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(71) Applicant: LANFRANCHI S.R.L. [IT/IT]; Via Scodoncello 41/E, 43044 Collecchio (PR) (IT).

(72) Inventor: LANFRANCHI, Mario; C/o Lanfranchi S.r.l., Via Scodoncello 41/E, 43044 Collecchio (PR) (IT).

(74) Agent: FANZINI, Valeriano et al.; C/O Ing. Dallaglio S.r.l., Via Mazzini, 2, 43121 Parma (IT).

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(54) Title: APPARATUS FOR FILLING CONTAINERS WITH A CORRESPONDING PRODUCT

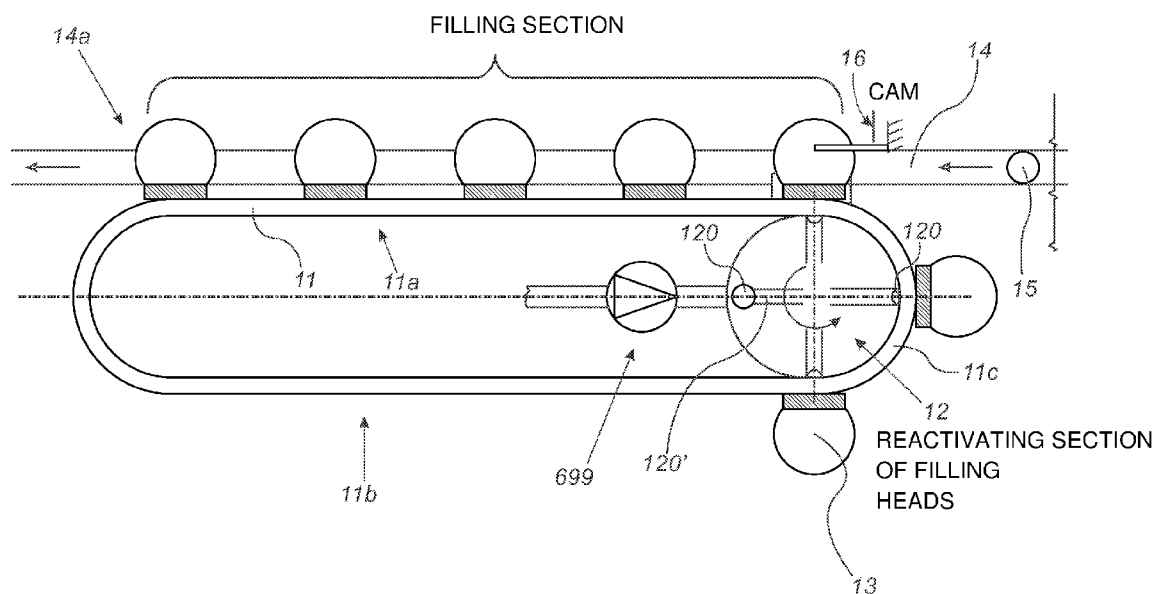


FIG. 1

(57) Abstract: An apparatus (10) for filling containers (15) with a corresponding product, in particular in the form of a liquid or semi-liquid product, and preferably for filling said containers with a predetermined portion of said product. The apparatus comprises one or more devices (13) for the insertion of said product in respective containers (15) and provide for said containers (15) and said one or more devices (13) for the insertion of the product in the corresponding container (15) to be movable independently of each other, with the respective inserting device (13) being movable in a coordinated manner, or correspondingly, with the movement of the corresponding container to be filled (15), during, in particular only during, the step of filling the latter by the same inserting device (13).



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DESCRIPTION

APPARATUS FOR FILLING CONTAINERS WITH A CORRESPONDING PRODUCT.

5 Field of application of this invention

The present invention relates to an apparatus for filling containers with a corresponding product, in particular in the form of a liquid or semi-liquid product, and preferably for filling said containers with a predetermined portion of said product.

10

Background

Apparatuses for filling containers with a predetermined portion of said product and in which the filling apparatus comprises a plurality of devices for the insertion of said product in respective containers are known.

15

In particular, according to the state of the art known so far, said automatic apparatuses for filling containers mostly comprise structures which are equipped with a plurality of taps, or inserting devices, which are arranged in a circular manner on a wheel whose axle is equipped with rotary fluid distribution systems, with the aim of continuously supplying said taps, or inserting devices, with liquid in the corresponding containers, which therefore during filling are movable together with the same taps, or inserting devices, being carried by the same rotatable part of the apparatus.

20

In said already known rotatable apparatuses, in order to supply and unload the containers, in a continuous and dynamic way, suitable devices are used for selecting and conveying the containers to, and from, said rotatable wheel, which however allow to exploit, in order to perform the filling of the containers, only a partial and active angular part of the same rotatable wheel.

25

There are also simpler versions of said filling apparatuses, in which

the arrangement of the taps, or filling devices, is instead linear. In these apparatuses, the filling strategy is that of conveying containers or bottles, in this case not continuously, but intermittently, to said taps, or filling devices, which are however collectively constrained in an integral manner to a
5 movable part of the structure of the apparatus so as to move globally and in a constrained way with all the containers to be filled by the same taps.

Therefore, this result in filling apparatuses which necessarily have a rather rigid and bulky conformation and which does not allow to reach an apparatus having any desired configuration, adapted to meet specific needs
10 of the companies using these plants, and in particular relating to the space to be allocated to such apparatuses within industrial production environments, i.e. to the overall production yield of the apparatus or much more.

In particular, according to the already known filling apparatuses, it is
15 not possible to control the movement of said product inserting device in a flexible and desired way.

Furthermore, said configuration of the already known filling apparatuses does not allow in any way to release the filling activities of the containers from other ancillary activities, such as loading and unloading of
20 the containers.

Anyway, in the sector the need is felt to have available filling apparatuses which are easy and quick to maintain and repair, i.e. which allow easy intervention by operators in charge, for example when a damaged container must be removed, i.e. to perform easy cleaning
25 operations.

Summary of the invention

With the present invention it is wished to propose a new solution and/or an alternative to the solutions known up to now and in particular it is

proposed to overcome one or more of the drawbacks or problems referred to above, and/or to satisfy one or more requirements referred to above and/or in any case experienced in the art, and in particular that can be deduced from the above.

5 It is therefore provided an apparatus for filling containers with a corresponding product, in particular in the form of a liquid or semi-liquid product; the apparatus comprising a plurality of devices for the insertion in respective containers of a corresponding predetermined portion of said product; characterized in that said inserting devices are movable
10 independently one from the other and from the corresponding containers to be filled, with the respective inserting device being movable in a manner that is coordinated with, or corresponding to, the movement of the corresponding container to be filled, during, in particular only during, the filling step thereof by the same inserting device.

15 In this way, it is possible to create an apparatus having any desired configuration, adapted to meet the specific needs of the companies using said apparatus, and in particular relating to the space used, the production yield or more.

20 **Brief description of the drawings**

This and other innovative aspects are, however, set forth in the appended claims, the technical characteristics of which can be found, together with corresponding advantages achieved, in the following detailed description, illustrating a purely non-limiting example of the embodiment of
25 the invention, which is made with reference to the appended drawings, in which:

- figure 1 illustrates a schematic top plan view of a preferred embodiment of apparatus according to the present invention;
- figure 2 illustrates a schematic and partial elevational side view of

the preferred embodiment of apparatus according to the present invention;

- figure 3 illustrates a schematic cross-sectional view specific to the preferred embodiment of apparatus according to the present invention, with particular illustration of said device for inserting said product at the section
5 for reactivating or loading of the product;

- figure 4 illustrates a schematic sectional view, of a detail of figure 3, of the preferred embodiment of apparatus according to the present invention;

- figure 5 illustrates a schematic sectional view, of a detail of figure 3,
10 of the preferred embodiment of apparatus according to the present invention;

- figure 6 illustrates a schematic sectional view, of a detail of figure 3, of the preferred embodiment of apparatus according to the present invention;

- figure 7 illustrates a schematic sectional view, of a detail of figure 3,
15 of the preferred embodiment of apparatus according to the present invention;

- figure 8 illustrates a schematic sectional view, of a detail of figure 3, of the preferred embodiment of apparatus according to the present
20 invention.

Detailed description of preferred embodiments of the invention

The appended figures illustrate a preferred embodiment 10 of apparatus for filling containers 15 with a corresponding product, in particular
25 in the form of a liquid or semi-liquid product, and preferably for filling said containers with a predetermined portion of said product.

As can be seen from the figures, the apparatus 10 comprises a plurality of devices 13 for inserting a corresponding predetermined portion of said product in respective containers 15.

Advantageously, it is provided for said inserting devices 13 to be movable independently one from the other and from the corresponding containers to be filled 15, with the respective inserting device 13 which is movable in a manner that is coordinated with, or corresponding to, the movement of the corresponding container to be filled 15, during, in particular only during, the filling step thereof by the same inserting device 13.

In this way, it is possible to create an apparatus having any desired configuration, adapted to meet the specific needs of the case, and in particular relating to the space used, the production yield or more.

As can be seen in particular from Figure 1, advantageous handling means 11 of the respective device, i.e. of the plurality of devices, 13 for the insertion of said product in a corresponding container 15 are therefore provided for.

Advantageously, as can be seen in particular from Figures 1 and 3, said handling means 11 of the respective device 13 for the insertion of said product in a corresponding container 15 comprise a respective linear motor.

In particular, as illustrated, said linear motor 11 therefore comprises respective magnetic propulsion means comprising a stationary magnetic interaction part 11', provided for along the forward path of the respective inserting device 13, and a movable magnetic interaction part 13' at the same device 13 for the insertion of said product in a corresponding container 15.

In this way, it is possible to control the movement of said device for the insertion of the product 13 in a flexible and desired way.

Advantageously, as can be seen in particular from Figure 1, it is provided for said handling means 11 of the respective device 13 for the insertion of said product in a corresponding container 15 to define a respective forward route of the respective inserting device 13, which

forward route has a respective length 11a during which the filling of the respective container 15 is carried out, in particular said filling length 11a corresponds to, or matches, i.e., it is preferably parallel, to a corresponding forward length 14a of the same container 15, by corresponding conveying
5 means 14 of the same container 15.

For example, as illustrated in Figure 1, said means for conveying the containers consist of a corresponding conveyor belt 14, on which the containers 15 are supported and are preferably guided laterally. Said means for conveying the containers may however also consist of any other
10 conveying system, in particular of a type already known in the sector, and in any case entirely within the reach of the person skilled in the art and which therefore does not need to be described herein in detail.

In this way, it is possible to release the container filling activities from the other ancillary activities, such as loading and unloading of the
15 containers and, in particular, as will be better deduced from the continuation of the present description, of reloading said device for the insertion of said product in a corresponding container.

It follows the advantageous possibility of being able to configure the filling apparatus, in particular the path of the devices and containers, in any
20 way desired and required by the particular needs, for example of space, dictated by the specific situation present within the industrial plants in which the present apparatus is placed.

With advantage, the device 13 for the insertion of said product in a corresponding container 15 during the filling step, i.e., along at least part of
25 the filling length 11a of the same handling means 11, moves at the same rate as the corresponding container to be filled 15.

With particular advantage, before carrying out the filling of the corresponding container 15, the device 13 for the insertion of said product in a corresponding container 15 travels along an intercepting length of the

corresponding container 15, in particular it moves following the same container 15.

Advantageously, said forward route of the respective inserting device 13 has a respective return length 11b towards said filling length 11a, in particular, which is travelled by the corresponding inserting device 13 at a different rate from the travel rate of said filling route 11a by the same inserting device 13, preferably said forward rate of said inserting device 13 along the return length being, at least along a part thereof, in particular at least along a significant part thereof, higher than the rate with which the same inserting device 13 travels said filling route 11a, and preferably with which it carries out the same filling.

In particular, as can be seen in particular from Figure 1, the filling length 11a of said forward route of said inserting device 13 is linear and parallel to a corresponding linear forward length 14a of the same container 15 by corresponding conveying means.

With advantage, as can be seen in particular from Figure 1, means 16 for detecting the container to be filled 15 are provided for, in particular arranged at the entrance in the forward filling zone on the corresponding conveying means 14, in order to coordinate by the control means of the apparatus 10, not particularly illustrated in the appended figures, the movement of the respective device 13 for the insertion of said product in a corresponding container 15 with the movement of the respective container to be filled 15. These detection means can consist of any device suitable for the purpose, for example they can be in the form of respective photocell means or other.

In particular, as can be seen especially from Figure 3, the respective device 13 for the insertion of said product in a corresponding container 15 comprises respective support means, or armature, 150 and means 151 for connecting the same support means 150 of the filling device to

corresponding fixed supporting means 11 of the apparatus, which connecting means are movable with respect to the fixed supporting means of the apparatus 10.

Advantageously, as can be seen in particular from Figure 3, said
5 means for connecting the same means 150 for supporting the filling device to corresponding fixed supporting means 11 of the apparatus, are in the form of a corresponding carriage 151 which slides along corresponding guide means 111, 111 of said fixed supporting means 11, especially along corresponding guide means 111, 111 of said linear motor 11.

10 Advantageously, the respective device 13 for the insertion of said product in a corresponding container 15, in particular the respective means, or support armature 150, develops by extending downwardly from said connecting means 151 and/or from said fixed supporting means 11 of said apparatus 10, and/or being positioned, or mainly positioned, laterally to the
15 same connecting means 151 and/or to said fixed supporting means 11.

In this way, it is possible to configure the apparatus in a particularly easy and flexible way and at the same time to operate easily in the filling area, for example in order to remove some defective containers or other, and at the same time to be able to carry out easy repairs and/or
20 maintenance of the filling device.

In particular, as can be seen in particular from Figure 3, the fixed part 11' of said linear propulsion motor 11 is provided at respective guide means 111, 111, in particular between a first and a second opposite guide 111, 111, especially between guides that are vertically spaced from each other.

25 In particular, as can be seen in particular from Figure 3, the movable part 13' of said linear propulsion motor 11 is provided on said means, or carriage, 151 for slidingly connecting to the corresponding supporting means 11 of said inserting device 13.

With particular advantage, as can be seen in particular from Figure 1,

said device 13 for the insertion of said product in a corresponding container 15 comprises, in particular supported by said of the respective means, or armature, for supporting 150 said inserting device 13, means for holding the product 152, i.e. a respective predetermined portion of the product, which
5 are preferably in the form of a respective tank 152.

In this way, said device 13 for the insertion of said product in a corresponding container 15 is in the form of a completely autonomous device and free to move in order to carry out its task of filling a corresponding container.

10 Advantageously, as can be seen in particular from Figure 1, said forward route 11 of the respective inserting device 13 comprises a product loading length on, or in, the same inserting device 13.

With advantage, as can be seen in particular from Figure 1, said route loading length 11c of said device 13 for the insertion of said product in
15 a corresponding container is located at the end of said return length 11b and/or just upstream of the filling length 11a of the forward route of said inserting device 13.

Advantageously, as can be seen in particular from Figure 1, said route loading length 11c of said device 13 for the insertion of said product in
20 a corresponding container 15, extends along an angular length, in particular according to an angular length equal, or substantially equal to 180° and especially at an extreme length of inversion of the forward direction by said inserting device 13.

Advantageously, as can be seen in particular from Figure 1, the route
25 travelled by said device 13 for the insertion of said product in a corresponding container 15 is in the form of a ring-closed route. In particular, it can be seen from Figure 1 that, according to the present preferred embodiment, the overall route of said respective inserting device 13 is in the form of a ring-closed route, with heads for the inversion of the

forward direction, in particular at opposite longitudinal ends of the longitudinal lengths of the route.

Advantageously, as can be seen in particular from Figure 3, said product holding means, or tank, comprise a product housing chamber 152 and means 152', 152" for the entry and exit of the product from the same chamber 152.

With advantage, said product holding means, or tank, 152 have a lateral peripheral wall 152a, in particular defined by said means, or armature, for supporting the inserting device 13, a longitudinally extreme lower wall 152b, in particular defined, at least in part, by said means, or armature, for supporting the inserting device 13, i.e. by an annular shoulder 603' and protruding internally of them, as is however better evident in Figure 4, and a longitudinally extreme upper wall 152c, which will be better described later in this description.

Advantageously, as can be seen in particular from Figure 4, said product holding means, or tank 152, have a respective product exiting opening 152", in particular provided at said longitudinally extreme lower wall 152b of said product holding means, or tank 152.

With particular advantage, as can be seen in particular from Figure 3, said product holding means, or tank 152 have a respective product entry opening 152', in particular provided in the peripheral side wall 152a of said product holding means, or tank 152, preferably at the lower part thereof.

Advantageously, as can be seen in particular from Figure 3, said device 13 for the insertion of said product in a corresponding container 15 comprises means for the exit of the product towards and into the respective container 15.

Said product exiting means comprise a corresponding mouth 153 for the exit of said product from the same inserting device 13.

Advantageously, as can be seen in particular from Figure 3, said

mouth 153 for the exit of said product from the same inserting device 13 is connected to said opening 152" for the exit of the product from the housing chamber 152, of said product holding means, or tank, through a connecting conduit 601", in particular which extends below said product housing chamber 152, preferably coaxially to said exiting mouth 153 and/or to said housing chamber 152.

With advantage, as can be seen in particular from Figure 1, the product exiting mouth is, in use, spaced, in particular vertically spaced, from the opening for the insertion of the product in the container 15, the latter not being particularly illustrated in the appended figures.

Advantageously, as can be seen in particular from Figure 3, said means 600 for the exit of the product from the device 13 for the insertion of said product in the corresponding container 15 comprise closing means 600 respectively openable to allow the passage of said product and closable to block the passage of said product.

Advantageously, as can be seen in particular from Figure 3, said closing means are at said product exiting mouth 153 and comprise an element, or pad, 600 which is adapted to engage and disengage with the edge 153 defining said product exiting mouth.

With particular advantage, as can be seen in particular from Figure 3, said element, or pad, 600 which defines said closing means, in particular of said product exiting mouth 153 is supported by a corresponding shaft 300, in particular at the respective end, especially lower, of the same shaft 300, which shaft 300 preferably extends longitudinally or vertically, to said device 13 for the insertion of said product in a corresponding container 15.

With advantage, as can be seen in particular from Figure 3, propulsion means 155 for the product that is exiting said device 13 are provided for, for the insertion of said product in a corresponding container 15, in particular in the form of thrusting means of the product exiting said

holding means towards and into said container 15.

Advantageously, the product propulsion means 155 are loaded during the product loading step, or route.

In this way, an apparatus is obtained which has a configuration that
5 is advantageously essential.

With particular advantage, as can be seen in particular from Figure 3, the product propulsion means 155 are loaded by the load of the product on said device 13 for the insertion of said product in a corresponding container 15, in particular in said product holding means, or tank 152, i.e., by the
10 action of the product itself that is loaded on said device 13 for the insertion of said product in a corresponding container 15, in particular that is loaded in said product holding means, or tank 152.

In this way, the use along the movement route of the respective inserting device 13 of the conduits for a corresponding actuating fluid or of
15 the supply wires of a corresponding actuating electric energy is waived.

Advantageously, said product holding means, or tank 152 on said device 13 for the insertion of said product in a corresponding container 15 comprise means for the compression of the product located in said product holding means, or tank 152, i.e. in said product housing chamber thereof.

Advantageously, said means, or tank 152 for holding the product on
20 said device 13 for the insertion of said product in a corresponding container 15 comprise a movable wall, or part thereof, for the propulsion or thrust of the product out of said product holding means, or tank 152, i.e., from said product housing chamber thereof.

With advantage, as can be seen in particular from Figure 3, said
25 propulsion means of the product exiting said inserting device 13, in particular said product holding means, or tank 152, comprise a respective membrane 155 for the compression, or thrust, of the product, in particular which membrane 155 is movable between an advanced position for the exit

of the product, illustrated in figure 3, and a retracted position, not particularly illustrated in the appended figures, especially said retracted position corresponding to a loading condition of the same product on said device 13 for the insertion of said product in a corresponding container 15, i.e., in said product holding means, or tank 152.

With particular advantage, as can be seen in particular from Figure 3, said membrane 155 defines said longitudinally extreme upper wall 152c of said means, or tank, 152 for holding the product on said inserting device 13, i.e. of the product housing chamber 152 thereof.

Advantageously, as can be seen in particular from Figure 3, said propulsion means of the product exiting said device 13 for the insertion of said product comprise respective actuating means 156, in particular means for the actuation of said product propulsion or thrusting membrane 155.

Advantageously, as can be seen in particular from Figure 3, said actuating means are in the form of a pressurized gas housed in a corresponding actuating chamber 156, preferably located behind said propulsion or thrusting membrane 155.

With advantage, as can be seen in particular from Figure 3, said actuating means, or chamber, 156, of said propulsion means of the product exiting said device 13 for the insertion of said product, have a peripheral wall 156a, in particular defined by said means, or armature, for supporting the inserting device 13 and preferably longitudinally aligned with the peripheral side wall 152a of said means, or tank, 152 for holding the product on said inserting device 13, a longitudinally extreme upper wall 156b, in particular defined by said means, or armature, for supporting the inserting device 13, and a longitudinally extreme lower wall 156c, in particular defined by said propulsion or thrusting membrane 155.

Advantageously, as can be seen in particular from Figures 3 and 5, said product propulsion membrane 155 is peripherally integral with the

means, or armature, for supporting said inserting device 13, i.e. with the peripheral wall 152a delimiting said product holding means, or tank, 152 and/or with the peripheral wall 156a delimiting the actuating or compression chamber 156.

5 In particular, as can be seen from Figure 5, the body 156a defining the propulsion chamber is fixed to the body 152a defining the product holding tank through corresponding screws 505, in particular directed axially operating to retain between them said first and second bodies the peripheral edge of said thrusting membrane 155.

10 Advantageously, as can be seen in particular from Figures 3 and 5, said product propulsion membrane 155 is movable between an advanced position, in particular lowered, for the exit of the product, illustrated in said Figures 3 and 5, and/or a retracted position, in particular raised, especially corresponding to a loading condition of the same product in said means, or
15 tank, for holding the product 152 and/or for the compression of the gas contained in said actuating chamber 156.

With particular advantage, as can be seen in particular from Figures 3 and 4, means 300 for guiding the movement of said propulsion means 155 of the product exiting said device 13 for the insertion of said product in
20 a corresponding container 15 are provided for.

Advantageously, as can be seen in particular from Figures 3 and 4, said means 300 for guiding the movement of said propulsion means 155 of the product exiting said device 13 from said device for the insertion of said product 13 are defined by a longitudinal shaft 300, in particular by said shaft
25 300 which carries the means 600 for closing said product exiting mouth 153.

With advantage, as can be seen in particular from Figures 3 and 5, said product propulsion membrane 155 has a central part fixed to corresponding means, or block 500, for sliding on said longitudinal guide

shaft 300.

Advantageously, as can be seen in particular from Figures 3 and 5, means for stopping the movement of said product propulsion membrane 155 in the advanced, in particular lowered, position, for the exit of the product are provided for.

Advantageously, as can be seen in particular from Figures 3 and 5, said means for stopping the movement of said product propulsion membrane 155 in the advanced position, in particular lowered, for the exit of the product are in the form of an annular body 300', which is coaxially fixed to said guide shaft 300. Especially, a corresponding, in particular extreme, face 300'' of said annular body 300' is engaged by the opposite, in particular extreme, face of said means, or block, 500 sliding on the same longitudinal guide shaft 300.

Advantageously, as can be seen in particular from Figure 3, means 305 for stopping the movement of said product propulsion membrane 155 in the retracted position, in particular raised, especially corresponding to a loading condition of the same product in said product holding means are provided for.

With advantage, as can be seen in particular from Figure 3, said means 305 for stopping the movement of said product propulsion membrane 155 in the retracted position, in particular raised, comprise a corresponding stop body or flange 305, in particular supported protruding from said longitudinally extreme upper wall 156b delimiting said actuating chamber 156.

Advantageously, as can be seen in particular from Figure 1, said propulsion means, or membrane, 155 of the product exiting said device for the insertion of said product 13, define means for actuating the closure of said mouth 153 for the exit of the product from the same device 13 for the insertion of said product in a corresponding container 15, i.e. for actuating

said closing means 600 in engagement and for closing said product exiting mouth 153.

With particular advantage, as can be seen in particular from Figures 1 to 3 and 6, means for loading the product in, or on the respective device
5 13 for the insertion of said product in a corresponding container 15, in particular to load said holding means, or tank 152 of the product thereof are provided for.

Advantageously, as can be seen in particular from Figures 1 to 3 and 6, said means 12 for loading the product on said device 13 for the insertion
10 of said product in a corresponding container 15, in particular on the corresponding product holding means, or tank 152, are in the form of means that advance together with the respective device 13 for the insertion of said product in a corresponding container 15.

Advantageously, as can be seen in particular from Figures 1 to 3 and
15 6, said loading means 12 of the product on said inserting device of said product 13, in particular on the corresponding product holding means, or tank 152, are in the form of rotatable means, in particular in the form of a rotatable carousel, having one or more loading heads 120, in particular each head being carried by a corresponding radial arm 120', preferably said
20 loading heads 120 being peripherally arranged with respect to the rotatable carousel.

Advantageously, as can be seen in particular from Figures 1 to 3 and 6, said means 699 for supplying said product to the respective device 13 for the insertion of said product in a corresponding container 15 are provided
25 for, in particular supplying the product towards said loading means 12.

Advantageously, as can be seen in particular from Figures 1 to 3 and 6, said loading means comprise means, which can be opened and closed, which are adapted to put in communication said product holding means, or tank, 152 on said inserting device 13 with said supplying means of the

product 699.

Advantageously, as can be seen in particular from Figures 1 to 3 and 6, valve means 700, 800, which can be opened and closed, for the connection of said product holding means, or tank 152, on said inserting
5 device 13, with said supplying means 699 of said product are provided for.

With particular advantage, as can be seen in particular from said Figures from 1 to 3 and 6, said valve means for the connection of said product holding means, or tank 152, on said inserting device 13, with supplying means 699 of said product comprise valve means 700, which can
10 be opened and closed, provided on said device 13 for the insertion of said product in a corresponding container 15.

With advantage, as can be seen in particular from said Figures 1 to 3 and 6, said valve means 700 for the connection of said product holding means, or tank 152, on said inserting device 13, with supplying means 699
15 of said product are carried by a corresponding arm 700", protruding laterally from the main body of said device 13 for the insertion of said product, in particular at the free end thereof. In particular, said protruding arm 700" has an internal passage conduit 700'" for said product which extends between said valve means 700 and the opening 152' for entering said product
20 housing chamber 152.

Advantageously, as can be seen in particular from Figures 1 to 3 and 6, said valve means 700 on said device 13 for the insertion of said product are in the form of means which are switchable between a condition for closing the passage of product, between said supplying means of the
25 product 699 and said product holding means, or tank, 152, and a condition for opening the same passage.

Advantageously, as can be seen in particular from Figures 1 to 3 and 6, said valve means 700 on said device 13 for the insertion of said product in a corresponding container 15 comprise a shutter body, in particular

internally hollow, 70, which is movable, in particular rotatable, between a position of free passage of the product and a position of closure of said passage of product.

Advantageously, as can be seen in particular from Figures 1 to 3 and 5 6, a radial hole 705' is provided on the external wall of said hollow shutter body 70', which is adapted to put in communication the internal cavity 705 of the same hollow shutter body 70 with said product holding means, or tank, 152 on said device 13 for the insertion of said product in a corresponding container 15. By rotating said hollow shutter body, in 10 particular by 90°, it is possible to switch the connection between supplying means of the same product 699 and said product holding means, or tank, 152, from closed passage to open passage and vice versa. However, it must be understood that even a rotation angle different from the one shown above of 90° would still be imaginable.

Advantageously, as can be seen in particular from said Figures 1 to 3 15 and 6, said hollow shutter body 70 has an external surface 70', with a conical shape, cooperating with a conical retaining surface 70'' provided on the support means of said device 13 for the insertion of said product in a corresponding container 15, in particular on said support arm 700'' of the 20 device 13. Elastic means 710 which keep said shutter body normally pushed against the conical retaining surface are provided for.

In this way, any wear and tear can be compensated for and the valve can be kept operating for quite a long time.

With advantage, said hollow shutter body 70 is axially, in particular at 25 the top, open, in 72, so as to receive said product in the internal cavity 705. Said radial through hole 705' opens in said internal cavity and is provided in the peripheral wall with the same hollow shutter body 70. Said radial through hole 705' remains closed until the same radial hole 705' is forced against the side wall 70'' of the seat which houses the same hollow shutter

body 70 and opens, to allow the passage of product, when the same hole is opposite the conduit 700" for the connection with the product housing chamber 152.

With particular advantage, as can be seen in particular from Figure 6, said valve means, on said inserting device 13, for the connection of said product holding means, or tank 152 with said supplying means 699 of said product, comprise a support body, in particular hollow, 170", in particular for housing, the shutter body 70.

Especially, said hollow body 170" internally defining the seat 70" for housing said shutter body 70, which housing seat 70" is open, in particular open perpendicularly, preferably upwards, to allow the access by the supplying means of the product 699, is open towards said product holding means, or tank, 152 on said inserting device 13, to allow the passage of the product towards said holding means, or tank, 152.

Advantageously, as can be seen in particular from Figure 6, said support body of the shutter 170" is provided at the end of said extension arm 700" and said shutter housing seat 70" is open, in particular horizontally, or radially, opening into the conduit 700" for conveying the product of the latter towards said product holding means, or tank, 152 on said inserting device 13.

Advantageously, as can be seen in particular from Figures 1 to 3 and 6, control means of said valve means 700 provided on said device 13 for the insertion of said product in a corresponding container 15 are provided for.

With advantage, as can be seen in particular from Figure 2, said control means 16 operate the switching of said valve means 700, i.e. they are at said loading means 12, at the entry to said loading means 12 and at the exit from the same loading means 12, in particular make the shutter body 70 rotate, especially by 90°, in such a way as to arrange the through

hole 705' opposite the conduit 700'" for the connection with the product housing chamber 152 and vice versa. However, it must be understood that even a rotation angle different from the one shown above of 90° would still be imaginable.

5 Advantageously, as can be seen in particular from Figures 2 and 6, said control means are in the form of corresponding cam means 16, in particular which are adapted to engage a corresponding wheel 702', which slides on the respective control cam 16 and which is connected through a corresponding arm 702 to a protruding shaft 71, in particular below, and
10 which is integral with said hollow shutter body 70.

 Advantageously, as can be seen in particular from Figure 6, said valve means for the connection of the device holding means with supplying means 699 of said product comprise valve means 800 provided on said means 12 for loading the product.

15 With particular advantage, as can be seen in particular from Figure 6, said valve means 800 provided on the product loading means 12 are carried by the respective product loading head 120.

 Advantageously, as can be seen in particular from Figure 6, said valve means 800, provided on the product loading means 12, comprise a
20 plate 801 for closing an opening, in particular open perpendicularly, preferably open downwards, 802 for unloading said product towards said inserting device 13. Especially, said closing plate 801 is normally pushed by corresponding elastic means 803 against a corresponding edge 802 delimiting said product unloading opening.

25 With advantage, said valve means 800 provided on the product loading means 12, i.e. the respective product loading head 120, comprise a body, in particular a cable, for the support 800', in particular for housing, said closing plate 801. Especially, said hollow body 800' internally defines a seat 80" for housing said shutter body 801, which housing seat 80" is open,

in particular open perpendicularly, preferably downwards, to allow the passage of the product towards said product holding means, or tank, 152 on said inserting device 13 and is open, horizontally, or radially, towards the supplying means of the product 699, to receive the product from them.

5 Advantageously, as can be seen in particular from Figure 6, control means are provided which are adapted to open said valve means 800 provided on the product loading means 12, in particular when the product is unloaded from the supplying means 699, i.e. from the respective product loading head 120.

10 Advantageously, as can be seen in particular from Figure 6, said control means which are adapted to open said valve means 800, of said product loading means 12, are provided on said device for the insertion of said product 13, in particular on the valve means 700 thereof.

15 Advantageously, as can be seen in particular from Figure 6, said control means which are adapted to open said valve means 800, of said means 12 for loading the product, are in the form of means which are adapted to thrust said closing plate 801, of the same valve means 800 towards an open position of the product unloading passage.

20 With advantage, as can be seen in particular from Figure 6, said control means of said valve means 800, provided on the product loading means 12, comprise a stem 701 for engaging the closing plate 801 thereof, which engaging stem 701 extends protruding, in particular perpendicularly or vertically, from the valve means 700 on said product inserting device 13, in particular from the hollow shutter body 70 of the same valve means 700
25 on said device 13 for the insertion of said product, especially by passing through said opening, which is turned upward, of said support body 170".

 Advantageously, as can be seen in particular from Figure 6, means are provided which are adapted to move said valve means 800 provided on the means 12 for loading the product, i.e. on the respective extreme head

120, towards and against said valve means 700 on said device 13 for the insertion of said product in a corresponding container 15.

In particular, said means which are adapted to move said valve means 800 provided on the product loading means 12 are in the form of a corresponding actuator, especially in the form of a pneumatic actuator, preferably in the form of a pneumatic cylinder 804, which is mounted above the head 120 and which has a corresponding movable stem, preferably perpendicularly or vertically, which carries the support body 800' of the valve means 800.

As illustrated, said support body 800' of the valve means 800 is preferably supported by the loading arm 120', in particular through said actuator 804, which is fixed to the end of said arm 120, and the same support body 800' is movable, slidingly, in particular perpendicularly or vertically, with respect to the same arm 120'.

Gasket means 805, 805 which allow the product to sealingly slide between said support body 800' and the open end of the same arm are provided for.

With particular advantage, as can be seen in particular from Figure 6, said means which are adapted to move said valve means 800 provided on the means 12 for loading the product, towards and against said valve means 700 on said inserting device 13, are adapted to lower the valve body 800 so that said closing plate 801 is engaged and thrust upwards by said stem 701 fixed to the valve means 700 on said device for the insertion of said product 13, in particular fixed to the hollow shutter body 70 of the same valve means 700 on said product inserting device 13, and/or in such a way that the conical external surface 800" of the extreme portion of the valve body 800, defining said unloading opening 802, sealingly engages a corresponding gasket 706 on said device for the insertion of said product 13, peripherally provided around the same opening 72, in particular above,

for introducing, into said hollow shutter body 70, the same valve means 700 on said inserting device 13.

Advantageously, as can be seen in particular from Figure 6, a peripheral surface 51 for engaging and stopping the travel is provided on the product loading means, in particular on the extreme head 120 thereof,
5 peripherally to said unloading opening 802, against an opposite surface 52, peripherally arranged with respect to said opening 72 for introducing said product inserting device 13 into said hollow shutter body 70, in particular outside said sealing gasket 706.

10 Advantageously, as can be seen in particular from Figures 3, 5 and 7, means 400 for closing said exiting mouth 153 of the product from said device 13 for the insertion of said product, in particular from said product holding means, or tank 152 on said inserting device 13 are provided for.

With advantage, as can be seen in particular from Figures 3, 5 and 7,
15 said means for closing said exiting mouth 153 of the product are defined by said propulsion means, or membrane, 155 of the product that is exiting said device for the insertion of said product 13, which act by longitudinally thrusting said shaft 300 which carries said closing means 600 of said exiting mouth 153, in particular by engaging the annular body 300' integral with the
20 same shaft 300.

Advantageously, as can be seen in particular from Figure 7, said means for closing said product exiting mouth 153 comprise retaining means 400 for closing said closing means 600.

Advantageously, as can be seen from Figures 3 and 7, said retaining
25 means 400 for closing said closing means 600 act on said shaft 300 which carries said closing means 600 of said exiting mouth of the product 153, in particular at the end that is opposite to that in which said closing means 600 of the product exiting mouth 153 are located.

With particular advantage, as can be seen in particular from Figure 7,

said retaining means comprise a corresponding tooth 401' for hooking said shaft 300, which carries said closing means 600, which hooking tooth 401' is supported, in particular in a movable manner, being pivoted at 403, by said means, or armature, for supporting 150 said device 13 for the insertion
5 of said product and engages against a corresponding surface 402' of a head 402, in particular extreme, of the same shaft 300.

With advantage, as can be seen in particular from Figure 7, said retaining means, i.e. in particular said retaining tooth, 401' are normally pushed into the retaining condition through corresponding elastic means, in particular in the form of a spring, 408 acting on the movable body 401, in
10 particular pivoted in 403, which carries said retaining means, or tooth 401'.

Advantageously, as can be seen in particular from Figure 7, means for opening said exiting mouth 153 of the product from said device 13 for the insertion of said product, in particular from said product holding means, or tank 152 on said inserting device 13 are provided for.
15

Advantageously, as can be seen in particular from Figure 7, said means for opening said product exiting mouth 153 comprise retaining means 16 for disengaging, in particular for releasing, said retaining means for closing 401 said closing means 600 of said product exiting mouth 153.

Advantageously, as can be seen in particular from Figure 7, said disengaging or release means of said closing retaining means are in the form of corresponding cam means 16, in particular acting on the body 401 carrying said retaining tooth 401' in contrast to corresponding elastic means, or spring, 408, located, with reference to the pivot 403, on the side
20 of said body 401 which is opposite to that of said retaining tooth 401'.

Advantageously, as can be seen in particular from Figure 7, said opening means of said product exiting mouth 153 comprise means 404 for thrusting said closing means 600, in particular of the respective support shaft 300, to open said exiting mouth 153.

With advantage, as can be seen in particular from Figure 7, said thrusting means of said closing means 600 opening said product exiting mouth 153 are in the form of corresponding elastic means 404, in particular in the form of a corresponding thrusting spring, acting on said shaft 300, carrying closing means 600, in particular on the head 402, preferably at the upper end, of the same shaft 300, in order to move it away from said exiting mouth 153.

With particular advantage, as can be seen in particular from Figure 7, said means 400 for closing said product exiting mouth 153 comprise means 408, 402' for reactivating said retaining means for closing said closing means 600 of said product exiting mouth 153.

Advantageously, as can be seen in particular from Figure 7, said reactivating means of said closing retaining means, of said closing means 600 of said product exiting mouth 153, comprise elastic means, in particular a spring, 408 acting on the movable body 401, in particular pivoted in 403, which carries said retaining means, or tooth 401', for thrusting said retaining means, or tooth 401' against a sliding surface 402" of the head 402 of the shaft carrying closing means 600 and, therefore, on said retaining surface 402' thereof.

Advantageously, as can be seen in particular from Figure 7, means 402, 405, 406, 407, 407' for damping the release action during opening of said closing means 600 of said product exiting mouth 153 are provided for.

With advantage, as can be seen in particular from Figure 7, said damping means of the release action during opening comprise a chamber 406 containing a fluid, or gas, under pressure, preferably said damping chamber having a calibrated hole 407' for the controlled exit and entry of said damping fluid, or gas.

Advantageously, as can be seen in particular from Figure 7, said calibrated hole 407' is made in an insert 407, in particular engageable and

disengageable at an opening 407" for the communication of said damping chamber 406 with the outside environment thereof.

In this way, among other things, it is thus possible to modify as desired the output resistance of the same damping fluid and therefore to
5 modulate the opening mode in an appropriate and desired way.

Advantageously, as can be seen in particular from Figure 7, said head 102, fixed to the shaft 600 carrying closing means of said product exiting mouth 153, delimits the damping chamber 406 and supports
10 respective gasket means 405 acting between the peripheral surface thereof and the opposite wall 406p delimiting said damping chamber 406.

With particular advantage, as can be seen in particular from Figure 3, said thrusting membrane 155, during the loading of the product on said device for the insertion of the same product 13, i.e. for the insertion thereof
15 into said product holding means, or tank, 152, slides freely on said shaft 300 which carries said closing means 600 of the product exiting mouth 153, towards and against corresponding stop means in the retracted condition 156a.

Advantageously, as can be seen in particular from Figure 5, means for guiding the distension movement of said propulsion membrane 155 are
20 provided for.

With advantage, as can be seen in particular from Figure 5, said means for guiding the distension movement of said thrusting membrane 155 are in the form of a corresponding cup-shaped body 502, fixed to said
25 annular guide body 500 on the guide shaft 300, which cup-shaped body 502 uniformly thrusts the same membrane 155 against the perimeter surface 152a of the product housing chamber 152.

Advantageously, as can be seen in particular from Figure 3, means 252 for adjusting the amount of product contained in said product holding means 152 and/or delivered by said device 13 for the insertion of said

product in a corresponding container 15 are provided for.

Advantageously, as can be seen in particular from Figure 8, said means 252 for adjusting the amount of product contained in said product holding means 152 and/or delivered by said device 13 for the insertion of
5 said product in a corresponding container 15, are in the form of means that adjust or modify the expansion amplitude, or the movement towards the retracted loading position, of the propulsion means, or membrane, 152 of the product that is exiting said device 13 for the insertion of said product in a corresponding container.

10 Advantageously, as can be seen in particular from Figure 8, said means 252 for adjusting the amount of product contained in said product holding means 152 and/or delivered by said device 13 for the insertion of said product in a corresponding container 15, are in the form of means that adjust or modify the travel of the central part of the propulsion means, or
15 membrane, 152 of the product that is exiting said device 13 for the insertion of said product in a corresponding container 15.

With advantage, as can be seen in particular from Figure 8, said means for adjusting the amount of product contained in said product holding means 152 are in the form of means which move, in particular
20 longitudinally, said surface, or body, 305 for stopping the movement, in the retracted loading position of said product holding means, or tank, 152 on said inserting device 13, of said propulsion means, or membrane, 152 of the product 152, in particular of the central part 500 of the same propulsion membrane 155.

25 Advantageously, as can be seen in particular from Figure 8, for adjusting the amount of product contained in said product holding means 152, said body, or flange, 305 for stopping the movement, in the retracted loading position, of said propulsion membrane 155, is supported by corresponding rod-like means, or rods, 304, in particular being integral with

the end thereof, which rod-like means, or rods, 304 are movable longitudinally on the impulse of corresponding actuating means 302.

As illustrated, said support rod-like means, or rods 304 pass through corresponding, hole-like means, or holes, 306', 307', equipped with
5 respective sealing gaskets 306, 307, which are formed in said extreme closing wall 301' of said propulsion chamber 156.

With particular advantage, as can be seen in particular from Figure 8, said means for actuating the longitudinal movement of said rod-like means, or rods, 304, which bring said body, or flange, 305 for stopping the
10 movement to the retracted loading position, of said propulsion membrane 155, comprise a corresponding externally threaded member 302, in particular coaxially freely arranged around said longitudinal shaft 300 and preferably supported between said extreme closing wall 301' of said propulsion chamber 156 and the upper extreme wall 306 of the means, or
15 armature, for supporting the inserting device of said product 13. Said threaded member cooperates with a corresponding element, or fixed, body, 303, in particular at the opposite end, to said rod-like means, or rods, 304 so that, through the rotation of said threaded member 302, the same element, or body 303 is moved longitudinally to move said body
20 longitudinally, or stop flange 305.

Advantageously, as can be seen in particular from Figure 4, means for varying the geometry, in particular the width or diameter, of the area for the exit of the product, or for varying the geometry of the product exiting
mouth 153 and/or of the connecting or unloading conduit 601", which opens
25 into said product exiting mouth 153, and especially connecting it with said holding or loading chamber 152, all preferably in order to maintain a laminar flow to said product that is exiting said device 13 for the insertion of said product in a corresponding container 15 are provided for.

Advantageously, as can be seen in particular from Figure 4, said

product exiting means comprise a hollow block 601 defining said product exiting mouth 153 and/or the product exiting conduit 601', extending upstream of said exiting mouth, which is connected in an engageable and disengageable manner, in view of its replacement with a different hollow
5 block with said support means of said inserting device 13, in particular to a sleeve 13 thereof which is protruding below, especially below the portion of the support means, or armature, which defines, or contains, said product holding chamber 152.

With advantage, as can be seen in particular from Figure 1, said
10 hollow block 601 defining said product exiting mouth 153 and/or product exiting conduit 601", extending upstream of said exiting mouth, is adapted to engage with the support means, or armature, of said inserting device 13, in an engageable and disengageable manner, through a corresponding axial movement, in particular directed longitudinally to said inserting device
15 13, in particular by being inserted into the end or lower portion 130, of said support means, or armature 150, with an insertion movement from below.

Advantageously, as can be seen in particular from Figure 4, said hollow block 601 defining said product exiting mouth 153 and/or the product exiting conduit 601", extending upstream of said exiting mouth, engages
20 against a corresponding internal surface 13' of the support means of said inserting device 13, in particular an end portion 130 thereof, and is fixed in position by means of corresponding means 602 for retaining the same hollow block 601" in axial direction.

Advantageously, as can be seen in particular from Figure 4, said
25 means 602 for retaining the same hollow block 601" in axial direction engage against the free extreme face of the same hollow block 601, in particular being in the form of a respective ring nut 602 engaging externally at the end of said support means of said inserting device 13, in particular of an end portion 130 thereof.

Said hollow block 601 is kept in a hermetic relationship with said support means of said inserting device 13, in particular at an end portion thereof, through a corresponding gasket 603, provided at an internal annular shoulder 603' of said means, or support armature 150, which
5 gasket 603 is engaged by the opposite end of the same hollow block 601.

With particular advantage, as can be seen in particular from Figure 4, said closing means of said product exiting mouth 153 are defined by a body, or ogive, 600, which is provided at the end of the corresponding support shaft 300, which body, or ogive, 600 is preferably fixed in an
10 engageable manner to, and in a disengageable manner from, the corresponding support shaft 300 for example by means of a corresponding fixing screw 600'.

With advantage, moreover, as can be seen in particular from Figure 4, said annular body 500, for sliding on the longitudinal support shaft 300, is
15 integral through corresponding screws 506, in particular extending longitudinally, with said cup-shaped body 502, defining the guide means of the distension of the propulsion membrane 155.

Advantageously, said means 152 for holding the product on said inserting device 13 are adapted to contain the entire amount of product to
20 be inserted in a respective container 15.

Advantageously, as can be seen from said Figure 2, said supplying means 101 of the product comprise a main supplying conduit 101', which extends axially within the shaft, in particular vertical, rotatable 1200 for supporting the loading carousel 12 of said loading devices 13, from which
25 main conduit inside the support shaft 1200 a plurality of radial conduits supported by, or inside, corresponding radial arms 120' that bring the product to the respective loading heads 120', extends.

In practice, as is evident, the technical characteristics illustrated above allow, individually or in a respective combination, achieving one or

more of the following advantageous results:

- it is possible to create an apparatus having any desired configuration, adapted to meet the specific needs of the case, and in particular relating to the space used, the production yield or more;

5 - it is possible to control the movement of said device for the insertion of the product in a flexible and desired way.

- the apparatus can be easily adapted to any forward mode of the containers, the filling devices in fact follow and coordinate their speed with the forward rate of the same containers;

10 - it is possible to release the filling activities of the containers from other ancillary activities, such as loading and unloading of the containers and, in particular, the reloading of said device for the insertion of said product in a corresponding container; in fact, the step of loading the filling devices takes place independently from the filling of the corresponding
15 containers and can therefore be performed in a desired and appropriate way;

- it is possible to configure the filling apparatus in any way desired and required by particular needs, for example of space, dictated by the specific situation present within the industrial plants in which the present
20 apparatus is placed;

- it is possible to configure the apparatus in a particularly easy and flexible way and at the same time to operate easily in the filling area, for example in order to remove some defective containers or other, and at the same time to be able to carry out easy repairs and/or maintenance of the
25 filling device;

- an advantageously essential apparatus is obtained;

- the use of conduits for a corresponding actuating fluid or power supply wires of a corresponding actuating electric energy is waived; in fact, the present device for the insertion of said product in a corresponding

container is in the form of a completely autonomous device which is free to move in order to carry out its task of filling a corresponding container;

- it is possible to have an apparatus available which is capable of operating for rather long times, without the need for frequent maintenance or repairs.

The present invention is susceptible to evident industrial application. The person skilled in the art will also be able to imagine numerous modifications and/or variations to be made to the same invention, while remaining within the scope of the inventive concept, as extensively explained. Moreover, the person skilled in the art will be able to imagine further preferred embodiments of the invention which include one or more of the above illustrated characteristics of the preferred embodiment. Moreover, it must also be understood that all the details of the invention can be replaced by technically equivalent elements.

15

CLAIMS

1. An apparatus (10) for filling containers (15) with a corresponding product, in particular in the form of a liquid or semi-liquid product; the apparatus comprising a plurality of devices (13) for the insertion in
5 corresponding containers (15) of a corresponding predetermined portion of said product; **characterized in that** said inserting devices (13) are movable independently one from the other and from the corresponding containers to be filled (15), with the respective inserting device (13) being movable in a manner that is coordinated with, or corresponding to, the movement of the
10 corresponding container to be filled (15), during, in particular only during, the filling step thereof by the same inserting device (13).
2. The apparatus according to claim 1 or according to the pre-characterizing part of claim 1, **characterized in that** handling means (11) of the respective device (13) for the insertion of said product in a
15 corresponding container (15) are provided for.
3. The apparatus according to claim 2, **characterized in that** said handling means (11) of the respective device (13) for the insertion of said product in a corresponding container (15) comprise a respective linear motor, in particular which linear motor (11) comprises corresponding
20 magnetic propulsion means comprising a stationary magnetic interaction part (11'), provided for along the forward path of said respective inserting device (13), and a movable magnetic interaction part (13') at said device (13) for the insertion of said product in a corresponding container (15).
4. The apparatus according to any of the preceding claims,
25 **characterized in that** the device (13) for the insertion of said product in a corresponding container (15) moves along a respective forward route of the respective inserting device (13), which forward route has a respective length (11a) during which the filling of the respective container (15) is carried out, in particular said filling length (11a) corresponds to, o matches,

i.e., it is preferably parallel, to a corresponding forward length (14a) of the same container (15), by corresponding conveying means (14) of the same container (15).

5 **5.** The apparatus according to any of the preceding claims, **characterized in that** the device (13) for the insertion of said product in a corresponding container (15) during the filling step, i.e., along at least part of the filling length (11a) of the same handling means (11), moves at the same rate as the corresponding container to be filled (15).

10 **6.** The apparatus according to any of the preceding claims, **characterized in that**, before carrying out the filling of corresponding container (15), the device (13) for the insertion of said product in a corresponding container (15) travels along an intercepting length of the corresponding container (15), in particular it moves following the same container (15).

15 **7.** The apparatus according to any of the preceding claims, **characterized in that** said forward route of the respective inserting device (13) has a respective return length (11b) towards said filling length (11a), in particular, which is travelled by the corresponding inserting device (13) at a different rate from the travel rate of said filling route (11a) by said same
20 inserting device (13), preferably said forward rate of said inserting device (13) along the return length being, at least along a part thereof, higher than the rate with which the same inserting device (13) travels said filling route (11a), and preferably with which it carries out the same filling.

25 **8.** The apparatus according to any of the preceding claims, **characterized in that** are means (16) for detecting the container to be filled (15) are provided for, in particular arranged at the entrance in the forward filling zone on the corresponding conveying means (14), in order to coordinate by the control means of the apparatus (10) the movement of the respective device (13) for the insertion of said product in a corresponding

container (15) with the movement of the respective container to be filled (15).

9. The apparatus according to any of the preceding claims or according to the pre-characterizing part of claim 1, **characterized in that** said device
5 (13) for the insertion of said product in a corresponding container (15) comprises product holding means (152), preferably in the form of a respective tank (152).

10. The apparatus according to any of the preceding claims, **characterized in that** said forward route (11) of the respective inserting
10 device (13) comprises a product loading length on, or in, said inserting device (13).

11. The apparatus according to any of the preceding claims or according to the pre-characterizing part of claim 1, **characterized in that** propulsion
means (155) for the product that is exiting said device (13) are provided for,
15 for the insertion of said product in a corresponding container (15), in particular in the form of thrusting means of the product exiting said holding means towards and into said container (15).

12. The apparatus according to claim 11, **characterized in that** the product propulsion means (155) are loaded during the product loading step,
20 or route.

13. The apparatus according to any of the preceding claims 11 and 12, **characterized in that** the product propulsion means (155) are loaded by
the load of the product on said device (13) for the insertion of said product
in a corresponding container (15), in particular in said product holding
25 means, or tank (152), i.e., by the action of the product itself that is loaded on said device (13) for the insertion of said product in a corresponding container (15), in particular that is loaded in said product holding means, or tank (152).

14. The apparatus according to any of the preceding claims 11 to 13,

characterized in that said means, or tank (152) for holding the product on said device (13) for the insertion of said product in a corresponding container (15) comprise a movable wall, or part thereof, for the propulsion or thrust of the product out of said product holding means, or tank (152),
5 i.e., from said product housing chamber thereof.

15. The apparatus according to any of the preceding claims 11 to 14, **characterized in that** said propulsion means of the product exiting said inserting device (13), in particular said product holding means, or tank (152), comprise a respective membrane (155) for the compression, or
10 thrust, of the product, in particular which membrane (155) is movable between an advanced position for the exit of the product and a retracted position, especially said retracted position corresponding to a loading condition of the same product on said device (13) for the insertion of said product in a corresponding container (15), i.e., in said product holding
15 means, or tank (152).

16. The apparatus according to any of the preceding claims 11 to 15, **characterized in that** said propulsion means of the product exiting said device (13) for the insertion of said product comprise corresponding actuating means (156), in particular means for the actuation of said product
20 propulsion or thrusting membrane (155).

17. The apparatus according to claim 16, **characterized in that** said actuating means are in the form of a pressurized gas housed in a corresponding actuating chamber (156), preferably located behind said propulsion or thrusting membrane (155).

25 18. The apparatus according to any of the preceding claims or according to the pre-characterizing part of claim 1, **characterized in that** means for loading the product in the respective device (13) for the insertion of said product in a corresponding container (15), in particular to load said holding means, or tank (152) of the product thereof are provided for.

19. The apparatus according to claim 18, **characterized in that** said means (12) for loading the product on said device (13) for the insertion of said product in a corresponding container (15), in particular on the corresponding product holding means, or tank (152), are in the form of
5 means that advance together with the respective device (13) for the insertion of said product in a corresponding container (15).

20. The apparatus according to any of the preceding claims 18 and 19, **characterized in that** said loading means (12) of the product on said inserting device of said product (13), in particular on the corresponding
10 product holding means, or tank (152), are in the form of rotatable means, in particular in the form of a rotatable carousel, having one or more loading heads (120), in particular each head being carried by a corresponding radial arm (120'), preferably said loading heads (120) being peripherally arranged with respect to the rotatable carousel.

15 21. The apparatus according to any of the preceding claims or according to the pre-characterizing part of claim 1, **characterized in that** means (699) for supplying said product to the respective device (13) for the insertion of said product in a corresponding container (15) are provided for, in particular supplying the product towards said loading means (12).

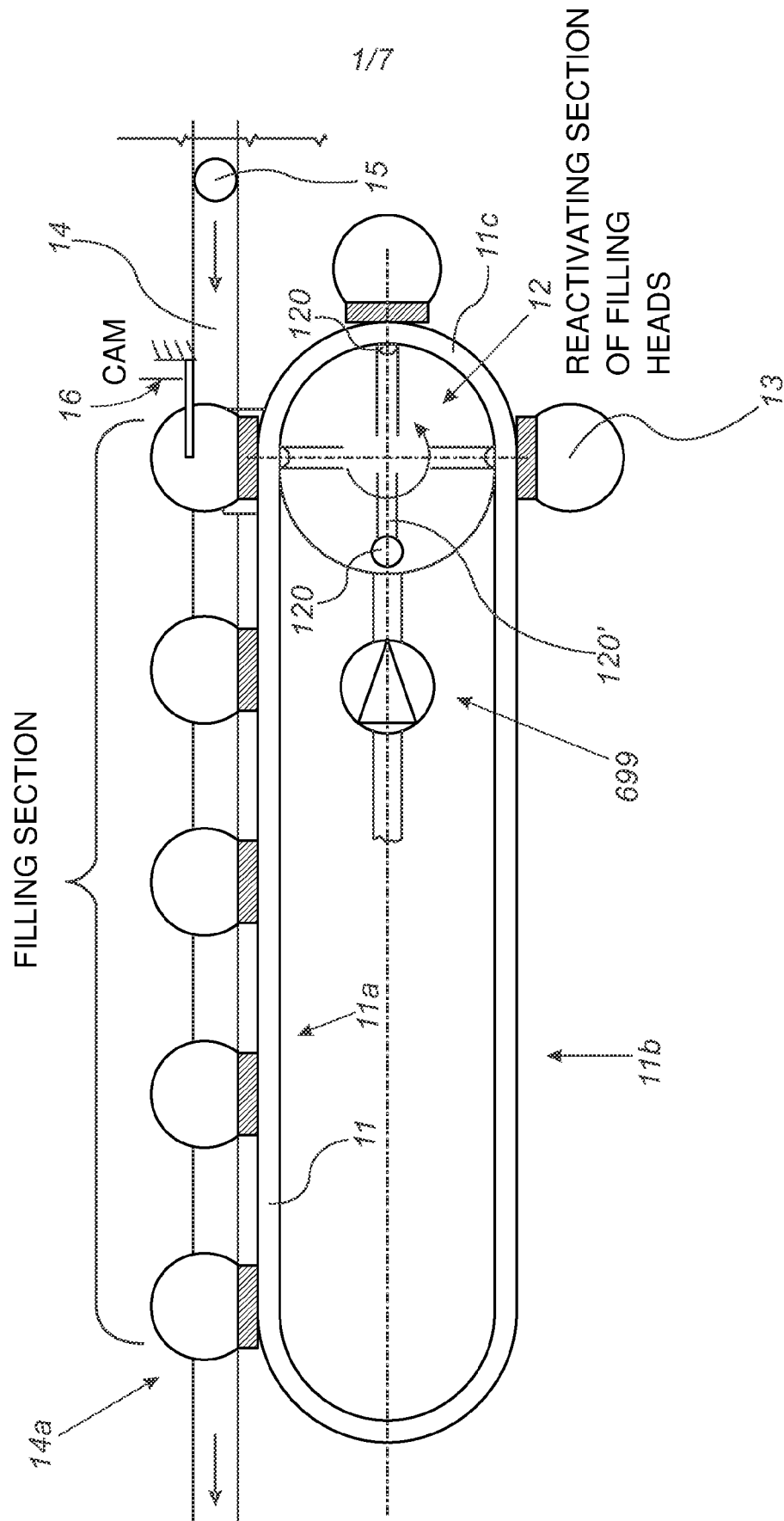
20 22. The apparatus according to any of the preceding claims or according to the pre-characterizing part of claim 1, **characterized in that** valve means (700, 800), which can be opened and closed, for the connection of said product holding means, or tank (152), on said inserting device (13), with said supplying means (699) of said product are provided for.

25 23. The apparatus according to any of the preceding claims or according to the pre-characterizing part of claim 1, **characterized in that** means (400) for closing said product exiting mouth (153) from said device (13) for the insertion of said product, in particular from said product holding means, or tank (152) on said inserting device (13) are provided for; in particular said

means for closing said product exiting mouth (153) are defined by said means, or membrane (155) for the propulsion of the product, exiting said inserting device of said product (13), which act by longitudinally pushing said shaft (300) carrying said closing means (600) of said exiting mouth
5 (153), in particular engaging the annular body (300') that is integral to the same shaft (300).

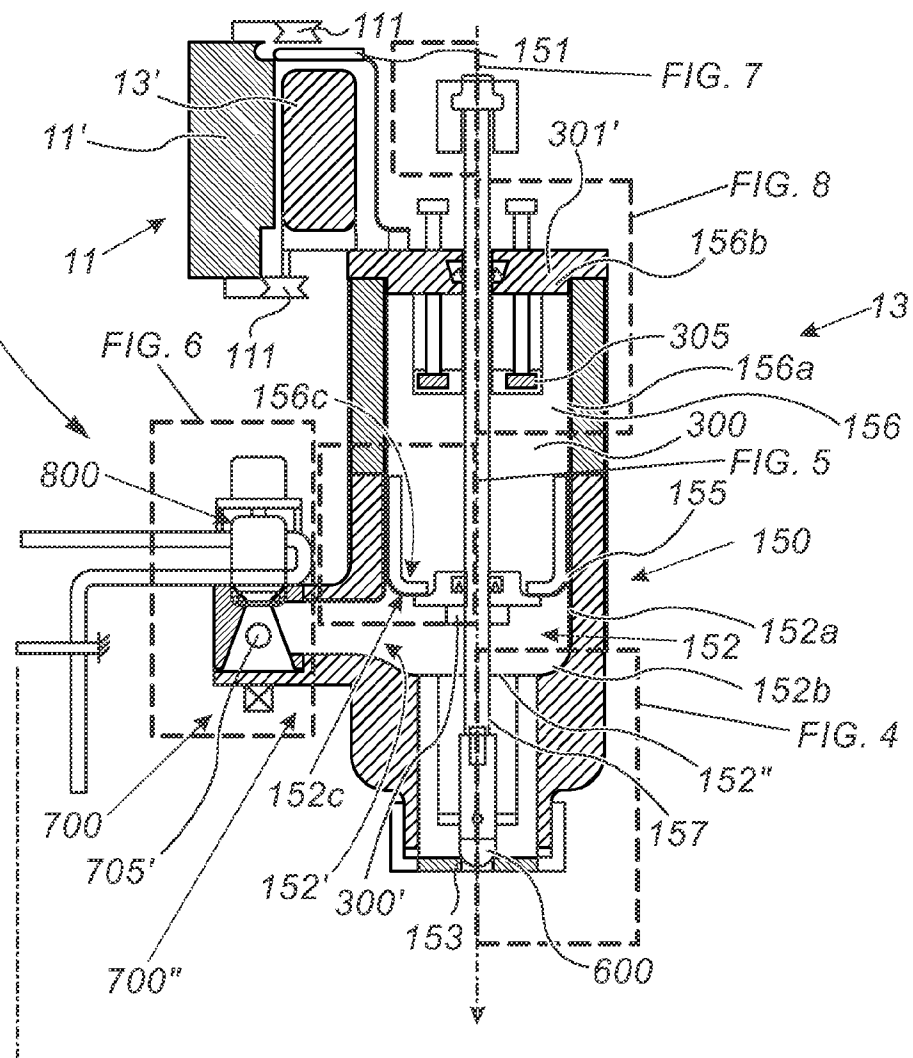
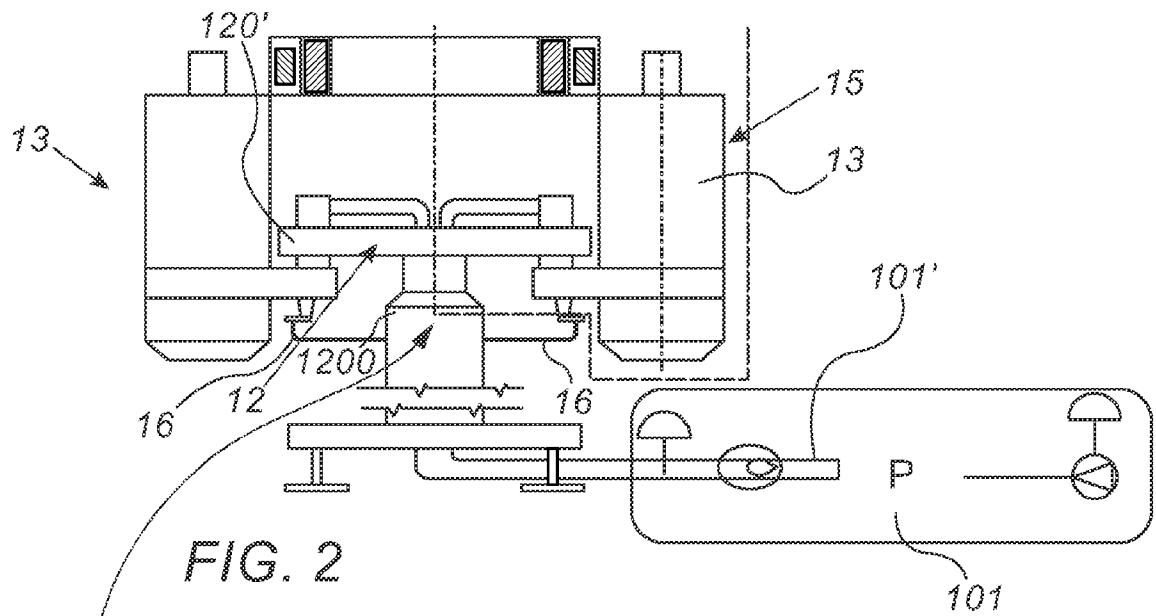
24. The apparatus according to any of the preceding claims or according to the pre-characterizing part of claim 1, **characterized in that** means for opening said exiting mouth (153) of the product from said device (13) for the
10 insertion of said product, in particular from said product holding means, or tank (152) on said inserting device (13) are provided for.

25. The apparatus according to any of the preceding claims or according to the pre-characterizing part of claim 1, **characterized in that** means (252) for adjusting the amount of product contained in said product holding means
15 (152) and/or delivered by said device (13) for the insertion of said product in a corresponding container (15) are provided for.



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2/7



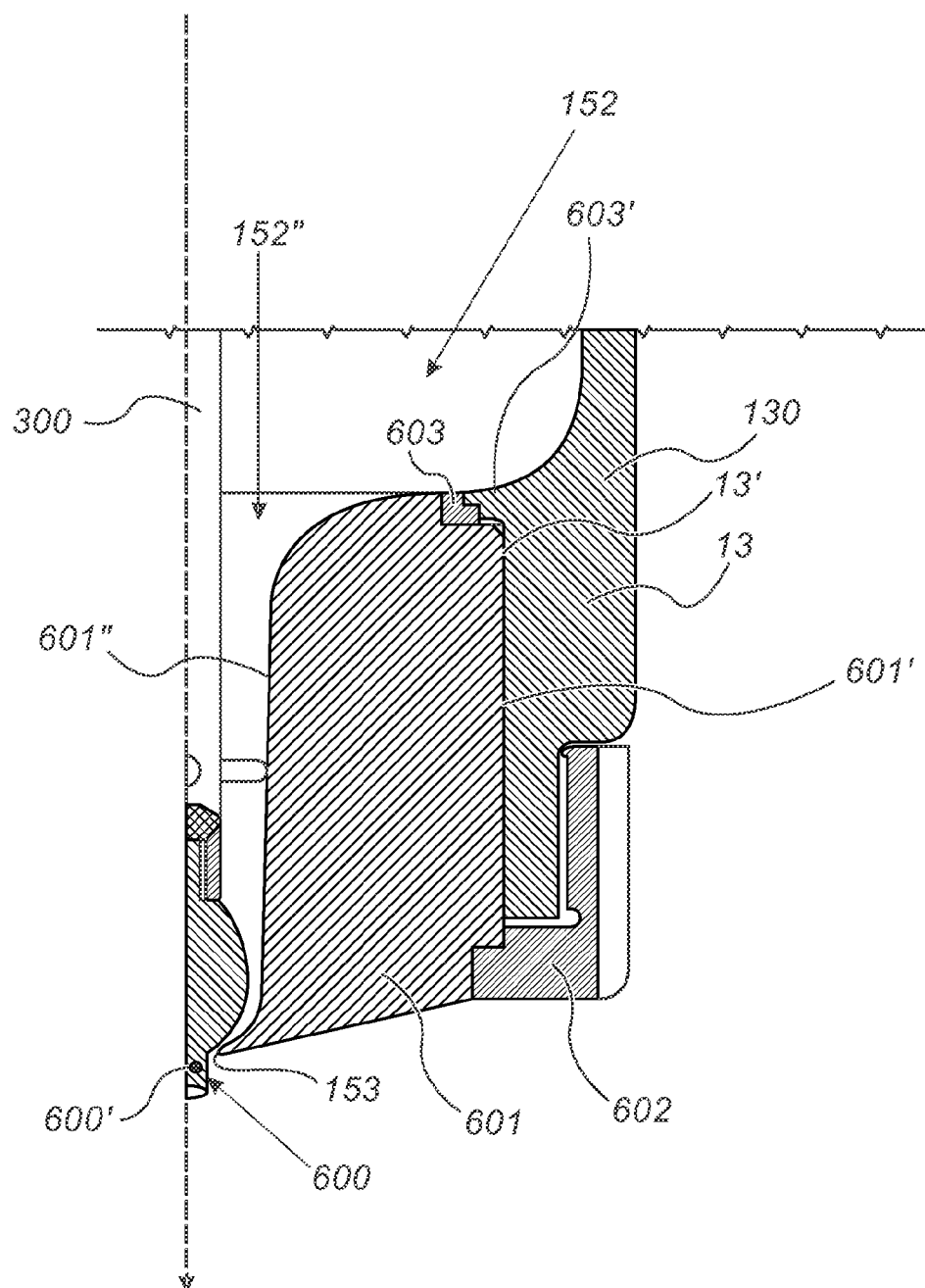


FIG. 4

4/7

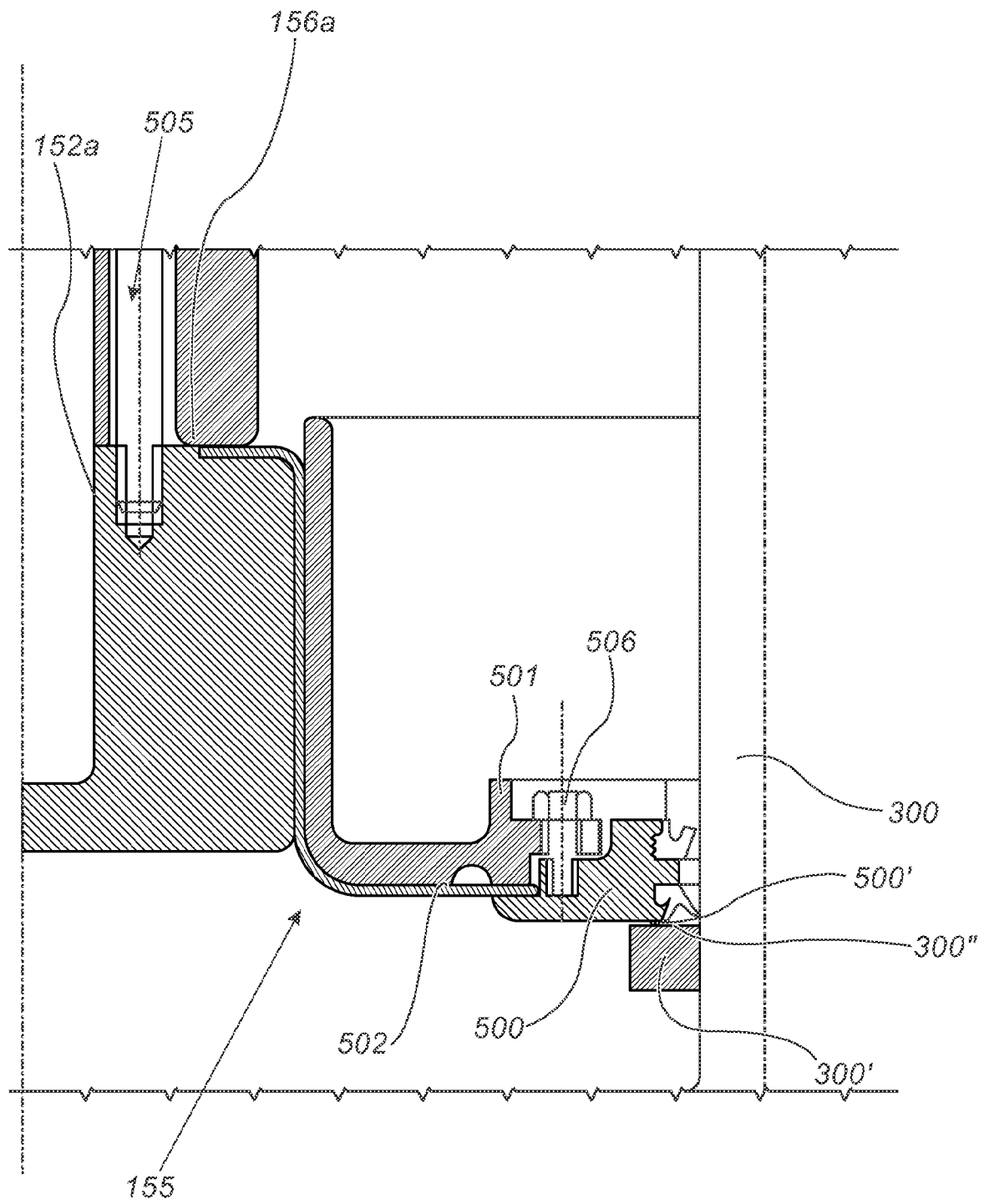


FIG. 5

5/7

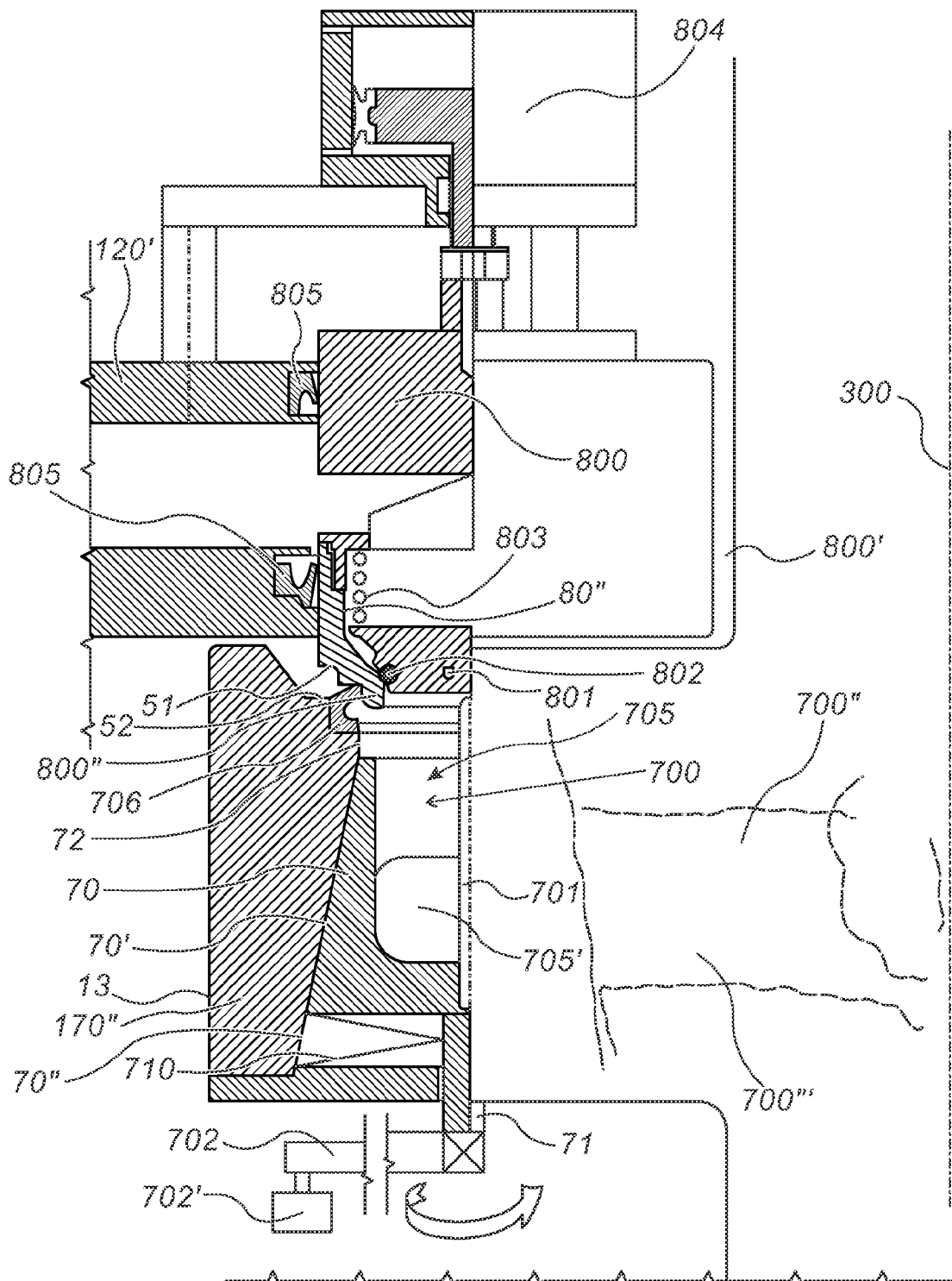


FIG. 6

6/7

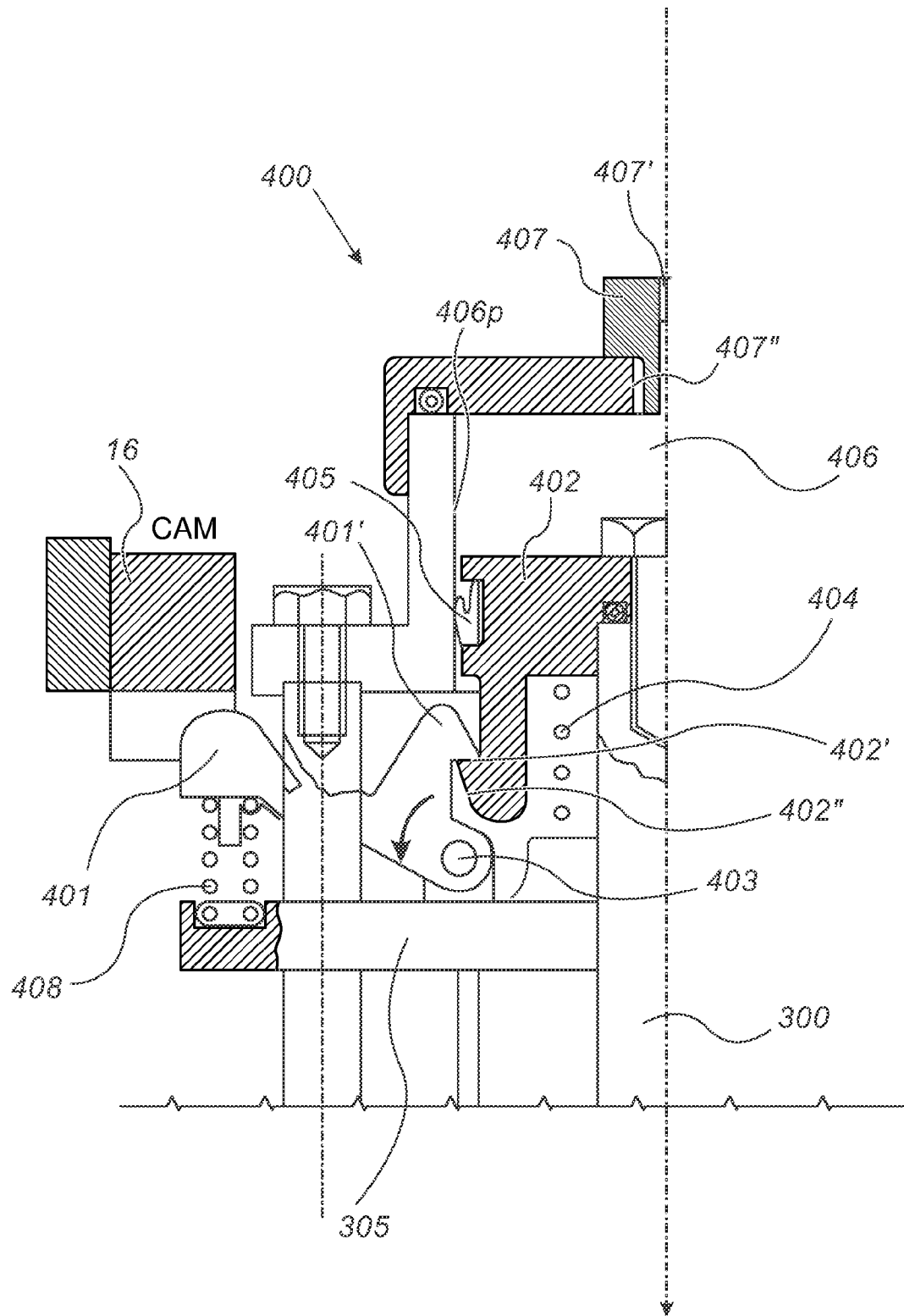


FIG. 7

7/7

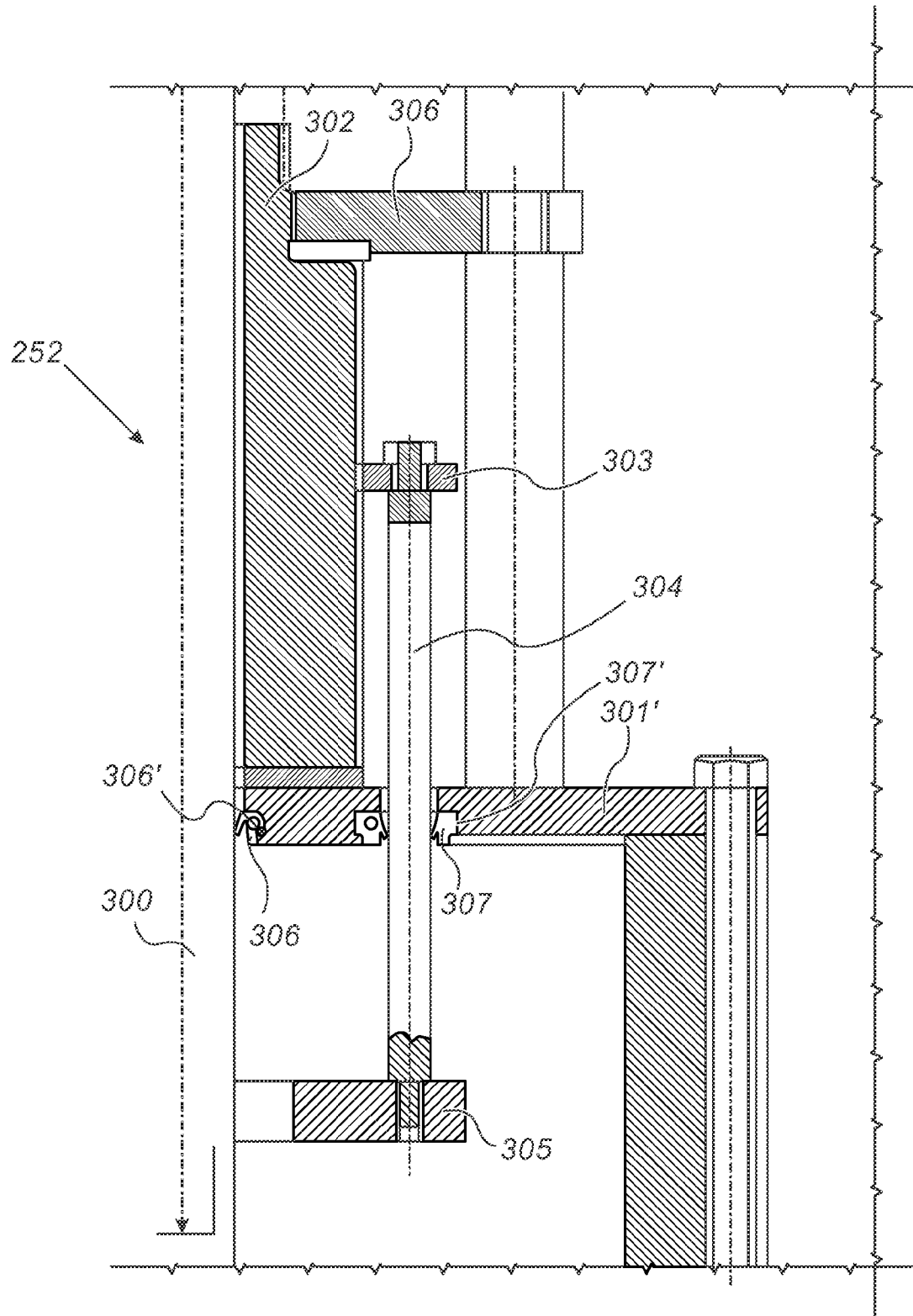


FIG. 8