

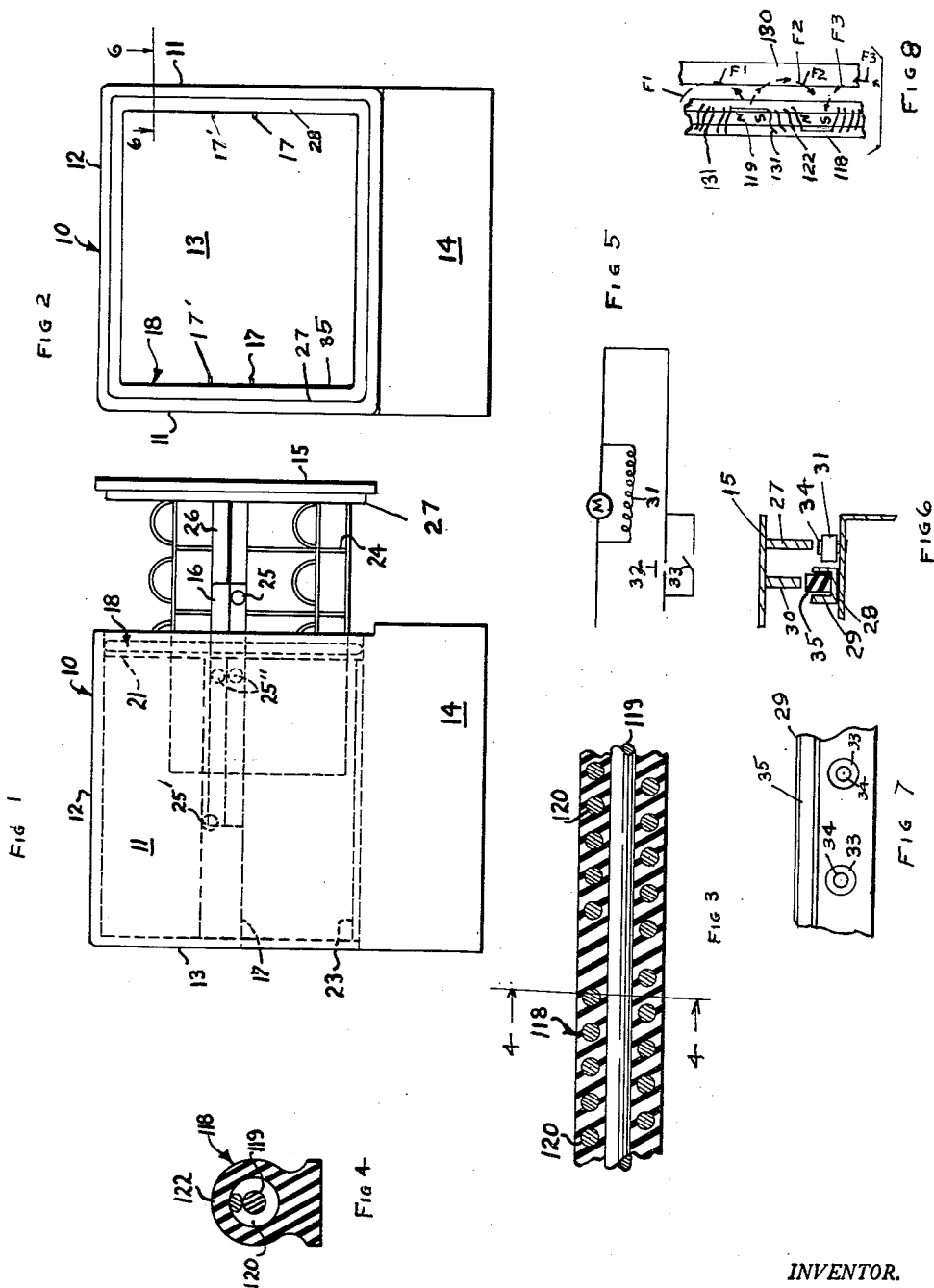
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APPLIANCE DOOR

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APPLIANCE DOOR

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This invention relates to doors and, more particularly, to doors for kitchen appliances; for example, dishwashers and the like.

Automatic dishwashers made according to present designs frequently have dish supporting racks which are slidable inwardly and outwardly like a drawer in a piece of furniture. The dishwasher often has a door hinged at the bottom which swings downwardly and the dish rack is pulled outwardly over the door. Therefore, in order to remove any dishes from the rack, the door must first be swung down to a horizontal position, then the rack pulled over it. Therefore, in order to remove any dishes whatsoever from the rack, the door must be in a fully open position where it will form an obstruction to the normal traffic around in front of the dishwasher. Further, mechanical locks or clamps are provided for fastening the door in closed position in order to cause the door to form a firm seal with the front of the dishwasher.

It has been discovered that in order to form a good seal around a door in a dishwasher if the door is attached to the sliding rack, an elaborate lock or clamp must be provided to cause the door to seal to the dishwasher case all around its periphery. It has further been discovered that by providing an electromagnet for holding the door to the dishwasher during the time that the dishes are being washed, the locking arrangement for the door and the seal therefor can be considerably simplified.

The inventor is familiar with the permanent magnet type of door seals such as are used in refrigerators; however, such door seals would be impractical for use in a sliding door such as in a dishwasher because it would be difficult to pull the door straight outward against the force of the permanent magnets. By providing an electromagnet lock, the door is sealed to the dishwasher during the time that the dishes are being washed. This is the only time that this seal is needed.

It is, accordingly, an object of the present invention to provide an improved door for an appliance.

Another object of the invention is to provide an improved door for use on a kitchen appliance.

Still another object of this invention is to provide an improved door utilizing an electromagnet for providing both a holding means and a seal for the door.

A further object of the invention is to provide a door for an appliance which is simple in construction, economical to manufacture, and simple and efficient to use.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawing and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:

FIG. 1 is a side view of a dishwasher according to the invention;

FIG. 2 is a front view of the dishwasher shown in FIG. 1;

FIG. 3 is a cross sectional view of an electromagnetic element for a dishwasher;

FIG. 4 is a cross sectional view taken on line 4—4 of FIG. 3;

FIG. 5 is a wiring diagram of the device;

FIG. 6 is a cross sectional view of another embodiment

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of the sealing device and electromagnet for the device taken on line 6—6 of FIG. 2;

FIG. 7 is a partial side view of the device shown in FIG. 6; and

FIG. 8 is a schematic side view of the embodiment of the invention shown in FIG. 4.

Now with more specific reference to the drawing, a dishwasher 10 of the open front type is shown having a case 12 with an interior cavity therein. The case 12 has a rear wall 13, side walls 11, and a base 14 for supporting it on a floor or the like in the conventional manner. Rails 17' and 18 are attached to the inside of the side walls 11.

A rack 24 slides in and out of the walls 11 on double suspension rails 16 and 26 which are carried on rollers 25 and 25'. A door 15 is fixed to the front in the rack 24. The rollers 25 are attached to the rail 16 at the lower front edge thereof and it rests on a lower flange 17 of the track which is attached to the inner side of the dishwasher 10. The rear rollers 25' are attached to the upper rear part of the rail 16 and ride on the lower edge of the track or rail 17' which is also attached in spaced relation to the flange 17.

The rail 26 telescopes with the rail 16 and rolls thereon carried on the roller 25". The rails 16 and 26 with the rollers 25 thereon make up a double suspension rail similar to the double suspension rails conventionally used to support double suspension filing cabinet drawers. These rollers will be made of some non-corrosive material such as nylon so that they will be unaffected by the water and detergents used in the dishwasher 10.

An impeller of the conventional type will be located in a bottom 23 of the dishwasher 10. Other circulating devices for the water such as is conventionally used may be provided. The door 15 has an iron core member 27 fixed to its inner surface and extending therearound. The core member 27 provides an armature for an electromagnet 31 when the door 15 is closed. The iron core member 27 is spaced outwardly from a sealing blade 30 so that the core member 27 will come into proximate relation with the electromagnets 31, thus resulting in maximum force. A sealing member 35 will be made of a strip of rubber or the like and may be supported to the door 15 by means of a channel member 29. The member 29 could be fixed to the inside of the door 15 and will extend completely around the outside thereof.

Spaced cylindrical cores 34 are attached to the door 15 and the electromagnets 31 are wound around the cores 34. Thus, the cores 34 are connected in series with each other and in parallel with an impeller motor M so that when the dishwasher is running, the door 15 will be locked.

Since the rack comes out with the door, the door does not form an unnecessary obstruction to traffic.

The embodiment of the seal shown in FIG. 4 discloses a series of inversely wound coils embedded in a resilient seal and wrapping around an iron core 19. Coils 131 are in series so that spaced magnets are formed by the coils 131 and the core 19 which will attract the blade 30. Flat edges 36 may be fitted into the channel like member 29.

The electromagnet shown in FIG. 8 has the advantage over permanent magnets used in similar applications in that the magnet and seal are unitary. Since the spaced coils 131 are alternately wound in opposite directions, segments of the core 19 between each spaced coil will be magnetized to form fields F1, F2, and F3 which will define separate magnets with like poles adjacent each other so that the magnetic fields will be as indicated and will interlock with the armature formed by the iron dishwasher case. Thus, a considerably greater holding power will be obtained from the spaced electromagnets than would be obtained if the rod were wound with one con-

tinuous coil of wire. The iron rod core 19 can be bent in the shape of a square so that it will form a continuous seal around the front of the dishwasher.

The material of a seal 22 could be of sponge rubber or any other suitable resilient seal forming material. In the same manner, the sealing member 35 could be made of sponge rubber or suitable sealing material.

It will be noted from FIG. 5 that since the coils 131 are connected in series with each other and in parallel with the motor M which drives the dishwasher impeller, the door will only be actuated when the motor is actuated. Therefore, no power will be consumed for sealing the door except when the motor is operated and, thus, power consumption will be minimized.

The foregoing specification sets forth the invention in its preferred practical forms but the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows.

I claim:

1. In combination, an electric dishwasher having electrically operated cleaning means and a door, said dishwasher having a door opening with a jamb means therearound, means for movably mounting said door whereby it may be brought into closing position with said jamb means or moved away therefrom, a flexible, compressible sealing gasket mounted on one of said door and said jamb means, the other of said door and said jamb means having a surface against which said gasket is adapted

to bear, a magnetically attractable material carried by one of said door and said jamb means, an electromagnet attached to the other of said door and said jamb means, and means to automatically energize said electromagnet when said cleaning means is operating and to automatically deenergize said electromagnet when said cleaning means is not operating.

2. The combination recited in claim 1 wherein said dishwasher has a rack slidable inwardly and outwardly thereof, said door being attached to said rack and slidable therewith.

3. The combination recited in claim 1 wherein a plurality of said electromagnets is provided, said electromagnets are disposed around said door and attached to said dishwasher, and said means to automatically energize and deenergize said electromagnet being adapted to energize and deenergize said electromagnets simultaneously.

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