FOLDING DOOR WITH FLEXIBLE HINGE STRIPS

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This invention relates to a folding door composed of panels that are hinged together along their side edges by means of flexible hinge strips so that the door when opened will be shallow, accordion-shape, and when closed the panels will be stacked face-to-face against each other.

One object of the invention is to provide a hinge strip formed of flexible material and having a pair of strip members at an angle relative to each other and terminating in enlarged beads along their edges so that they can enter slots in the side edges of door-forming panels with the enlarged beads in enlargement at the bottoms of the slots for retaining the hinge strips in the panel edges and the panels in assembled relation to each other thereby for effective opening and closing movement of the door.

Another object is to provide the hinge strip formed of stretchable material so as to have a cushioning effect that prevents damage to the door in case of accidental blows.

A further object is to provide the ends of the panels bevelled so as to limit the closing of the door to the desired shallow, accordion shape.

Still a further object is to provide a modified form of the hinge strip having a panel edge-engaging bead along the central portion thereof to engage square edges of panels and thus limit the closed position of the door to the desired shallow, accordion shape.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my folding door with flexible hinge strips, whereby the objects above contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in detail in the accompanying drawing wherein:

Fig. 1 is a perspective view of a folding door embodying my invention and associated with a door frame;

Fig. 2 is an enlarged plan view showing a section of the door in the closed position of Fig. 1;

Fig. 3 is a similar plan view showing the door in the open and collapsed position;

Figure 4 is an enlarged sectional view through one of the hinge strips and shows in solid lines the normal position thereof, and in dotted lines the position thereof assumed when the door is opened from the position of Figure 3 to the position of Figure 2; and

Figures 5, 6 and 7 are views similar to Figures 2, 3 and 4, respectively, showing a modified construction of hinge strip.

On the accompanying drawing I have used the reference numerals 10, 12, 14, 16, 18, 20 and 22 to indicate successive panels of a folding door which panels are substantially identical. Their vertical side edges are connected together by hinge strips H, each of which as shown in Figure 4 comprises a pair of flanges 24 and 26 at substantially right angles to each other which terminate in enlarged beads 28 and 30 along their edges. The hinge strips H extend substantially throughout the vertical lengths of the panels 10, 12, 14, 16, 18, 20 and 22, as well as the remaining panels shown in Figure 1 but not numbered.

The side edges of the panels are provided with slots 32 to receive the flanges 24 and 26 and the bottoms of these slots are enlarged as indicated at 34 to receive the beads 28 and 30 of the hinge strips H. The hinge strips are slid longitudinally into the slots 32 and enlargements 34, preferably under slight compression, the hinge strips being made of rubber or rubber-like material such as soft, flexible, resilient plastic, neoprene or the like.

The hinge strips H as shown in Figure 4 by solid lines are formed with the flanges 24 and 26 substantially at right angles (x) to each other, and the strips are slid into the slots 32 of the panels while they are in the position of Figure 3. When the door is moved to the closed position shown in Figure 2, the hinge strips H are bent to the dotted shape shown in Figure 4, reversing the angle (x) as indicated (y).

To show the action of the hinge strips H, the solid position in Figure 4 is designated A, and the corresponding position in Figure 3 is designated a. The bent position of the hinge from normal position is shown at A′ in Figure 4 and at a′ in Figure 2.

To limit the door to shallowness, accordion character in its closed position as shown in Figures 1 and 2, the edges of the panels 12, 14, 16, 18, 20 and 22 are bevelled as indicated at 36. These bevelled edges contact each other in the closed position of the door as shown in Figure 2.

In Figures 5, 6 and 7, a modified shape of hinge strip H is shown having flanges 24a and 26a, and beads 28a and 30a similar to those illustrated in Figure 4, but additionally having a limiting bead 38 at the intersection of the flanges 24a and 26a. With this limiting bead the vertical side edges of the panels (two of which, 18a and 20a are shown in Figure 5) may engage for limiting the shallow, accordion closed shape of the door and the beads 38 form a trim along the opposite edges of the panels in the collapsed position of Figure 6.

Again, the normal and sprung shapes for the hinge strip H′ are shown in Figure 7 as B and B′ respectively which correspond to the positions b and b′ of Figures 6 and 5 respectively.

From the foregoing specification it will be obvious that I provide a comparatively simple hinge strip for connecting the side edges of the panels of a folding door together such as a door of the type shown in my patent No. 2,677,420. The hinge strips are neat in appearance and so cooperate with the panels as to hold them in a shallow, accordion shape as desired in the closed position of the door by means of either bevelled edges as shown in Figure 2 or the beads 38 as shown in Figure 5.

Some changes may be made in the construction and arrangement of the parts of my folding door with flexible hinge strips without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may reasonably be included within their scope.

I claim as my invention:

1. A folding door, a series of panels adapted to lie face-to-face in the open position of the door and to assume a shallow, accordion shape in the closed position thereof, and flexible hinge strips for connecting adjacent edges of said panels together comprising substantially angle shaped strips having enlarged beads along the edges of their flanges and each having a third enlarged bead medially thereof, said flanges being received in slots of said panels which have enlargements provided to receive said beads, said hinge strips being bendable to permit partial closure of said panels to said shallow, accordion shape with said third beads limiting such closing by engagement of the panel edges therewith.
2. In a folding door with flexible hinge strips, said hinge strips being substantially angle shaped and having enlarged beads along the edges of their flanges, said flanges and beads being received in slots and enlargements of the panels that form the door and being bendable to permit closing thereof to a shallow, accordion shape, said hinge strips each having a limiting bead longitudinally thereof and located substantially midway between said enlarged beads and on one side only of the strip.

3. In a folding door, a series of panels adapted to lie face-to-face in the open position of the door and to assume a shallow, accordion shape in the closed position thereof, flexible hinge strips for connecting adjacent edges of said panels together comprising substantially angle shaped strips having enlarged beads along the edges of their flanges, said flanges being received in slots of said panels which have enlargements to receive said beads, said hinge strips being bendable to permit closing of said door to said shallow, accordion shape, said angle shaped strips having limiting beads projecting from the outside corners of the intersections of their flanges and adaptable to be engaged by the edges of said panels in the closed position of the door to limit the door to said shallow, accordion shape.

4. In a folding door, a series of panels, flexible hinge strips for connecting adjacent edges of said panels together comprising substantially angle shaped strips having enlarged beads along the edges of their flanges, said flanges being received in slots of said panels which have enlargements to receive said beads, said hinge strips being bendable to permit closing of said door to a shallow, accordion shape, and each of said angle shaped strips having a limiting bead integral therewith and adaptable to be engaged by the edges of adjacent panels in the closed position of the door to limit the door to said shallow, accordion shape.

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