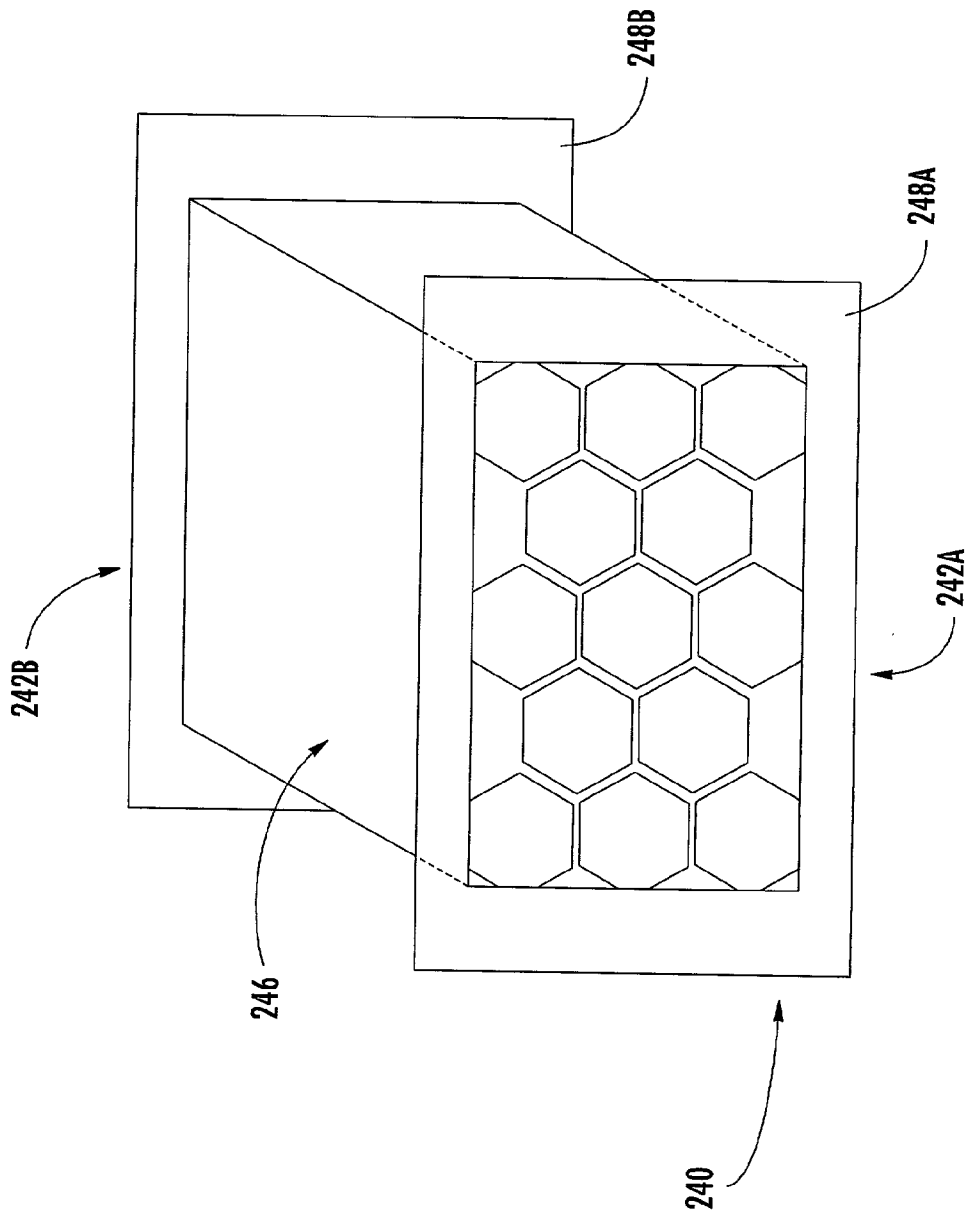
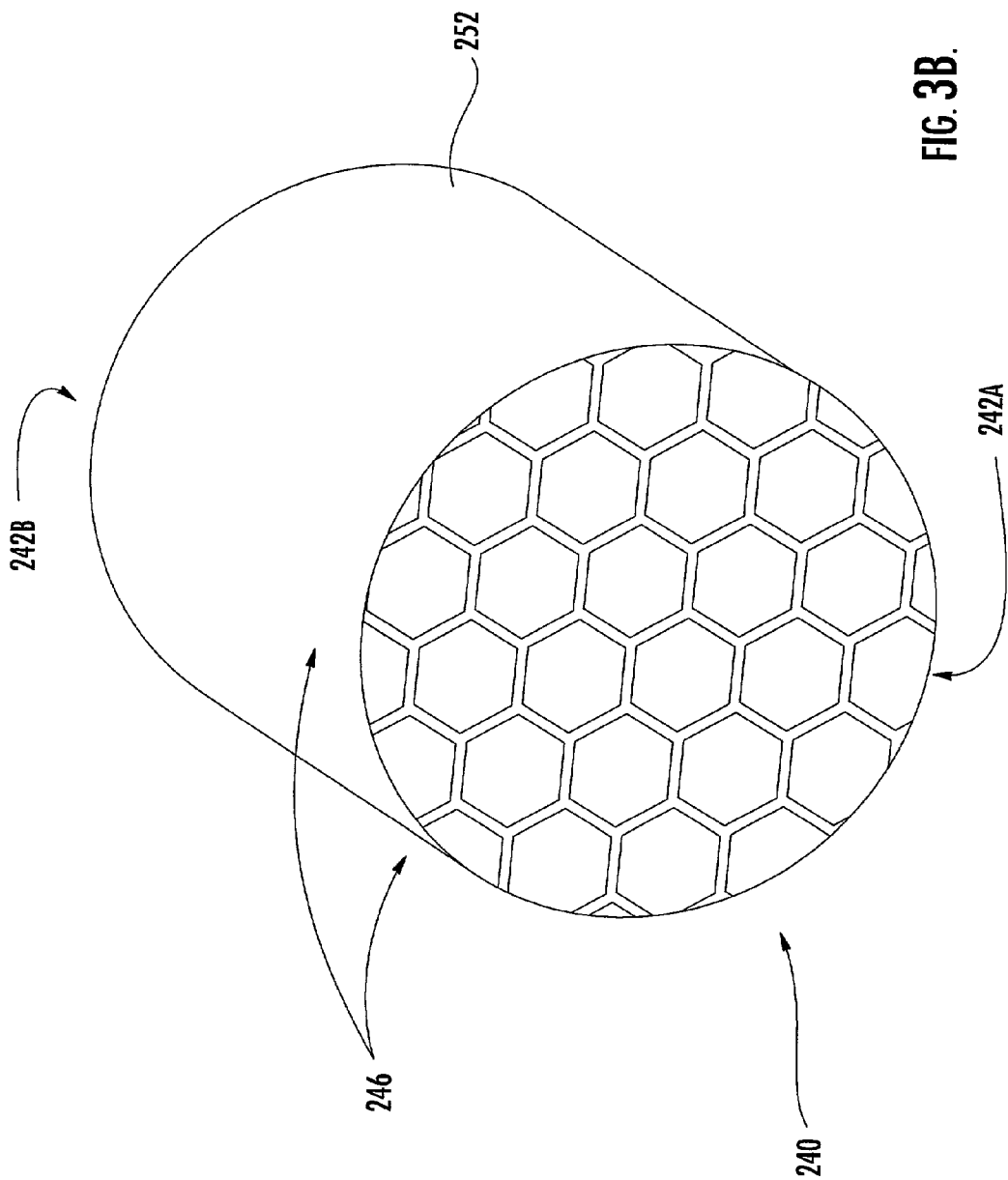
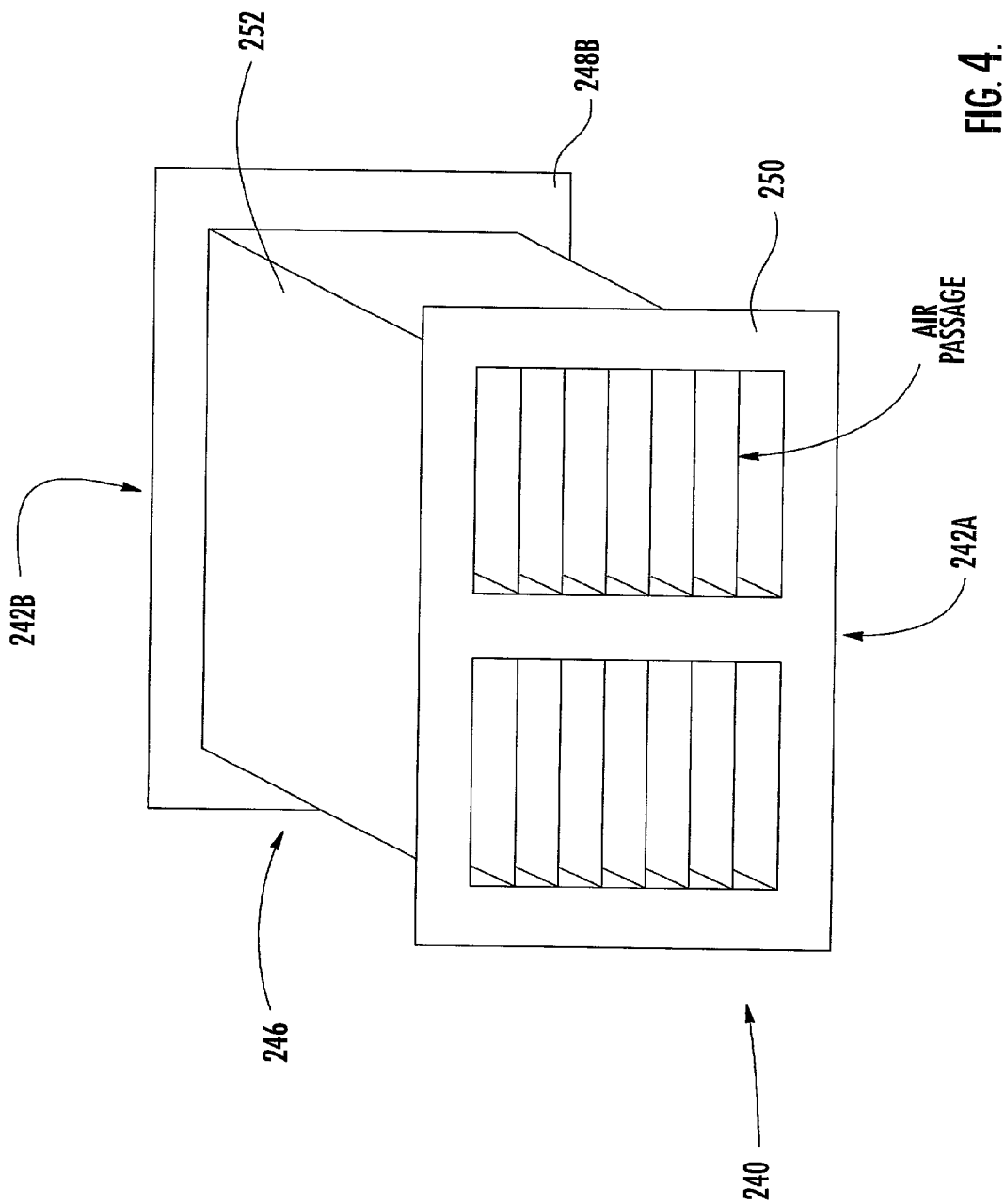


FIG. 3A.





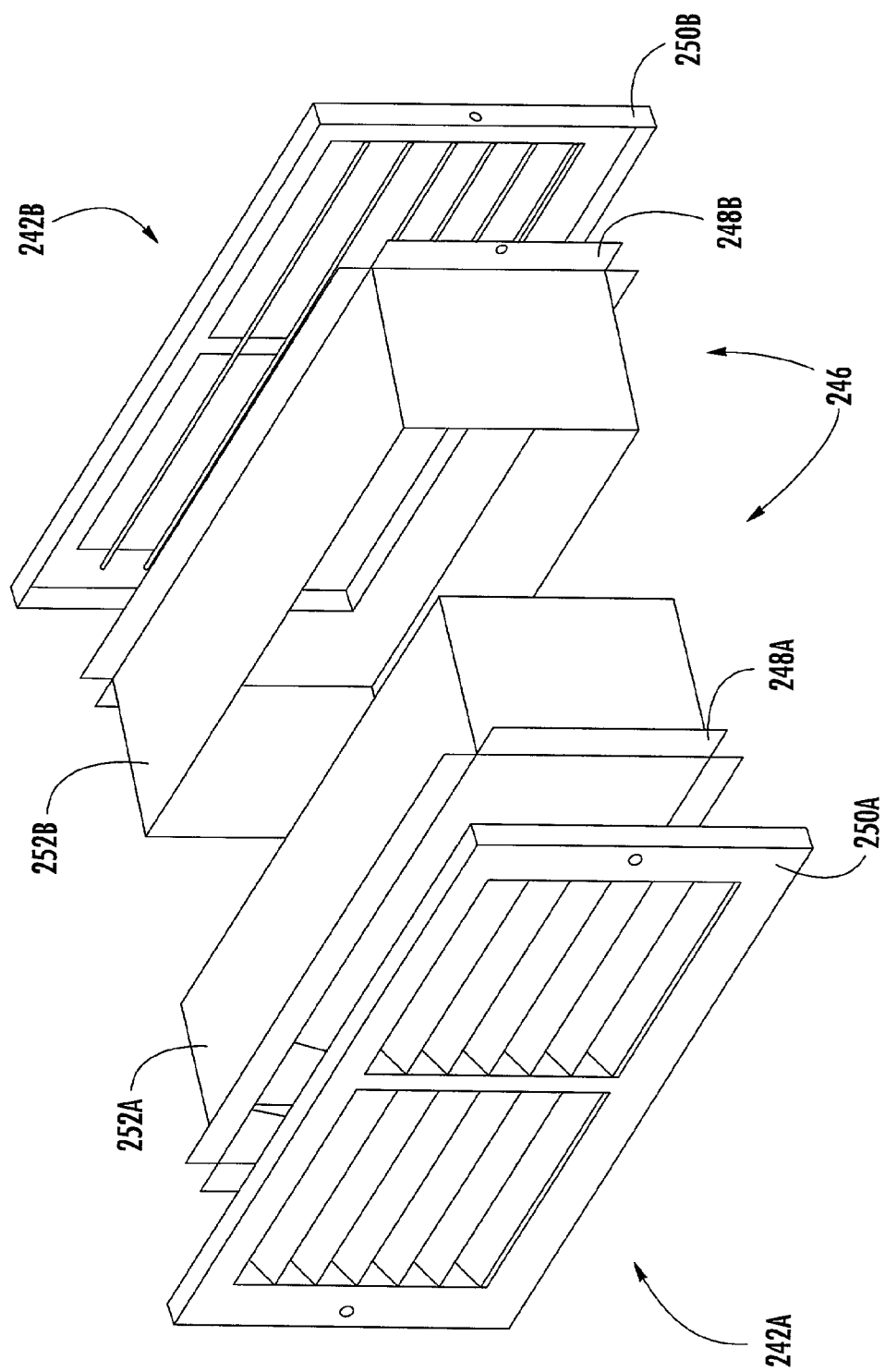


FIG. 4A.

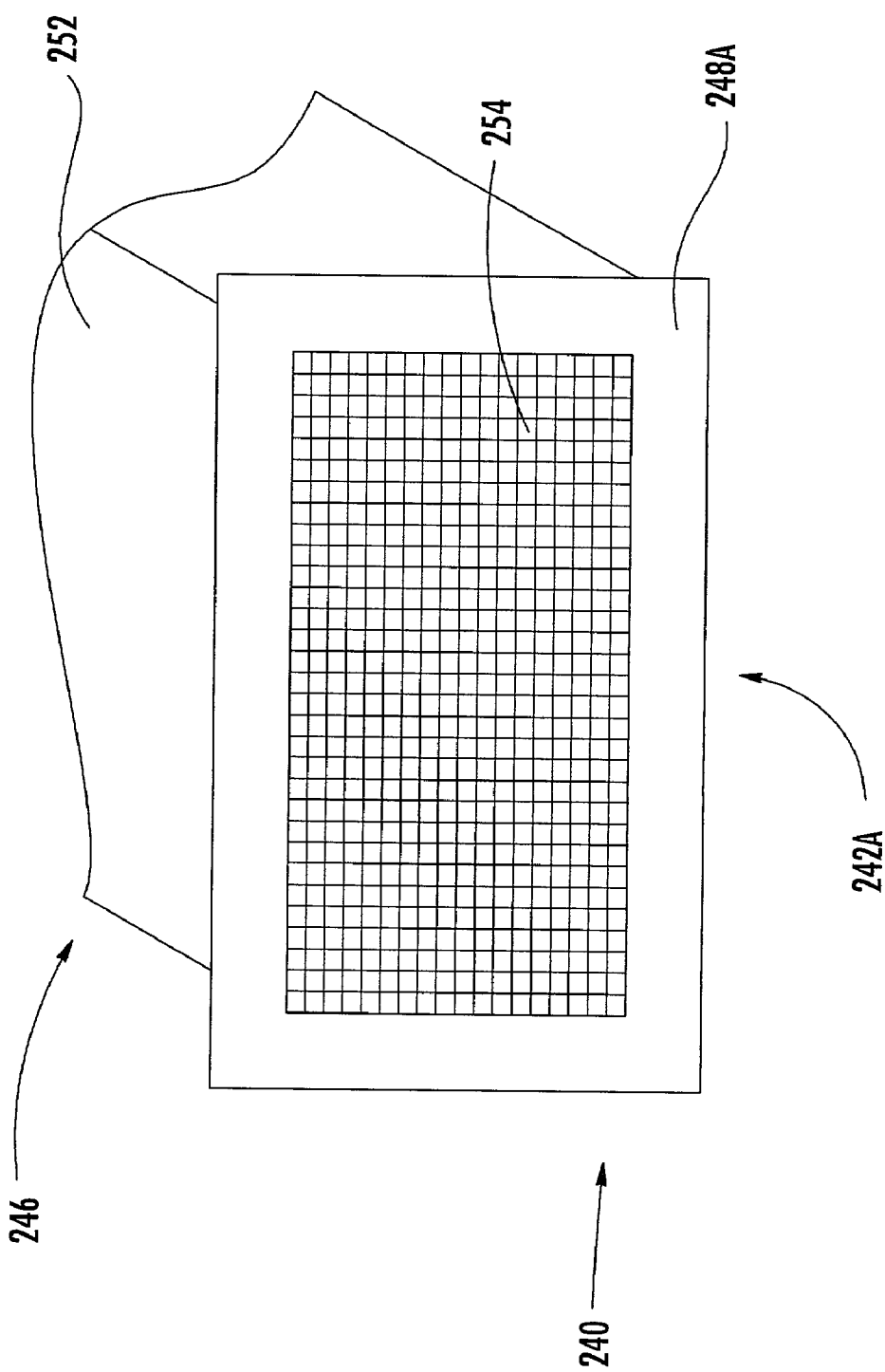


FIG. 4B.

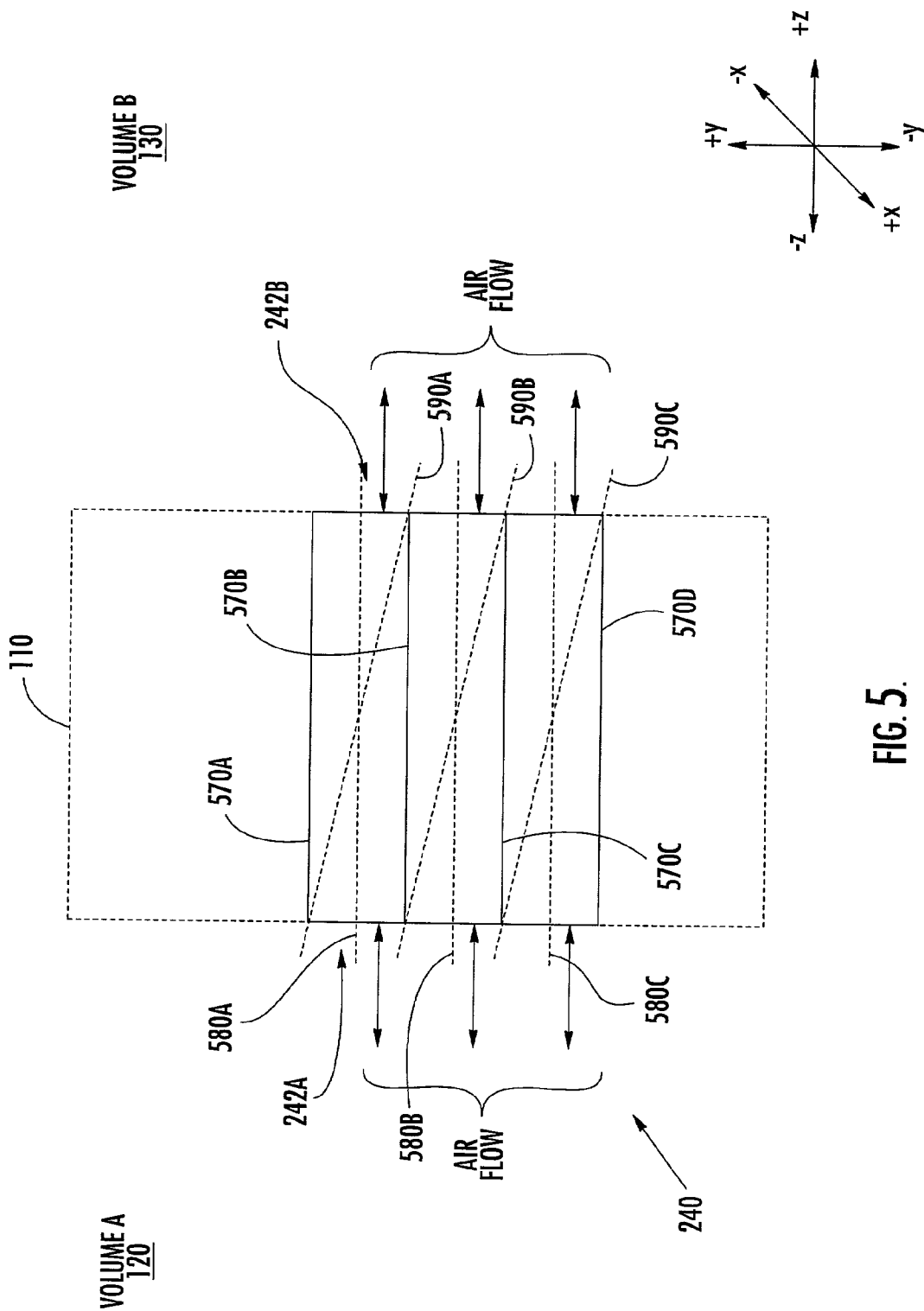


FIG. 5.

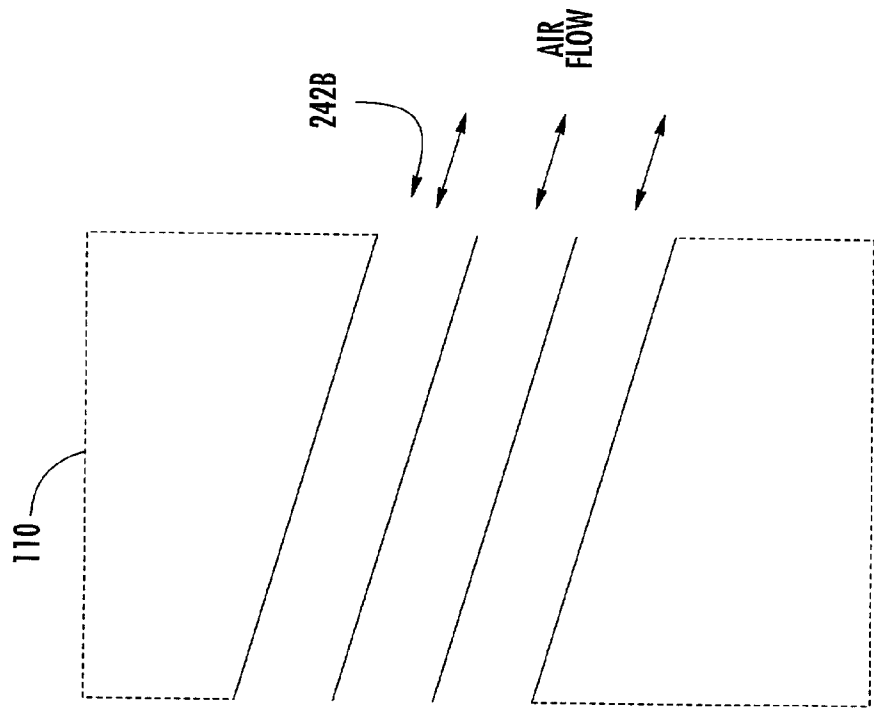


FIG. 6.

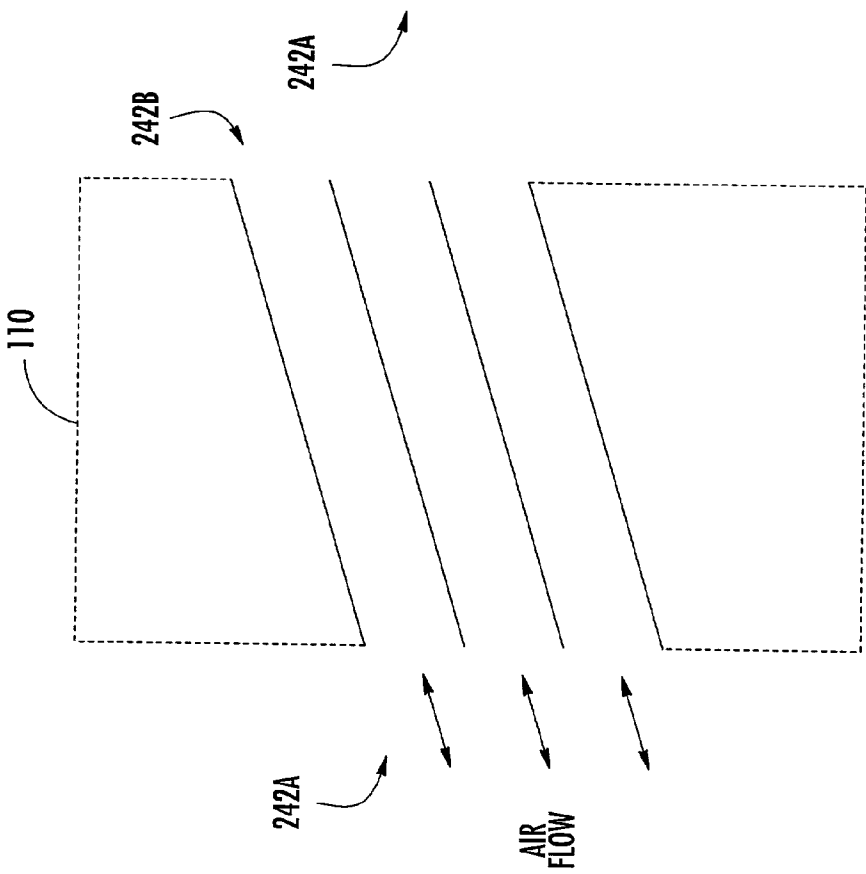


FIG. 7.

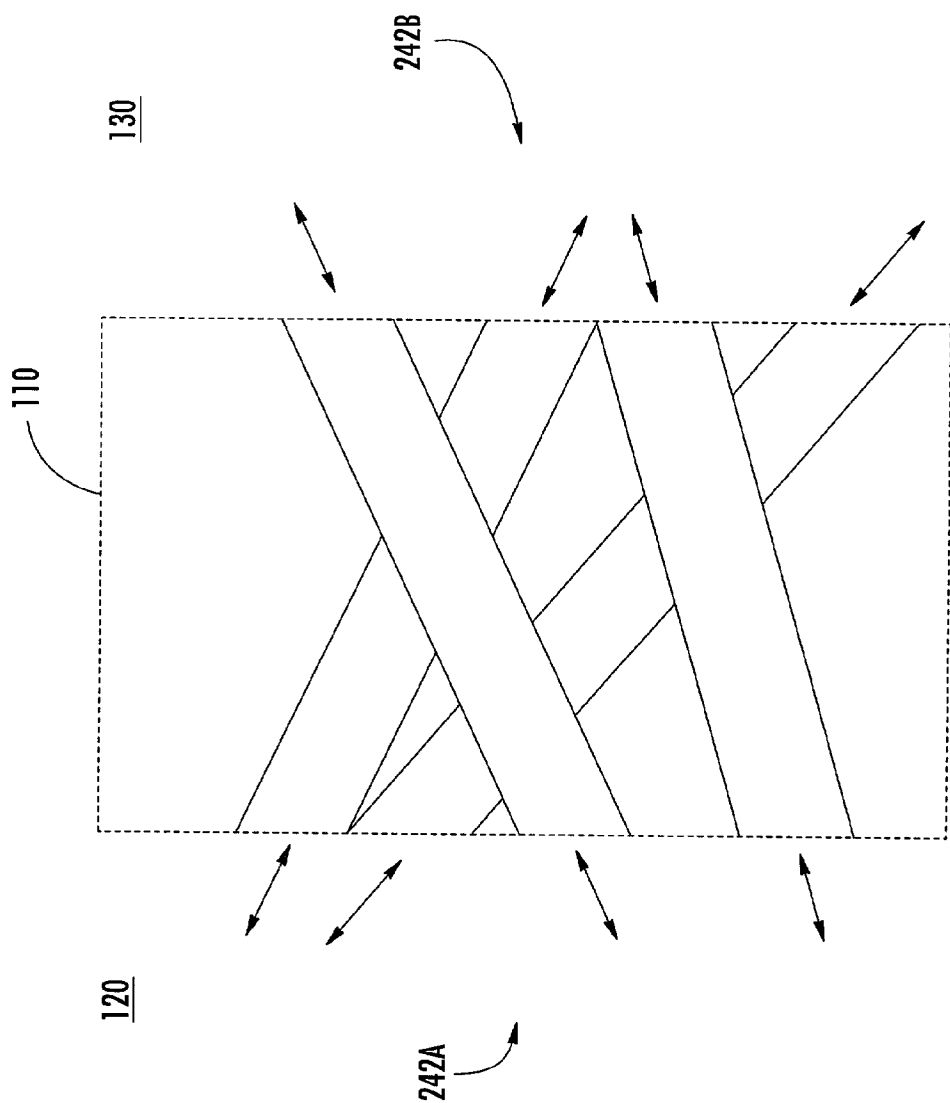
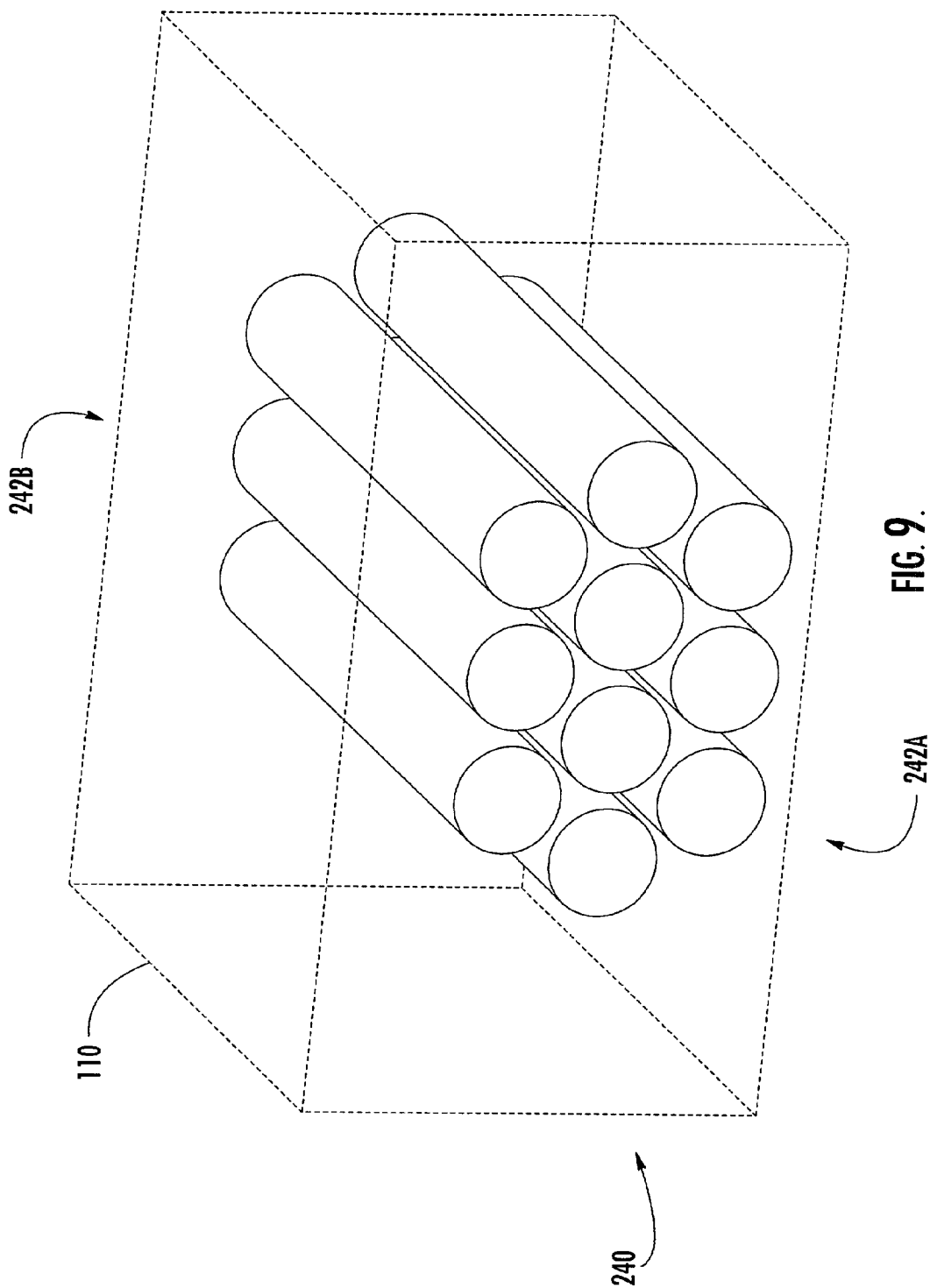


FIG. 8.



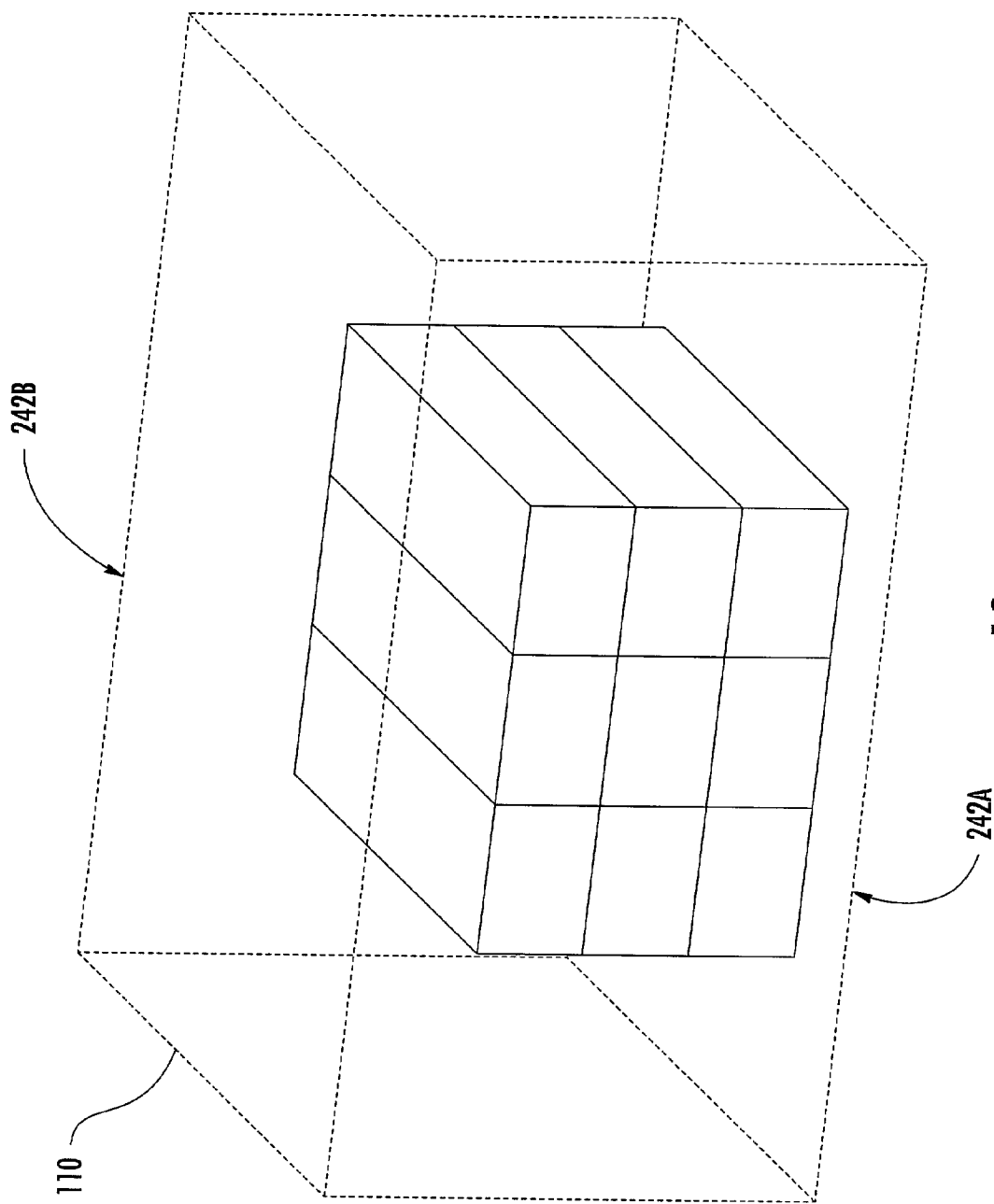


FIG. 10.

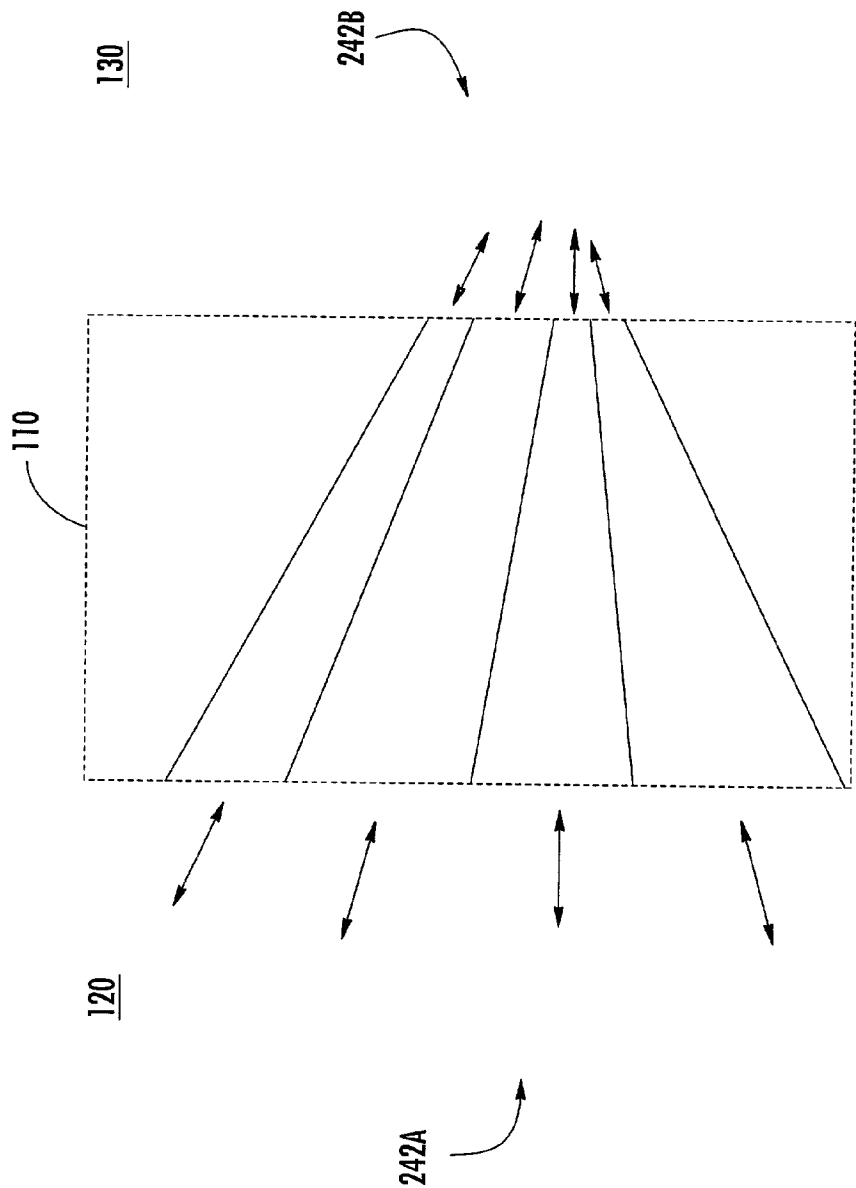


FIG. 11.

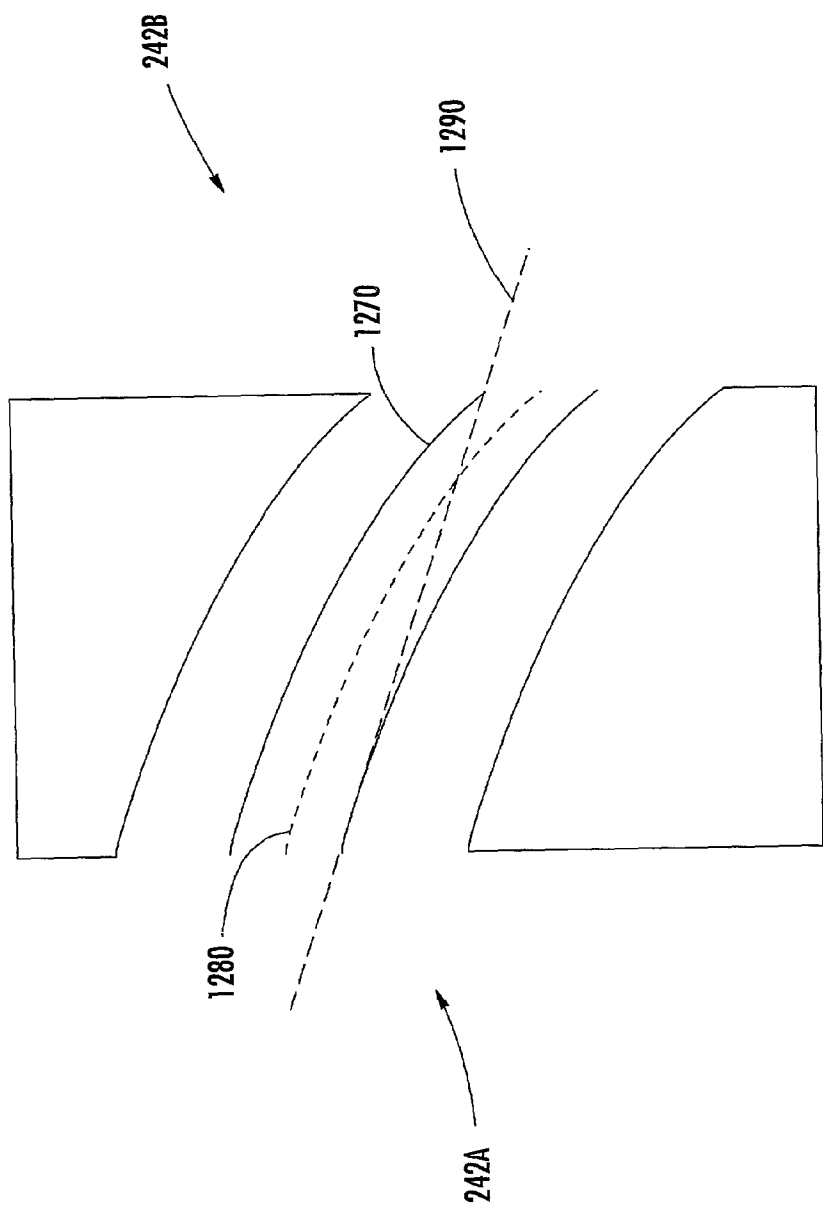


FIG. 12.

RETURN AIR PRESSURE RELIEF VENT

FIELD OF THE INVENTION

[0001] This invention relates to a return air vent that permits pressure balancing air flow while preserving sight and sound privacy.

BACKGROUND OF THE INVENTION

[0002] A central air system supplies conditioned air from a central air supplier (air handler) through air supply ducts to various rooms and spaces located within a building. Conditioned air is returned to the air handler from the various rooms and spaces through air return ducts. Conditioned air is heated or cooled, humidified or dehumidified in order to maintain a comfortable environment within the building differing from the ambient conditions. The air handler re-conditions air returned through the air return ducts and re-supplies the re-conditioned air through the air supply ducts to the various rooms and spaces within the building.

[0003] Operation of the system can cause air pressure differences between rooms and spaces within the building. These air pressure differences can reflect the relative amount of the flow of air supplied by the air handler via air supply ducts and returned to the air handler via air return ducts. When the system is balanced, an equal amount of air is supplied by the air handler via the air supply ducts and returned to the air handler via air return ducts.

[0004] A system providing the complete return of air to the air handler provides an air return duct in each room or space having an air supply duct. This type of central air system maximizes the flow of conditioned air from the various rooms and spaces back to the air handler. This type of system also minimizes pressure differences between rooms and spaces supplied with conditioned air and also reduces any unintentional comfort differences between rooms and spaces supplied with conditioned air to better enhance comfort within the building.

[0005] Unfortunately, it is common for building construction contractors to reduce the cost of a central air system by constructing a system providing less than the complete return of air to the air handler. This type of system does not provide an air return duct for each room or space having an air supply duct. Air supplied to rooms and spaces lacking a return duct typically causes air pressure to increase within that room or space. Increased air pressure within that room or space causes air to exit or leak from that room or space to other rooms or spaces having less air pressure and/or to exit or leak to the outside atmosphere if the room is adjacent to an outside wall.

[0006] In an attempt to compensate for some of the disadvantages of a system having a less than complete return of air to the air handler, air return ducts are typically placed in central locations (central return ducts) within the building to collect air that has exited or leaked from rooms and spaces having an air supply duct but lacking an air return duct. In this situation, rooms and spaces supplied with air effectively act as return ducts and their associated doors effectively act as obstacles to the flow of returned air. When these doors are closed, air is further restricted from flowing back to the centrally located return ducts. This causes pressure imbal-

ances within the building and system to further increase. When these doors are open, sound and light privacy is reduced within each room and space associated with an open door.

[0007] Furthermore, air pressure in rooms and spaces where a central return duct is located can drop below the air pressure in other spaces due to a suction effect caused by the inability of the system to return or draw back the amount of air supplied to the building.

[0008] Despite attempts to compensate for the disadvantages of a system having a less than complete return of air to the air handler, such a system typically has higher operating costs and continues to cause uneven air pressure and uneven heating or cooling of rooms and spaces within the building.

[0009] Even small air pressure differences between rooms and spaces can cause serious health and building maintenance problems. When a room is under higher pressure than surrounding rooms or spaces, the air within the room leaks out of the room passing through any available hole or crack.

[0010] If the building is in a heating climate, the warmer and moister air of the room leaks out through walls and around windows and doors. When the warm and moist air strikes a surface within the wall structure that is cooler than the dew point, the moisture in the leaking air condenses out and onto surfaces inside the wall causing rot and enhancing the growth of mold. If the building is in a cooling climate, the suction effect of a room or space having an air return duct can draw warm and moist air from the atmosphere through external walls of the building to also cause rot and the growth of mold within the external walls of the building.

[0011] It has been shown that these types of problems can occur from very small pressure differences, for example from as low as a 2.5 Pascals or 0.01 inches WC pressure difference between adjacent rooms and/or spaces. As a result, some jurisdictions, such as the State of Florida, have adopted stringent regulations that require new buildings with central air systems to be designed and constructed to limit pressure differences between rooms to less than 2.5 Pascals.

BRIEF SUMMARY OF THE INVENTION

[0012] It is a further object of this invention to provide an improved return air pressure relief vent that permits sufficient air flow to balance pressure between two volumes of air while restricting the passage of light and sound for the preservation of sight and sound privacy.

[0013] It is a further object of this invention to provide an improved return air pressure relief vent that complies with stringent building codes.

[0014] It is a further object of this invention to provide an improved return air pressure relief vent that is less expensive and simpler to install than the prior art.

[0015] It is a further object of this invention to provide an improved return air pressure relief vent which wholly determines the pressure balancing air flow between two volumes of air.

[0016] The invention results from the realization that a truly simple and more effective return air pressure relief vent that balances pressure between two volumes of air can be

effected by employing a plurality of passages that each encompass a straight line that extends between the two volumes of air.

[0017] This invention features a return air pressure relief vent including a baffle structure having two ports. The baffle structure is disposed in a partition between two volumes of air where each of the two ports confront each of the two volumes of air, respectively. The baffle structure includes a plurality of passages, each of the plurality of passages encompasses a straight line extending between the two volumes of air. The plurality of passages are structured and arranged to accommodate a pressure balancing flow of air between the two volumes of air while restricting the passage of sound and light.

[0018] In some embodiments the partition is a wall separating two rooms or spaces within a building where each of the two rooms or spaces includes one of the two volumes of air, respectively. In some embodiments the return air pressure relief vent permits 200 cubic feet per minute of air passage while limiting the pressure difference between the two volumes of air to be less than 2.5 Pascal's.

[0019] In some embodiments, the return air pressure relief vent includes a frame configured to attach the plurality of passages to the partition. Optionally the frame includes an exterior surface extending between the two ports and the two volumes of air. The exterior surface can include one or more rectangular and flat surfaces or alternatively can include one or more curved surfaces.

[0020] In some embodiments the exterior surface of the frame includes two sections which are sized to slide (telescope) into one another to adjust the width dimension of the frame. Optionally the frame can include a grill or a screen covering at least one of the two ports. Also, the grill can include a baffle member and the baffle member can optionally include a plurality of louvers. In the preferred embodiment the baffle includes passages that are provided by a honeycomb structure and a frame that is made of sheet metal. Preferably, the honeycomb structure is made from cardboard and the frame is made from sheet metal to reduce the cost of manufacture of each return air pressure relief vent.

[0021] In some embodiments the plurality of passages have a cross-sections of circular shape. In other embodiments the plurality of passages have cross-sections of rectangular shape. Alternatively, the plurality of passages can have cross sections with a wide variety of shapes and sizes.

[0022] In some embodiments the passages are parallel to each other. In other embodiments the passages are not all parallel to each other. Optionally, the passages are perpendicular to a plane defined by the exterior surfaces of the partition. Alternatively, the passages are not perpendicular to a plane defined by the exterior surfaces of the partition.

[0023] In some embodiments the plurality of passages each have a cross-section that varies in size or shape along a center line of the passage extending between both volumes of air. In some embodiments the plurality of passages each have a cross-section not equal to the size and shape of the cross-sections of the other passages.

[0024] In some embodiments, the plurality of passages have a centerline and an interior wall that are straight and

parallel to each other. In other embodiments, the plurality of passages have a centerline and an interior wall that are not parallel to each other. In some embodiments the passages have a center line or an interior wall that is straight. In other embodiments, the plurality of passages have a centerline and an interior wall that is not straight.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] Other objects, features and advantages will occur to those skilled in the art from the following description of a preferred embodiment and the accompanying drawings, in which:

[0026] FIG. 1 is a top-down view of a partition separating two volumes of air.

[0027] FIG. 2 is a side view of an embodiment of the baffle structure comprising a port and a plurality of passages having hexagonal cross-sections as disposed within a partition according to an embodiment of the invention.

[0028] FIG. 3A is a side view of an embodiment of the baffle structure comprising a plurality of passages having hexagonal cross-sections that are disposed within a frame having a rectangular exterior surface.

[0029] FIG. 3B is a side view of an embodiment of the baffle structure comprising a plurality of passages having hexagonal cross-sections that are disposed within a frame having a curved exterior surface.

[0030] FIG. 4 is a side view of an embodiment of the baffle structure comprising a port, a frame and a grill according to an embodiment of the invention.

[0031] FIG. 4A is a perspective view of an embodiment of the frame comprising two telescoping portions that are each attached to a separate grill.

[0032] FIG. 4B is a perspective view of a portion of an embodiment of the frame attached to a screen.

[0033] FIG. 5 is a side view of paths of air flow through an embodiment of the baffle structure having passages that are perpendicular to a plane defined by the partition.

[0034] FIG. 6 is a side view of the paths of air flow through an embodiment of the baffle structure having passages that are not perpendicular to a plane formed by the partition.

[0035] FIG. 7 is a side view of the paths of air flow through an embodiment of the baffle structure having passages that are also not perpendicular to a plane formed by the partition.

[0036] FIG. 8 is a side view of the paths of air flow through an embodiment of the baffle structure having passages that are not parallel to each other.

[0037] FIG. 9 is a side view of an embodiment of the baffle structure comprising a port and a plurality of passages having circular cross-sections as disposed within a partition according to an embodiment of the invention.

[0038] FIG. 10 is a side view of an embodiment of the baffle structure comprising a port and a plurality of passages having rectangular cross-sections as disposed within a partition according to an embodiment of the invention.

[0039] FIG. 11 is a side view of an embodiment of the baffle structure comprising a plurality of passages that each have a straight center line, a straight interior wall and a cross-section that varies in size along each center line.

[0040] FIG. 12 is a side view of an embodiment of the baffle structure comprising a plurality of passages that each have a curved center line and a curved interior wall that are parallel to each other.

PREFERRED EMBODIMENT

[0041] Aside from the preferred embodiment or embodiments disclosed below, this invention is capable of other embodiments and of being practiced or being carried out in various ways. Thus, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of components set forth in the following description or illustrated in the drawings.

[0042] Partition 110 (FIG. 1) separates volume A of air 120 from volume B of air 130. Volumes of air A 120 and B 130 can each represent a room or space within a building separated by the partition 110 representing a wall within the same building.

[0043] For reference, the X and Y axes are directed parallel to the partition, and the Z-axis is directed perpendicular to the partition. The Y-axis is directed parallel to the top to bottom viewing perspective while the X axis is directed perpendicular to the Y.

[0044] The baffle structure 240 (FIG. 2) is disposed within partition 110 between two volumes of air 120, 130. The baffle structure 240 comprises a plurality of passages that each encompasses a straight line that extends between the two volumes of air 120, 130 (See FIG. 5).

[0045] Each of the plurality of passages within baffle structure 240 has two opposite and open ends. The ends of the passages on one side of partition 110 as shown in FIG. 2 comprise port A 242 of baffle structure 240. The ends of the passages on the opposite side of partition 110 that are not directly shown in FIG. 2 comprise port B 242B of baffle structure 240.

[0046] In this embodiment, the plurality of passages are formed by a honeycomb structure. Each passage has a hexagonal cross-section at each end and along the interior wall extending between each end and the two volumes of air 120, 130. The interior wall of each passage extends along a straight line between each end and between the two volumes of air 120, 130. The shape and the size of the cross-section of each passage at each end is the same (constant) for each of the plurality of passages. The shape and the size of the cross-section of each passage does not vary along the interior wall of the passage extending between each end and between the two volumes of air 120, 130.

[0047] For other embodiments, other structures can be used to form these passages. Also, the shape or size of the cross-section of each passage at each end can vary between each of the plurality of passages. Furthermore, the shape or the size of the cross-section of each passage can vary along the interior wall of the passage extending between each end and between the two volumes of air 120, 130.

[0048] Each cross-section of each passage as measured at each end or as measured along the interior wall between

each end of each passage, has a center point. The plurality of center points of the cross-sections of each passage as measured along the interior wall between each end forms a center line of each passage. In this embodiment, the center line of each passage is straight and parallel to its interior wall. In other embodiments, the center line may or may not be straight and may or may not be parallel to the interior wall of each passage.

[0049] The plurality of passages within baffle structure 240 are structured and arranged to accommodate air flow and to simultaneously restrict the passage of sound and light between the two volumes of air 120 and 130. Air flow through the baffle structure 240 enables any difference in air pressure between the two volumes of air 120 and 130 to equalize (balance).

[0050] This embodiment can be used as a vent between two rooms and/or spaces within a building to allow air to pass between one room or space and another room or space while restricting the passage of light and sound between those rooms and/or spaces. In this embodiment, each passage is shown to have a cross section that is hexagonally shaped (six-sided) and uniformly sized. The cross-section of each passage can be one of a variety of many shapes or sizes.

[0051] A central air system typically passes 50 to 200 cubic feet of air per minute through an air supply duct into a room or space. Generally, the larger the cross-sectional area of air passage provided by the ports 242A, 242B of a baffle structure, the smaller the pressure difference required between both ports 242A, 242B for the baffle structure 240 to pass a particular amount of air flow between volumes A 120 and B 130.

[0052] To limit pressure differences between two volumes of air 120, 130 to less than 2.5 Pascals while allowing 150 cubic feet per minute of air passage through the baffle structure 240, the cross-sectional area of air passage of the baffle structure 240 should approximate at least 140 square inches. For example, the embodiment shown in FIG. 2 with a twelve inch by twelve inch cross-section for each port 242A, 242B would allow 150 cubic feet per minute of air to pass through the baffle structure while limiting the pressure difference between each port 242A, 242B to less than 2.5 Pascals.

[0053] The frame 246 (FIG. 3A) encloses the plurality of passages and enables the baffle structure 240 to be properly fitted and aligned into an opening within a partition 110. The partition 110 can be an interior wall of a building. Port B 242B is not directly shown from this perspective.

[0054] Frame 246 is preferably made of sheet metal or plastic material. There is no requirement that the frame function as a structural member of the partition 110. Frame 246 preferably has two lips 248a and 248b each having an outer surface that are each parallel to a proximate outer surface of the partition 110. The distance between frame lips 248a and 248b is preferably equal to the width dimension (parallel to the Z axis) of the partition 110 to enable a snug and flush fit between the frame 246 and the partition 110. In some embodiments, the distance between the lips 248a and 248b is adjustable as shown in FIG. 5.

[0055] Preferably, to limit the cost of each installation, the frame 246 is constructed from sheet metal and the plurality

of passages are constructed from cardboard. Many other materials can be used to construct either the frame and/or the plurality of passages.

[0056] The embodiment of a frame 246 having a curved exterior surface 252 (FIG. 3B) encloses the plurality of passages and enables the baffle structure 240 to be properly fitted and aligned into an opening within a partition 110. The partition 110 can be an interior wall of a building. Port B 242B is not directly shown from this perspective.

[0057] The grill 250 (FIG. 4) functions as a decorative cover to the baffle structure 240. Grill 250 encloses port A 242 while allowing the passage of air flow. Port B 242B is not directly shown from this perspective. Optionally, grill 250 can have a plurality of louvers that redirect airflow traveling through baffle structure 240.

[0058] An embodiment of the frame 246 comprises two telescoping exterior surfaces 252A, 252B (FIG. 4A) that each have separate lips 248A, 248B respectively, and that optionally attach to a separate grill 250A, 250B. Exterior surface 252B of the frame 246 is manufactured to have a slightly larger exterior perimeter than that of the exterior surface 252A of the frame 246. Exterior surface 252B is designed to fit outside of and slide over exterior surface 252A to enable the width dimension (parallel to the Z axis) of the frame 246 to be adjustable.

[0059] Optionally, the frame 246 (FIG. 4A) can include portions which are sized to slide (telescope) into one another to adjust the width dimension (Z dimension, FIG. 1) of the frame 246. The width dimension of the frame 246 can be adjusted to the width dimension of the partition 110. As shown this embodiment, the frame 246 can optionally include grills 250A and 250B that are disposed on opposite sides of the partition 110 (not shown).

[0060] An embodiment of the baffle structure comprises a frame 246 and a screen 254 (FIG. 4B). The screen 254 filters particulate matter from the air flowing through the baffle structure 246. As shown, the screen 254 covers port A 242 of the baffle structure and partially covers lip 248a of the frame 246. Optionally, the screen can partially cover or entirely cover the lip 248a of the frame 246. The screen 254 can be manufactured from a variety of materials (typically metal or plastic) that filter particulate matter located within the air. Optionally the screen 254 can be further covered by a grill 250 to effect an appearance shown in FIG. 4.

[0061] Air flows through the plurality of passages of the baffle structure 240 (FIG. 5). In this embodiment, the plurality of passages are directed straight and parallel to each other. Each passage encompasses a straight line 580A, 580B, 580C extending between the two volumes of air 120, 130. The center line 590A, 590B, 590C and the interior wall 570A, 570B, 570C, 570D of each passage is straight and parallel to each other and parallel to the center line 590A, 590B, 590C and interior walls 570A, 570B, 570C, 570D of the other passages. The center line 590A, 590B, 590C and interior wall 570A, 570B, 570C, 570D of each passage are directed along straight lines that are perpendicular to the plane that is parallel to the opposing surfaces of the partition 110.

[0062] Preferably, the plurality of passages are formed by a honeycomb structure like that shown in FIG. 2. Straight and parallel passages, such as those formed by a honeycomb

structure, provide low resistance to air flow and provide an added benefit of reducing the air turbulence of air flow exiting the baffle structure 240 relative to that of the air flow entering the baffle structure 240.

[0063] In some embodiments (FIGS. 6 and 7), the plurality of passages are directed straight and parallel to each other and along straight lines that are not perpendicular to a plane that is parallel to the opposing surfaces of the partition 110. Each passage encompasses a straight line (not shown) extending between the two volumes of air 120, 130 (FIGS. 1 and 5).

[0064] These embodiments can be used to direct air exiting from the baffle structure 240 in the upward or downward direction as desired. The port 242A, 242B from which air is desired to enter the baffle structure 240 is placed on the side of the partition 110 having an air supply duct and/or not having an air return duct. The port from which air is desired to exit the baffle structure 240 is placed on the side of the partition 110 having the lower air pressure during the operation of the central air system.

[0065] In some embodiments (FIG. 8), the plurality of passages are directed between ports 242A, 242B along straight lines that are not parallel to each other and that are not necessarily perpendicular to a plane that is parallel to the opposing surfaces of the partition 110. Each passage encompasses a straight line (not shown) extending between the two volumes of air 120, 130.

[0066] In some embodiments, the passages of the baffle structure 240 (FIG. 9) have circular cross-sections. Each passage encompasses a straight line (not shown) extending between the two volumes of air 120, 130. The plurality of passages shown function in the same manner as the plurality of the passages shown in FIG. 2. The cross-sectional surface area of the openings of the passages should preferably be greater than 90% of the total cross-sectional area comprising the openings of the passages and the material forming the walls of the passages.

[0067] In some embodiments, the passages of the baffle structure 240 (FIG. 10) have rectangular cross-sections. Each passage encompasses a straight line 580A, 580B, 580C extending between the two volumes of air 120, 130. The plurality of passages shown function in the same manner as the plurality of the passages shown in FIG. 2.

[0068] In some embodiments, the passages of the baffle structure 240 (FIG. 11) each comprises a plurality of passages that each have cross-sections that vary in size along a its center line extending between ports 242A and 242B and volumes of air 120, 130. Each passage encompasses a straight line (not shown) extending between the two volumes of air 120, 130. The center point of each cross-section of the passage between its two ends forms a straight center line between port A 242A and port B 242B and the volumes of air 120, 130. The plurality of passages shown function in the same manner as the plurality of the passages shown in FIG. 2.

[0069] Preferably, the baffle structure 240 is oriented so that port A 242A is the port from which air is likely to exit. Preferably, port A is placed on the side of the partition 110 having lower air pressure during the operation of the central air system. In some embodiments, each of the plurality of passages of the baffle structure 240 (FIG. 12) has a center

line **1290** and an interior wall **1270** that is not straight. Each of the plurality of passages encompasses a straight line **1280** extending between both ports **242A**, **242B** and the two volumes of air **120**, **130**. The center point of each cross-section of the passage along its interior wall **1270** extending between its two ends forms a center line **1280** that is curved and not straight.

[0070] The embodiments of the return air pressure relief vent described are designed to permit a sufficient flow of air (150 cubic feet per minute) between two rooms or spaces to accommodate return air flow for a central air system while limiting the air pressure difference between the two rooms or spaces to be less than 2.5 Pascals. Furthermore, these embodiments are designed to restrict the passage of sound and light between the two rooms or spaces.

[0071] Although specific features of the invention are shown in some drawings and not in others, this is for convenience only as each feature may be combined with any or all of the other features in accordance with the invention. The words “including”, “comprising”, “having”, and “with” as used herein are to be interpreted broadly and comprehensively and are not limited to any physical interconnection. Moreover, any embodiments disclosed in the subject application are not to be taken as the only possible embodiments.

[0072] Other embodiments will occur to those skilled in the art and are within the following claims:

What is claimed is:

1. A return air pressure relief vent comprising:
 - a baffle structure having two ports and disposed in a partition between two volumes of air, each of said two ports confronting each of said two volumes of air respectively; and
 - said baffle structure including a plurality of passages, each of said plurality of passages encompasses a straight line extending between said two volumes of air, said plurality of passages structured and arranged to accommodate a pressure balancing flow of air between said two volumes of air while restricting the passage of sound and light.
2. The return air pressure relief vent of claim 1 in which said partition is a wall separating two rooms or spaces within a building and where each of said two rooms or spaces includes one of said two volumes of air respectively.
3. The return air pressure relief vent of claim 2 where the return air pressure relief vent permits 150 cubic feet per minute of air passage while limiting the pressure difference between the two volumes of air to less than 2.5 Pascals.
4. The return air pressure relief vent of claim 1 in which the baffle structure includes a frame configured to attach the plurality of passages to the partition.
5. The return air pressure relief vent of claim 4 in which said frame includes an exterior surface extending between said two ports.
6. The return air pressure relief vent of claim 5 in which said exterior surface comprises one or more rectangular and flat surfaces.

7. The return air pressure relief vent of claim 5 in which said exterior surface comprises one or more curved surfaces.

8. The return air pressure relief vent of claim 5 in which said exterior surface includes two sections which telescope into one another to adjust the width dimension of said frame.

9. The return air pressure relief vent of claim 4 in which said frame includes a grill covering at least one of the two said ports.

10. The return air pressure relief vent of claim 9 in which said grill includes a baffle member.

11. The return air pressure relief vent of claim 10 in which said baffle member includes a plurality of louvers.

12. The return air pressure relief vent of claim 9 in which said grill includes a screen.

13. The return air pressure relief vent of claim 1 in which said baffle structure includes a honeycomb structure, said honeycomb structure including at least some of the said plurality of passages.

14. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages have a circular cross-section.

15. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages are not parallel to other of said plurality of passages.

16. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages are not perpendicular to a plane defined by the exterior surfaces of the partition.

17. The return air pressure relief vent of claim 1 in which said frame is made from sheet metal.

18. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages have a cross-section that varies in size or shape along a center line of the passage extending between both ports of the baffle structure.

19. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages have a cross-section not equal to the size and shape of a cross-section of other of said plurality of passages.

20. The return air pressure relief vent of claim 1 in which said plurality of passages are constructed from a honeycomb structure manufactured from cardboard.

21. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages have a center line and an interior wall that are straight and parallel to each other.

22. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages have a center line and an interior wall that are not parallel to each other.

23. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages have a center line or an interior wall that is straight.

24. The return air pressure relief vent of claim 1 in which at least some of said plurality of passages have a center line or an interior wall that is not straight.

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