April 17, 1962 H. R. SCOTT 3,029,805

OVEN DOOR SEAL

Filed Oct. 21, 1957

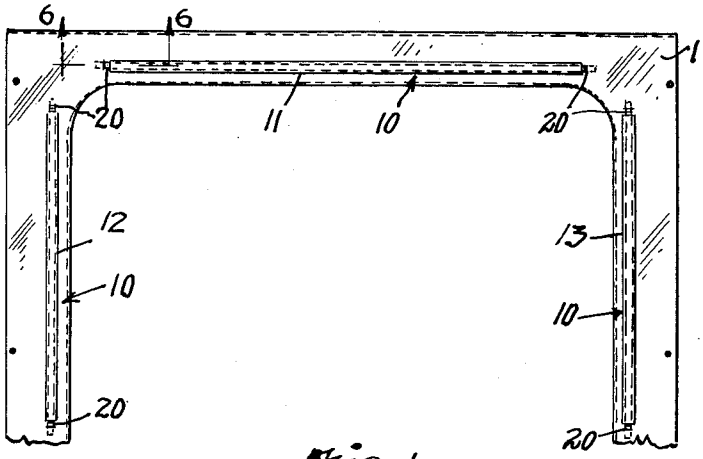


Fig. 1

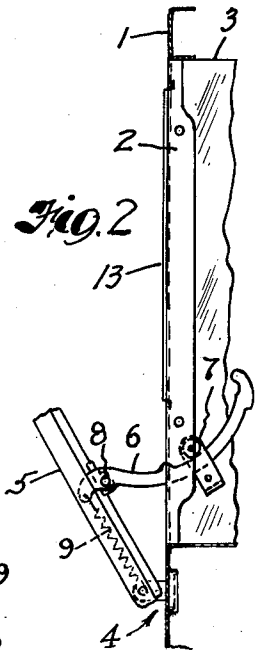


Fig. 2

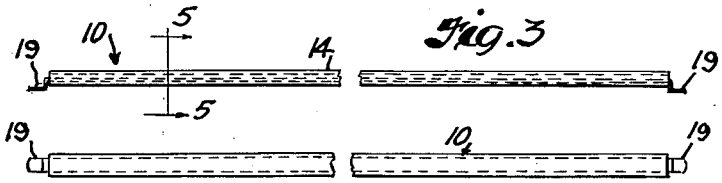


Fig. 3

Fig. 4

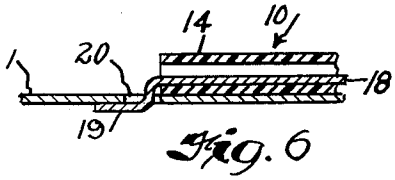


Fig. 6

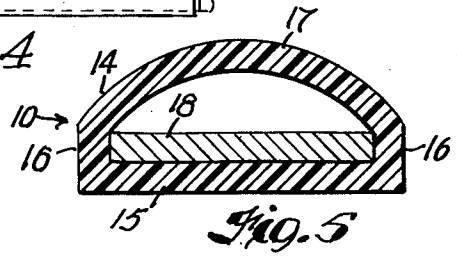


Fig. 5

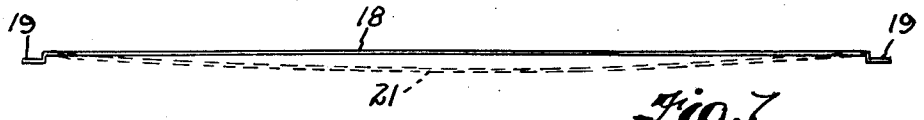


Fig. 7

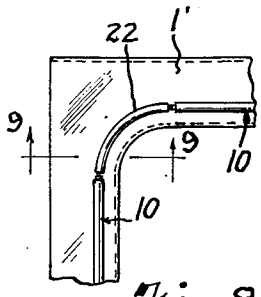


Fig. 8

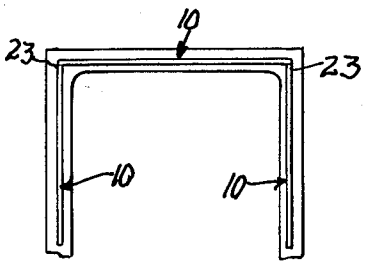


Fig. 10

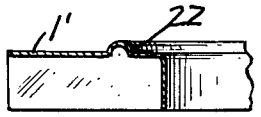


Fig. 9

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3,029,805
OVEN DOOR SEAL

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4 Claims. (Cl. 126—190)

This invention relates to improved means for sealing the door of an oven, when closed, against the escape of heat through the interface between the door and the usual peripheral framing piece against which the door is held by appropriate latch or bias mechanism.

It is customary to provide some form of seal positioned for interengagement between the frame and door in an oven and usually carried by the former. The sealing device used most commonly at present is a woven fiberglass strip which is transversely rounded in the installation thereof and retained in such form by clamping the longitudinal edges with suitable elements to the face of the framing piece. This prior sealing arrangement is, for practical purposes, a permanent one, since the fiberglass assembly cannot be removed and replaced without a certain amount of skill and experience and even then the job is a fairly laborious one.

It is a principal object of my invention to provide a seal in the nature indicated so formed and constructed as greatly to simplify initial assembly thereof in the oven construction and also replacement of the same, in the event of wear or damage.

A further object is to provide such a seal, carried by the oven peripheral framing piece, which may be applied and removed completely by hand, that is, without requiring the use of any tool or any special technique. Realization of such objectives of course facilitates both fabrication of the oven and purchaser maintenance of the same in proper operating condition with regard to sealing.

It is a further object of the present invention to provide an oven seal having such characteristics which is itself convenient and inexpensive to manufacture.

Other objects and advantages of the present invention will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawings:

FIG. 1 is a fragmentary front elevational view of an oven frame piece equipped with seals in accordance with the present invention;

FIG. 2 is a side elevation showing the FIG. 1 assembly in association with an oven shell and door, both the latter being broken away for simplicity of illustration;

FIG. 3 is a side elevation of one of the new seals removed from the frame;

FIG. 4 is a top plan view of such seal;

FIG. 5 is a transverse sectional view in the plane indicated by the lines 5—5 in FIG. 3;

FIG. 6 is a broken longitudinal section taken on the plane of the line 6—6 in FIG. 1, showing the manner in which the seal is attached to the frame;

FIG. 7 is an elevational view of the retainer element of such seal;

FIG. 8 is a fragmentary elevational view showing a slightly modified form of framing piece;

FIG. 9 is a sectional view taken on the plane of the line 9—9 in FIG. 8; and

FIG. 10 shows in elevation another modified assembly of seal and frame.

Referring now to the drawings in detail, reference numeral 1 designates a conventional front frame for an oven, said frame in this embodiment having a rearwardly directed flange 2 at its inner periphery which is fastened to the walls of the oven shell 3 to join the frame to the latter. The lower portion of such frame supports hinge means indicated generally at 4 on which the door 5 of the oven is pivoted for movement between a horizontal open position and a vertical closed position, with the frame in such latter position being opposed to the periphery of the door.

In FIG. 2, I have shown the door 5 equipped with concave arms 6 which extend rearwardly at the respective sides of the frame 1 through slots formed for the purpose in the latter, with a roller 7 behind the frame engaging the upper surface of each arm. Such arms are pivoted at points 8 on the door and are biased in this view in a counter-clockwise direction about such pivots by springs 9, housed within the door. This type of door mounting is conventional and need not be illustrated or described in more detail for a full and proper understanding of the seal which forms the present invention.

In such assembly, there are three seals, indicated generally by reference numeral 10, with one 11 extending along the top of the frame 1 and the other two 12 and 13 disposed respectively at the sides of the frame. The three are identical except as to length, the top seal being slightly longer, and they are all positioned against the front or outer surface of the frame.

Each seal then comprises a hollow strip 14 made of a resiliently deformable material, preferably of the cross-section shown most clearly in FIG. 5, whereby it comprises a flat base portion 15, relatively short vertical wall portions 16, and a transversely rounded top portion 17, all extending longitudinally. In addition to being resiliently deformable, this seal strip must be able to withstand the heat of the oven and it is preferred to make the same of silicone rubber. Polytetrafluoroethylene, known in the trade by the trademark "Teflon" (Du Pont), and polychlorotrifluoroethylene, known as "Kell-F" (Minnesota Mining & Mfg.), are examples of other materials likewise having the necessary stability at fairly high temperatures. The silicone rubber is preferred because of its lower cost and it will be apperciated that such material may be extruded to the desired cross-sectional shape in indefinite lengths quickly and economically.

Within the strip 14 of silicone rubber and the like, cut to predetermined length, there is a retainer 18 in the form of a flexible metal strip, the same being threaded through the hollow member and having its ends turned downwardly and then outwardly to form tabs 19 for a purpose to be described. As shown in FIG. 5, the retainer sits fairly snugly in the lower portion of the rubber element and while the composite article may be flexed longitudinally, the retainer does provide lateral rigidity.

At the ends of the several seals, as positioned against the frame piece 1, the latter is provided with openings 20 into which the end tabs 19 of the retainers are inserted, such attachment being shown most clearly in FIG. 6. The seals are bowed outwardly for such insertion of the tabs and the latter engage behind the frame with the flat bottoms of the deformable strips 14 held against the outer frame surface. This tab engagement constitutes the means of securing the seals to the frame and obviously the installation is extremely easy and quick. Furthermore, to replace a worn or damaged seal, the same is simply bowed outwardly by hand to withdraw the tabs and a new seal is then inserted. If desired, the retainer 18 may in fabrication of the seal be given a longitudinally curved set in the direction of the tabs as indicated by the

dashed outline **21** in FIG. 7, so that there will be a spring tension which will assist in holding the seal base firmly against the frame.

In the modification shown in FIGS. 8 and 9, each upper corner of the frame **1** is embossed outwardly along a radius to form a curved raised bead **22** for contact by the door between the ends of the adjacent seals. The dimensions of the frame may, moreover, be sufficient to have the ends of the side seals abut the top seal, as shown at **23** in FIG. 10, or, for that matter, to have the top seal extending between the side seals, the same method of attachment being utilized in such further instances.

The seals are thus located between the opposed faces of the door and frame and they are of course compressible in the sense of being deformable under pressure and by virtue of the inner voids of the same, the metal retainers not fully occupying or filling the latter. It will be obvious that cross-sectional shapes different than the one specifically shown may provide the same or equivalent characteristics.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims or the equivalent of such be employed.

I, therefore, particularly point out and distinctly claim as my invention:

1. In oven construction including a door and a frame having cooperable opposed surfaces when the door is closed, means for sealing the closed door comprising an elongated hollow member made of a resiliently deformable material which is stable at the temperatures of operation of the oven, and a longitudinally flexible retainer made of metal extending through said hollow member and projecting at the ends of the same, the projecting ends of said retainer being formed as laterally off-set stepped tabs which are inserted in openings provided therefor in one of said opposed surfaces, the thus inserted tabs engaging the rear side of said one surface and holding the deformable member removably against said one surface so as yieldingly to contact the other surface.

2. In oven construction including a door and a frame having cooperable opposed surfaces when the door is closed, means for sealing the closed door comprising an elongated hollow member made of a resiliently deformable material which is stable at the temperatures of operation of the oven, said member having a flat base and a transversely rounded outer wall, and a longitudinally flexible retainer made of metal extending through said hollow member and projecting at the ends of the same, said retainer being in the form of a strip which only partially fills the void of the deformable member and having laterally stepped tabs at its ends which are inserted in openings provided therefor in one of said opposed surfaces, the hollow deformable member being removably held by engagement of the thus inserted retainer tabs behind said one surface with its base against said one surface so as yieldingly to contact the other surface.

3. In oven construction including a door and a frame having cooperable opposed surfaces when the door is closed, a seal between the door and frame comprising a hollow elongated member made of silicone rubber and being substantially D-shaped in cross-section, a longitudinally flexible metal retainer strip extending freely through said member in the flat base portion thereof and projecting at the respective ends of the member, each projecting end of said retainer being bent downwardly and then outwardly to form a tab which is off-set from the member base approximately equal to the thickness of one of said opposed surfaces, the later having openings at a spacing which is slightly less than the distance between the tab extremities, and the seal being removably attached to said one surface for yielding contact by the other surface by bowing the same to insert the tabs of the retainer in the openings of said one surface and releasing the seal, whereupon the seal base overlies the said one surface and the tabs engage against the rear of the same.

4. In oven construction and the like including a door and a frame having cooperable opposed surfaces when the door is closed, a seal between the door and frame comprising an elongated hollow member made of resiliently deformable material, and a longitudinally flexible retainer made of metal extending through said hollow member and projecting at the ends of the same, one of said opposed surfaces being formed with openings spaced apart at a distance less than the length of the retainer in flat condition but not less than the length of the hollow member, with the projecting ends of the retainer engaged in such openings to hold the hollow member against said one surface therebetween and being withdrawable therefrom to remove the seal by outward bowing of the same.

References Cited in the file of this patent

UNITED STATES PATENTS

1,105,183	Collins	July 28, 1914
2,130,017	Lewis	Sept. 13, 1938
2,215,515	Matheny	Sept. 24, 1940
2,823,660	Holzboog et al.	Feb. 18, 1958

FOREIGN PATENTS

312,421	Great Britain	May 30, 1929
723,277	Great Britain	Feb. 2, 1955
1,068,955	France	Feb. 10, 1954