July 14, 1959 O. V. SAUNDERS 2,894,379

REFRIGERATING APPARATUS

Filed Sept. 16, 1957 2 Sheets-Sheet 1

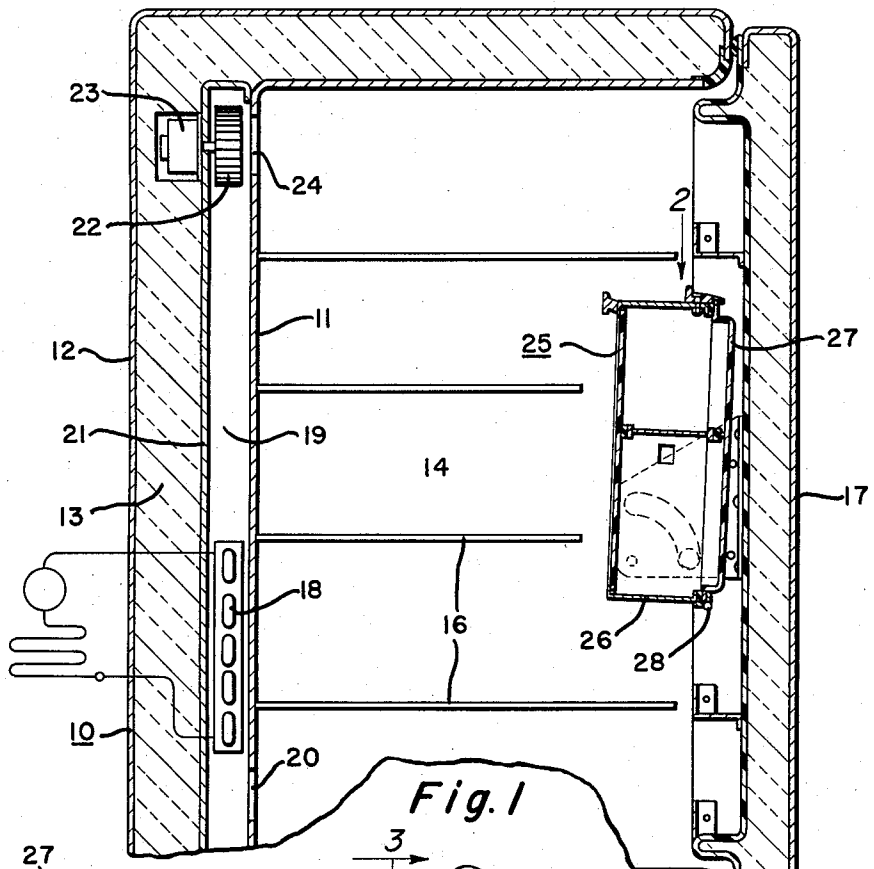


Fig. 1

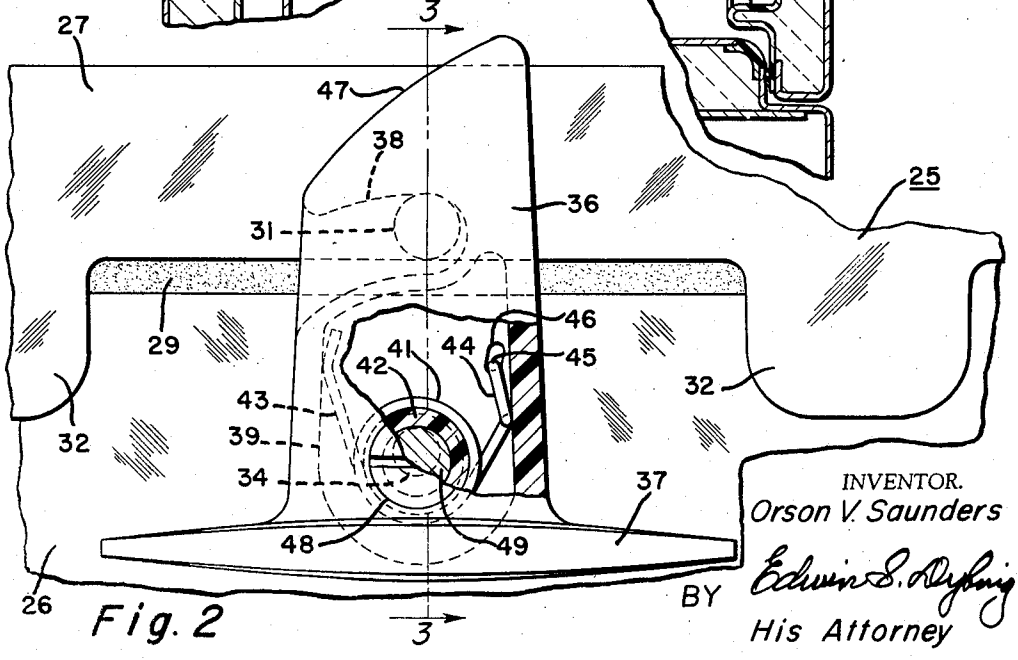


Fig. 2

INVENTOR.
Orson V. Saunders
BY Edwin S. Lybeck
His Attorney

July 14, 1959 O. V. SAUNDERS 2,894,379

REFRIGERATING APPARATUS

Filed Sept. 16, 1957 2 Sheets-Sheet 2

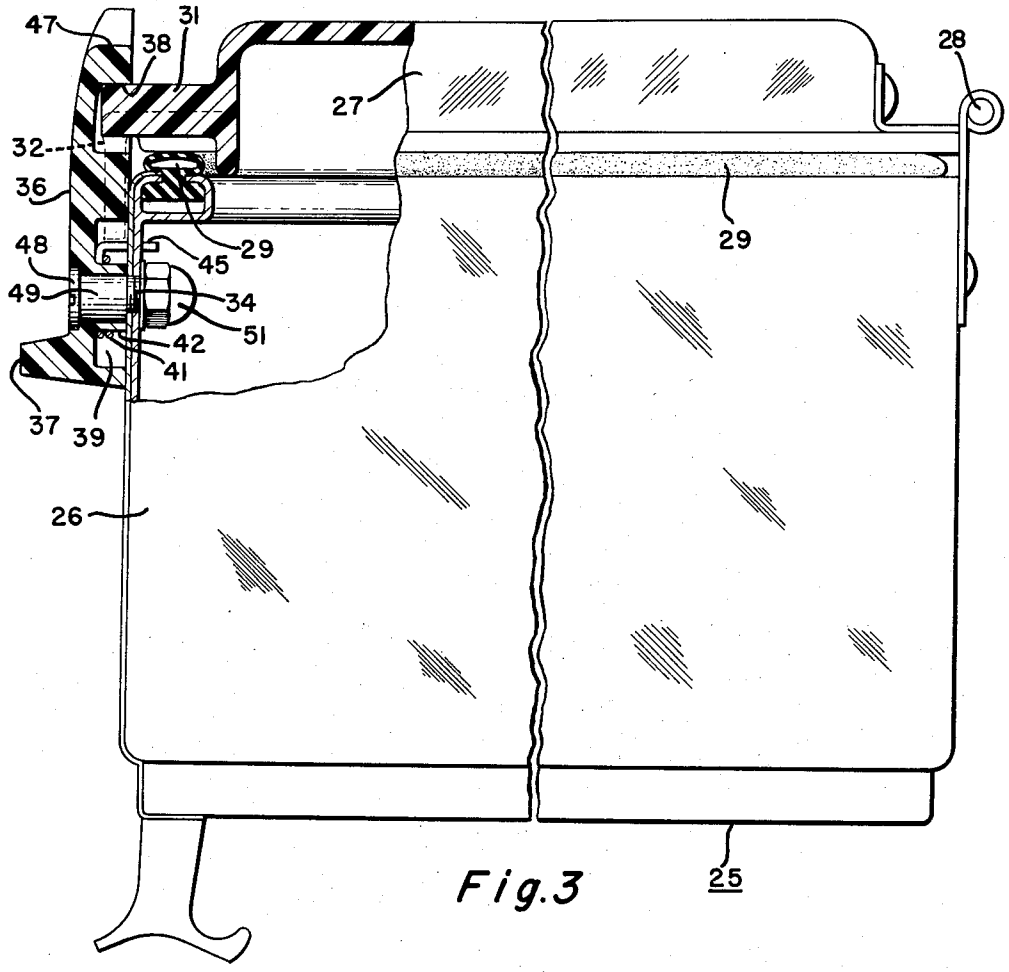


Fig. 3

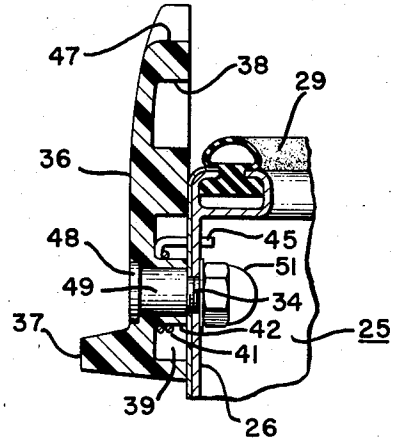


Fig. 4

INVENTOR.
Orson V. Saunders
BY Edwin S. Oxbrig
His Attorney

United States Patent Office

2,894,379

Patented July 14, 1959

2,894,379

REFRIGERATING APPARATUS

Orson V. Saunders, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application September 16, 1957, Serial No. 684,190

9 Claims. (Cl. 62—377)

This invention relates to refrigeration and particularly to a hydrator receptacle used in mechanically refrigerated refrigerators.

The present invention has to do with a latching arrangement for a cover of a hydrator structure wherein the cover is to be sealed against a gasket on the food storage receptacle thereof and in this respect my invention is an improvement over the disclosure in the O. V. Saunders and C. F. Petkwitz copending application S.N. 659,967 filed May 17, 1957 entitled Refrigerating Apparatus and assigned to the assignee of the present application. Reference is made to this copending application in order that a more detailed description of the construction, function and operation of a compartmented hydrator receptacle structure now on the market and to which my invention pertains may be had. Complaints have been received from women users of refrigerators equipped with a hydrator receptacle or structure of the type illustrated and described in the Saunders and Petkwitz copending application just referred to in that their fingernails frequently become torn or broken in attempting to open the receptacle cover or lid. My invention is therefore primarily directed to eliminating these complaints and rendering such a hydrator structure more practical in use.

One of the objects of my invention is to provide a food storing hydrator structure for use in a refrigerator of a type wherein the cover or lid of the structure is to be sealed to the receptacle thereof with a latch device having a striker which is handy and easily operable to unlatch the cover or lid and wherein the cover or lid is readily openable without causing damage or breakage of the operator's fingernails.

It is another object of my invention to provide for adjustment of a hydrator structure latch striker so as to compensate for manufacturing tolerances during assembly of the structures to assure sealing of an access opening in the receptacle thereof by a pivoted cover thereon against a resilient gasket bounding the opening.

In carrying out the foregoing objects it is a further and more specific object of my invention to provide a latch arrangement for the cover of a hydrator receptacle with a striker that is pivoted upon an eccentric part of a stud rotatably secured to the receptacle and rotation of which adjusts the position of the eccentric with respect to the stud mounting for varying the distance between a keeper receiving and engaging portion of the striker and a keeper on the receptacle cover.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is a fragmentary vertical sectional view through a refrigerator cabinet having a food storage hydrator receptacle therein provided with my improved latch arrangement;

Figure 2 is an enlarged fragmentary view of the hydrator receptacle taken in the direction of the arrow 2 in Figure 1 with portions of the latch striker in section showing its adjustable mounting;

Figure 3 is a broken side view of the hydrator receptacle shown in Figure 1 in a horizontal position and is taken on the line 3—3 of Figure 2 with a portion of the latch side thereof in section; and

Figure 4 is a fragmentary sectional view illustrating one position of adjustment of the receptacle latch striker.

Referring to the drawings wherein I show, in Figure 1 thereof, a refrigerator cabinet 10 of the household type having inner and outer metal shells or panels 11 and 12 respectively with suitable or conventional insulating material 13 therebetween and which inner walls define or form a liner of a food storage chamber 14 in the cabinet. A plurality of vertically spaced apart food supporting shelves 16 are mounted in chamber 14 in any suitable or desirable manner. Chamber 14 is provided with an opening front which is closed by an insulated door structure 17 hingedly mounted on cabinet 10. The outer cabinet shell 12 is extending downwardly beyond chamber 14 to provide walls of a machine compartment in the lower portion of cabinet 10 in which a refrigerant translating device or condensing unit portion of a closed refrigerating system is located. The refrigerating system may be of any conventional type such, for example, as is disclosed in the copending application hereinbefore referred to. An evaporator or cooling element 18 of the refrigerating system is mounted in a flue 19 provided in the back wall of cabinet 10 inset in the insulation 13 and formed by a substantially U-shaped in horizontal cross section length of metal 21 cooperating with the liner 11 of chamber 14. A fan or blower 22 is also located in flue 19 and is driven, either intermittently or continuously as desired, by an electric motor 23. The evaporator 18 may be of any desired construction and cools air circulated thereover by blower 22 which draws air from chamber 14 into flue 19, by way of openings 24 in liner 11, and forces the air cooled by evaporator 18 into and throughout the food storage chamber by way of openings 20 in liner 11. Door structure 17 has its inner panel shaped to provide a recess in the inner face thereof and a food storing hydrator structure, generally represented by the reference character 25, is pivotally mounted about a horizontal axis on the inner door face. This hydrator structure 25 includes a compartmented receptacle member 26 and a plastic cover member 27 therefor hingedly mounted thereon by a piano-like hinge 28. A rubber-like resilient gasket 29 (see Figure 3) is secured to the edge of walls of the receptacle member 26 in any suitable or desirable manner such, for example, as is clearly illustrated and fully described in the copending application hereinbefore referred to and for the purpose explained therein.

In accordance with my invention I provide an improved easily operable latch arrangement for latching cover member 27 to receptacle member 26 in compressive contact with gasket 29 whereby the joint therebetween is effectively sealed. Referring now to Figures 2 and 3 of the drawings wherein I show a latch arrangement for the hydrator structure 25 it will be noted that the side of cover member 27 opposite the hinge side thereof is provided with an integral projection 31 which forms a keeper for the present latch. On either side of this keeper there is a tab 32 depending from the cover, which tabs, when cover 27 is closed, overlap a portion of a wall of receptacle member 26. The tabs 32 tend to guide cover 27 into closed position and serve to maintain keeper 31 in a proper location to be engaged by and received in a keeper receiving or catch portion on a latch striker to be presently described. In this con-

nection the tabs 32 will, if the side wall of receptacle member 26 opposite hinge 28 is slightly bowed outward under the weight of fruit contained therein such, for example, as a quantity of apples or oranges, when the hydrator structure 25 is moved about door 10 into a horizontal position, engage the outer surface of the receptacle side wall, during closing of cover 27, and pull it into parallel relationship with the opposite side wall thereof. The latch arrangement also comprises a plastic striker or catch which is pivotally mounted, as by stud 34, upon the side wall of receptacle 26 opposite the hinge 28. This catch or striker includes a substantially flat body portion 36 and an enlarged elongated finger gripping or handle portion 37. Flat body portion 36 of the striker is hollowed out at two places on its inner side such, for example, as at 38 to provide a hook-like recess or catch part therein and at 39 to provide a recess or cavity for the reception of a spring 41 coiled about a pivoted hub portion 42 of the striker. Recessed catch portion 38 of the striker is of a curved or arcuate shape with the radius of the arc shorter than the distance between catch portion 38 and the axis of the pivotal mounting stud 34. One leg or end 43 of spring 41 bears against a wall of the hollowed out portion 39 of the striker (see Figure 2) and the other leg or end 44 thereof is bent laterally as at 45 to extend through and be stationarily anchored in a slightly elongated opening 46 in the side wall of receptacle member 26. A portion of the leg 44 of spring 41 adjacent its anchored end 45 engages a wall of cavity 39 to hold the striker in an upright operative position so that keeper 31 will strike against an inclined or curved outer surface 47 provided on the striker or catch body 36 when lid or cover 27 is to be closed against receptacle 26. It is to be noted that stud 34 for the latch striker includes its head 48, a shank portion 49 concentric therewith, upon which the striker is pivoted, and its integral threaded mounting portion that is eccentric with respect to the portion 49 thereof and normally locked stationary upon receptacle 26 by a lock washer and nut 51. The purpose of this peculiarly shaped stud 34 is to provide for adjustment of the striker and particularly adjustment of the recessed catch or keeper receiving portion 38 thereof with respect to the mounting of stud 34 so that the distance between keeper projection 31 and catch 38 may if necessary be changed. In Figures 3 and 4 of the drawings I show the bearing or shank portioon 49 of stud 34 in two different positions, obtained by loosening lock nut 51 rotating same relative to receptacle 26 and then retightening it, and it will be noted by reference to these figures that portion 49 of the stud has been shifted in eccentric fashion with respect to the axis of the mounting of stud 34 to shift catch portion 38 of the striker a greater distance away from the stud mounting. This adjustability is required or is desirable in order to compensate for dimensional manufacturing variations in mass production and assembly of food storing hydrator structures of the type herein disclosed and more fully or explicitly described in the copending application hereinbefore identified. Adjustability of the distance between keeper projection 31 and catch portion 38 of the latch striker is also desired to compensate for differences in the cross sectional contour of the gasket 29 both during assembly of the receptacle structure and after a period of time in the use thereof in a refrigerator cabinet in a home so as to insure proper sealing of the joint between receptacle member 26 and its cover member 27.

Access to the hydrator structure 25 is had by opening door 17 of refrigerator cabinet 10 and swinging the food storage structure downwardly about its pivoted mounting on the door into a substantially horizontal position. The finger grip or handle portion 37 of the latch striker or receptacle 26 is grasped by fingers of the operator's hand and manually rotated or swung in a counter-clockwise direction as viewed in Figure 2 of the drawings, against the tension of spring 41 to move or slide the recessed catch part 38 of the striker out of engagement with keeper projection 31. Thereafter an upward force is applied to a tab 32 to move the cover member 27 upwardly about its hinged mounting 28 to open receptacle member 26 whereby to expose fruits or vegetables therein to the operator. After opening cover 27 the compressed spring 41 applies force to the striker and returns same to the position thereof shown in Figure 2. When cover 27 is released it swings down and the keeper projection 31 thereon strikes the curved nose surface 47 of body portion 36 of the striker. This cams the striker about its pivotal mounting and spring 41 causes the open side of the catch portion 38 to slide over the keeper 31. Spring 41, under influence of force stored up therein, now automatically rotates the striker to move its body 36, to the left or clockwise as viewed in Figure 2 of the drawings, and the catch portion 38 thereof over the keeper 31 to cam cover 27 against or into contact with resilient gasket 29 on receptacle 26 with a slight compressive force. In other words it is unnecessary to handle or manipulate the latch striker when cover 27 is to be closed and the spring 41 together with the camming action of the latch striker causes the cover to seal the joint between members 26 and 27 the cover engaging and compressing gasket 29. The short or sharp radius of catch portion 38 on the striker tends to augment action of spring 41 in caming of the cover 27 into compressive contact with the gasket seal 29 when the cover is closed.

It should, from the foregoing, be apparent that I have provided an improved food storing hydrator structure for use in a household refrigerator cabinet and by my novel latch therefore its handling is facilitated. The latch arrangement on the structure is easily operable to open the receptacle and the latch functions automatically upon permitting the cover of the receptacle to close whereby the cover is brought into compressive contact with a sealing gasket. The latch is of a type that can be manipulated without fumbling or groping around in a manner to cause one's finger-nails to become torn or broken. By providing for the adjustability of the latch striker as herein disclosed my latch arrangement is rendered capable of installation under mass production conditions of hydrator receptacles wherein the relative position of engagement of a receptacle cover with a gasket on some units may vary widely over some other units. The adjustable feature of the latch striker is furthermore useful in correcting the seal of a cover with a hydrator after a gasket seal therebetween has become worn or deformed to such a degree that the cover can no longer make a good or positive seal with the receptacle. In such a case adjustment of the latch striker is performed to shorten the distance between the pivotal mounting thereof and the keeper on the cover of the receptacle to cause the cover to more tightly engage the gasket.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. In combination, a refrigerator cabinet having walls defining a food storage chamber therein, a refrigerating system associated with said cabinet including an evaporator for cooling air within said chamber, a food storing hydrator structure within said cabinet exposed to the cool air in said chamber including a receptacle member, a cover member hingedly secured thereto for closing an access opening therein and a resilient gasket on one of said members engageable therebetween, a latch for said structure comprising a keeper on one of said members and a striker pivotally mounted on the other of said members for swinging movement relative thereto, said striker having a keeper receiving portion latchable with

said keeper upon closing said cover member, a spring interposed between said other member and said swingable striker for biasing the keeper receiving portion thereof toward said keeper, the keeper receiving portion of said striker being so shaped as to engage said keeper and cam said members together into compressive contact with said gasket under the influence of force exerted by said spring for sealing the joint between said members, and the pivotal mounting of said swingable striker being adjustable to vary the distance between the keeper receiving and engaging portion thereof and said keeper.

2. The combination defined by claim 1 wherein the striker is provided with a handle for manually swinging it against the tension of the spring out of engagement with the keeper.

3. In combination, a refrigerator cabinet having walls defining a food storage chamber therein, a refrigerating system associated with said cabinet including an evaporator for cooling air within said chamber, a food storing hydrator structure within said cabinet exposed to the cool air in said chamber including a receptacle, a cover hingedly secured thereto for closing an access opening therein and a resilient gasket on the receptacle bounding the access opening for engagement by said cover, a latch for said structure comprising a keeper on said cover and a striker pivotally mounted upon said receptacle for swinging movement relative thereto, said striker having a keeper receiving portion latchable with said keeper upon closing said cover, the keeper receiving portion of said swingable striker being so constructed and arranged as to engage said keeper and cam said cover into compressive contact with said gasket, a spring acting between said receptacle and said striker for applying force to the striker and causing said camming action of the keeper receiving and engaging portion thereof, and said pivotal mounting of said swingable striker being adjustable to vary the distance between the keeper receiving and engaging portion thereof and said keeper.

4. In combination, a refrigerator cabinet having walls defining a food storage chamber therein, a refrigerating system associated with said cabinet including an evaporator for cooling air within said chamber, a food storing hydrator structure within said cabinet exposed to the cool air in said chamber including a receptacle member, a cover member hingedly secured thereto for closing an access opening therein and a resilient gasket on one of said members engageable therebetween, a latch for said structure comprising a keeper on one of said members and a striker on the other of said members, said striker being swingably mounted on a part of a stud eccentric with respect to the axis of another part thereof rotatably secured to said other member, said striker having a keeper receiving portion latchable with said keeper upon closing said cover member, a spring interposed between said other member and said swingable striker for biasing the keeper receiving portion thereof toward said keeper, the keeper receiving portion of said striker being so shaped as to engage said keeper and cam said members together into compressive contact with said gasket under the influence of force exerted by said spring for sealing the joint between said members, and rotation of said stud changing the position of the eccentric part thereof relative thereto whereby to vary the distance between the keeper receiving and engaging portion of said striker and said keeper.

5. A latch for a food storage hydrator structure including a receptacle member, a cover member therefor to close an access opening therein and a resilient gasket on one of said members engageable therebetween, said latch comprising a keeper on one of said members and a striker pivotally mounted on the other of said members for swinging movement relative thereto, said striker having a keeper receiving portion latchable with said keeper upon closing said cover member, a spring interposed between said other member and said swingable striker for biasing the keeper receiving portion thereof toward said keeper, the keeper receiving portion of said striker being so shaped as to engage said keeper and cam said members together into compressive contact with said gasket under the influence of force exerted by said spring for sealing the joint between said members, and said pivotal mounting of the striker being in the form of an eccentric on a stud rotatably secured to said other member so as to adjust said eccentric with respect to said stud whereby the distance between the keeper receiving and engaging portion of said striker and said keeper may be varied.

6. In combination, a refrigerator cabinet having walls defining a food storage chamber therein, a refrigerating system associated with said cabinet including an evaporator for cooling air within said chamber, a food storing hydrator structure within said cabinet exposed to the cool air in said chamber including a receptacle, a cover hingedly secured thereto for closing an access opening therein and a resilient gasket on the receptacle bounding the access opening for engagement by said cover, a latch for said structure comprising a keeper on said cover and a striker on said receptacle, said striker being swingably mounted on a part of a stud eccentric with respect to the axis of another part thereof rotatably secured to said receptacle, said striker having a keeper receiving portion latchable with said keeper upon closing said cover, the keeper receiving portion of said swingable striker being so constructed and arranged as to engage said keeper and cam said cover into compressive contact with said gasket, a spring acting between said receptacle and said striker for applying force to the striker and causing said camming action of the keeper receiving and engaging portion thereof, and rotation of said stud changing the position of the eccentric part thereof relative thereto whereby to vary the distance between the keeper receiving and engaging portion of said striker and said keeper.

7. The combination defined by claim 6 wherein the striker is provided with a handle for manually swinging it against the tension of the spring out of engagement with the keeper.

8. In combination, a refrigerator cabinet having a food storage chamber therein, a refrigerating system associated with said cabinet including an evaporator for cooling air in said chamber, a food storing receptacle within said chamber exposed to the cool air therein, a cover hingedly secured to said receptacle for closing an access opening thereof and a resilient gasket on said receptacle in the vicinity of its access opening engageable by said cover for preventing flow of air in said chamber into and out of at least a portion of said receptacle, a latch for said receptacle cover, said latch comprising a keeper on said cover and a striker pivotally mounted on a wall of said receptacle, said striker comprising a molded plastic element having a curved keeper receiving recess in the side thereof facing said receptacle and latchable with said keeper upon closing said cover, said molded plastic striker element also having a cavity in its side facing said receptacle wall adjacent the pivotal mounting of said striker element, a spring coiled about the pivotal mounting of said striker element with an end thereof abutting a wall of said cavity and with its other end anchored to said receptacle wall for biasing the keeper receiving recess over said striker, the side of said molded plastic striker element opposite the side thereof facing said receptacle wall concealing said spring in said cavity and the keeper receiving recess, said striker element being provided with a nose portion spaced from said curved recess thereof for engaging said keeper and guiding said recess thereover upon closing said cover, a wall of said keeper receiving recess being of such curvature relative to the mounting of said striker element as to engage said keeper and cam said cover into compressive contact with the gasket on said receptacle under the influence of force exerted by said spring for sealing the receptacle in air tight fashion, and said pivotal mounting of the striker element being in the form of an eccentric on a stud ro-

tatably secured to said receptacle so as to adjust said eccentric with respect to said stud whereby the distance between the curved wall of the keeper receiving recess of said striker element and said keeper may be varied.

9. A latch for a receptacle member having a movable cover member closing an access opening therein and a resilient gasket on one of said members engageable therebetween, said latch comprising a keeper on one of said members and a striker pivotally mounted on a wall of the other of said members for swinging movement relative thereto, said striker comprising a molded solid element having a curved keeper receiving recess in the side thereof facing said other member and latchable with said keeper upon closing said cover member, said molded solid striker element also having a cavity in its side facing said other member adjacent the pivotal mounting thereof, a spring coiled about the pivotal mounting of said striker element with one of its ends abutting a wall of said cavity and with its opposite end anchored to the wall of said other member for biasing the keeper receiving recess over said keeper, the side of said molded solid striker element opposite the side thereof facing said other member concealing said spring in said cavity, a wall of said keeper receiving recess being of such curvature as to engage said keeper and cam said members toward one another into compressive contact with said gasket under the influence of force exerted by said spring for sealing the joint between said members, and said pivotal mounting of the striker element being in the form of an eccentric on a stud rotatably secured to said other member so as to adjust said eccentric with respect to said stud whereby the distance between the curved wall of the keeper receiving recess of said striker element and said keeper may be varied.

References Cited in the file of this patent

UNITED STATES PATENTS

172,399	Dibble	Jan. 18, 1876
279,857	Campbell	June 19, 1883
938,131	Dutschke	Oct. 26, 1909
1,885,713	Hammerly	Nov. 1, 1932
2,345,432	Schweller	Mar. 28, 1944
2,694,906	Didion	Nov. 23, 1954
2,745,260	Saunders	May 15, 1956

FOREIGN PATENTS

375,226	Italy	Sept. 28, 1939