ABSTRACT

The specification discloses a door assembly and chamber combination. The door is disposed in a door chamber at the front of the sterilizing chamber and a lifting mechanism is provided for the door. A clamping mechanism is provided for clamping the door to a seal around an opening to the chamber. The door chamber is made up of a front plate and a rear plate, each of which have an opening aligned with the other and the door slides between these openings and is forced into engagement with a rearwardly facing seal attached to the front plate. A clamping arrangement made of plungers spaced around the opening and fixed to the back plate provided with chains and sprockets driven by an electric motor which forces the plungers into engagement with the door and causes it to seal against the seal. The door is counterweighted and a lifting motor is provided to lift the door out of the space between the two openings.

7 Claims, 6 Drawing Figures
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DOOR ASSEMBLY AND CHAMBER COMBINATION

STATEMENT OF INVENTION

This invention relates to sterilizing chambers and, more particularly, to an improved door and operating mechanism in combination with the sterilizer chamber.

OBJECTS OF THE INVENTION

It is an object of the invention to provide an improved sterilizer chamber.

Another object of the invention is to provide a sterilizer chamber and door operating mechanism that is simple in construction, economical to manufacture, and simple and efficient to use.

Another object of the invention is to provide an improved door operating and sealing mechanism.

GENERAL DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of the sterilizer according to the invention.

FIG. 2 is a cross sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is a cross sectional view similar to FIG. 2, taken on line 3—3 of FIG. 1.

FIG. 4 is a partial top view of the sterilizer operating mechanism according to the invention.

FIG. 5 is a cross sectional view taken on line 5—5 of FIG. 1.

FIG. 6 is a rear view of the sterilizer according to the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

Now with more particular reference to the drawings, the sterilizer chamber 10 is welded to the rear plate 14 of the enclosure shown. The sterilizer is made up of an outer shell 13 and an inner shell 12 which enclose the chamber space shown and may be of a conventional design in steam sterilizers. The outer shell 13 and inner shell 12 are welded to the rear plate 14 which forms the rear wall of the door enclosure. The door slides to open and to closed positions below top wall 54 between the front wall 17 and the rear wall 14 and these two walls are connected at the sides, top and bottom to form the sealed enclosure for the door 15. A lifting mechanism made up of gear reducer 22 and motor 34 is supported on a bracket 35 at the side of the sterilizer and the gear reducer drives the shaft 36 to which sprockets are attached and over which a chain 37 is suspended, the chain being attached to the door 15. A counterweight 16 is connected to the chain 26. The counterweight balances the weight of the door.

The door has laterally extending pins 37 and 38 which slide between the cleats 39 and 40 and guide the door to open and closed position.

An entrance chamber 18 is fixed to the door around the opening 41 in the front wall 17. A door frame 42 is fixed to the front wall 17 and this door has an opening 42 which is aligned with the opening 33 in the rear wall 14.

A seal 18 is fixed to the door frame around the opening 42 and this seal may be made of a resilient gasket, suitable to withstand the required temperatures, against which the door 15 rests when in closed position.

The plungers 19 are supported in plunger supports 20 which have suitable seals. The sprockets 28 are supported on the plungers.

The front wall 17 and rear wall 14 are reinforced by stiffening members 25. The sprockets 28 are connected by a continuous chain 26 which passes around the outside of the sprockets 28 and engages the sprocket 29 which is connected to the shaft of motor 23.

In operation, the motor 23 is driven in one direction. It will move the limit shaft 31 to a position to open the limit switch 30. This will move the plungers 19 outward to disengage the door 15 so that motor 22 can drive its sprocket to lift the door 15 to open position. is, clamping the door 15 against the seal 18.

Limit switch is actuated by members 29 and 30 and the limit switches 50 and 51 may be connected in electrical circuit with motor 22 and motor 23 to synchronize the motor 23 with the motor 22.

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:

1. A door assembly for a chamber comprising a sealed enclosure, a door supported in said enclosure, said enclosure being made of a front wall, a rear wall, a top wall and a bottom wall spaced from each other and connected together to form said sealed enclosure, an opening in said front wall and an opening in said rear wall aligning with said opening in said front wall, said door being disposed between said openings, means to move said door from its position between said openings to a position out of the space between said openings, a seal around said opening in said front wall on the side thereof adjacent said rear wall, and means to force said door into engagement with said seal when said door is in position between said openings.

said rear wall being adapted to be connected to a chamber connected around said opening therein whereby the space in said chamber communicates with the space in said enclosure when said door is in closed position, said means to force said door against said seal comprises a plurality of plungers supported on said rear wall, and means for urging said plungers into engagement with said door.

said means to actuate said plungers comprises actuating means attached to each said plunger, a motor on said enclosure, and connecting means connecting said motor to each of said plungers whereby said plungers are actuated.

said actuating means comprises a first sprocket and a plurality of second sprockets, one said sprocket being attached to each said plunger,
and means to drive said motor whereby said first plunger moves said second sprockets to actuate said plungers toward and away from said door when said door is in closed position,
said spaced sprockets are connected to said plungers by means of a nut and screw arrangement whereby said plungers are moved toward said door when said sprockets are rotated in a first direction and said sprockets are moved away from said door when said sprockets are rotated in an opposite direction.

2. The door assembly recited in claim 1 wherein said means to move said door away from said space between said openings comprises a motor means above said door,
a sprocket connected to said motor, and a chain over said sprocket, said chain being attached to said door.

3. The door assembly recited in claim 2 wherein said means to move said door comprises a flexible member attached to said door, and means on said door engaging said flexible member, and a counterweight attached to said flexible member on the end thereof remote from said door.

4. A door for a chamber comprising a sealed enclosure, a door supported in said enclosure, said enclosure being made of a front wall, a rear wall, a top wall and a bottom wall spaced from each other and connected together to form said sealed enclosure, an opening in said front wall and an opening in said rear wall aligned with said opening in said front wall, said door being disposed between said openings, means to move said door from its position between said openings to a position out of the space between said openings, a seal around said opening in said front wall on the side thereof adjacent said rear wall, and means to force said door into engagement with said seal when said door is in position between said openings, said rear wall being adapted to be connected to a chamber connected around said opening therein whereby the space in said chamber communicates with the space in said enclosure when said door is in closed position, said means to force said door against said seal comprises a plurality of plungers supported on said rear wall, and means for urging said plungers into engagement with said door, said means to actuate said plungers comprises actuating means attached to each said plunger, a motor on said enclosure, and connecting means connecting said motor to each of said plungers whereby said plungers are actuated, said actuating means comprises a first sprocket and a plurality of second sprockets, one said sprocket being attached to each said plunger, and means to drive said motor whereby said first plunger moves said second sprockets to actuate said plungers toward and away from said door when said door is in closed position, detent means are attached to said plungers, and electrical limit switch means are supported on said door, means for moving said detent means with said plungers whereby said limit switches are opened when said plungers are moved to position to clamp said door and to position to unclamp said door.

5. The door assembly recited in claim 4 wherein said detent means is attached to said plunger, and electrical limit switch means is supported on said door, means for moving said detent means with said plungers whereby said detent means disconnect said motor from said power supply when said door reaches said open position.

6. In combination, a sterilizer chamber and a door assembly for said chamber comprising a sealed enclosure extending above said chamber, a door supported in said enclosure, said enclosure being made of a front wall, a rear wall, a top wall and a bottom wall spaced from each other and connected together to form said sealed enclosure, an opening in said front wall and an opening in said rear wall aligned with said opening in said front wall, said door being disposed between said openings, means to move said door from its position between said openings to a position out of the space between said openings, a seal around said opening in said front wall on the side thereof adjacent said rear wall, and means to force said door into engagement with said seal when said door is in position between said openings, said rear wall being connected to a chamber connected around said opening therein whereby the space in said chamber communicates with the space in said enclosure when said door is in closed position.

7. The combination recited in claim 6 wherein said sterilizer chamber has a steam jacket around the outside thereof, said steam jacket and said chamber being welded to said rear wall around said opening, and said enclosure extending upwardly above said sterilizer chamber.

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