

Jan. 18, 1966

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3,229,750

FOLDING DOOR AIR EXHAUST

Filed Oct. 21, 1963

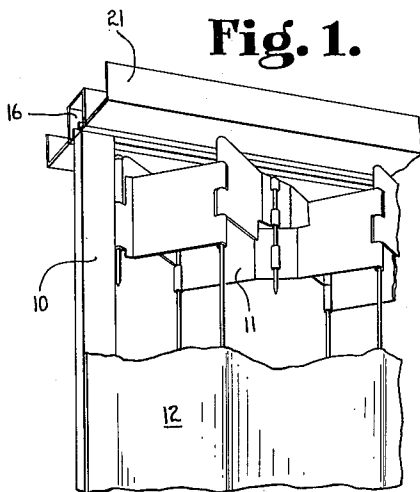
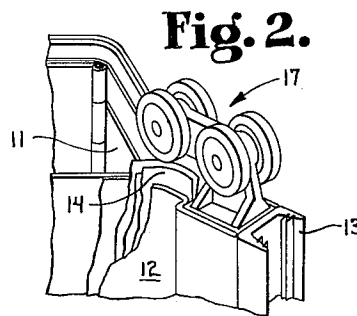
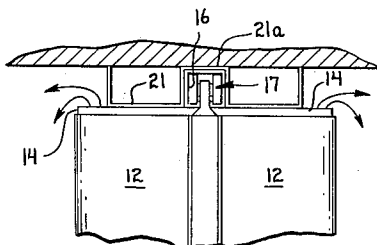
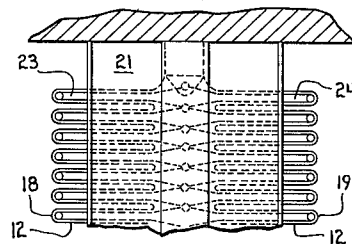
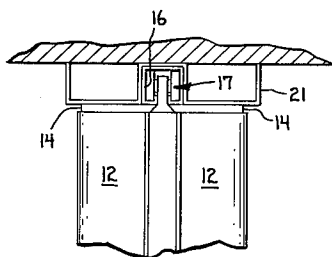
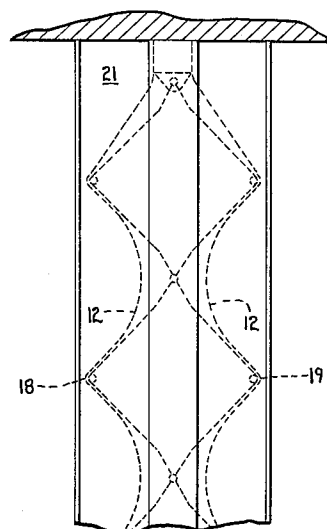


**Fig. 6.**  
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## FOLDING DOOR AIR EXHAUST

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Filed Oct. 21, 1963, Ser. No. 317,649

4 Claims. (Cl. 160-40)

This invention relates generally to sound retarding folding doors and in particularly to a sound retarding folding door having a novel means for exhausting or venting air from the interior of the door structure as the door is moved toward retracted position.

Folding door structures formed by fabric covered extensible and retractable frames are well known in the prior art. In the recent past, the ability to retard the transmission of sound across the extended door has become a factor of increasing importance. The sound isolating or retarding requirement has been effectively solved in prior art structures by air sealing the door structure and providing a sound retarding construction interior of the fabric covering for the door. The sealing of the door has, in general, been accomplished by providing sealing sweep strips along the top and bottom of the door structure and by providing a seal between the junction of the lead post and the jamb or between the junction of the two lead posts of two adjoining, intersecting doors.

While this sealed construction adequately retards sound transmission, it introduces a further problem. Since each extended door is, in effect, a sealed air cell, when the door is moved toward retracted position, unless adequate means for venting the air from the interior of the door structure is provided, the resistance to compression of the trapped air opposes retracting movement of the door and causes the covering fabric of the door to distort or "balloon" outwardly.

It is the primary object of the present invention to provide a folding door structure which adequately vents the interior of the door as it is moved toward retracted position.

It is a further object of the present invention to provide a folding door or partition structure of the type referred to which adequately vents the interior of the door structure as it is moved toward retracted position without the use of seal destroying vent openings in the door jamb or in the fabric covering of the door.

These and other objects will become apparent as the description proceeds with reference to the accompanying drawings in which:

FIG. 1 is a fragmentary, perspective view of a folding door structure embodying the present invention with portions of the flexible exterior covering broken away to better illustrate the interior construction.

FIG. 2 is a fragmentary, perspective view of a further portion of the door structure.

FIG. 3 is a fragmentary, end view of the door structure shown in stacked or retracted position.

FIG. 4 is a top plan view of the structure shown in FIG. 3, again with the door in retracted position.

FIG. 5 is a view similar to FIG. 3 but showing the door structure in extended position.

FIG. 6 is a top plan view, similar to FIG. 4 but showing the door structure in extended position.

Referring to the drawings, there is shown in FIG. 1 a folding door structure which is composed of a fixed jamb 10 and a framework composed of hinged plates 11. Certain of the pintles for the hinged plates are elongated and the plates carry generally parallel, spaced, flexible fabric covering 12. As may best be seen in FIG. 2 the fabric covering extends adjacent to a lead post 13 for the door structure which is adapted to have substantially sealed engagement with a fixed door jamb or with the lead post of an intersecting, adjoining, folding door.

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As may best be seen in FIG. 2, laminated between the fabric covering and the frame are sound retarding sweep strips 14 which extend somewhat above the upper margin of the fabric covering 12.

The inner frame and the fabric covering 12, forming two spaced flexible walls, is suspended from a ceiling or other overlying supporting surface by means of a track member 16 which cooperates conventionally with a trolley assembly (indicated generally at 17 in FIG. 2) extending at spaced intervals from the upper margin of the frame. This supporting means for the frame permits movement of the door structure between an extended position illustrated in FIG. 6 and a retracted position illustrated in FIG. 4.

As will be evident from FIGS. 4 and 6, the spaced, flexible walls formed by the fabric covering 12 have an accordion-like folded configuration so that a line joining the apices of opposite folds is generally normal to the direction of movement of the door structure as it is moved between its extended position of FIG. 6 and its retracted position of FIG. 4. When the door structure is in its extended position of FIG. 6 it will be evident that the distance between correspondingly opposite fold apices, between the points 18 and 19, for example, is at a minimum and that the distance between correspondingly opposite apices becomes a maximum as the door structure assumes its retracted position of FIG. 4.

The structure further includes a sealing element, taking the form of the plate 21 and this plate is supported on the ceiling or other overlying supporting surface so that the upper margins of the sweep strips 14 engage or wipe the face of the plate 21. As will be evident from FIGS. 1, 3, and 5, the plate 21 may have an inset portion 21a to accommodate the track element 16.

The plate 21 is coextensive with the path of travel of the door structure as it moves between its extended position of FIG. 6 and its retracted position of FIG. 4. As will be evident from FIGS. 5 and 6 the plate 21 has a width such that the plate spans the distance between correspondingly opposite apices of the flexible wall folds only as the door structure closely approaches its extended position of FIG. 6. As the door structure is moved away from its extended position toward its retracted position, the correspondingly opposite apices of the flexible wall folds move outboard of the marginal edges of the plate 21 and the apex portions (indicated at 23 and 24 in FIG. 4) are unmasked from the face of the plate 21.

Thus, after a slight initial movement of the door structure from its extended position and toward its retracted position, the apex areas unmasked from the surface of the plate 21 serve as openings for venting from the top of the door structure the air which must be forced from the structure as the door is moved into its retracted position, the venting referred to being indicated by arrowed lines in FIG. 3.

In the foregoing description, the structure has been referred to as a folding door and it will be understood that such reference includes structures variously referred to as folding partitions or room dividers. It will be evident that the structure of the present invention provides appropriate venting of air from the interior of the door structure so as to eliminate distortion of the flexible wall coverings and resistance to retracting impetus as the door structure is moved towards retracted position. When the door structure is in extended position the sealed construction necessary for retarding the transfer of sound across the door structure is maintained. No seal destroying vent openings need be made in the lead post 13 or in the fabric covering 12. It will be understood that the venting arrangement described also permits air to be freely drawn into the interior of the door structure as the door is

extended, such intake of air terminating as the door closely approaches its extended position.

While the invention has been disclosed and described in some detail in the drawings and foregoing description, they are to be considered as illustrative and not restrictive in character, as other modifications may readily suggest themselves to persons skilled in this art and within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. A folding door structure adapted to retard the transfer of sound, said door structure including two spaced, generally parallel, flexible walls supported on an extensible and retractable framework, supporting means for slidably suspending said frame from an overlying supporting surface and permitting movement of said frame and the spaced flexible walls supported thereby between a retracted and an extended position, said spaced walls having an accordion-like folded configuration with the folds disposed so that a line joining the apices of opposite folds is generally normal to the direction of movement of the door structure between said extended and retracted positions, the distance between the apices of correspondingly opposite folds on said walls varying from a minimum to a maximum as the door structure is moved between said extended and retracted positions, and a plate adapted to overlie and be engaged by the upper margins of said flexible walls, said plate being coextensive with the path of travel of the door structure as it moves between said extended and retracted positions and spanning the distance between correspondingly opposite apices of said flexible wall folds only as the door structure closely approaches its said extended position, whereby movement of said door structure from its said extended position toward its said retracted position moves the correspondingly opposite apices of said folds outboard of said plate to vent the space between said flexible walls upwardly through the spaces thereby unmasked from said plate.

2. A folding door structure adapted to retard the transfer of sound, said door structure including spaced, generally parallel, flexible walls supported on an extensible and retractable framework, supporting means for slidably suspending said frame from an overlying supporting surface and permitting movement of said frame and the spaced flexible walls supported thereby between a retracted and an extended position, said spaced walls having an accordion-like folded configuration with the folds disposed so that a line joining the apices of opposite folds is generally normal to the direction of movement of the door structure between said extended and retracted positions, the distance between the apices of correspondingly opposite folds on said walls varying from a minimum to a maximum as the door structure is moved between said extended and retracted positions, and a sealing element adapted to overlie and be engaged by the upper margins of said flexible walls, said element being coextensive with the path of travel of the door structure as it moves between said extended and retracted positions and spanning the distance between correspondingly opposite apices of said flexible wall folds only as the door structure closely approaches its said extended position, whereby movement of said door structure from its said extended position toward its said retracted position moves the correspondingly opposite apices of said folds outboard of said ele-

ment to vent the space between said flexible walls upwardly through the spaces thereby unmasked from said element.

3. A folding door structure adapted to retard the transfer of sound, said door structure including spaced, generally parallel, flexible walls, supporting means for slidably suspending said flexible walls from an overlying supporting surface and permitting movement of said walls between a retracted and an extended position, said spaced walls having an accordion-like folded configuration with the folds disposed so that a line joining the apices of opposite folds is generally normal to the direction of movement of the door structure between said extended and retracted positions, the distance between the apices of correspondingly opposite folds on said walls varying from a minimum to a maximum as the door structure is moved between said extended and retracted positions, and a sealing element adapted to overlie and be engaged by the upper margins of said flexible walls, said element being coextensive with the path of travel of the door structure as it moves between said extended and retracted positions and spanning the distance between correspondingly opposite apices of said flexible wall folds only as the door structure closely approaches its said extended position, whereby movement of said door structure from its said extended position toward its said retracted position moves the correspondingly opposite apices of said folds outboard of said element to vent the space between said flexible walls upwardly through the spaces thereby unmasked from said element.

4. A folding door structure adapted to retard the transfer of sound, said door structure including two spaced, generally parallel, flexible walls supported on an extensible and retractable framework, supporting means for slidably suspending said frame from an overlying supporting surface and permitting movement of said frame and the spaced flexible walls supported thereby between a retracted and an extended position, said spaced walls having an accordion-like folded configuration, the distance between the apices of said flexible wall folds and the axis of motion of said door structure varying from a minimum to a maximum as the door structure is moved between said extended and retracted positions, and a sealing element adapted to overlie and be engaged by the upper margins of said flexible walls, said element being coextensive with the path of travel of the door structure as it moves between said extended and retracted positions and spanning the distance between the apices of said flexible wall folds and the axis of motion of said door structure only as the door structure closely approaches its said extended position, whereby movement of said door structure from its said extended position toward its said retracted position moves the apices of said folds outboard of said element to vent the space between said flexible walls upwardly through the spaces thereby unmasked from said element.

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