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(54) **AN ENCLOSING STRUCTURE FOR CONTAINER PACKAGING MACHINES AND/OR MACHINE UNITS, IN PARTICULAR CAPPING MACHINES.**

GEHÄUSESTRUKTUR FÜR BEHÄLTERVERPACKUNGSMASCHINEN UND/ODER
MASCHINENEINHEITEN, INSBESONDERE VERSCHLISSMASCHINEN

STRUCTURE D'ENCEINTE POUR MACHINES ET/OU UNITÉS DE MACHINE D'EMBALLAGE DE
RÉCIPIENTS, NOTAMMENT DES MACHINES D'ENCAPSULAGE

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Description

Technical Field

[0001] The present invention relates to an enclosing structure for container packaging machines and/or machine units, and in particular for capping machines, in accordance with the preamble of claim 1 and as known from WO 2007 132 339.

[0002] The present invention finds application to advantage in the art field of carousel type machines such as fillers, cappers, sterilizers and the like, generally handling open containers intended to hold food products of both liquid and powder consistency, or indeed any product that needs to be protected from external contaminants.

Background Art

[0003] In the case of cappers, the prior art embraces machines consisting in a carousel rotatable about a vertical axis, which comprise a drum furnished peripherally with a set of capping units distributed circumferentially about the vertical axis of rotation. Each capping unit comprises a hollow shaft centred on a vertical axis and carrying a relative capping head at the lower end, equipped with a respective gripper mechanism.

[0004] Located below the drum, generally, will be a disc or a set of pedestals on which to stand respective open containers. The disc or pedestals are supplied with containers from a corresponding infeed station. At the same time, the capper is supplied from a feeder station with single caps positionable on each of the incoming containers. Containers capped by the carousel are released ultimately, by the disc or by the pedestals, to a corresponding outfeed station.

[0005] During the passage of the containers from the infeed station to the outfeed station, a single cap is picked up from the aforementioned feeder station by each capping head and fitted to a respective container standing on the disc or on the relative pedestal. In order to accomplish this sequence of steps, each capping head is able to rotate while remaining vertically aligned above the corresponding container, as well as being translatable vertically toward or away from the selfsame container. The containers can be closed with the aforementioned caps by applying a twisting action or a forcing action, or a combination of the two, depending on the type of closure specified.

[0006] In greater detail, the capping units and the disc or pedestals are caused to rotate as one about the vertical axis of the capping machine by means of a vertical shaft that is common to both.

[0007] Both the capping units and the disc or pedestals carrying the containers are connected to the vertical shaft in such a way that all must necessarily rotate together about the vertical axis of the capping machine.

[0008] The translational movement of the capping

units is induced by respective follower mechanisms engaging in a groove that constitutes the active profile of a cylindrical cam positioned between the rotating vertical shaft and the capping units.

[0009] The cylindrical cam does not rotate about the vertical axis of the machine but remains stationary, so that when the capping units are set in rotation about the vertical axis, each will descend or ascend as a result of the interaction between the respective follower mechanism and the cam profile.

[0010] To ensure that the capper can be used with different types of containers, the operating distance between the capping units and the disc or pedestals supporting the containers will be adjustable between presettable maximum and minimum values.

[0011] To this end, the capping units are coupled cap- tively and slidably to the rotating vertical shaft and the cylindrical cam is coupled cap- tively and slidably to re- spective fixed mountings.

[0012] Capping machines of the type described above may also be equipped with a casing, cowl or similar struc- ture, placed over the machine and enclosing the capping units at least in part. The casing in question is fixed in relation to the moving parts of the machine, which nor- mally will be enclosed within the casing. In this way, most of the motion-inducing components in the capping units of carousel type machines can be protected from un- wanted infiltrations of dust and/or dirt.

[0013] Notwithstanding the fact that with a casing fitted to machines for handling open containers, such as the capping machine described above, it becomes possible to protect moving parts from the infiltration of unwanted dust and particles, and similarly to protect operators from these same moving parts, the applicant observes none- theless that the assembly of machine and casing is af- fected by certain drawbacks, connected principally with the infiltration of liquids and/or cleansing substances uti- lized at high pressures when the machines are washed down, and with the need to maintain the aseptic integrity of the containers both when empty and when filled with the product being packaged.

[0014] In particular, it has been noted that in the course of washing operations, which normally include a prelim- inary step of spraying foamable substances onto ex- posed working parts of the packaging machine, followed by a step of rinsing these same parts with high pressure jets, the washing liquids utilized can find their way un- desirably into the space enclosed by the protective casings. Such infiltrations can damage motion-inducing com- ponents of the capping heads, with the result that these same parts may require servicing more than once to re- store their correct operation, and may even need replac- ing. Self-evidently, these servicing operations impact heavily on production and running costs generated by the machines in question, incurred both through the pur- chase of replacement parts and the payment of labour charges, and as a result of maintenance stoppages.

[0015] It will be appreciated also that when carousel

machines of the aforementioned type are in operation, there is the risk that contaminant particles and/or substances can escape from the bottom of the casing and drop into the open containers; such contaminants include oils, grease and other lubricants on the motion-inducing components of the capping heads, or rust and other particles shed by parts of these components engaged in sliding contact, all of which will inevitably spoil the product, whether already in the container or yet to be batched.

Disclosure of the Invention

[0016] The object of the present invention, accordingly, is to overcome the drawbacks associated with prior art machines.

[0017] A first object of the present invention, in particular, is to provide an enclosing structure for container packaging machines and/or machine units, in particular capping machines, by which motion-inducing components of the various operating mechanisms will be protected when the machine is washed and rinsed periodically.

[0018] A further object of the present invention is to ensure that when the machine by which containers are packaged is in operation, there will be no possibility of contaminant particles and/or substances dropping from the motion-inducing components of machine units into the containers being processed.

[0019] Another object of the invention is to ensure that any pulverulent material transported and/or set in motion by the conveyors at the infeed and outfeed stations, or deposited on the outer surfaces of the containers being processed, will not circulate above the open tops of the containers.

[0020] The stated objects and others besides are substantially realized in an enclosing structure for container packaging machines and/or machine units, in particular capping machines, as recited in the appended claims.

Brief Description of the Drawings

[0021] The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

- figure 1 is a perspective illustration of an enclosing structure according to the present invention, applicable to packaging machines and/or machine units for packaging containers, and in particular to capping machines;
- figure 2 is an elevation view of the structure illustrated in figure 1;
- figure 3 is a section taken on cutting plane A-A in figure 1, which shows a machine for packaging containers equipped with an enclosing structure according to the present invention, illustrated in a first operating position;
- figure 4 is an enlarged detail of figure 3.

Detailed description of the preferred embodiments of the invention

[0022] With reference to the accompanying drawings, numeral 1 denotes an enclosing structure, in its entirety, for container packaging machines and/or machine units, and in particular for capping machines.

[0023] More specifically, albeit implying no limitation in scope of the present invention, the structure disclosed is applicable to carousel machines of whatever type, for example fillers, cappers, sterilizers, etc., utilized for processing open containers in which liquid and/or powdered products are to be packaged, such products consisting preferably in food products.

[0024] As discernible from the accompanying drawings, the enclosing structure 1 comprises at least one isolation casing 2, extending at least in part around at least one motion-inducing component 3 (see figures 3 and 4) of a packaging unit 4 operating on open containers 5.

[0025] Preferably, the isolation casing 2 will encompass a plurality of motion-inducing components 3 presented by the packaging unit 4, by which one or more operations are performed on the open containers 5 in the process of capping and releasing the finished article.

[0026] Applied to a capping machine, or indeed to any machine of generally similar type, the isolation casing 2 extends at least partially around the motion-inducing components 3 of the packaging unit 4, which is equipped with a plurality of capping units 6 distributed circumferentially about a common vertical axis X. Each capping unit 6 is equipped with an appropriate capping head 7 that operates by activating a relative gripper mechanism 7a designed to take up and apply successive caps of familiar design (not illustrated) supplied to the machine by way of a respective feeder station (not illustrated).

[0027] The capping units 6 are carried by a drum 8 positioned above a plurality of pedestals (not illustrated) on which the open containers 5 are supported while being capped.

[0028] With reference in particular to figures 1 and 2 of the drawings, the pedestals supporting the containers 5 are supplied from a respective infeed station 9 with open containers, singly and in succession. In a preferred embodiment, these same pedestals are designed to release the containers 5, closed with respective caps by the aforementioned capping units 6, to an outfeed station 10.

[0029] To advantage, the containers 5 advance from the infeed station 9 to the outfeed station 10 following a substantially circular path, along which each capping head 7 is caused to rotate while remaining above and in vertical alignment with the relative container 5 and, in controlled sequence, to translate toward and/or away from the selfsame container 5. In this way, each gripper mechanism 7a is made to pick up a single cap from the relative feeder station and place it on a respective container 5 directed onto the carousel from the infeed station

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[0030] The nature of the motion induced in the cap by the capping unit 6 will depend entirely on the type of cap specified for the containers 5 in production.

[0031] To ensure that the capping units 6 and the pedestals supporting the containers 5 revolve as one on the carousel, both are coupled to a common vertical shaft 11.

[0032] The translational movement of the capping units 6 is induced through the agency of respective follower mechanisms (conventional in embodiment) engaging in a groove that constitutes the active profile of a cylindrical cam positioned between the common vertical shaft 11 and the capping units 6.

[0033] The position of the cylindrical cam remains unchanged during operation, whereas the capping units 6 revolve around the vertical shaft 11 and will also ascend or descend, as dictated by the cam profile.

[0034] The distance between the capping units 6 and the respective pedestals supporting the containers 5 can be adjusted to suit containers of different heights received from the infeed station. In particular, the entire superstructure of the packaging unit 4, that is to say the plurality of capping units 6 and all of the mechanisms by which motion is induced in these same units, are capable of movement along the common vertical shaft 11 between an upper limit position, in which the capping units 6 are placed at a maximum distance from the respective pedestals, and a lower limit position (figures 3 and 4), in which the capping units 6 are placed at a minimum distance from the respective pedestals.

[0035] As illustrated in the drawings, the aforementioned isolation casing 2 comprises at least one fixed cowl 13 extending at least partially around the motion-inducing components 3 of the packaging unit 4, that is to say around the capping units 6, in this particular instance.

[0036] The fixed cowl 13 comprises a substantially cylindrical body 14 presenting a first end 15 at least partially enclosed by a relative wall 16, preferably of rounded profile, and a second end 17 located opposite to the first end 15 and consequently remote from the enclosing wall 16.

[0037] As discernible in figure 3, the second end 17 of the fixed cowl 13 is directed downwards, facing toward the capping heads 7 and toward the pedestals carrying the containers 5 being capped.

[0038] Still referring to figure 3, the body 14 of the fixed cowl 13 comprises at least one circular rib 18 projecting internally from an inside wall 19 of the selfsame cowl 13 and serving to create a stop 20 (figure 4) directed toward the common vertical shaft 11.

[0039] More specifically, the body 14 of the fixed cowl 13 comprises a first module 21 and a second module 22 connected one to another and presenting dissimilar diametral dimensions.

[0040] To advantage, the diameter of the second module 22 is greater than the diameter of the first module 21, and accordingly, the fixed cowl 13 presents a cross section that reduces in width progressing from the second end 17 to the first end 15.

[0041] The circular internal rib 18 is positioned preferably between the first module 21 and the second module 22 of the fixed cowl 13.

[0042] As illustrated in the accompanying drawings, the isolation casing 2 also comprises at least one movable cowl 23 furnished internally with at least one sealing element 24. The movable cowl 23 is associated operationally with the fixed cowl 13 and affords a passage to each of the capping units 6, these being the components of the packaging unit 4 by which the containers 5 fed onto the carousel are effectively handled.

[0043] Advantageously, the movable cowl 23 is capable of movement between an open configuration (figures 3 and 4) assumed with the structure 1 in a first operating position, in which at least one gap 23a is created between the fixed cowl 13 and the movable cowl 23, thereby placing the fixed cowl 13 in fluid communication with the surrounding environment, and a closed configuration, assumed with the structure 1 in a second operating position, in which the sealing element 24 registers against the stop 20 presented by the fixed cowl 13, in such a way as to isolate the selfsame fixed cowl hermetically from the surrounding atmosphere and from the exposed parts of the capping units 6.

[0044] In the preferred embodiment illustrated, the movable cowl 23 comprises a substantially cylindrical body 25 of which one end is attached to a rotating disc 26 of the packaging unit 4 rigidly associated with the common vertical shaft 11 and positioned at least in part over the pedestals carrying the containers 5. Thus, the movable cowl 23 rotates as one with the capping units 6 about the aforementioned vertical axis X and is slidable together with the selfsame units on the vertical shaft 11 between the upper limit position and the lower limit position.

[0045] Referring in particular to figures 3 and 4, the movable cowl 23 is hermetically sealed at bottom by the rotating disc 26, which presents a plurality of openings 26a furnished with suitable seals 26b proportioned to accommodate the capping units 6.

[0046] As discernible in figures 3 and 4, the end of the movable cowl 23 farthest from the rotating disc 26 carries the sealing element 24, which is interfaceable with the aforementioned stop 20 when the movable cowl 23 assumes the closed configuration.

[0047] To establish the communicating gap 23a between the fixed cowl 13 and the surrounding environment when the movable cowl 23 presents the open configuration, the diametral dimension of the movable cowl 23 is advantageously less than the diametral dimension presented by the first module 21 of the fixed cowl 13. The gap 23a, accordingly, is of substantially circular geometry, being delimited between the first module 21 of the fixed cowl 13 and the outermost part of the movable cowl 23.

[0048] Still referring to figures 3 and 4, the sealing element 24 presents a substantially circular appearance, considered overall.

[0049] In particular, the sealing element 24 projects

outwardly in cantilever fashion from the movable cowl 23 toward the first module 21 of the fixed cowl 13, in such a way as to interact radially with the stop 20 and isolate the fixed cowl 13 hermetically when the movable cowl 23 assumes the closed configuration.

[0050] More exactly, the sealing element 24 presents a circumferential mounting portion 27 designed to engage an annular edge 28 of the movable cowl 23 directed toward the fixed cowl 13, and a circumferential sealing portion 29 positioned on the side opposite to the circumferential mounting portion 27.

[0051] The circumferential mounting portion 27 is secured to the annular edge 28 through the agency of a respective retaining ring 30 by which the selfsame portion 27 of the sealing element 24 is forced vertically down against the annular edge 28.

[0052] To advantage, as discernible in the sectional illustration of figure 4, the circumferential sealing portion 29 presents at least one circumferential groove 31 engageable by the stop 20 when the movable cowl 23 assumes the closed configuration, in the second operating position.

[0053] The circumferential groove 31 of the sealing portion 29 is delimited preferably by two superposed circumferential projections 32 of the sealing element 24, which extend radially toward the first module 21 of the fixed cowl 13.

[0054] Advantageously, in accordance with the present invention, the isolation casing 2 comprises ventilation means 33 associated operationally with the fixed cowl 13 and serving, when the movable cowl 23 is in the first operating position, to generate at least one flow of air B entering through the gap 23a and exiting at the end of the fixed cowl remote from the gap.

[0055] The ventilation means 33 in question will preferably comprise an extractor fan 34, installed and operating in an opening 35 afforded by the top enclosing wall 16 of the fixed cowl 13.

[0056] In detail, the extractor fan 34 can be set in rotation in such a way as to draw air through the gap 23a when the movable cowl 23 assumes the open configuration, and will be disabled when the movable cowl 23 assumes the closed configuration, that is to say with the gap 23a occluded by the sealing element 24.

[0057] As illustrated in the drawings, the isolation casing 2 comprises a frame 36 by which the fixed cowl 13 is surrounded and at least partially enclosed together with the movable cowl 23 and the packaging unit 4. The enclosing frame 36 also houses conveyor means 37 (figure 2) operating on the infeed and the outfeed side of the packaging unit 4, serving to transport the containers 5 and consisting for example in belts or similar conveying systems.

[0058] It will be seen in the drawings that the enclosing frame 36 delimits an enclosure 38 protected from external elements and in fluid communication with the surrounding environment by way of an infeed channel 36a and an outfeed channel 36b. More exactly, the conveyor

means 37 carrying open containers 5 toward the capping units 6 of the carousel are housed at least in part by the infeed channel 36a, whilst the conveying means 37 carrying capped containers 5 away from the capping units 6 are housed at least in part by the outfeed channel 36b.

[0059] To advantage, the ventilation means 33 are associated operationally with the enclosing frame 36 in such a way as to generate at least one flow of air C within the enclosure 38, directed from a top portion of the frame 36 to a bottom portion of the frame, where the conveyor means 37 transporting the containers 5 are located. In other words, the flow C is forced by the ventilation means 33 from top to bottom, in such a manner that the air will be expelled through the infeed channel 36a and the outfeed channel 36b, as well as through other outlets (not illustrated) located at the bottom of the enclosing frame 36.

[0060] To this end, the ventilation means 33 comprise a first blower fan 39 occupying and operating within a first opening 40 afforded by a top wall 41 of the enclosing frame 36 in a position alongside the fixed cowl 13. To advantage, ambient air drawn in by the first fan 39 is filtered before being directed into the infeed channel 36a admitting open containers 5.

[0061] The ventilation means 33 also comprise a second blower fan 42 occupying and operating within a second opening 43 afforded by the top wall 41 of the enclosing frame 36 in a position alongside the fixed cowl 13.

[0062] Similarly, ambient air drawn in by the second fan 42 is filtered before being directed into the outfeed channel 36b.

[0063] The first and second blower fans 39 and 42 are set in rotation to generate respective flows of air C during normal operation of the packaging unit 4.

[0064] It will be appreciated however that the first and second blower fans 39 and 42 can also be activated during situations other than the normal operation of the packaging unit 4, such as when the equipment is being washed, for example.

[0065] In the event that the packaging unit 4 is equipped with capping units 6, it will be preferable to set up the ventilation means in such a way that the air flow produced by the first blower fan 39 is gentler than the air flow produced by the second blower fan 42. Adopting this expedient, it becomes possible to ensure that the air flow directed through the infeed channel 36a will not encroach on the operating space of an upstream machine operating in a protected atmosphere, such as a filler.

[0066] To protect the enclosure 38 accommodating the packaging unit 4 from the introduction of undesirable contaminant particles, the first opening 40 and the second opening 43 are equipped each with a respective filter element.

[0067] The drawbacks associated with the prior art are overcome by the present invention, which provides numerous advantages.

[0068] Firstly, the enclosing structure of the present invention affords complete protection to the mechanical

components by which motion is induced in assemblies such as the capping units, in the course of washing operations on a machine or a packaging unit of the type described and illustrated.

[0069] In particular, the isolation casing is able to accompany the elevating movement of the entire packaging unit, and thus shield the mechanical parts when the unit is exposed to foamable substances and rinsing liquids applied by means of high pressure jets. In this situation, the interaction between the sealing element and the relative stop presented by the fixed cowl will prevent washing liquids from penetrating the fixed cowl and investing the motion-inducing components of the packaging unit, thereby causing damage.

[0070] In addition, the inclusion of the ventilation means helps to preserve the aseptic integrity of the containers and/or the product held in the containers given that, on the one hand, contaminant particles and/or substances attached to the motion-inducing components of the packaging unit are prevented from falling onto the containers while still open, during the operation of the machine, and on the other, pulverulent material present on the conveyor belts and on the containers entering the machine are prevented from rising above the level of the container mouths.

[0071] In effect, the extractor fan operating on the fixed cowl removes air from inside this cowl and creates a protective barrier at the gap between the fixed and movable cowls, whilst the first and second blower fans ensure that any dust or powder particles present in the infeed and outfeed channels will stay tight against the bottom of the enclosure.

Claims

1. An enclosing structure for container packaging machines and/or machine units, and in particular capping machines, comprising at least one isolation casing (2) extending at least in part around at least one motion-inducing component of a packaging unit (4) operating on initially open containers (5), wherein the isolation casing (2) of the structure (1) comprises:

- at least one fixed cowl (13) extending at least in part around the at least one motion-inducing component (3) of the packaging unit (4),
- at least one movable cowl (23) operationally associated with the fixed cowl (13), furnished with at least one sealing element (24), **characterized in that** the movable cowl (23) affords a passage to at least one working part (3) of the packaging unit (4) and is capable of movement between an open configuration assumed with the structure (1) in a first operating position, in which at least one gap (23a) is created between the fixed cowl (13) and the movable cowl (23), thereby placing the fixed cowl (13) in fluid com-

munication with the surrounding environment, and a closed configuration, assumed with the structure (1) in a second operating position, in which the sealing element (24) registers against a stop (20) afforded by the fixed cowl (13), in such a way as to isolate the selfsame fixed cowl hermetically from the surrounding atmosphere and from an exposed portion of the working part (3).

2. A structure as in claim 1, wherein the fixed cowl (13) comprises a substantially cylindrical body (14) presenting a first end (15) enclosed at least in part by a wall (16) preferably of rounded appearance, also a second end (17) located opposite to the first end (15) and directed toward the movable cowl (23).
3. A structure as in claim 2, wherein the cylindrical body (14) of the fixed cowl (13) presents at least one circular rib (18) projecting internally from an inside wall (19) of the selfsame cowl (13) and serving to create a stop (20) such as will engage the sealing element (24) of the movable cowl (23) when this same cowl (23) assumes the closed configuration.
4. A structure as in claim 2 or 3, wherein the cylindrical body (14) of the fixed cowl (13) comprises a first module (21) and a second module (22) connected one to the other and presenting dissimilar diametral dimensions.
5. A structure as in claim 4, wherein the diametral dimensions presented by the second module (22) of the fixed cowl (13) are greater than the diametral dimensions presented by the first module (21).
6. A structure as in claim 4 or 5, where claim 4 is dependent on claim 3, wherein the internal circular rib (18) is located between the first module (21) and the second module (22) of the fixed cowl (13).
7. A structure as in preceding claims, wherein the movable cowl (23) comprises a substantially cylindrical body (25) of which one end is attached to a rotating disc (26) of the packaging unit (4) positioned at least partly over the containers (5) being processed by this same unit, and the other end carries the sealing element (24), the movable cowl (23) being closed hermetically by the rotating disc (26) and revolving as one with the selfsame disc about a common vertical axis (X) relative to the fixed cowl (13).
8. A structure as in claim 7 where dependent on claims 4 to 6, wherein the diametral dimensions of the movable cowl (23) are smaller than the diametral dimensions presented by the first module (21) of the fixed cowl (13), and the gap (23a) is of substantially circular geometry, created between and delimited by

the movable cowl (23) and the first module (21) of the fixed cowl (13).

9. A structure as in claims 4 to 8, wherein the sealing element (24) presents a substantially circular appearance, and extends from the movable cowl (23) toward the first module (21) of the fixed cowl (13). 5
10. A structure as in claims 4 to 9, wherein the sealing element (24) presents: 10
 - a circumferential mounting portion (27) designed to engage an annular edge (28) of the movable cowl (23) directed toward the fixed cowl (13); 15
 - a circumferential sealing portion (29), positioned on the side opposite to the circumferential mounting portion (27) and presenting at least one circumferential groove (31) engageable by the stop (20) when the movable cowl (23) assumes the closed configuration. 20
11. A structure as in claims 2 to 10, comprising ventilation means (33) associated operationally with the fixed cowl (13) and serving, when the movable cowl (23) assumes the open configuration, to generate at least one flow of air (B) entering the fixed cowl (13) through the gap (23a) and exiting at the end of the selfsame cowl (13) remote from the gap (23a). 25
12. A structure as in claim 11, wherein ventilation means (33) comprise an extractor fan (34), installed and operating in an opening (35) afforded by the enclosing wall (16) of the fixed cowl (13), which can be set in rotation in such a way as to draw air through the gap (23a) when the movable cowl (23) assumes the open configuration, and is disabled when the movable cowl (23) assumes the closed configuration. 30
13. A structure as in claim 12, wherein the isolation casing (2) comprises a frame (36) by which the fixed cowl (13) is surrounded and at least partially enclosed together with the movable cowl (23), the packaging unit (4), and respective conveyor means (37) by which containers (5) are transported into and away from the packaging unit (4), wherein the enclosing frame (36) delimits an enclosure (38) in fluid communication with the surrounding environment by way of an infeed channel (36a) at least partially accommodating the conveyor means (37) by which containers (5) are transported into the packaging unit, and an outfeed channel (36b) at least partially accommodating the conveyor means (37) by which containers (5) are transported away from the packaging unit. 40 45 50
14. A structure as in claim 13, wherein ventilation means (33) are associated operationally with the enclosing

frame (36) in such a way as to generate a flow of air (C) internally of the enclosure (38), directed from a top portion of the frame (36) toward a bottom portion of the selfsame frame occupied by the conveyor means (37) on which the containers (5) are transported.

15. A structure as in claim 14, wherein the ventilation means (33) comprise: 10
 - a first blower fan (39) occupying and operating within a first opening (40) afforded by a top wall (41) of the enclosing frame (36), in a position alongside the fixed cowl (13), by which ambient air is drawn in and filtered before being directed toward the channel (36a) through which containers (5) are admitted to the packaging unit; 15
 - a second blower fan (42) occupying and operating within a second opening (43) afforded by the top wall (41) of the enclosing frame (36), in a position alongside the fixed cowl (13), by which ambient air is drawn in and filtered before being directed toward the channel (36b) through which containers (5) leave the packaging unit. 20
16. A structure as in claim 15, wherein the first and second blower fans (39, 42) are set in rotation in such a way as to generate respective flows of air (C) during the operation of the packaging unit (4) processing the containers (5), of which the air flow (C) produced by the first blower fan (39) is gentler than the air flow (C) produced by the second blower fan (42). 30
17. A structure as in claim 16, wherein the first opening (40) and the second opening (43) are equipped each with a respective air filter element. 35

Patentansprüche

1. Gehäusestruktur für Behälterverpackungsmaschinen und/oder -maschineneinheiten und insbesondere Verschleißmaschinen, umfassend mindestens eine Isolierummantelung (2), die sich zumindest teilweise um mindestens eine bewegungseinleitende Komponente einer Verpackungseinheit (4) erstreckt, die auf anfangs offene Behälter (5) einwirkt, wobei die Isolierummantelung (2) der Struktur (1) Folgendes umfasst: 40
 - mindestens eine fixierte Haube (13), die sich zumindest teilweise um die mindestens eine bewegungseinleitende Komponente (3) der Verpackungseinheit (4) herum erstreckt, 45
 - mindestens eine bewegliche Haube (23), die mit der fixierten Haube (13) wirkverbunden und mit mindestens einem Dichtungselement (24) versehen ist, **dadurch gekennzeichnet, dass** 50 55

- die bewegliche Haube (23) mit einem Durchgang zu mindestens einem arbeitenden Teil (3) der Verpackungseinheit (4) ausgestattet und zu einer Bewegung zwischen einer offenen Konfiguration, in der die Struktur (1) eine erste Betriebsposition einnimmt, in der mindestens ein Spalt (23a) zwischen der fixierten Haube (13) und der beweglichen Haube (23) gebildet wird, wodurch die fixierte Haube (13) mit der Umgebung in Fluidverbindung gesetzt wird, und einer geschlossenen Konfiguration fähig ist, in der die Struktur (1) eine zweite Betriebsposition einnimmt, in der das Dichtungselement (24) an einem Anschlag (20) anliegt, der von der fixierten Haube (13) gebildet wird, sodass diese fixierte Haube hermetisch von der umgebenden Atmosphäre und von einem freiliegenden Abschnitt des arbeitenden Teils (3) isoliert wird.
2. Struktur nach Anspruch 1, wobei die fixierte Haube (13) einen im Wesentlichen zylindrischen Körper (14) umfasst, aufweisend ein erstes Ende (15), das zumindest teilweise von einer Wand (16) umschlossen wird, vorzugsweise von abgerundeter Gestalt, und ein zweites Ende (17), das dem ersten Ende (15) gegenüber liegt und auf die bewegliche Haube (23) gerichtet ist.
3. Struktur nach Anspruch 2, wobei der zylindrische Körper (14) der fixierten Haube (13) mindestens eine kreisförmige Rippe (18) aufweist, die innen von einer Innenwand (19) dieser Haube (13) hervorragt und dazu dient, einen Anschlag (20) zu bilden, der in das Dichtungselement (24) der beweglichen Haube (23) eingreift, wenn diese Haube (23) die geschlossene Konfiguration einnimmt.
4. Struktur nach Anspruch 2 oder 3, wobei der zylindrische Körper (14) der fixierten Haube (13) ein erstes Modul (21) und ein zweites Modul (22) umfasst, die miteinander verbunden sind und ungleiche diametrale Abmessungen aufweisen.
5. Struktur nach Anspruch 4, wobei die diametralen Abmessungen des zweiten Moduls (22) der fixierten Haube (13) größer als die diametralen Abmessungen des ersten Moduls (21) sind.
6. Struktur nach Anspruch 4 oder 5, wenn Anspruch 4 von Anspruch 3 abhängt, wobei die innere kreisförmige Rippe (18) zwischen dem ersten Modul (21) und dem zweiten Modul (22) der fixierten Haube (13) liegt.
7. Struktur nach den vorangehenden Ansprüchen, wobei die bewegliche Haube (23) einen im Wesentlichen zylindrischen Körper (25) umfasst, dessen eines Ende an einer rotierenden Scheibe (26) der Verpackungseinheit (4) befestigt ist, die zumindest teilweise über den von dieser Einheit verarbeiteten Behältern (5) positioniert ist, und dessen anderes Ende das Dichtungselement (24) trägt, wobei die bewegliche Haube (23) von der rotierenden Scheibe (26) hermetisch verschlossen wird und sich einstückig mit dieser Scheibe um eine gemeinsame Vertikalachse (X) relativ zur fixierten Haube (13) dreht.
8. Struktur nach Anspruch 7, wenn dieser von den Ansprüchen 4 bis 6 abhängt, wobei die diametralen Abmessungen der beweglichen Haube (23) kleiner als die diametralen Abmessungen des ersten Moduls (21) der fixierten Haube (13) sind, und der Spalt (23a) eine im Wesentlichen kreisförmige Form aufweist und zwischen der beweglichen Haube (23) und dem ersten Modul (21) der fixierten Haube (13) gebildet und von diesen begrenzt wird.
9. Struktur nach den Ansprüchen 4 bis 8, wobei das Dichtungselement (24) eine im Wesentlichen kreisförmige Gestalt aufweist und sich von der beweglichen Haube (23) in Richtung des ersten Moduls (21) der fixierten Haube (13) erstreckt.
10. Struktur nach den Ansprüchen 4 bis 9, wobei das Dichtungselement (24) Folgendes aufweist:
- einen Umfangshalteabschnitt (27), der für den Eingriff in eine ringförmige Kante (28) der beweglichen Haube (23) konzipiert ist, die auf die fixierte Haube (13) gerichtet ist;
 - einen Umfangsdichtungsabschnitt (29), der an der Seite gegenüber dem Umfangshalteabschnitt (27) positioniert ist und mindestens eine Umfangsnut (31) aufweist, die durch den Anschlag (20) eingreifbar ist, wenn die bewegliche Haube (23) die geschlossene Konfiguration einnimmt.
11. Struktur nach den Ansprüchen 2 bis 10, umfassend Lüftungsmittel (33), die mit der fixierten Haube (13) wirkverbunden sind und dazu dienen, mindestens einen in die fixierte Haube (13) durch den Spalt (23a) eintretenden und am Ende dieser Haube (13) entfernt vom Spalt (23a) austretenden Luftstrom (B) zu erzeugen, wenn die bewegliche Haube (23) die offene Konfiguration einnimmt.
12. Struktur nach Anspruch 11, wobei die Lüftungsmittel (33) ein Absauggebläse (34) umfassen, das in einer Öffnung (35) installiert ist und wirkt, die in der Gehäusewand (16) der fixierten Haube (13) ausgebildet ist, das so in Rotation versetzt werden kann, dass es Luft durch den Spalt (23a) ansaugt, wenn die bewegliche Haube (23) die offene Konfiguration einnimmt und deaktiviert werden kann, wenn die bewegliche Haube (23) die geschlossene Konfiguration

on einnimmt.

13. Struktur nach Anspruch 12, wobei die Isolierummantelung (2) einen Rahmen (36) umfasst, von dem die fixierte Haube (13) umgeben und zumindest teilweise gemeinsam mit der beweglichen Haube (23), der Verpackungseinheit (4) und entsprechenden Fördermitteln (37), durch die Behälter (5) in die Verpackungseinheit (4) hinein und daraus hinaus transportiert werden, umschlossen wird, wobei der umschließende Rahmen (36) ein in Fluidverbindung mit der Umgebung stehendes Gehäuse (38) mithilfe eines Zuführkanals (36a), der zumindest teilweise die Fördermittel (37) aufnimmt, durch die Behälter (5) in die Verpackungseinheit transportiert werden, und eines Ausleitkanals (36b) begrenzt, der zumindest teilweise die Fördermittel (37) aufnimmt, durch die Behälter (5) von der Verpackungseinheit weg transportiert werden.
14. Struktur nach Anspruch 13, wobei Lüftungsmittel (33) so mit dem umschließenden Rahmen (36) wirkverbunden sind, dass innerhalb des Gehäuses (38) ein Luftstrom (C) erzeugt wird, der von einem oberen Abschnitt des Rahmens (36) auf einen unteren Abschnitt dieses Rahmens gerichtet ist, der von den Fördermitteln (37) eingenommen wird, auf denen die Behälter (5) transportiert werden.
15. Struktur nach Anspruch 14, wobei die Lüftungsmittel (33) Folgendes umfassen:
- ein erstes drückendes Gebläse (39), das eine erste, in einer oberen Wand (41) des umschließenden Rahmens (36) ausgebildete Öffnung (40) in einer Position neben der fixierten Haube (13) einnimmt und darin wirkt, durch das Umgebungsluft angesaugt und gefiltert wird, bevor sie auf den Kanal (36a) gerichtet wird, durch den Behälter (5) zur Verpackungseinheit geleitet werden;
 - ein zweites drückendes Gebläse (42), das eine zweite, in der oberen Wand (41) des umschließenden Rahmens (36) ausgebildete Öffnung (43) in einer Position neben der fixierten Haube (13) einnimmt und darin wirkt, durch das Umgebungsluft angesaugt und gefiltert wird, bevor sie auf den Kanal (36b) gerichtet wird, durch den Behälter (5) die Verpackungseinheit verlassen.
16. Struktur nach Anspruch 15, wobei das erste und zweite drückende Gebläse (39, 42) so in Rotation versetzt werden, dass jeweilige Luftströme (C) während des Betriebs der die Behälter (5) verarbeitenden Verpackungseinheit (4) erzeugt werden, wobei der vom ersten drückenden Gebläse (39) erzeugte Luftstrom (C) leichter als der vom zweiten drückenden Gebläse (42) erzeugte Luftstrom (C) ist.

17. Struktur nach Anspruch 16, wobei die erste Öffnung (40) und die zweite Öffnung (43) jeweils mit einem entsprechenden Luftfilterelement ausgestattet sind.

Revendications

1. Structure d'enceinte pour machines et/ou unités de machine d'emballage de récipients, et notamment des machines d'encapsulage, comprenant au moins une enveloppe isolante (2) se développant au moins en partie autour d'au moins un composant induisant le déplacement d'une unité d'emballage (4) agissant sur des récipients initialement ouverts (5), dans laquelle l'enveloppe isolante (2) de la structure (1) comprend :
 - au moins une calotte fixe (13) se développant au moins en partie autour de l'au moins un composant induisant le déplacement (3) de l'unité d'emballage (4),
 - au moins une calotte mobile (23) opérationnellement associée à la calotte fixe (13), munie d'au moins un élément d'étanchéité (24), **caractérisée en ce que** la calotte mobile (23) laisse passer au moins une partie travaillante (3) de l'unité d'emballage (4) et est capable de se déplacer entre une configuration ouverte adoptée avec la structure (1) dans une première position de fonctionnement, dans laquelle au moins un interstice (23a) est créé entre la calotte fixe (13) et la calotte mobile (23), plaçant par conséquent la calotte fixe (13) en communication fluide avec l'environnement qui l'entoure, et une configuration fermée, adoptée avec la structure (1) dans une seconde position de fonctionnement, dans laquelle l'élément d'étanchéité (24) se cale contre une butée (20) présente sur la calotte fixe (13), de sorte à isoler hermétiquement ladite calotte fixe de l'atmosphère qui l'entoure et d'une partie exposée de la partie travaillante (3).
2. Structure selon la revendication 1, dans laquelle la calotte fixe (13) comprend un corps substantiellement cylindrique (14) présentant une première extrémité (15) au moins en partie fermée par une paroi (16) ayant de préférence un aspect arrondi, ainsi qu'une deuxième extrémité (17) située à l'opposée de la première extrémité (15) et dirigée vers la calotte mobile (23).
3. Structure selon la revendication 2, dans laquelle le corps cylindrique (14) de la calotte fixe (13) présente au moins une nervure circulaire (18) interne dépassant d'une paroi interne (19) de ladite calotte (13) et servant à créer une butée (20) de sorte qu'elle engage l'élément d'étanchéité (24) de la calotte mobile (23) lorsque ladite calotte (23) adopte la configura-

tion fermée.

4. Structure selon les revendications 2 ou 3, dans laquelle le corps cylindrique (14) de la calotte fixe (13) comprend un premier module (21) et un second module (22) reliés l'un à l'autre et présentant des dimensions diamétrales différentes. 5
5. Structure selon la revendication 4, dans laquelle les dimensions diamétrales dudit second module (22) de la calotte fixe (13) sont supérieures aux dimensions diamétrales dudit premier module (21). 10
6. Structure selon les revendications 4 ou 5, lorsque la revendication 4 dépend de la revendication 3, dans laquelle la nervure circulaire interne (18) est située entre le premier module (21) et le second module (22) de la calotte fixe (13). 15
7. Structure selon l'une quelconque des revendications précédentes, dans laquelle la calotte mobile (23) comprend un corps substantiellement cylindrique (25) dont une extrémité est attachée à un disque rotatif (26) de l'unité d'emballage (4) positionné au moins en partie au-dessus des récipients (5) étant traités par ladite unité, et dont l'autre extrémité soutient l'élément d'étanchéité (24), la calotte mobile (23) étant fermée hermétiquement par le disque rotatif (26) et tournant de façon solidaire avec ledit disque autour d'un axe vertical commun (X) par rapport à la calotte fixe (13). 20 25 30
8. Structure selon la revendication 7, lorsqu'elle dépend des revendications de 4 à 6, dans laquelle les dimensions diamétrales de la calotte mobile (23) sont inférieures aux dimensions diamétrales dudit premier module (21) de la calotte fixe (13), et l'interstice (23a) est de géométrie substantiellement circulaire, créé entre et délimité par la calotte mobile (23) et le premier module (21) de la calotte fixe (13). 35 40
9. Structure selon les revendications 4 à 8, dans laquelle l'élément d'étanchéité (24) présente un aspect substantiellement circulaire, et se développe de la calotte mobile (23) vers le premier module (21) de la calotte fixe (13). 45
10. Structure selon les revendications 4 à 9, dans laquelle l'élément d'étanchéité (24) présente :
 - une partie de montage circonférentielle (27) conçue pour engager un bord annulaire (28) de la calotte mobile (23) dirigé vers la calotte fixe (13) ;
 - une partie circonférentielle de scellement (29), positionnée sur le côté opposé de la partie de montage circonférentielle (27) et présentant au moins une rainure circonférentielle (31) pouvant

s'engager à travers la butée (20) lorsque la calotte mobile (23) adopte la configuration fermée.

11. Structure selon les revendications 2 à 10, comprenant des moyens de ventilation (33) associés opérationnellement à la calotte fixe (13) et servant, lorsque la calotte mobile (23) adopte la configuration ouverte, à générer au moins un flux d'air (B) entrant dans la calotte fixe (13) à travers l'interstice (23a) et ressortant à l'extrémité de ladite calotte (13) à l'opposé de l'interstice (23a). 5
12. Structure selon la revendication 11, dans laquelle les moyens de ventilation (33) comprennent un ventilateur de tirage (34), installé et agissant dans une ouverture (35) présente sur la paroi d'enceinte (16) de la calotte fixe (13), pouvant tourner de sorte à aspirer l'air à travers l'interstice (23a) lorsque la calotte mobile (23) adopte la configuration ouverte, et pouvant être désactivé lorsque la calotte mobile (23) adopte la configuration fermée. 10
13. Structure selon la revendication 12, dans laquelle l'enveloppe isolante (2) comprend un cadre (36) dont la calotte fixe (13) est entourée et au moins en partie enfermée avec la calotte mobile (23), l'unité d'emballage (4), et les moyens de convoyage correspondants (37) par lesquels les récipients (5) sont amenés et éloignés de l'unité d'emballage (4), dans laquelle le cadre d'enceinte (36) délimite un compartiment (38) étant en communication fluïdique avec l'environnement qui l'entoure par le biais d'un canal d'entrée (36a) accueillant au moins partiellement les moyens de convoyage (37) par lesquels les récipients (5) sont transportés dans l'unité d'emballage, et un canal de sortie (36b) accueillant au moins partiellement les moyens de convoyage (37) par lesquels les récipients (5) sont éloignés de l'unité d'emballage. 20 25 30 35 40
14. Structure selon la revendication 13, dans laquelle les moyens de ventilation (33) sont opérationnellement associés au cadre d'enceinte (36) de sorte à générer un flux d'air (C) à l'intérieur de l'enceinte (38), dirigé d'une partie supérieure du cadre (36) vers une partie inférieure dudit cadre occupé par les moyens de convoyage (37) sur lesquels les récipients (5) sont transportés. 45
15. Structure selon la revendication 14, dans laquelle les moyens de ventilation (33) comprennent :
 - un premier ventilateur soufflant (39) occupant et agissant à l'intérieur d'une première ouverture (40) présente sur une paroi supérieure (41) du cadre d'enceinte (36), dans une position située le long de la calotte fixe (13), par lequel l'air ambiant est aspiré et filtré avant d'être dirigé vers

le canal (36a) par lequel les récipients (5) sont admis dans l'unité d'emballage ;

- un second ventilateur soufflant (42) occupant et agissant à l'intérieur d'une seconde ouverture (43) présente sur la paroi supérieure (41) du cadre d'enceinte (36), dans une position située le long de la calotte fixe (13), par lequel l'air ambiant est aspiré et filtré avant d'être dirigé vers le canal (36b) par lequel les récipients (5) quittent l'unité d'emballage ;

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16. Structure selon la revendication 15, dans laquelle les premier et second ventilateurs soufflants (39, 42) sont mis en rotation de sorte à générer des flux d'air respectifs (C) lors du fonctionnement de l'unité d'emballage (4) en traitant les récipients (5), desquels le flux d'air (C) produit par le premier ventilateur soufflant (39) est plus doux que le flux d'air (C) produit par le second ventilateur soufflant (42).

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17. Structure selon la revendication 16, dans laquelle la première ouverture (40) et la seconde ouverture (43) sont équipées chacune d'un élément de filtre à air respectif.

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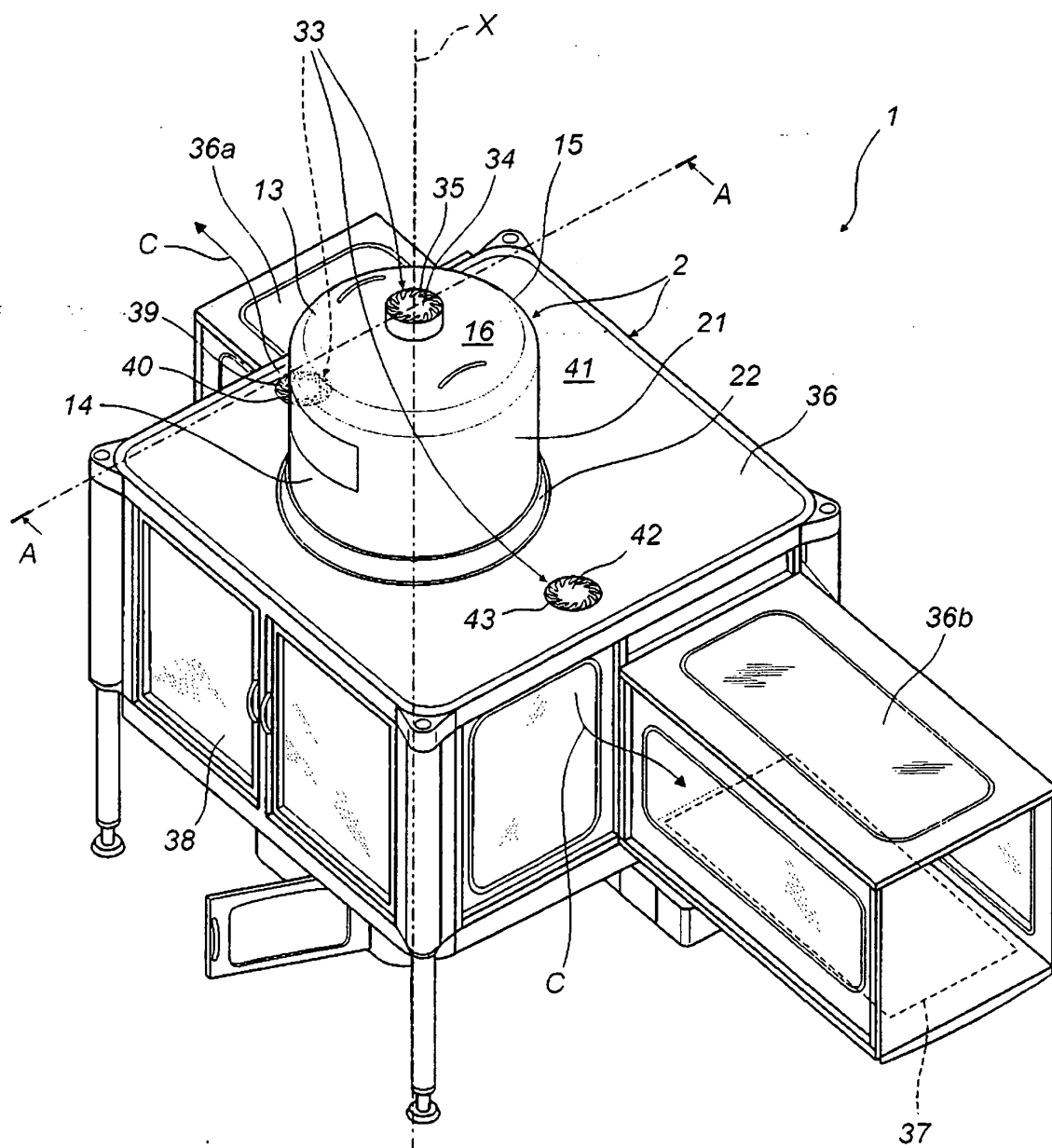
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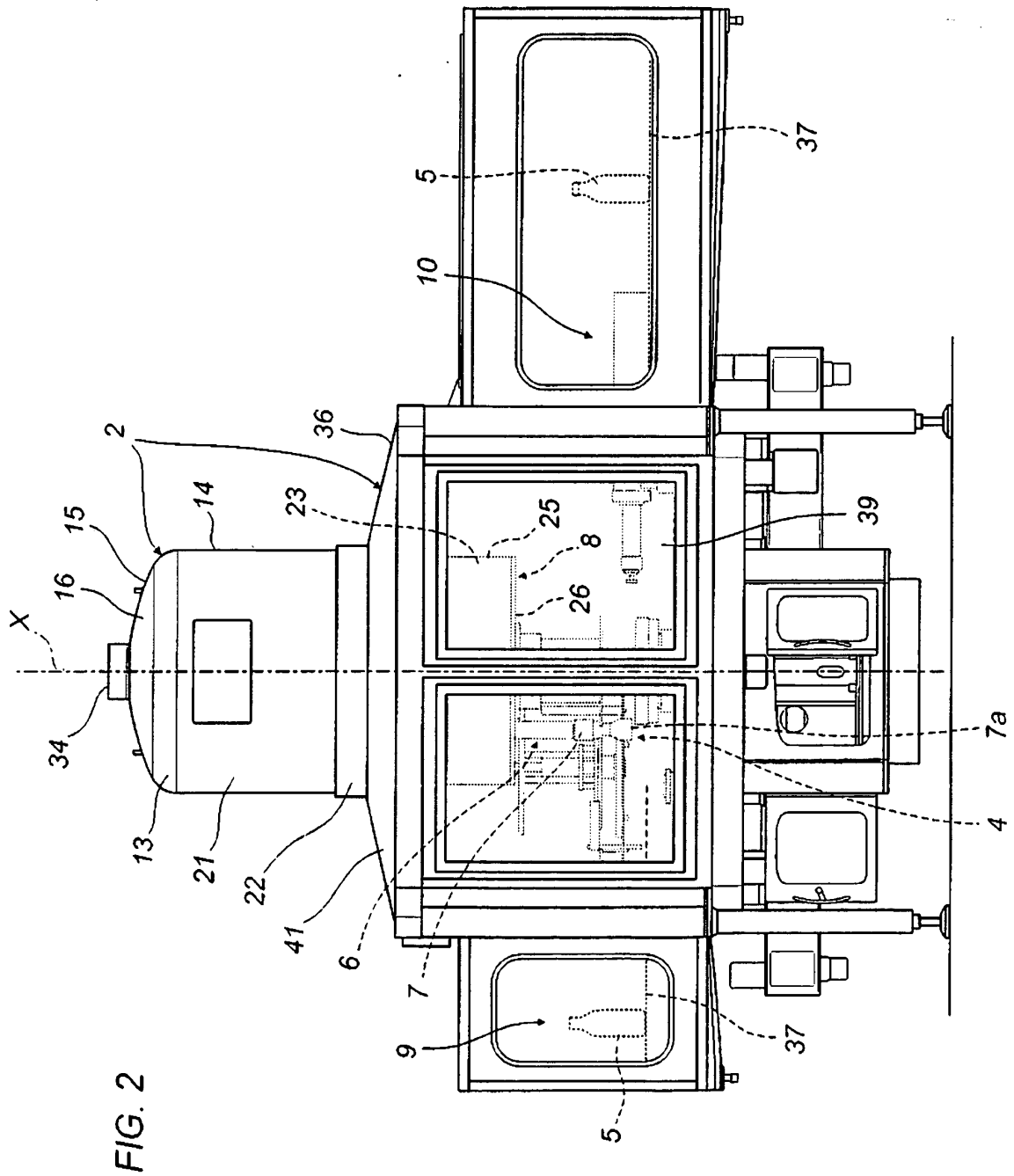
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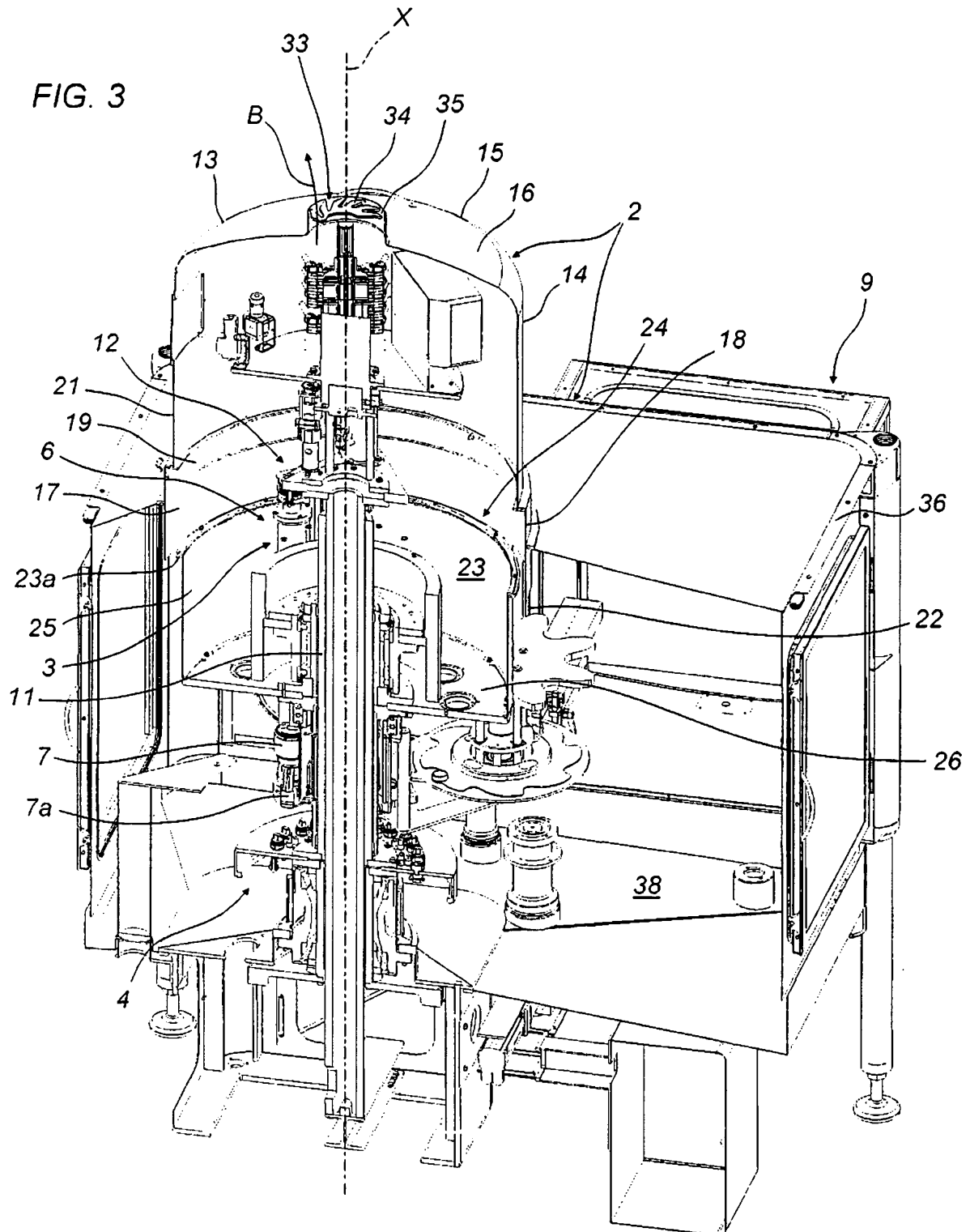
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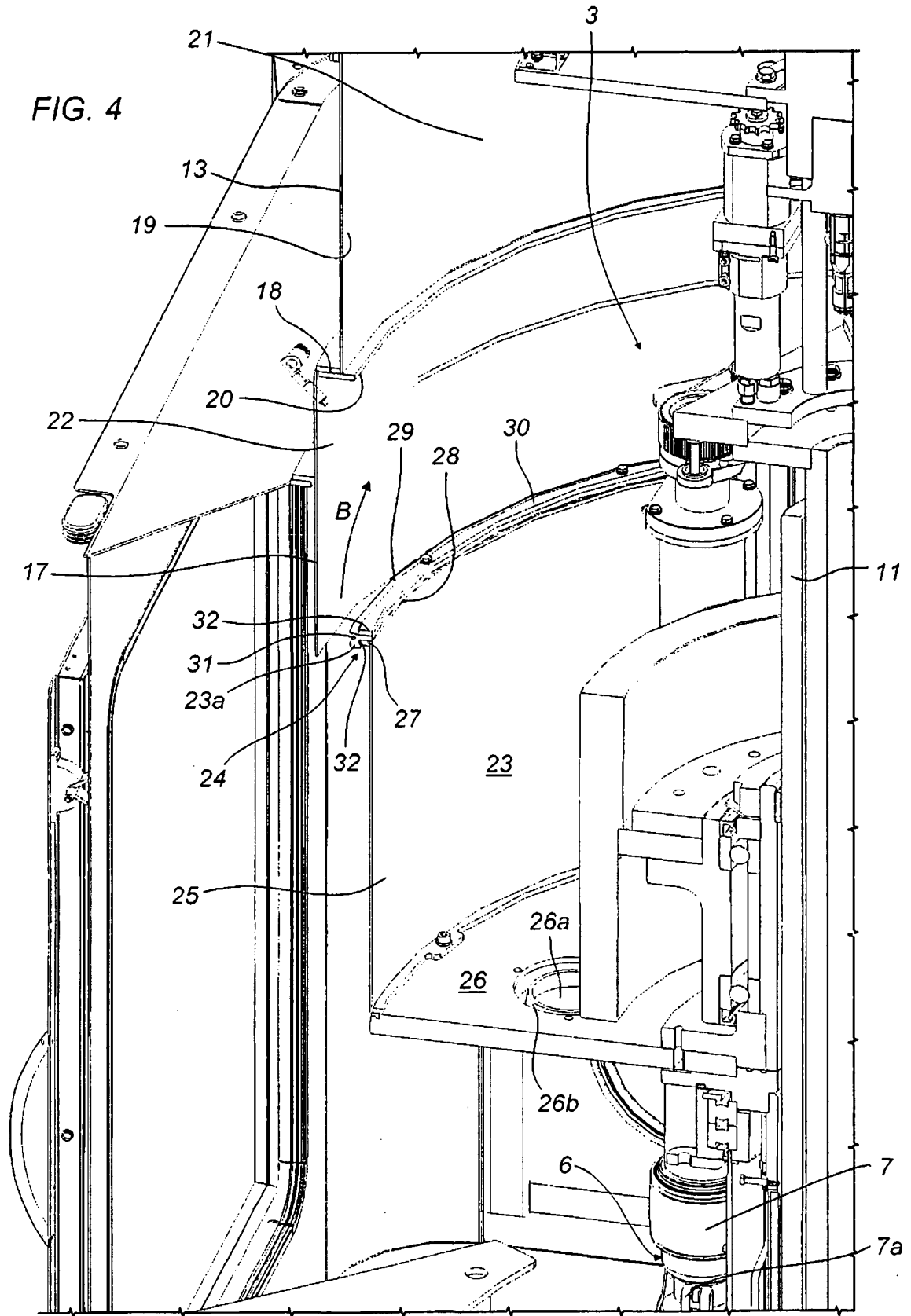
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FIG. 1









REFERENCES CITED IN THE DESCRIPTION

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