Feb. 26, 1935. D. E. RUTISHAUSER 1,992,239

REFRIGERATOR DOOR

Filed Aug. 6, 1931

FIG. 1

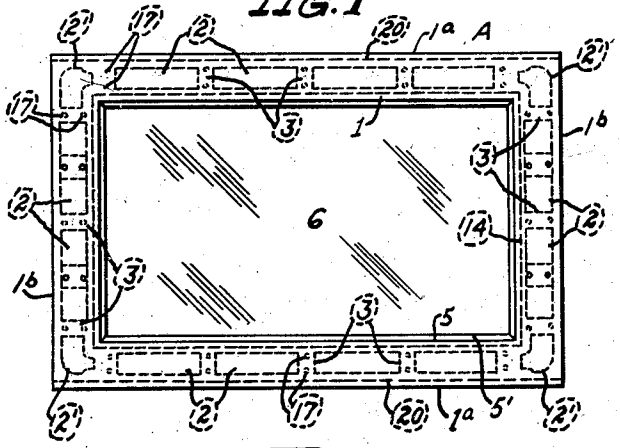


FIG. 2

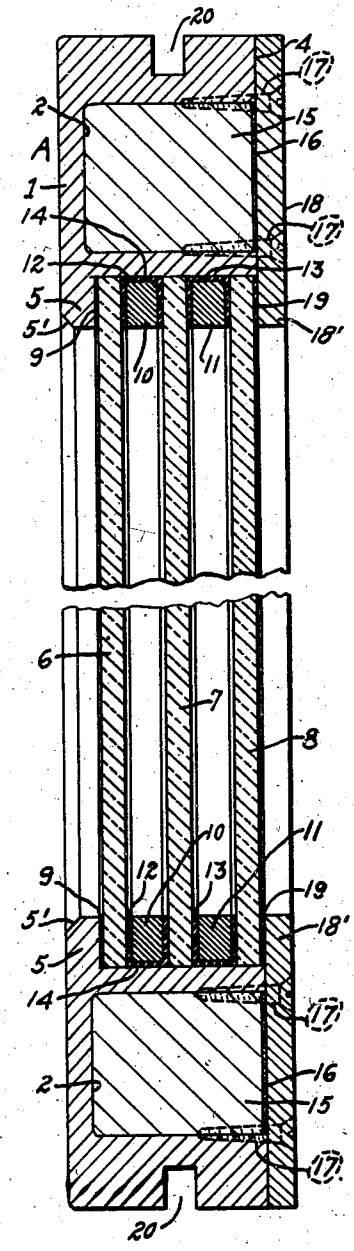
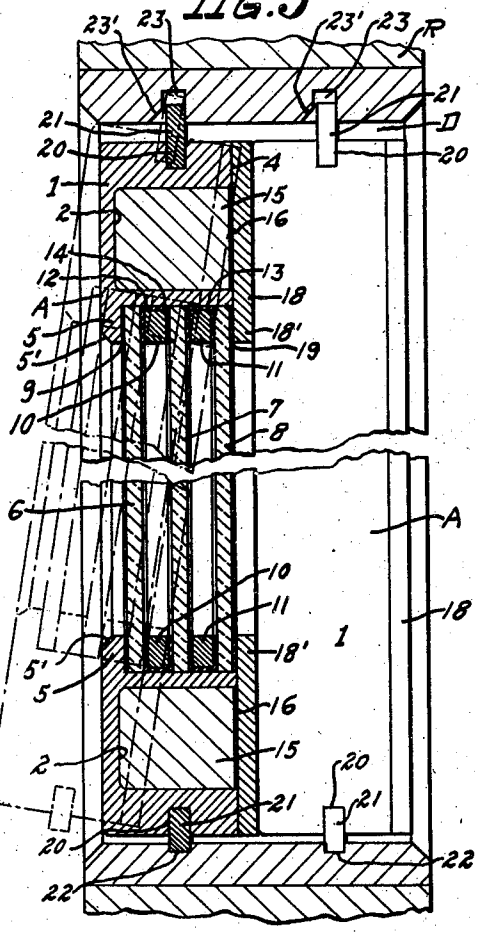


FIG. 3



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REFRIGERATOR DOOR

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3 Claims. (Cl. 20—35)

This invention relates generally to doors, and more specifically to a refrigerator door of the type having a transparent portion produced by a plurality of layers of glass or other transparent material, the predominant object of the invention being to provide an improved door of the type mentioned which is so constructed that moisture is excluded from the spaces between the adjacent layers of transparent material.

Fig. 1 is an elevation of a refrigerator door constructed in accordance with this invention.

Fig. 2 is an enlarged section on line 2—2 of Fig. 1, a portion of the door illustrated in said view being broken away to conserve space.

Fig. 3 is a sectional view showing doors constructed in accordance with this invention associated with a refrigerator.

In the drawing, wherein is shown for the purpose of illustration, merely, one embodiment of the invention, A designates my improved door generally. The door A comprises a rectangular body portion 1 which is open at its center to provide a marginal frame and is provided with a plurality of cavities 2, the adjacent cavities being separated by walls 3 which are substantially flush with the face 4 of the door at which the open ends of the cavities are located. The cavities 2, preferably, though not necessarily, are of different dimensions and shapes, as shown in Fig. 1, the cavities in the longitudinal bar portions 1^a of the body portion being elongated in shape, while the cavities in the transverse bar portions 1^b are more nearly square. Also, the cavities 2' at the four corners of the body portion have the shape illustrated in Fig. 1. While the precise shapes of the cavities 2 have been referred to herein, it is obvious that these shapes may be varied as desired without departing from the spirit of the invention.

Extended inwardly from the inner edges of the longitudinal and transverse bar portions 1^a and 1^b of the body portion 1 is a continuous flange 5, which may, if desired, be provided with a beveled edge 5'. The flange 5 serves as a stop or abutment for a layer 6 of glass or other transparent material, said layer 6 having associated therewith a layer 7 of similar material which is spaced inwardly from said layer 6. Also, a layer of transparent material 8, which is similar to the layers 6 and 7, is spaced inwardly from said layer 7. Interposed between the layer of transparent material 6 and the inwardly extended flange 5 is a layer of suitable cement 9 which preferably is coextensive with the inner face of said flange and serves to securely fix the layer of material to the flange. Also interposed between the layers of transparent material 6 and 7 and between the layers of transparent material 7 and 8 are spacing elements 10 and 11. The spacing elements 10 and 11 have associated with them what might be termed gaskets 12 and 13, each of said gaskets being shaped so as to contact with three faces of the associated spacing element and portions of the gasket being interposed between the opposite side faces of the spacing element and the layers of transparent material at opposite sides of said spacing element, and between faces of the spacing element and the adjacent inner face 14 of the body portion 1. The gaskets are formed of soft rubber or other suitable compressible material.

Disposed within the cavities 2 of the body portion 1 are bodies of suitable insulating material 15, such, for instance, as cork, and applied to the face of each of said bodies of insulating material which is located at the face 4 of the body portion 1 is a layer of suitable moisture-proof material 16. For this purpose I find that a material known commercially as "Flexseal" serves in an ideal manner, although other pitch or tar compositions may be used with success. Secured to the body portion 1 of the door A at the face 4 thereof by means of fastening devices 17 is an element 18 of the same rectangular shape as said body portion. The element 18 is coextensive with the face 4, and in addition thereto said element includes an inwardly extended portion 18' which overlaps the outer edge portion of the layer of transparent material 8, as shown in Figs. 2 and 3, and interposed between said portion 18' of the element 18 and said layer of material 8 is a layer 19 of soft rubber or other suitable compressible material.

In assembling my improved door the bodies of insulating material 15 are arranged in the cavities 2 and the layers of moisture-proof material 16 are applied to the outer faces of said bodies of insulating material. The layer of cement 9 is also applied to the inner face of the flange 5 and the layer of transparent material 6 is arranged in place so as to be secured to said flange by said cement. The other layers of transparent material are then located in their proper positions with the spacing elements 10 and 11, and the gaskets 12 and 13 disposed so as to separate said layers of transparent material, as illustrated in Figs. 2 and 3. When the layers of transparent material 6, 7, and 8, together with the spacing elements 10 and 11 and the gaskets 12 and 13, are arranged in position, the outer face of the layer of transparent material together with the layer of material 19 will extend outwardly slightly be-

yond the face 4 of the body portion 1. The element 18 is then arranged in place and the fastening devices 17 are screwed inwardly to draw the inner face of said element 18 into close contact with the face 4 of the body portion and the outer faces of the layers of moisture-proof material 16 on the outer faces of the bodies of insulating material 15. The result of this will be that the group of parts comprising the layers of transparent material, the spacing elements, the gaskets and the layer of material 19 will be crowded together by the inwardly moving element 18, hence the gaskets and the layer of material 19 will be compressed so as to provide tight, moisture-proof joints between the layers of transparent material and the parts of the door structure arranged adjacent thereto. Thus in the use of my improved door the trouble and annoyance formerly encountered in the use of doors as heretofore constructed in connection with moisture finding its way into the spaces between the spaced layers of transparent material is entirely eliminated, and said spaces are maintained at all times free from moisture.

In Fig. 3 I illustrate the manner in which my improved doors are associated with a refrigerator, in which view R designates the refrigerator and D designates the door opening thereof. Each of my improved doors is provided with grooves 20 formed in its top and bottom edge, said grooves being extended from end to end of the door as shown by dotted lines in Fig. 1. Arranged in each of the grooves 20 is a guiding element 21, a portion of said guiding element being fixedly seated in the associated groove and another portion of said guiding element being extended outwardly beyond the adjacent edge of the door. At its lower face the door opening D is provided with a groove 22 for each door which provides a guideway in which the lower guiding element 21 of the door is slidably seated, and at its upper face said door opening is provided with a groove 23 for each door which likewise provides a guideway in which the upper guiding element 21 of the door is slidably seated. The groove 22 at the lower face of the door opening is quite shallow while the groove 23 at the upper face of the door opening is substantially deep and is of slightly greater width than the thickness of the guiding element 21 which is extended into said groove. Also, the groove 23 is provided with an angular face 23' which gives the lower portion of the groove an irregular shape, as shown clearly in Fig. 3.

When it is desired to remove one of my doors from the refrigerator with which it is associated, the door is moved upwardly, there being sufficient space between the top wall of the groove 23 and the top edge of the associated guiding element 21 to permit such movement. This upward movement of the door will withdraw the guiding element at the lower edge of the door from the groove 22, whereupon the lower portion of the door may be swung outwardly to the approximate position in which it is illustrated by dotted lines and the door lowered to remove the guiding element 21 from the groove 23.

An important feature of the invention resides in the fact that because the insulating material 15 is located in a plurality of independent cavities 2, only the bodies of insulating material with which moisture has actually contacted need be removed in the event moisture contacts with the insulating material. In other words, if a single continuous cavity were provided for the reception of the insulating material, the entire body of insulating material would have to be replaced if moisture came into contact with any part thereof. With the independent cavities, however, only the insulating material actually subjected to the effects of moisture need be replaced as the moisture is confined to the cavity into which it directly finds its way.

I claim:

1. A refrigerator door comprising a marginal frame provided with a plurality of cavities open at a face of the frame, insulating material located within said cavities, means comprising a marginal plate for closing the open portions of said cavities in a manner to confine said insulating material therein, and a transparent portion within the marginal frame and marginal plate.

2. A refrigerator door comprising a marginal frame provided with a plurality of cavities open at a face of the frame, insulating material located within said cavities, a layer of moisture-proof material on said insulating material at the open ends of the cavities, means comprising a marginal plate for closing the open portions of said cavities in a manner to confine said insulating material therein, and a transparent portion within the marginal frame and marginal plate.

3. A refrigerator door comprising a marginal frame provided with a plurality of independent cavities, bodies of insulating material in said cavities, said cavities being open at a face of said marginal frame, layers of moisture-proof material on the faces of said bodies of insulating material located at the open portions of said cavities, means comprising a marginal plate for closing the open portions of the cavities in a manner to confine the insulating material therein, and a transparent door portion within the marginal frame and marginal plate.

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