

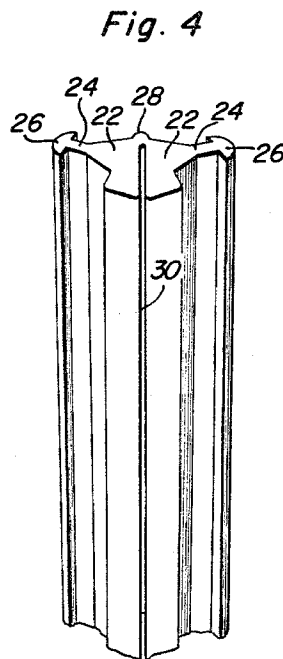
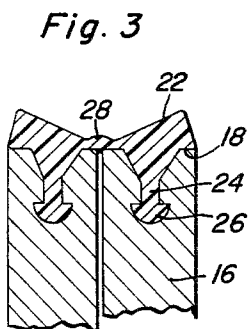
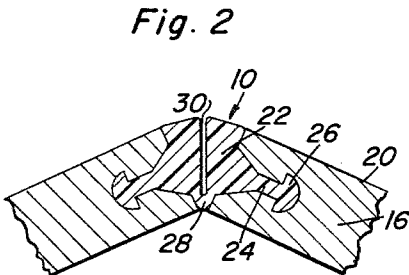
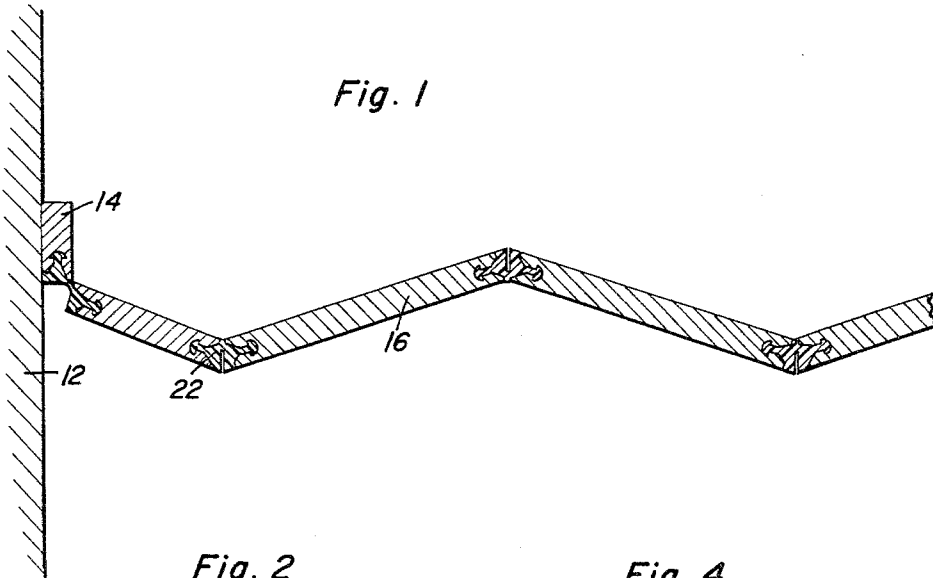
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3,236,289

FOLDING DOOR WITH FLEXIBLE JOINT

Original Filed July 21, 1960



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3,236,289

FOLDING DOOR WITH FLEXIBLE JOINT

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Original application July 21, 1960, Ser. No. 44,437, now Patent No. 3,131,753, dated May 5, 1964. Divided and this application Jan. 10, 1963, Ser. No. 250,647 3 Claims. (Cl. 160—231)

The present invention generally relates to a folding door with a flexible joint and more particularly this application is a division of co-pending application Serial No. 44,437 filed July 21, 1960 for Folding Door With Flexible Joint, now Patent No. 3,131,753, issued May 5, 1964.

It is an object of the present invention to provide a folding door of that type formed of a plurality of vertically elongated rigid panels adapted to be folded in relation to each other somewhat in the nature of an accordion so that when the door is in closed position, the panels are in extended angulated position with the accordion formation generally being substantially shallow. In the open position of the door, the panels are folded in face-to-face relationship to each other at one side of the door opening thereby requiring a minimum of space for the door and incorporating all of the advantages of a folding door such as the ease of opening and closing, ease of installation and the like.

The present invention involves an improved novel and unique joint construction between the panels which not only provides a joint between the panels but specifically provides a complete seal between adjacent panels for eliminating the passage of air, light and sound through the door panel. It is well known that sound and light will travel even through a very minute opening and with the present invention, the joint between the adjacent folding panels is completely sealed throughout the length of the panels. Ancillary to this, the joint is constructed in a manner which renders the entire joint quite attractive in appearance. Previously, there have been developed folding doors and the present invention represents an improvement on such folding doors. In some of the prior patented devices, the panels are interconnected by spring devices and an insert of wood material or an insert of whatever material from which the panels are constructed for purposes of somewhat concealing the joint. However, the spring devices are generally not concealed at all times and also do not provide a seal throughout the length of the panels due to warpage of the panels and the like. Therefore, the present invention has certain advantages over the prior patents in that it produces a complete air, light and noise seal from top to bottom of the folding door thereby rendering the door more effective for its particular purposes while at the same time not materially increasing the manufacturing cost thereof.

Another important object of the present invention is to provide a folding panel door having a novel joint therein which is continuously sealed and provides a highly attractive appearance while at the same time providing a highly effective connection between the panels which forms an effective seal to block passage of air, light and sound.

Another feature of the present invention is to provide a flexible hinge joint for a foldable door having a body portion overlying both edges of the panels and having flanges received in grooves formed in the edge of the panels.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a sectional view of a plurality of the

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panels and hinges forming the flexible door of the present invention;

FIGURE 2 is a detailed sectional view illustrating the hinge joint when the panels are in their unfolded accordion shaped relation;

FIGURE 3 is a sectional view similar to FIGURE 2 but with the panels disposed in folded face-to-face relation; and

FIGURE 4 is a perspective view of the hinge strip.

Referring now specifically to the drawings, the numeral 10 generally designates the hinge joint of the present invention incorporated into a folding panel door. The numeral 12 designates one side jamb to which an anchor strip 14 is attached. The door includes a plurality of elongated rigid panels 16 formed of wood or other suitable materials which have substantially flat edges 18 and flat parallel front and rear surfaces 20 which may also be considered as inner and outer surfaces which render the panels relatively easy to manufacture. The joint 10 of the present invention is used to interconnect the edges of adjacent panels 16 in a manner described hereinafter.

The particular details of the supporting mechanism for the panels and the particular details of any trackways provided in the header of the door frame do not form part of the present invention and have not been illustrated since various manners of supporting the panels may be employed.

The joint 10 includes an elongated insert which may be considered a molding that is continuous throughout the length of the panels. The hinge joint or molding 10 includes what may be considered two main body portions 22 of generally triangular configuration and including projections 24 with enlarged edges 26 received in the grooves in adjacent panels 16. The main body portions 22 are interconnected by a hinge area 28 with the remainder of the main body portions being separated by a line of division 30. This insert is constructed of a vinyl plastic or the like and the hinge area 28 forms substantially a hinge point or axis. The insert or molding actually forms substantially a "near" fixed hinge axis in that a very small area of flexible material is left free of the panels 16 or free of the main body portions of the molding thus leaving a very small area to permit flexibility as far as movement in a lateral direction is concerned but still permitting adequate area for pivotal movement of the adjacent panels.

The essential features of the invention lie in the provision of a continuous flexible resilient sealing strip extending between the panels with the sealing strip being of one piece construction for providing a connection between the panels and providing a sealed joint between the panels for eliminating passage of air, light, dirt and noise.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In a folding door, a series of vertical panels arranged in edge-to-edge relationship, and a continuous one-piece flexible element extending vertically between adjacent panels and forming a seal and hinge therebetween for enabling the panels to move from a folded condition in which the panels are disposed in generally parallel side-by-side relationship to an extended position in which the panels are disposed in a shallow accordion fold position, said element including a pair of generally triangular body portions connected together at the apices thereof by a

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relatively thin and narrow connecting area whereby the remainder of the adjacent surfaces of the body portion are slightly spaced apart for forming abutment means when the body portions are moved toward each other about a hinge axis defined by the connecting area with the slightly spaced surfaces moving into diverging relationship when the body portions are hinged away from each other about the hinge axis defined by the connecting area, each body portion having a flange projecting generally perpendicularly from the remote surfaces thereof and being relatively narrow in relation to the width of the remote surfaces, an edge bead on each flange, each of said panels having a groove in each side edge thereof for receiving the flanges on the element, said groove being undercut for receiving the beaded edge of the flange thereby securing the flexible element to the panels, said flexible element having a width generally equal to the thickness of the panels whereby the combined body portion and connecting area substantially completely covers the side edges of the panels with the connecting area being disposed generally coincidental with the adjacent corners of the adjacent panels thereby forming the sole means interconnecting the panels as well as the sole means for defining a hinge axis between the panels, for enabling movement of the panels between their folded and extended positions and limiting the movement of the panels when the adjacent surfaces of the body portion abut each other thereby preventing the panels from assuming a straight line position.

2. In a folding door, a series of vertical panels arranged in edge-to-edge relationship, and a continuous flexible element extending vertically between adjacent panels and forming a seal and hinge therebetween for enabling the panel to move from a folded condition in which the panels are disposed in generally parallel side-by-side relationship to an extended position in which the panels are disposed in a shallow accordion fold position, said element including a pair of body portions having a relatively thin edge connected together orientated at the adjacent corner edges of adjacent panels with the relatively thin edges being connected together by a relatively thin and narrow connecting area with the remainder of the adjacent surfaces of the body portions being slightly spaced apart when the panels are in their extended positions for forming abutment means when the body portions are moved toward each other about a hinge axis defined by the connecting area, each body portion having a flange projecting from the surface thereof engaged with the edge of an adjacent panel with the flange being relatively narrow in relation to the width of the body portion and thickness of the panel, each panel having a relatively narrow groove in the side edge thereof receiving the flanges on the element thereby securing the flexible element to the panels, each body portion of the flexible element having a width generally equal to the thickness of the panels

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whereby the body portions substantially completely cover the side edges of the panels with the connecting area being disposed generally coincidental with the adjacent corners of adjacent panels thus forming a hinge axis coincidental with the adjacent corners of adjacent panels for enabling movement of the panels between their folded and extended positions and limiting the movement of the panels toward their extended position when the adjacent surfaces of the body portions abut each other thereby preventing the panels from assuming a straight line position.

3. In a folding door, a series of vertical panels arranged in edge-to-edge relationship, and a continuous flexible element extending vertically between adjacent panels and forming a seal and hinge therebetween for enabling the panel to move from a folded condition in which the panels are disposed in generally parallel side-by-side relationship to an extended position in which the panels are disposed in a shallow accordion fold position, said element including a pair of body portions, each body portion having a relatively thin edge orientated at the adjacent corner edges of adjacent panels, the relatively thin edges being connected together by a relatively thin and narrow connecting area with the remainder of the adjacent surfaces of the body portions being spaced apart when the panels are in their extended positions, each body portion having a flange projecting from the surface thereof engaged with the edge of an adjacent panel with the flange being relatively thin in relation to the width of the body portion and thickness of the panel, each panel having a relatively narrow groove in the side edge thereof receiving the flanges on the element thereby securing the flexible element to the panels, each body portion of the flexible element having a width generally equal to the thickness of the panels whereby the body portions substantially completely cover the side edges of the panels with the connecting area being disposed generally coincidental with the adjacent corners of adjacent panels thus forming a hinge axis substantially with the adjacent corners of adjacent panels for enabling movement of the panels between their folded and extended positions.

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