

United States Patent

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 [31] **49,828**

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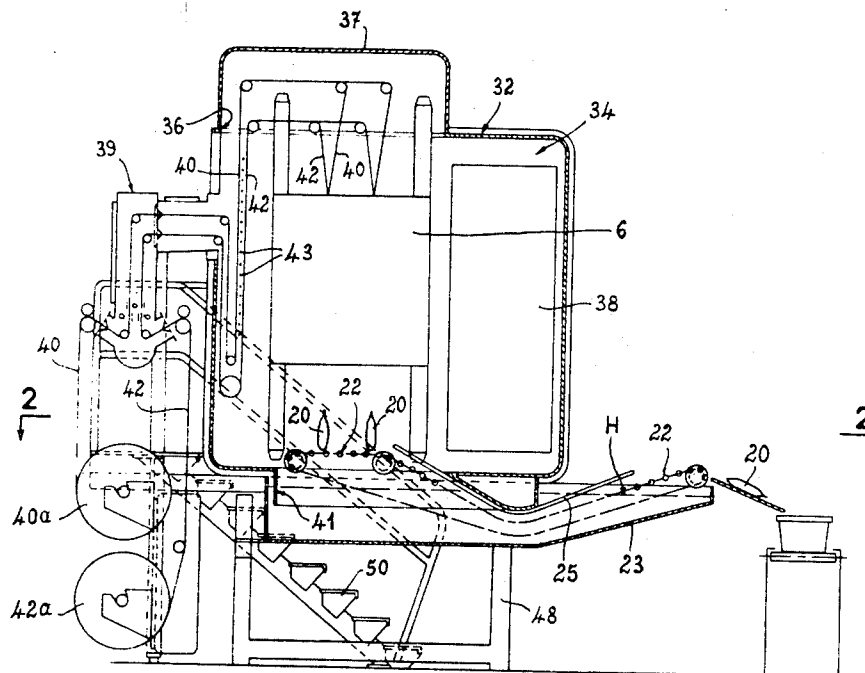
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[54] **STERILE CHAMBER FOR THE PACKAGING OF VARIOUS PRODUCTS**
 3 Claims, 3 Drawing Figs.

[52] U.S. Cl. **53/180**
 [51] Int. Cl. **B65b 9/02**
 [50] Field of Search. 53/28, 141, 180

[56] **References Cited**
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ABSTRACT: A sterile chamber for packaging various products comprises a sealed one-piece box divided internally by a partition into two separate compartments. One chamber has an upper opening for vertically introducing the packaging machine after which it is closed by a cover, and a lower opening for removing the packaged products on a conveyor belt through a bath of germicidal liquid. A lateral aperture is provided for supplying webs of plastic film to the packaging machine from two reels through a single cleaning device using germicidal lamps between the films. The second compartment houses a panel bearing remote-control elements for the packaging machine. A door in the partition gives access from the control compartment to the packaging compartment and a transparent window in the partition permits observation.



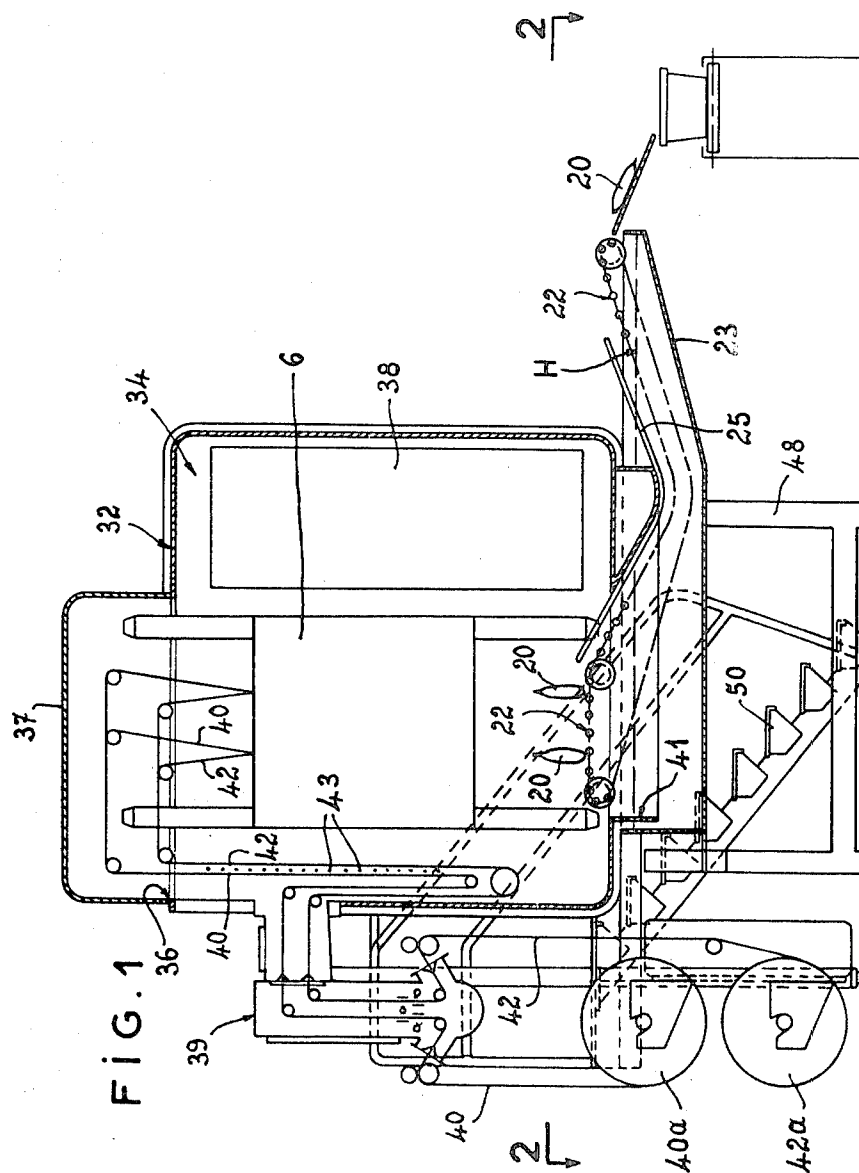


FIG. 1

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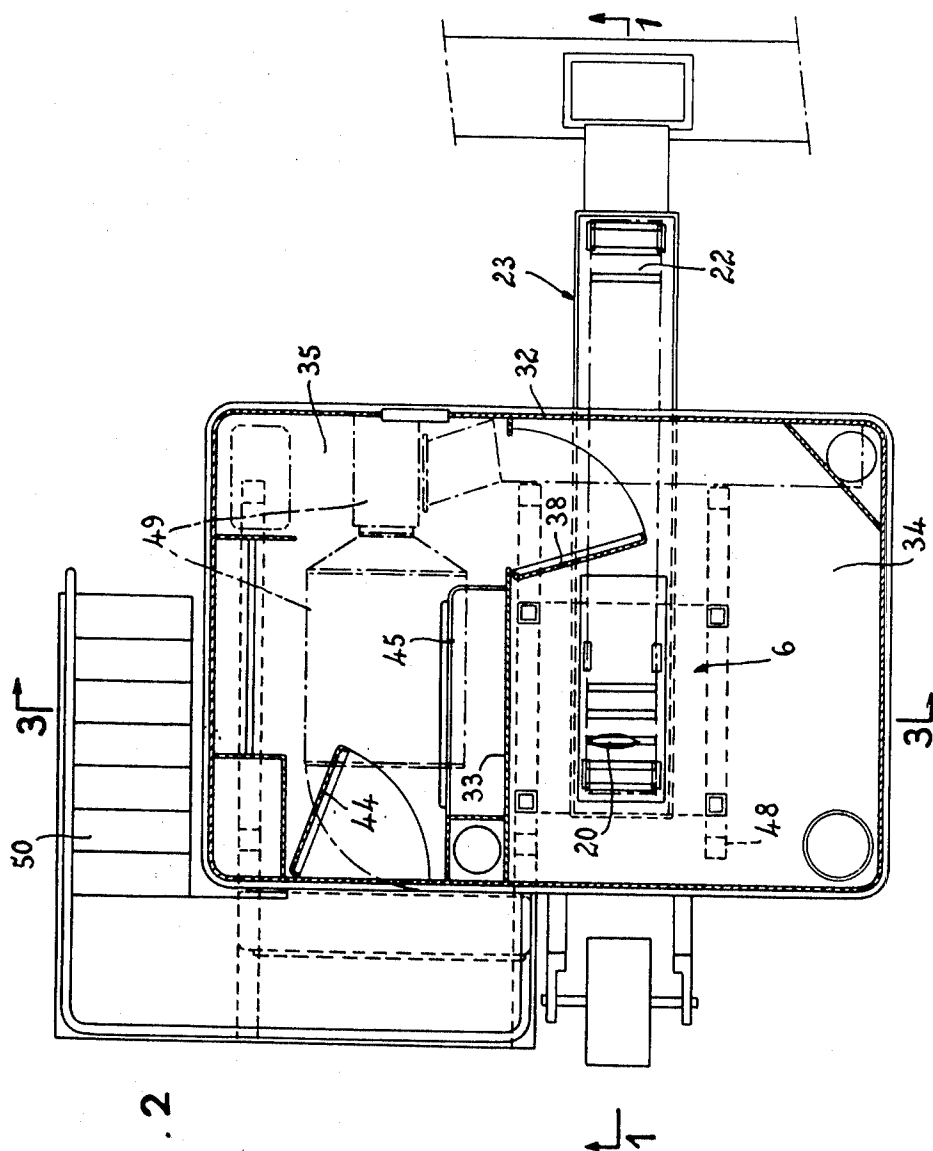


FIG. 2

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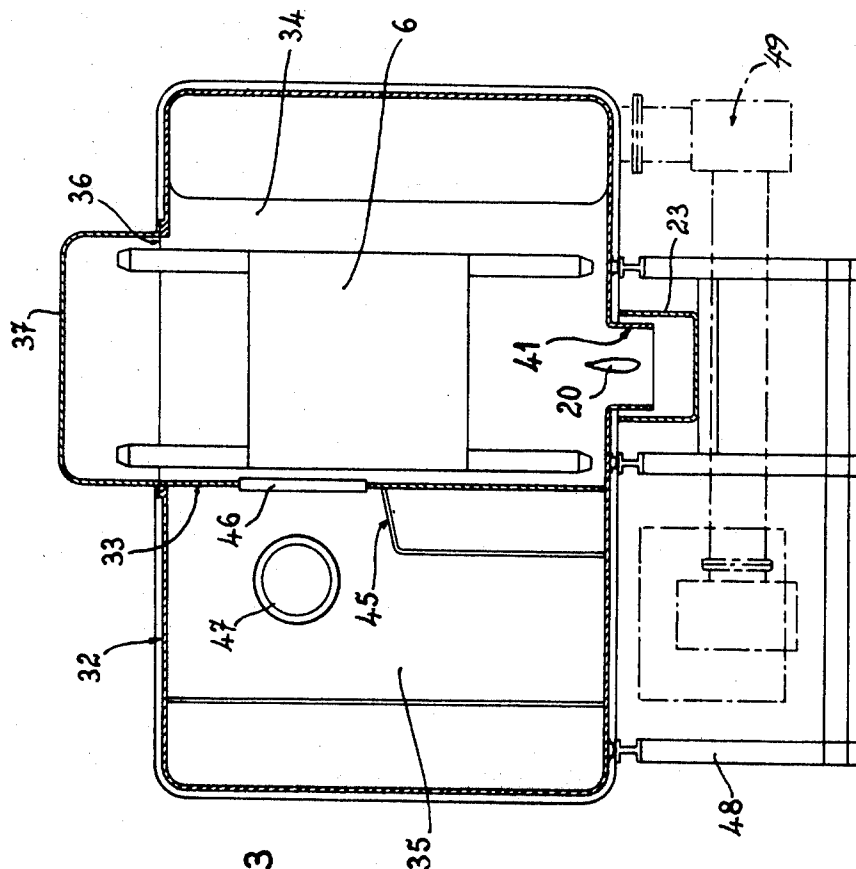


FIG. 3

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STERILE CHAMBER FOR THE PACKAGING OF VARIOUS PRODUCTS

The present invention relates to a sterile chamber for the packaging of various products.

To increase the duration of preservation of certain products, it is necessary that their packaging be effected in a sterile atmosphere, especially in a sterile chamber.

French Pat. No. 1,558,310 describes a sterile chamber which comprises a sealed enclosure constituted by a central ring closed on both sides by two casings sufficiently large to fit around the packaging machine, the enclosure defining a central walking space giving a man access to the machine; a conveyor for the removal of the packaged products has one end extending into the sterile chamber below the packaging machine while its other end lies outside this conveyor describing a V-shaped path in the course of which it passes into a well containing a bactericidal liquid, a V-shaped ramp being provided above the well to force the packaged products to enter the latter before arriving at the exterior.

It is an object of the present invention to provide an improved sterile chamber which enables substantial reduction in its bulk while affording full access to the packaging machine.

Other objects and advantages will emerge from the general and detailed descriptions which follow.

According to the invention, the sealed enclosure of the sterile chamber is constituted by a single one-piece box internally divided, by means of a partition, into two distinct compartments. One of these compartments is provided with an upper opening large enough to enable the vertical introduction of the machine into the box, this opening being subsequently closed by a cover; with a lower opening for the removal of the packaged products by means of a conveyor; and with at least one lateral opening for the passage of films of plastic material feeding the packaging machine. The other compartment forms an operator's cabin containing all the remote-control elements for the packaging machine.

Advantageously, the supply of film of plastic material to the packaging machine is ensured by two separate reels arranged on the same side and externally of the sealed enclosure, the webs unwound from these reels entering the sealed enclosure through a common sterilization device.

By virtue of this construction of the enclosure and the external arrangement of the supply reels, the control and supervision of the operation of the packaging machine are rendered very easy. Moreover, in the case of a malfunction, it is always possible to enter the sterile enclosure and to have free access to all the parts of the packaging machine.

In order that the invention may be more fully understood, one embodiment of a sterile chamber according to the invention is described below, purely by way of illustrative but non-limiting example, with reference to the accompanying diagrammatic drawing in which:

FIG. 1 is a front view of this embodiment in vertical section along the line 1-1 of FIG. 2;

FIG. 2 is a top plan view thereof taken along the line 2-2 of FIG. 1; and

FIG. 3 is a side view thereof in section along the line 3-3 of FIG. 2.

The shielded packaging plant according to my invention is constituted by a monobloc shell or one-piece box 32, of parallelepipedic form, entirely divided by means of a partition 33 into two distinct compartments, namely a sterile enclosure 34 and a cabin 35. Compartment 34 has at its top an opening 36 sufficiently large to enable the insertion of a packaging machine 6. As soon as the machine 6 has been introduced vertically into the chamber 34, the opening 36 is finally closed by a cover 37, as shown in FIGS. 1 and 3.

Compartment 34 also has at its base an opening 41 enabling, as shown in FIG. 1, one of the ends of a conveyor 22 to extend into this compartment to receive bags 20 of products packaged by the machine 6. The conveyor 22 is also located in part in a trough 23 filled, up to a level H, with a bactericidal liquid; its chains or links describe a V-shaped path in

the course of which they pass into the bath of bactericidal liquid drawing with them, below the level H, the bags 20. In the course of their displacement by the conveyor 22, the bags 20 are directed by a V-shaped guide 25 into the well thus formed.

As shown in FIG. 2, the packaging machine 6 is disposed close to the partition 33 separating the two compartments; it is laterally offset from the longitudinal axis of the sterile chamber to permit the inward swinging of a door 38 placing the compartment 34 in communication with the cabin 35.

On the lateral wall nearest the packaging machine is fixed a device 39, such as that described in French Pat. No. 1,539,775 which enables two webs of plastic material 40 and 42 to be introduced into the sterile enclosure 34, these webs being unwound in generally parallel paths from two separate reels 40a and 42a, arranged one above the other on corresponding supports outside the chamber. The webs passing through this device are subjected to the action of germicidal lamps 43, especially of ultra-violet radiation, which destroy bacteria liable to subsist thereon.

It is to be noted that these lamps are arranged between the two webs and radiate each toward those webs surfaces which will later constitute the inner surface of the package. With this arrangement, for an identical result, the number of lamps necessary is less than that required by the installation described in the aforementioned French Pat. No. 1,558,310.

The cabin 35 is accessible from the outside through a door 44; it contains a panel 45 on which are assembled all the elements and instruments for the control of the packaging machine 6 visible to the operator in cabin 35 through a light-transmitting screen 46, provided in the partition 33, as shown in FIG. 3. A porthole 47 also enables supervision of the activities of the operator from the outside.

The accommodation in a common housing of the sterile compartment and of its operator's cabin enables considerable reduction of the bulk of the assembly without impairment of the accessibility of the machine 6. In fact, as shown in greater detail in FIG. 2, in the case of a malfunction or for cleaning purposes, the machine 6 can be very easily reached.

The unitary shell 32 is raised with respect to the ground by means of a frame 48 which advantageously serves a housing for the accessories 49 of the chamber and of the packaging machine. A staircase 50 gives access to the operator's room 35.

It will be apparent that various changes and modifications may be made in the embodiment described above without departing from the essential concept of the invention as defined in scope by the appended claims.

I claim:

1. A shielded plant for the sterile packaging of products, comprising:

a packaging machine;

an enclosure completely surrounding said machine, said enclosure having a closable top opening large enough to enable insertion of said machine, a bottom opening and a side opening;

supply means at said side opening for the feeding of sterilized packaging material from the outside to said machine; control means for said enclosure outside said enclosure; a trough underneath said enclosure forming a well for a germicidal liquid;

and conveyor means entering said enclosure through said bottom opening for the removal of packages produced by said machine, said conveyor means traversing said well for submerging completed packages in said germicidal liquid.

2. A plant as defined in claim 1 wherein said enclosure is part of an integral shell provided with a partition dividing the interior of said shell into a compartment for said machine and into an operator's room containing said control means, said partition being provided with a door giving access to said compartment.

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3. A plant as defined in claim 1 wherein said supply means comprises a pair of reels outside said enclosure for delivering said packaging material in two generally parallel webs to said side opening, said supply means further comprising a source of

germicidal radiation interposed ahead of said side opening between the paths of said webs for simultaneously irradiating same.

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