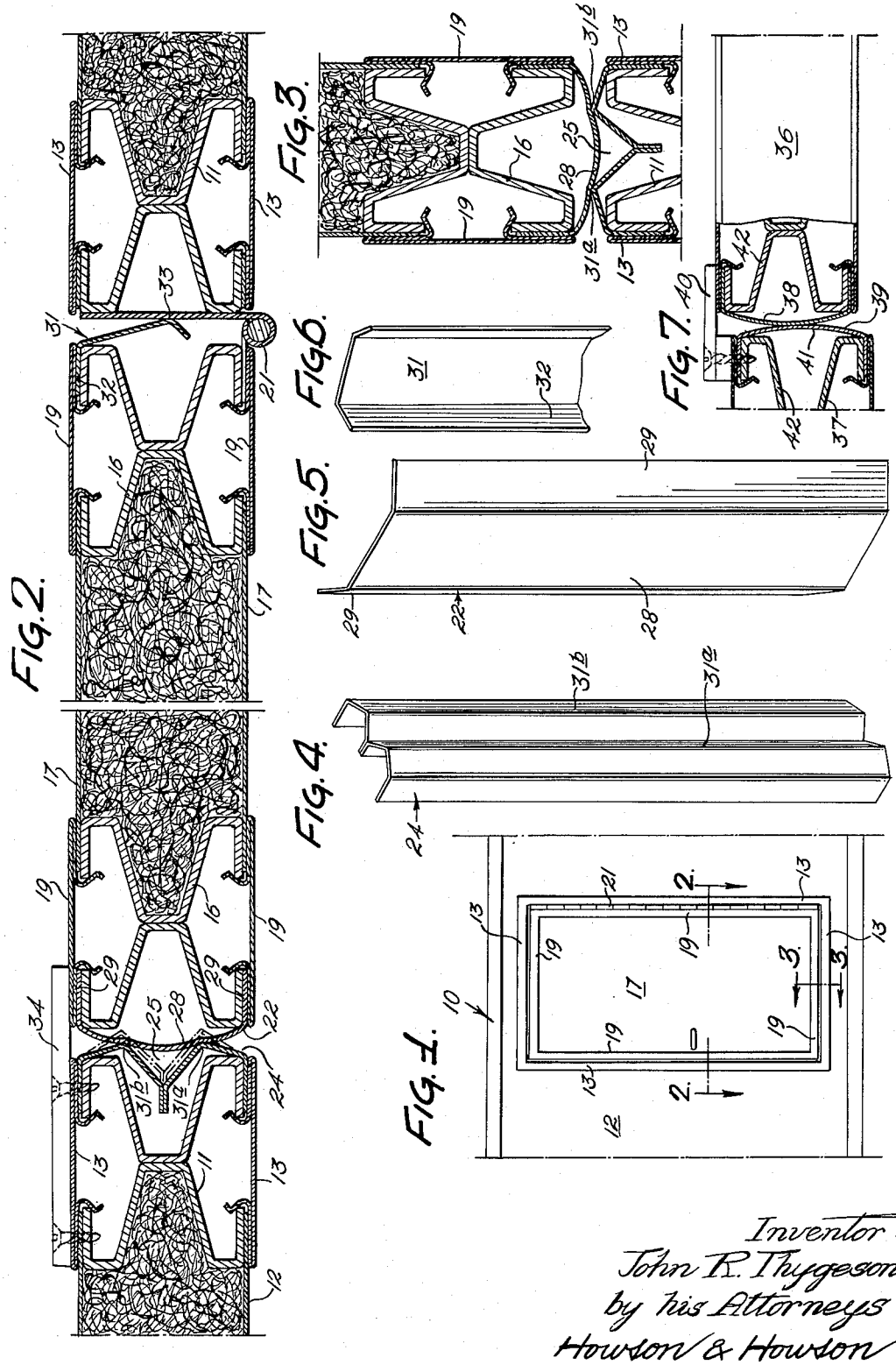
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SEALED DOOR CONSTRUCTION FOR DRYERS AND THE LIKE

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# SEALED DOOR CONSTRUCTION FOR DRYERS AND THE LIKE

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The present invention relates to a door and seal construction for closures such as the housings of dryers and the like and more particularly to a novel seal construction which operates both to seal the door in the frame and to eliminate the need for separate latch means to maintain the door in closed position.

The conventional seal for dryer doors consists of a gasket, rubber or other suitable material, secured about the periphery of the door or its frame and held in compression between the door and the frame by a positive latch mechanism. The gasket and the latch mechanism protrude beyond the surface of the door and frame and frequently are affected by the high temperature at which the dryer is operated. In addition such constructions are comparatively expensive and usually preclude the provision of a door construction, which has a smooth unbroken surface to provide flush surfaces both interiorly and exteriorly of the dryer, a condition which is highly desirable in dryer constructions.

With the foregoing in mind, a primary object of the present invention is to provide a novel and inexpensive seal construction for the doors of dryers and similar enclosures.

The invention further contemplates a novel door structure, embodying effective, inexpensive, and durable sealing means which is inexpensive, easy to install, is resistive to wear, and is not adversely affected by the elevated temperatures of the drying atmosphere within the dryer housing.

Another object is to provide a novel seal construction for doors for dryers and like enclosures which is confined within the door frame opening when the door is closed to provide a flush door with both the interior and exterior walls of the inclosure.

These and other objects of the invention and the various features and details of the construction and operation thereof are more fully set forth hereinafter with reference to the accompanying drawing in which:

Fig. 1 is a fragmentary side elevational view of a panel for a dryer housing embodying a door construction in accordance with the present invention;

Fig. 2 is an enlarged horizontal sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary vertical sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a detached perspective view of a sealing strip for the jamb of the door frame illustrated in Fig. 2;

Fig. 5 is a detached perspective view of the sealing strip for the free edge of the door illustrated in Fig. 2;

Fig. 6 is a detached perspective view of the sealing strip for the hinged edge of the door illustrated in Fig. 2; and,

Fig. 7 is a fragmentary sectional view similar to Fig. 2 illustrating a modified form of the invention.

The present invention contemplates a novel door and seal construction for dryer housings comprising a door composed of panels releasably secured to a framework of prefabricated structural members and cooperating sealing



strips provided on the confronting edges of the door and the door frame.

Referring now to the drawing, the housing 10 comprises a plurality of interconnected structural members 11, and wall panels 12 secured to the structural members by snap strips 13 as clearly illustrated in Fig. 2. The door is likewise formed of interconnected structural members 16 and wall panels 17 held in place on the members 16 by means of a plurality of snap strips 19. The structural elements of the housing and door may be similar to that described in copending U. S. application Serial No. 223,840 filed April 30, 1951. The door is hingedly supported in the housing as indicated at 21 and suitable sealing means is provided about its entire periphery.

In accordance with the invention, the sealing means comprises a U-shaped resilient strip 22 of metal such as, for example, spring steel, secured about the top and bottom and the free swinging edge of the door by the snap strips 19, and a cooperating W-shaped sealing strip 24 secured to the confronting structural members of the door frame. The W-shaped strip 24 defines a longitudinal channel or recess 25 to receive the strip 22 as described more fully hereinafter. The strip 24 is resilient and dimensioned so that the protruding side edges 31*a* and 31*b* of the channel 25 are biased outwardly into the frame opening as indicated by the broken lines in Fig. 2. In the present instance, the strip 24 comprises a pair of flanged members which are formed as illustrated in Fig. 4 and welded together along their length to provide a continuous channel along the confronting edge of the frame. The outer flanges of the strips 24 are dimensioned to snugly embrace the structural member 11 and are held securely in place by the snap strips 13, as illustrated in Fig. 2.

The U-shaped strip 22 is engaged in the channel 25 when the door is in the closed position as illustrated in Fig. 2. The peripheral edge portions of the strip 22 are turned back as indicated at 29 and are confined between the structural member 16 and the snap strips 19 to cause the body portion 28 of the strip to bow outwardly into the channel 25. Thus, when the door is closed, the outwardly bowed body portion 28 of the strip 22 is engaged behind the protruding side edge 31*a* of the channel 25, and because of the resilient character of the material forming the strips 22 and 24, a double sealing contact is provided between the door and the jamb as indicated at 31*a* and 31*b*.

It should be noted that the strips 22 and 24 correspond in width to the thickness of the door and the jamb so that when the door is closed, with the strip 22 nesting in the channel 25, there is no protruding surface beyond the sides of the door and the latter is thereby flush with the interior and exterior walls of the housing. This is especially important in dryer housings for treating chemical and other pulverulent and finely divided materials which may lodge and collect on protruding surfaces causing corrosion. Since the strips are formed of resilient metal, they are not subject to deterioration by the elevated temperatures or other conditions within the housing. However, in the event of corrosion or other damage, each strip can be removed readily simply by removing the snap strips and the damaged strip, and replacing the latter with a new one.

The strip 22 not only seals the opening against the escape of the drying medium within the housing but also serves to maintain the door closed against the pressure within the housing. This closing action is effected by the over-center engagement of the body portion 28 beyond the edge 31*a* of the channel 25 as clearly illustrated in Fig. 2. In other words, as the door is closed, the center of the outwardly bowed portion 28 passes beyond the center of

the outwardly biased edge 31*a*. Over-center movement beyond the edge 31*a* is limited by the engagement of the portion 28 against the edge 31*b*. The present construction thus permits the door to spring open automatically when the pressure within the housing exceeds a predetermined safe minimum value. The minimum pressure causing the door to open is determined by the pressure required to close the door against the bias of the resilient strips 22 and 24. If it is desired to change the pressure which springs the door open, the strips 22 and 24 may be adjusted relative to the structural members 16 and 11 respectively by simply releasing the snap strips 13 and shifting the resilient strips 22 and 24 outwardly of the structural members.

The clearance between the sill and lintel of the door frame and the door is sealed as illustrated in Fig. 3 by strips identical in structure and function to the strips 22 and 24, which therefore need not be described in detail.

The hinged edge of the door is also sealed against the escape of the drying medium from the housing. To this end, an elongated L-shaped strip 31, the leg of which is provided with a longitudinal lip 32, is secured to the structural member 16 of the door as indicated in Fig. 2. The angle between the lip 32 and the body of the member 31 is such that the member is biased outwardly into engagement with the hinge plate 33 of the hinge 21. The hinge plate 33 is continuous along the length of the door jamb and will, therefore, provide a continuous sealing surface for the member 31. Since the strip 31 is formed of resilient metal, it effectively seats against the hinge plate 33 in sealing engagement and is substantially proof against damage by the high temperature conditions of the dryer. As with the strips 22 and 24, the strip 31 is releasably secured to the jamb by means of the removable snap strip 19 and, therefore, may be easily removed and replaced.

The door is sealed around its complete periphery so that there is no possibility of the escape of the drying medium from the housing. If desired, a door stop 34 may be secured to the jamb confronting the free edge of the door to prevent excessive strain on the sealing member 31 when the door is being closed. If desired however, the stop may be eliminated since the over-center engagement of the bowed body portion 28 with the protruding sealing surface 31*a*, and the limiting of the over-center movement by the edge 31*b* of the sealing strip 24 effectively seats the door in its proper closed position.

A modified form of the invention is illustrated in Fig. 7 wherein both the door 36 and the frame 37 are provided with U-shaped sealing strips 38 and 39 respectively, each of which is identical to the sealing strip 22. In this embodiment of the invention, a door stop 40 properly seats the door in closed position by limiting the over-center movement of the center of the strip 38 inwardly of the dryer housing beyond the center of the bowed out portion 41 of the strip 39. It should be noted that the door, when closed, is offset relative to the jamb so that the strip 38 seats behind the protruding surface 41. The offset bowed portions of the strips 38 and 39 thereby constitute an over-center closure which resiliently maintains the door closed against pressure within the housing. The strips 38 and 39 are resilient to provide an effective seal therebetween, and when the pressure within the housing exceeds a predetermined minimum value it automatically springs the door open to relieve the pressure within the housing. As described above in connection with Figs. 1 to 6, the strips 38 and 39 may be adjusted outwardly of the structural members 42 to determine the pressure which automatically springs the door open.

While particular embodiments of the invention have been illustrated and described herein, it is not intended to limit the invention to such disclosures, and changes and modifications may be made therein and thereto within the scope of the following claims.

I claim:

1. In a door assembly comprising a frame member and a door member hinged at one edge to said frame for swinging movement therein, a seal construction between the free edge of the door member and the confronting surface of the frame member comprising a first continuous longitudinal resilient strip secured to one of said members and having a portion thereof biased transversely outward to define at least one continuous protruding longitudinal sealing surface, a second continuous longitudinal resilient strip secured to the other member and having a portion biased outwardly for over-center engagement beyond said continuous protruding sealing surface of said first strip, and means to limit over-center movement of said strip beyond said protruding sealing surface to thereby maintain said strips in continuous sealing engagement with each other.

2. In a door assembly comprising a frame member and a door member hinged at one edge to said frame for swinging movement therein, a seal construction between the free edge of the door member and the confronting surface of the frame member comprising cooperating continuous longitudinal resilient strips mounted respectively on the free edge of the door and the confronting edge of the frame and confined between the planes of the sides of the respective edges, the first of said strips being secured to one of said members and having a portion thereof biased transversely outward to define at least one continuous protruding longitudinal sealing surface, the second of said strips being secured to the other member and being convex outwardly for over-center engagement beyond said continuous protruding sealing surface of said first strip, and means to limit over-center movement of said strip beyond said protruding sealing surface to thereby maintain said strips in continuous sealing engagement with each other.

3. In a door assembly comprising a frame member and a door member hinged at one edge to said frame for swinging movement therein, a seal construction between the free edge of the door member and the confronting surface of the frame member comprising a first continuous longitudinal resilient strip secured to one of said members and having a portion thereof biased transversely outward to define at least one continuous protruding longitudinal sealing surface, a second continuous longitudinal generally U-shaped resilient strip secured to the other member and having its central portion bowed outwardly for over-center engagement beyond said continuous protruding sealing surface of said first strip, and means to limit the over-center movement of said strip beyond said protruding sealing surface to thereby maintain said strips in continuous sealing engagement with each other.

4. In a door assembly comprising a frame member and a door member hinged at one edge to said frame for swinging movement therein, a seal construction between the free edge of the door member and the confronting surface of the frame member comprising a continuous longitudinal generally W-shaped resilient strip secured to one of said members defining a longitudinal channel having its side edges biased transversely outward to define laterally spaced continuous protruding longitudinal sealing surfaces, and a continuous longitudinal generally U-shaped resilient strip secured to the other member and having its central portion bowed outwardly for over-center engagement beyond the first of said continuous protruding sealing surfaces of said W-shaped strip, the second of said continuous protruding surfaces of said W-shaped strip constituting means to limit the cover-center movement of said strip beyond said first protruding sealing surface to thereby maintain said strip in continuous sealing engagement with each other.

5. In a door assembly comprising a frame member and a door member hinged at one edge to said frame for swinging movement therein, a seal construction between the free edge of the door member and the confronting

surface of the frame member comprising a first continuous longitudinal generally U-shaped resilient strip secured to one of said members and being bowed transversely outward to define a continuous protruding longitudinal sealing surface, a second continuous longitudinal generally U-shaped resilient strip secured to the other member and being bowed outwardly for over-center engagement beyond said continuous protruding sealing surface of said first strip, and stop means to limit the over-center movement of said strip beyond said protruding sealing surface to thereby maintain said strips in continuous sealing engagement with each other.

6. In a housing for dryers and the like, a door assembly comprising a frame, and a door hinged at one edge to said frame for swinging movement therein, the free marginal edge portion of the door and the confronting portion of the frame each comprising a longitudinal structural member having at each of the opposite sides thereof a snap strip including a part biased inwardly against the side of said structural member, a continuous resilient sealing strip having its peripheral edge portions embracing said opposite sides of each said structural member and confined between said inwardly biased parts of the snap strips, each said sealing strip having its central portion



biased outwardly toward the other to define at least one continuous protruding longitudinal sealing surface, the protruding sealing surface of one of said sealing strips being operable upon inward swinging movement of said door to move over-center beyond the protruding sealing surface of the other of said sealing strips, and means to limit said over center movement of the strips to thereby maintain said strips in continuous sealing engagement with each other.

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