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(54) **Cleaning equipment for a bottle filling machine**

(57) The invention relates to cleaning equipment for a bottle filling machine that comprises a vat (1), a plurality of spouts (2) connected to said vat (1), a revolving bench (3) whereon a plurality of holders (4) are mounted, whereon the vat (1) is disposed. For the purpose of reducing the number of components, said cleaning equipment comprises at least one container holder support (5) having a capacity for at least two containers (6) and for carrying out a rotating movement around a rotation axis (7) perpendicular to the plane formed by the container holder support (5) with two equilibrium positions, a resting position and a cleaning position. The rotating movement is carried out by means of an actuation cylinder (8) that actuates the container holder support (5) from the resting position to the cleaning position and from the cleaning position to the resting position.

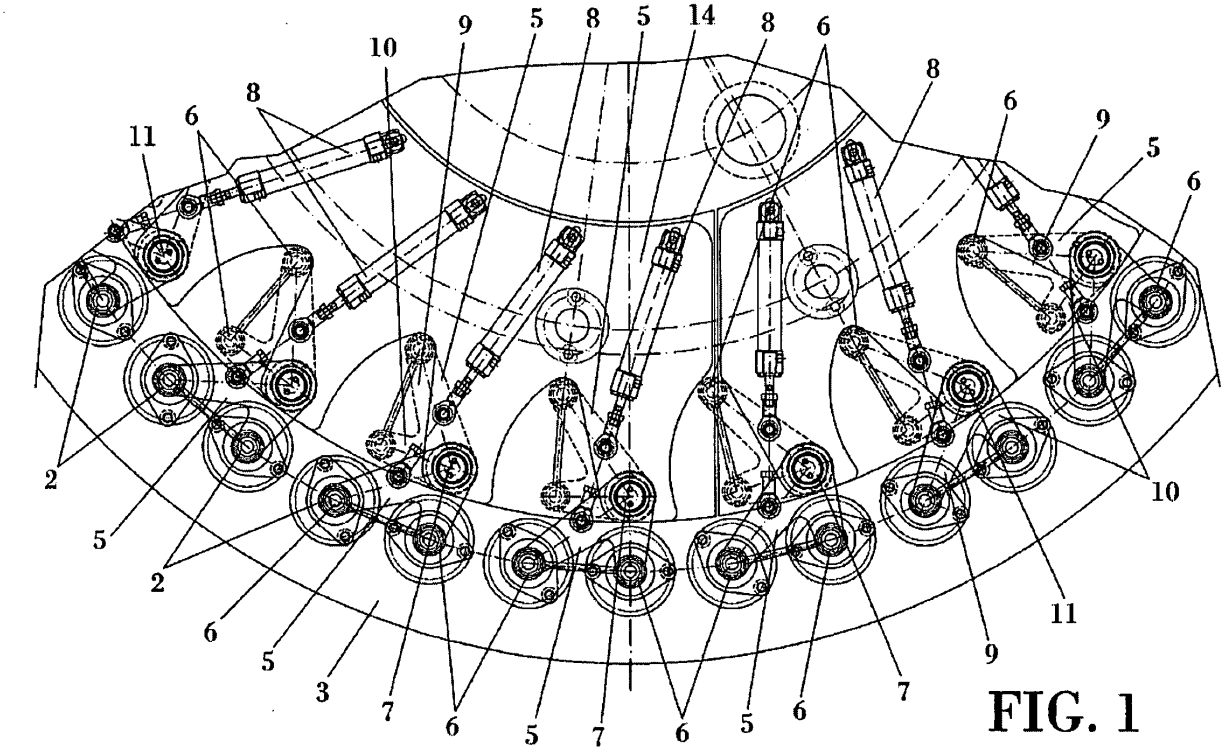

FIG. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention pertains to the field of bottle filling machines. More specifically, it relates to cleaning equipment for said machines. Said cleaning equipment is configured in such a manner as to allow the cleaning to be carried out efficiently and at minimum cost.

BACKGROUND OF THE INVENTION

[0002] The filling machines used to fill bottles with liquids such as wine, water, soft drinks or oil require regular in-depth cleaning. Said cleaning can be due to the end of the working day, in which case the machine must be cleaned to avoid residue formation on the machine while it is stopped, or due to the change of liquid to be used. In this case cleaning is required to decontaminate the elements that are in contact with the previous liquid, in such a manner that no residue of this last liquid remains that could affect the quality of the second liquid used. The parts that are cleaned in these processes are the vat, where the liquid that will be loaded into the bottles is stored, the spouts, which are used to adjust the bottleneck and pour the liquid, and the communication ducts between both elements.

[0003] Traditional cleaning methods are based on the disassembly of the filling machine to clean each of the spouts, in addition to the different communication ducts thereof. This option involves considerable time and effort.

[0004] Alternatively, other solutions are known which are based on a mechanical actuation system that couples a bowl to each spout, which is mounted on the structure of each spout. These solutions have the problem that the actuation system causes striking against a fixed stop of the machine structure. This series of blows can cause the breakdown or deterioration of the machine and the vat raising system.

[0005] Patent of invention ES 2192453 B1 from the same applicant solves this problem through the incorporation of a bowl for the automatic cleaning of the spout. Each machine spout will have its corresponding bowl. Said bowl is articulated by means of a pneumatic cylinder in such a manner that its actuation produces the coupling of the lower base of the bowl to the corresponding spout, whereupon the cleaning of the machine can be carried out. The deactivation of the pneumatic cylinder involves the decoupling of the bowl, thereby allowing the use of the spout to fill the bottles.

[0006] The device disclosed in the aforementioned patent allows the quick and efficient cleaning of all machine spouts, thereby minimising the machine's stopping time and increasing the performance thereof. However, the investment required to incorporate said device is high, which makes it economically unfeasible in machines that do not exceed a certain production level, wherein the aforementioned advantages do not justify the expenditure that must be made.

DESCRIPTION OF THE INVENTION

[0007] The invention relates to cleaning equipment for a bottle filling machine. The bottle filling machine will comprise the conventional devices of said machines, which include a vat, a plurality of spouts communicated with said vat, a revolving bench whereon a vat is disposed, whereon a plurality of holders are mounted. Each holder supports a bottle that is carried on a filling carousel. Each holder is equipped with vertical movement, upward/downward, to approach the spouts, become coupled thereto and become separated therefrom once the bottle has been filled.

[0008] The vat, which may be supported by telescopic columns that allow the vertical movement thereof, necessary for adapting the position of the spouts to the height of the bottle or for allowing the coupling of the cleaning containers to the spouts in the cleaning operation, will be mounted on the revolving bench.

[0009] In accordance with the invention, said cleaning equipment comprises at least one container holder having a capacity for at least two containers and for carrying out a rotation movement around a rotation axis perpendicular to the plane formed by the container holder support. In said rotation movement, the container holder support may reach two equilibrium positions, a resting position and a cleaning position.

[0010] In the resting position the containers are not coupled to the spouts, while in the cleaning position the different containers of each container holder support are coupled to the spouts. Said coupling will be carried out individually, i.e. a container of the container holder support will be coupled to a spout, and another container will be coupled to another spout. In a preferred embodiment, the number of containers disposed in the different container holder supports will the same as the number of machine spouts, in such a manner that all the containers will have a spout to which they will be coupled and each spout a container to carry out the cleaning thereof. In the case that a container holder support has two containers, said containers will be coupled to two successive spouts; in the same manner, they will be coupled to three containers in the case that the container holder support has three containers.

[0011] The transition from the resting position to the cleaning position is carried out by means of an actuation cylinder, for example pneumatic. Said actuation cylinder will actuate the container holder support from the resting position to the cleaning position and from the cleaning position to the resting position, making the container holder support rotate around the rotation axis perpendicular to the plane of the container holder.

[0012] The fact that several containers destined to cleaning the spouts can be grouped in the same container holder support lowers the cost of said cleaning devices due, among other reasons, to the lower number of parts

and elements required to clean the same number of spouts. In the solutions of the state of the art, N spouts would need N cleaning devices, while in this case the number of devices is reduced to N/2. For this reason, the cleaning equipment of the invention can be incorporated to machines having a lower production in which it is not economically feasible to install independent equipment for each spout.

[0013] Additionally, the container holder support may have a V-shaped configuration, with a first arm and a second arm joined in a joining zone and with free ends, the first arm being longer than the second arm. The rotation axis of the container holder support may be located in the joining zone.

[0014] Due to the fact that a plurality of containers will be included in the same container holder support, said containers may be intercommunicated, in such a manner that there is a single communicating spout with the general cleaning system. The cleaning liquid that is transported by this spout, via the internal ducts of the container holder support, may spread through all the support containers, avoiding a series of additional conduits in the case that this concentration of elements in the container holder support does not exist.

DESCRIPTION OF THE DRAWINGS

[0015] For the purpose of complementing this description and helping to better understand the characteristics of the invention, a set of drawings has been included as an integral part of this description, in which the following has been represented in an illustrative and unlimitative manner:

Fig. 1 shows a plan view of a bottling machine in which cleaning equipment has been implemented according to the present invention, where a dashed line indicates the position of the container holder support in the resting position and a continuous line indicates the position of the container holder support in the cleaning position;

Fig. 2 shows an elevational view of the container holder support in the resting position, that shown by the dashed line in Figure 1; and

Fig. 3 shows an elevational view of the container holder support in the cleaning position, that shown by the continuous line in Figure 1.

PREFERRED EMBODIMENT OF THE INVENTION

[0016] In reference to the figures, a preferred form of embodiment of the cleaning equipment for a bottle filling machine that constitutes the object of this invention is described below.

[0017] Figure 1 shows a partial view of a bottle filling machine. In said figure we can see how the different spouts (2) that will fill the bottles are disposed on a revolving bench (3) of circular configuration. The bottles will be disposed on holders (4) having a vertical movement. The content for carrying out the filling will come from a vat (1) disposed on a plane above that of the plane represented in Figure 1, which is more clearly visible in figures 2 and 3. Said vat (1), as will be mentioned later, may have a vertical movement that allows it to rise and fall.

[0018] In the interior of the circular configuration we can observe the container holder supports (5). All of the container holder supports (5) are identical and have two containers (6) and having a V-shaped configuration, with a first arm (9) and a second arm (10) joined together in a joining zone (11) and with the ends of the first and second arm (9, 10) free, wherein a first container (6) and a second container (6) are disposed. In this embodiment, the first arm (9) is longer than the second arm (10).

[0019] Figure 1 also shows, in each of the container holder supports (5), a hydraulic actuation cylinder (8) which allows the transition of the container holder support (5) from the resting position to the cleaning position.

[0020] In the figure, the container holder supports (5) are shown in their resting position by a dashed line and in their cleaning position by a continuous line. In the resting position, the container holder support (5) is removed from the bottle circulation zone. In the cleaning position, the containers (6), disposed on the container holder support (5) arm (9, 10) ends will be disposed in a position in which the coupling of each container (6) to its corresponding spout (2) is possible. For the purpose of carrying out said coupling, the vat (1) may be raised to allow the containers (6) to be disposed underneath the corresponding spouts (2), in order to subsequently descend and couple the spouts (2) to their corresponding containers (6). The two containers (6) of each container holder support (5) will be coupled to two correlative containers (2).

[0021] Each container holder support (5) will form part of a cleaning unit assembly (13). Said cleaning unit (13) will be mounted on a base, not represented in the figures. A platform (14) will be disposed in a cantilevered manner on said base. The container holder support (5) will be joined to this platform (14) through its joining zone (11), allowing rotation around the rotation axis (7) that passes through said joining zone (11). An end of the hydraulic actuation cylinder (8) will also be joined to the platform (14). The other end of the hydraulic actuation cylinder (8) will be joined to the first arm (9) of the container holder support (5). In this manner, the extension of the hydraulic actuation cylinder (8) will make the container holder support (5) rotate, causing the transition from the resting position to the cleaning position. In the opposite direction, the contraction of the hydraulic actuation cylinder (8) will cause the container holder support (5) to pass from the cleaning position to the resting position. In both cases, the vat (1) must collaborate by moving upwards or downwards according to the position to be adopted.

[0022] Figure 2 represents the resting position of the container holder support (5) corresponding to the dashed

line position of Figure 1. This position corresponds to the situation in which the machine fills the bottles. In this position, the bottles in the holders (4) adjust their bottlenecks in the spouts (2) so that the bottles receive the liquid to be bottled via said spouts (2). In this situation, the hydraulic actuating cylinder (8) is compressed, whereupon the containers (6) of the container holder support (5) remain outside of the spout (2) influence area. In this position, we can observe how the lower part of the containers (6) is communicated and one of the containers (6) is connected to the tube (12) that communicates with the general cleaning system. Therefore, the cleaning of the two containers (6) will require only one tube (12) that communicates with the general cleaning system and not two as in currently known solutions.

[0023] In Figure 3, the hydraulic actuation cylinder (8) has been extended, in such a manner that the container holder support (5), which revolves around the rotation axis (7) located in the central zone of said container holder support (5), has placed the containers (6) underneath their corresponding spouts (2). This situation, corresponding to the continuous line position of Figure 1, has occurred because the vat (1) has been raised, thus allowing the containers (6) to be disposed in their cleaning position. Subsequently, and for the purpose of adjusting the spouts (2) inside the containers (6), the vat (1) has been lowered, carrying the aforementioned adjustment. The cleaning manoeuvre can be carried out at this time by any conventional means. As mentioned earlier, the water or liquid used for cleaning will reach one of the two containers (6) formed by the cleaning unit (13), and will pass to the next container (6) via an inner duct.

[0024] The connection and communication between the central cleaning collector, the containers, the spout and the vat itself allows the complete cleaning and sterilisation of all the machine parts that are in contact with the food product. The spouts, the vat and the whole product piping process may be cleaned and sterilised simultaneously.

[0025] This is carried out automatically and with programmed circuits and cycles.

[0026] In light of this description and set of figures, a person skilled in the art will be able to understand that the invention has been described according to a preferred embodiment thereof, but that multiple variations may be introduced in said preferred embodiment, without breaking away from the object of the invention as it has been claimed.

Claims

1. Cleaning equipment for a bottle filling machine that comprises a vat (1), a plurality of spouts (2) connected to said vat (1), a revolving bench (3) whereon a plurality of holders (4) are mounted, whereon the vat (1) is disposed, **characterised in that** said cleaning equipment comprises at least one container holder support (5) having a capacity for at least two containers (6) and for carrying out a rotating movement around a rotation axis (7) perpendicular to the plane formed by the container holder support (5), having two equilibrium positions, a resting position and a cleaning position, said rotating movement being carried out by means of an actuation cylinder (8) that actuates the container holder support (5) from the resting position to the cleaning position and from the cleaning position to the resting position.

2. Cleaning equipment, according to claim 1, **characterised in that** the container holder support (5) has a V-shaped configuration, having a first arm (9) and a second arm (10) joined in a joining zone (11) and having free ends, the first arm (9) being longer than the second arm (10).

3. Cleaning equipment, according to claim 1, **characterised in that** the rotation axis (7) of the container holder support (5) is located in the joining zone (11).

4. Cleaning equipment, according to any of claims 1 to 3, **characterised in that** the, at least one, containers (6) of the container holder support (5) are joined to a single tube (12) that communicates with the general cleaning system.

5. Cleaning equipment, according to any of claims 1 to 4, **characterised in that** the actuation cylinder (8) is pneumatic.

6. Cleaning equipment, according to any of claims 1 to 5, **characterised in that** the, at least one, container holder supports (5) are identical.

7. Cleaning equipment, according to claim 6, **characterised in that** the container holder support (5) includes two containers (6), a first container (6) disposed at the end of the first arm (9) and a second container disposed at the end of the second arm (10).

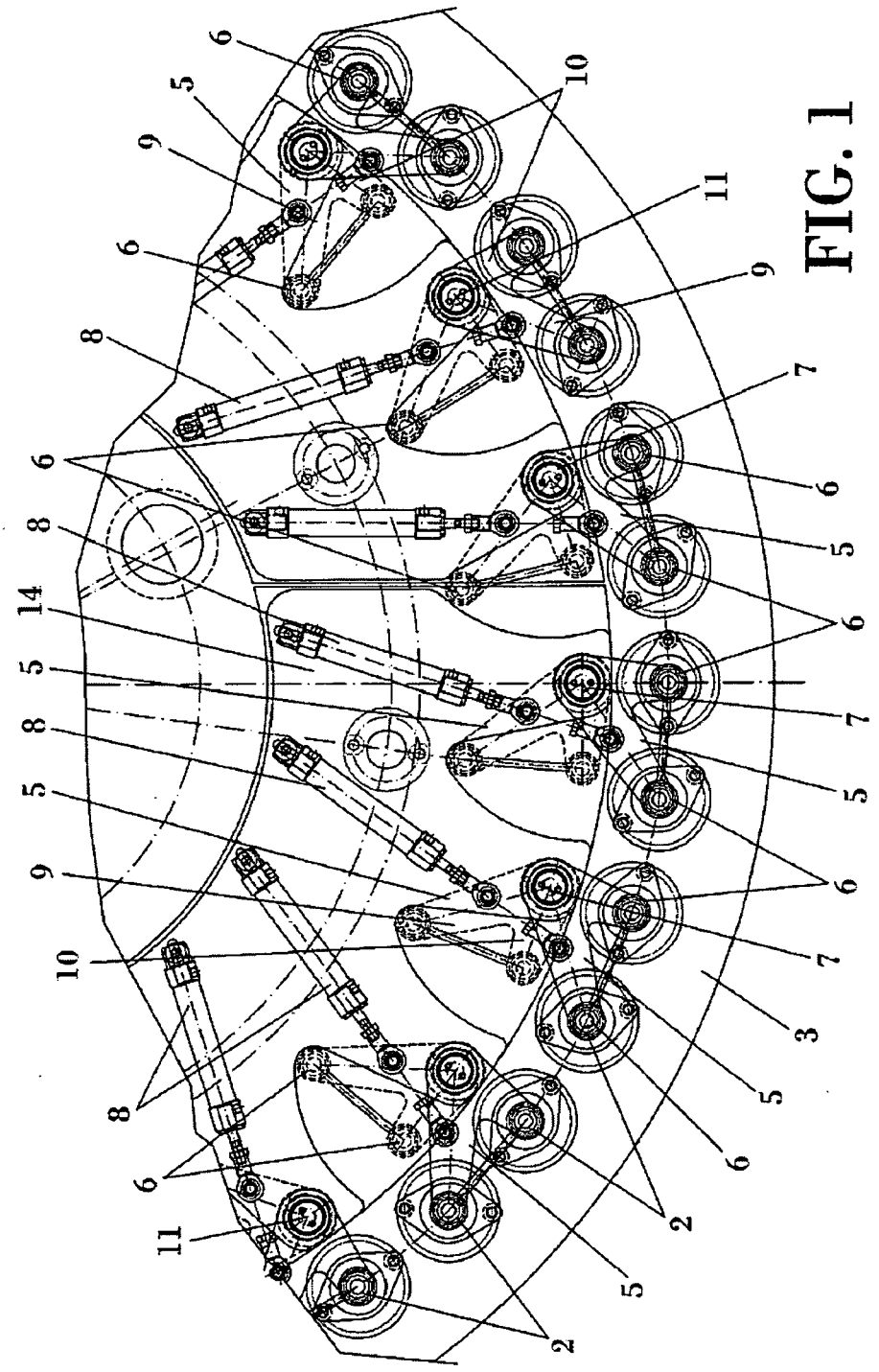

FIG. 1

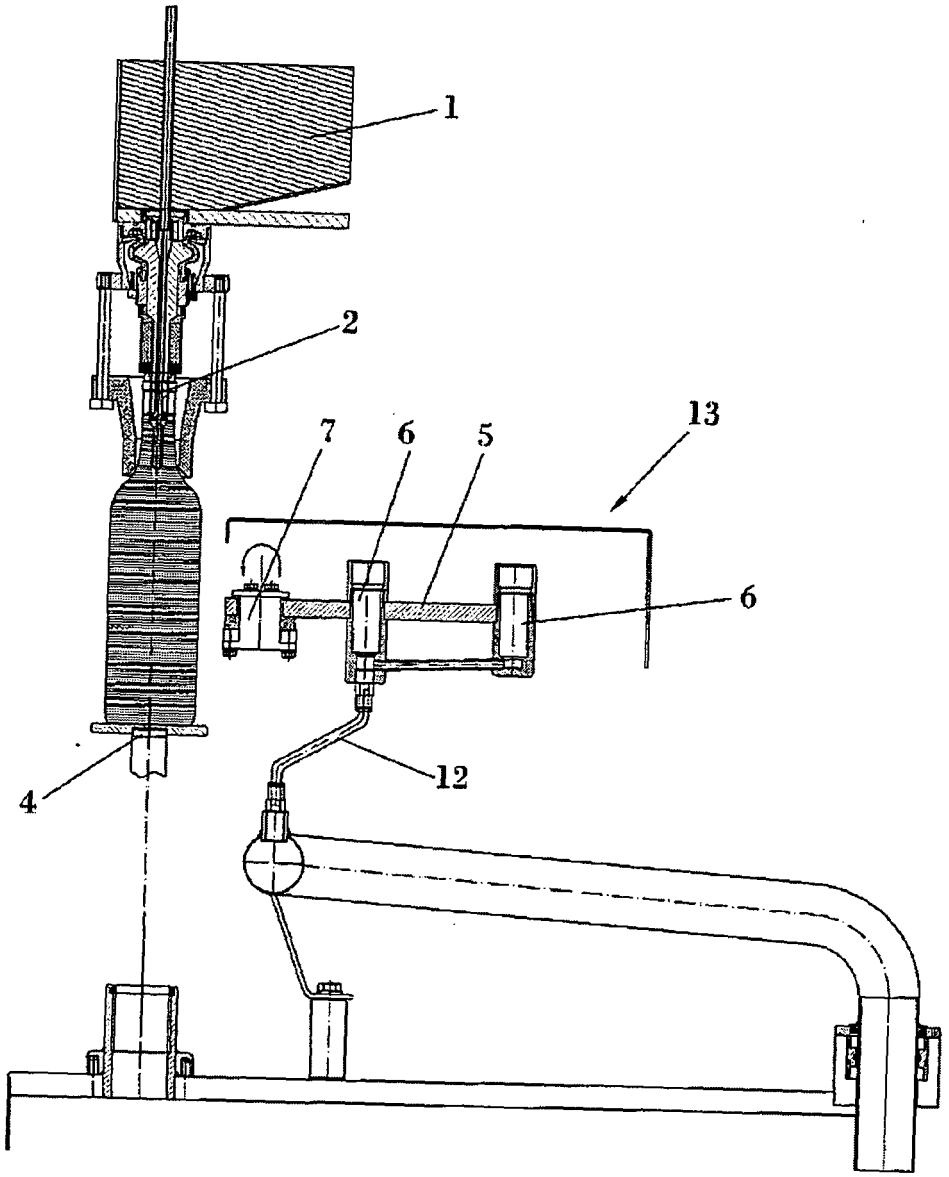

FIG. 2

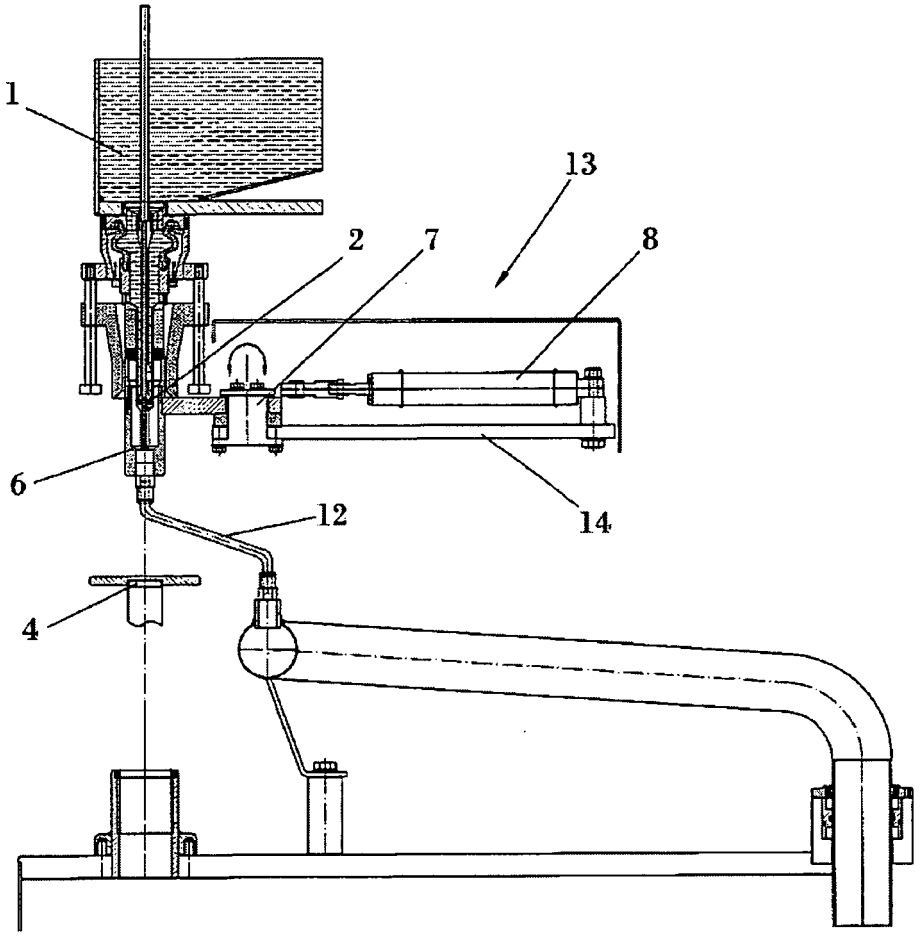

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 09 38 0029

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 024 896 A (ISHIOKA YOSHIJI ET AL) 24 May 1977 (1977-05-24) * column 6, line 19 - line 60; figures 1-7 *	1,4-5	INV. B67C3/00
X	WO 2007/070222 A1 (SEMAJ HOLDINGS B V [NL]; BERGER GERALD PAUL [US]) 21 June 2007 (2007-06-21) * page 3, line 3 - line 19; figures 1,2 *	1,4-5	
A	EP 0 554 951 A1 (SHIKOKU KAKOKI CO LTD [JP]) 11 August 1993 (1993-08-11) * column 6, line 34 - column 7, line 4; figures 1,4,5 *	1	
A	EP 0 785 134 A2 (GRUPPO BERTOLASO S P A [IT]) 23 July 1997 (1997-07-23) * figures 1-8 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B67C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 June 2009	Wartenhorst, Frank

CATEGORY OF CITED DOCUMENTS

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25-06-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4024896 A	24-05-1977	NONE	
WO 2007070222 A1	21-06-2007	US 2007144610 A1	28-06-2007
EP 0554951 A1	11-08-1993	DE 69301159 D1	15-02-1996
		DE 69301159 T2	30-05-1996
		DK 554951 T3	05-02-1996
EP 0785134 A2	23-07-1997	AT 210047 T	15-12-2001
		DE 69617620 D1	17-01-2002
		DE 69617620 T2	08-08-2002
		ES 2167514 T3	16-05-2002
		IT 1281670 B1	26-02-1998

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 2192453 B1 **[0005]**