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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) Packeting machine comprising a distribution device

(57) It is provided a packeting machine (1) adapted to form packets, bags or sachets and fill them with a product and comprising: a container (6) for the product, a plurality of production lines (5) adapted to make the packets or bags, a distribution device (7) adapted to distribute the product from the container (6) to each of said production lines (5) into said packets, wherein the distribution device (7) comprises a plurality of distribution channels (70) each directly connected to the container (6) and each comprising at least one nozzle (8) adapted to eject the product in correspondence with one of the production lines (5).

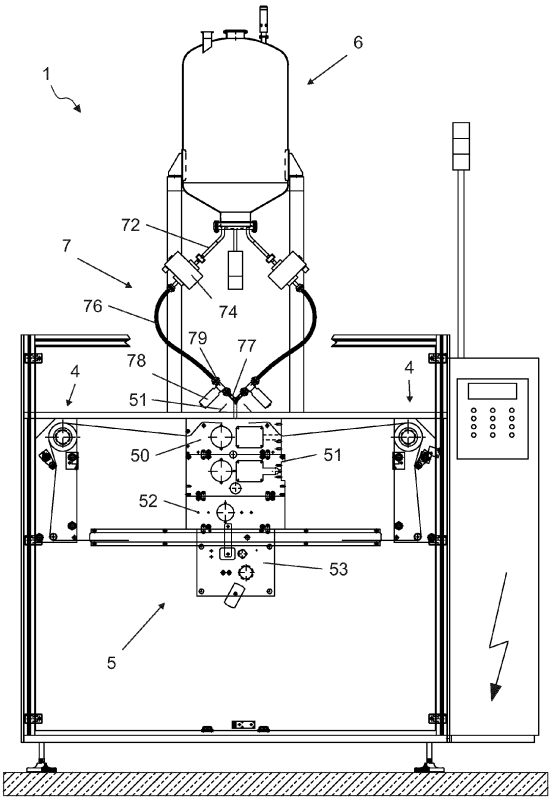

Fig. 1

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Description

[0001] The present invention relates to a packeting machine comprising a distribution device of the type pointed out in the preamble of the first claim.

[0002] Presently known are packeting machines or sacking machines for products consisting of liquid substances or the like.

[0003] These machines are described in the European Patent Application No. EP 10425220 of the same Applicant, for example. These machines are particularly adapted to make packets, bags or sachets for containing foods.

[0004] They comprise members suitable to form, starting from one or more continuous membranes, a plurality of bags or sachets sealed along three or four sides. In particular, a plurality of bags in parallel can be made along a plurality of processing lines.

[0005] During formation of the bags the aforesaid products are also inserted into the bags themselves, so that said bags are manufactured and filled with the appropriate contents during the same process.

[0006] The products to be contained are conveyed to the inside of the bags, in particular before the latter are closed, by means of a suitable container and of a distribution device.

[0007] Said container can be of different types; under pressure, hopper-shaped or others. On the contrary, the distribution device substantially consists of a pipeline connected to the container's bottom and in connection with a linear header including a plurality of outlets in series.

[0008] Said outlets are vertically connected to injectors adapted to introduce the liquids directly into said bags.

[0009] Liquid transfer takes place merely by fall or due to the pressure present in the container.

[0010] The distributor can further comprise valves or flowmeters to control and monitor transfer of the products.

[0011] The known art mentioned above has some important drawbacks.

[0012] In fact, the described distribution device does not achieve a homogeneous distribution of the products along all the processing lines. In particular the lines that are the closest to the container have a greater product flow rate, while the farthest ones have a smaller flow rate.

[0013] Said drawback also affects washing of the distribution device. In fact, in the header there are serious "dead" or stagnation points.

[0014] Under this situation, the technical task underlying the present invention is to devise a packeting machine comprising a distribution device capable of substantially obviating the mentioned drawbacks.

[0015] Within the scope of this technical task it is an important aim of the invention to obtain a packeting machine comprising a distribution device enabling homogeneous distribution along all the processing lines.

[0016] Another important aim of the invention is to conceive a packeting machine comprising a distribution device enabling correct washing of the machine and in particular of the measuring system.

[0017] The technical task and the aims specified are achieved by a packeting machine comprising a distribution device as claimed in the appended claim 1.

[0018] Preferred embodiments are highlighted in the sub-claims.

[0019] The features and advantages of the invention are hereinafter clarified by the detailed description of a preferred embodiment of the invention, with reference to the accompanying drawings, in which:

Fig. 1 is a front view of a machine according to the invention in a simplified manner;
Fig. 2 shows a machine according to the invention laterally and in a simplified manner;
Fig. 3 shows a portion of the machine of the invention, in a side view;
Fig. 4 is a top view of a machine portion according to the invention; and
Fig. 5 is a variant of a machine portion according to the invention.

[0020] With reference to the mentioned drawings, the packeting machine according to the invention is generally identified by reference numeral 1.

[0021] It is adapted to make packets, bags and sachets including goods such as fluid products or substances, in particular liquid substances and preferably having masses smaller than one kilo.

[0022] The packeting machine 1 briefly comprises: a reel-unrolling unit 2 adapted to unroll a reel on which a polymer membrane or the like is wound up; a cutting unit 3, for separating said membrane into two ribbons; a guiding and directing unit 4, comprising suitable rollers adapted to convey the ribbons along suitable trajectories, and dragging means adapted to enable advancing of the ribbons; a plurality of production lines 5 for manufacturing the closed bags or packets, a container 6 and a distribution device 7 to store and distribute the products to be inserted into the bags.

[0023] In greater detail, each production line 5 preferably extends mainly in a vertical direction and is adapted to convert a ribbon into a bag.

[0024] In particular, the ribbon is divided into two parts upstream of the cutting unit 3. The two ribbon parts are then mutually sealed and cut along four sides to form the bags; during sealing the bags are also filled.

[0025] Each line 5 therefore comprises longitudinal sealing means 50 and transverse sealing means 51. They are adapted to seal the two ribbon portions in the two perpendicular directions, in the longitudinal and transverse directions, at given longitudinal space intervals to form the bags. This device conveniently carries out sealing by heat supply.

[0026] The production lines 5 in addition comprise longitudinal cutting means 52 and transverse cutting means

53, downstream of the ribbon sealing means 51. They preferably consist of two opposite cutting edges and divide the bags close to the sealing line in the longitudinal direction, so that sealing in the transverse direction constitutes the side edges of the bag, and in the transverse direction, so that sealing in the transverse direction constitutes the lower edge of the open bag that will be shortly filled and the upper edge of the bag formed in the previous ribbon space interval.

[0027] The production lines are preferably sixteen and are suitably disposed along a straight line (Fig. 1 and Fig. 2).

[0028] Container 6 for preferably liquid products, is preferably a container closed under pressure. In particular, it is adapted to reach maximum pressures of 2 bars at the end.

[0029] Convenient, it has a capacity included between 70 l and 120 l.

[0030] Container 6 is further preferably of cylindrical shape and is provided with a concave bottom having a portion of minimum 60 relative to the gravitational gradient, at the centre.

[0031] The distribution device 7 is adapted to distribute the products, in particular fluids, from container 6 to each of the production lines, into the bags.

[0032] It therefore comprises a plurality of distribution channels 70, each comprising at least one, and preferably only one, nozzle 8, adapted to eject the products in correspondence with a production line 5. In Figs. 1, 2 and 3 for the sake of simplicity and clarity only some channels 70 are shown, but actually there is one channel 7 for each line 5.

[0033] Furthermore, advantageously, each distribution channel 70 is directly connected, for fluid passage, to container 6 through a connection 71. Connections 71 are suitably disposed at the bottom of container 7 and in particular at the portion of minimum 60 and are at least mainly arranged in circumferential symmetry in the vicinity of the portion of minimum 60.

[0034] In particular, sixteen connections 71 are present or at all events the connection number is the same as that of lines 5.

[0035] In addition, at the absolute minimum of container 6, generally placed centrally in the circumference defined by connections 71, a central connection 71a is disposed that preferably interrupts the circular symmetry, as shown in Fig. 4. This central connection 71 a makes it possible to carry out self-draining of the container, as better specified hereinafter.

[0036] Connections 71 and 71a are preferably structurally made by welding of a worked portion to the container 6 (Fig. 3) or by application of a flanged bottom that is bolted to the container (Fig. 5).

[0037] Each distribution channel 70 extends starting from connection 71 and through an upper portion 72, at least partly radially away from container 6 (Figs. 3 and 4).

[0038] Each upper portion 72 extends over a length of the order of the decimetres and comprises, from the opposite end relative to connection 71 or 71 a, an upper attachment element 73, preferably of the DIN11864.1 type Pattern A DN10. Preferably, each upper portion 72 has the same length so that regular flow of the product is ensured. This involves that the central connection 71 a will be secured to an upper portion that radially has a smaller distance from the container 6 than the other upper portions 70 (Fig. 4). The upper attachment element 73 is connected to a flow measuring device 74.

[0039] This measuring device 74 is a flowmeter adapted to monitor the product flow. The measuring device 74 further comprises a second attachment element 75 downstream of the flowmeter.

[0040] The second attachment element 75 is adapted to connect the measuring device 74 to a lower channel 76.

[0041] The lower channel 76 preferably consists of a flexible hose for connecting the second attachment element 75 to an outlet portion 77.

[0042] The outlet portion 77 comprises nozzle 8, adapted to eject the products in correspondence with the packet or bag being formed on the production line 5, and in particular in the vicinity of the transverse sealing means 51.

[0043] The lower channels 76 are therefore adapted to connect the second attachment elements 75, substantially disposed in circular symmetry, to the nozzles 8 that are arranged in a straight line above the production lines 5.

[0044] Moreover, a valve 78 is preferably present between the outlet portion 77 and lower channel 76, which valve is adapted to interrupt or open the product flow inside nozzles 8.

[0045] Valve 78 is preferably of the pneumatic type and is connected through lower attachment elements 79 of known type, to the lower channel 76 and the outlet portion 77.

[0046] Operation of a packeting machine 1, described above as regards structure, is the following.

[0047] The reel-unrolling unit 2 unrolls the membrane 2 that is divided into two ribbons by the cutting unit 3.

[0048] The guiding and directing unit 4 drags along the ribbons and guide them along suitable trajectories inserting the two ribbons into the production lines 5.

[0049] In the production lines 5 the ribbon is in succession: longitudinally sealed, transversely sealed at the bottom, filled, transversely sealed at the top, longitudinally cut and transversely cut.

[0050] In particular, filling takes place through the distribution channels 70 connecting container 6 to nozzles 8. Specifically, each distribution channel 70 can be controlled in an independent manner and is adapted to adjust and measure the flow through the measuring device 74 and valve 78.

[0051] The invention achieves important advantages.

[0052] In fact, since the distribution channels 70 comprise connections 71 directly fastened to container 6 and not interfaced with a header, distribution of the product

is homogeneous in all channels 70 and all nozzles 8.

[0053] Therefore more uniform metered amounts can be obtained.

[0054] In addition, due to the aforesaid particular and innovative arrangement, it is possible to position a plurality of lines, even sixteen or more lines as described. Furthermore, channels 70 and in particular the arrangement of connections 71 and above all of the central connection 71 a enable optimal cleaning and self-draining of the container 6 and distribution device 7. In fact the described configuration does not include points where the product can stagnate. This feature is fundamental in particular when foods are to be packeted as hygiene and sterility must be ensured.

[0055] The invention is susceptible of variations falling within the inventive idea. In particular several nozzles could be connected to each distribution channel through a header. Although the last-mentioned solution is not the ideal one, it would greatly reduce the drawbacks of the known art as several headers would allow a reduced number of connections for each of them.

[0056] All of the details can be replaced by equivalent elements and the materials, shapes and sizes can be of any nature and magnitude.

Claims

1. A packeting machine (1) adapted to form packets, bags or sachets and fill them with a product and comprising: a container (6) for said product, a plurality of production lines (5) adapted to make said packets or bags, a distribution device (7), adapted to distribute said product from said container (6) to each of said production lines (5) into said packets, **characterised in that** said distribution device (7) comprises a plurality of distribution channels (70), each directly connected to said container (6) and each comprising at least one nozzle (8) adapted to eject said product in correspondence with one of said production lines (5).

2. A packeting machine (1) as claimed in claim 1, wherein each of said distribution channels (70) comprises only one nozzle (8).

3. A packeting machine (1) as claimed in one or more of the preceding claims, wherein said container (6) is concave and said distribution channels (70) are connected for fluid passage to said container (6) through a connection (71) substantially disposed at the bottom of said container (6).

4. A packeting machine (1) as claimed in the preceding claim, wherein said container (6) when installed has a portion of minimum (60) relative to the gravitational gradient, and said connections (71) comprise a central connection (71 a) disposed at said portion of minimum (60).

5. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) extends, starting from said connection (71), at least partly in a radial direction away from said container (6).

6. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) comprises a measuring device (74) consisting of a flowmeter.

7. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) in the vicinity of said nozzle (8) comprises a valve (78) adapted to interrupt or open the product flow inside said nozzles (8).

8. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) in the vicinity of said nozzle (8) comprises a lower channel (76) consisting of a flexible hose.

9. A packeting machine (1) as claimed in one or more of the preceding claims, wherein said production lines (5) are disposed aligned along a straight line.

10. A packeting machine (1) as claimed in one or more of the preceding claims, wherein said production lines (5) are in the range from five to twenty in number.

Amended claims in accordance with Rule 137(2) EPC.

1. A packeting machine (1) adapted to form packets, bags or sachets and fill them with a product and comprising: a container (6) for said product, a plurality of production lines (5) adapted to make said packets or bags, a distribution device (7), adapted to distribute said product from said container (6) to each of said production lines (5) into said packets, **characterised in that** said distribution device (7) comprises a plurality of distribution channels (70), each directly connected to said container (6) and each comprising only one nozzle (8) adapted to eject said product in correspondence with one of said production lines (5).

2. A packeting machine (1) as claimed in the preceding claim, wherein said container (6) is concave and said distribution channels (70) are connected for fluid passage to said container (6) through a connection (71) substantially disposed at the bottom of said container (6).

3. A packeting machine (1) as claimed in the preceding claim, wherein said container (6) when installed has a portion of minimum (60) relative to the gravitational gradient, and said connections (71) comprise a central connection (71 a) disposed at said portion of minimum (60).

4. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) extends, starting from said connection (71), at least partly in a radial direction away from said container (6).

5. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) comprises a measuring device (74) consisting of a flowmeter.

6. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) in the vicinity of said nozzle (8) comprises a valve (78) adapted to interrupt or open the product flow inside said nozzles (8).

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8. A packeting machine (1) as claimed in one or more of the preceding claims, wherein said production lines (5) are disposed aligned along a straight line.

9. A packeting machine (1) as claimed in one or more of the preceding claims, wherein said production lines (5) are in the range from five to twenty in number.

1. A packeting machine (1) adapted to form packets, bags or sachets and fill them with a product and comprising: a container (6) closed and under pressure for said product, a plurality of production lines (5) adapted to make said packets or bags, a distribution device (7), adapted to distribute said product from said container (6) to each of said production lines (5) into said packets, **characterised in that** said distribution device (7) comprises a plurality of distribution channels (70), each directly connected to said container (6) and each comprising only one nozzle (8) adapted to eject said product in correspondence with one of said production lines (5).

2. A packeting machine (1) as claimed in the preceding claim, wherein said container (6) is concave and said distribution channels (70) are connected for fluid passage to said container (6) through a connection (71) substantially disposed at the bottom of said container (6).

3. A packeting machine (1) as claimed in the preceding claim, wherein said container (6) when installed has a portion of minimum (60) relative to the gravitational gradient, and said connections (71) comprise a central connection (71a) disposed at said portion of minimum (60).

4. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) extends, starting from said connection (71), at least partly in a radial direction away from said container (6).

5. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) comprises a measuring device (74) consisting of a flowmeter.

6. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) in the vicinity of said nozzle (8) comprises a valve (78) adapted to interrupt or open the product flow inside said nozzles (8).

7. A packeting machine (1) as claimed in one or more of the preceding claims, wherein each of said distribution channels (70) in the vicinity of said nozzle (8) comprises a lower channel (76) consisting of a flexible hose.

8. A packeting machine (1) as claimed in one or more of the preceding claims, wherein said production lines (5) are disposed aligned along a straight line.

9. A packeting machine (1) as claimed in one or more of the preceding claims, wherein said production lines (5) are in the range from five to twenty in number.

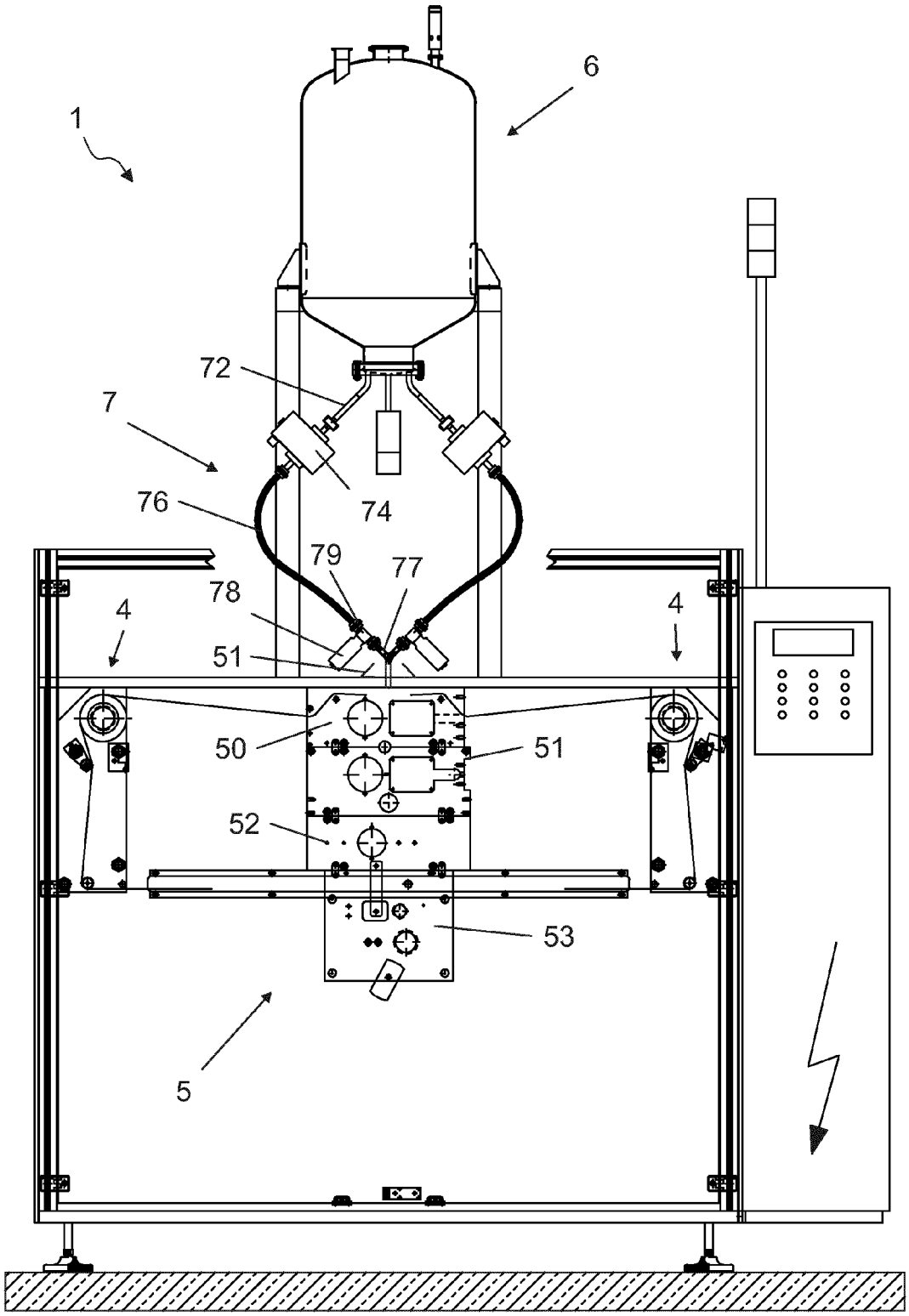


Fig. 1

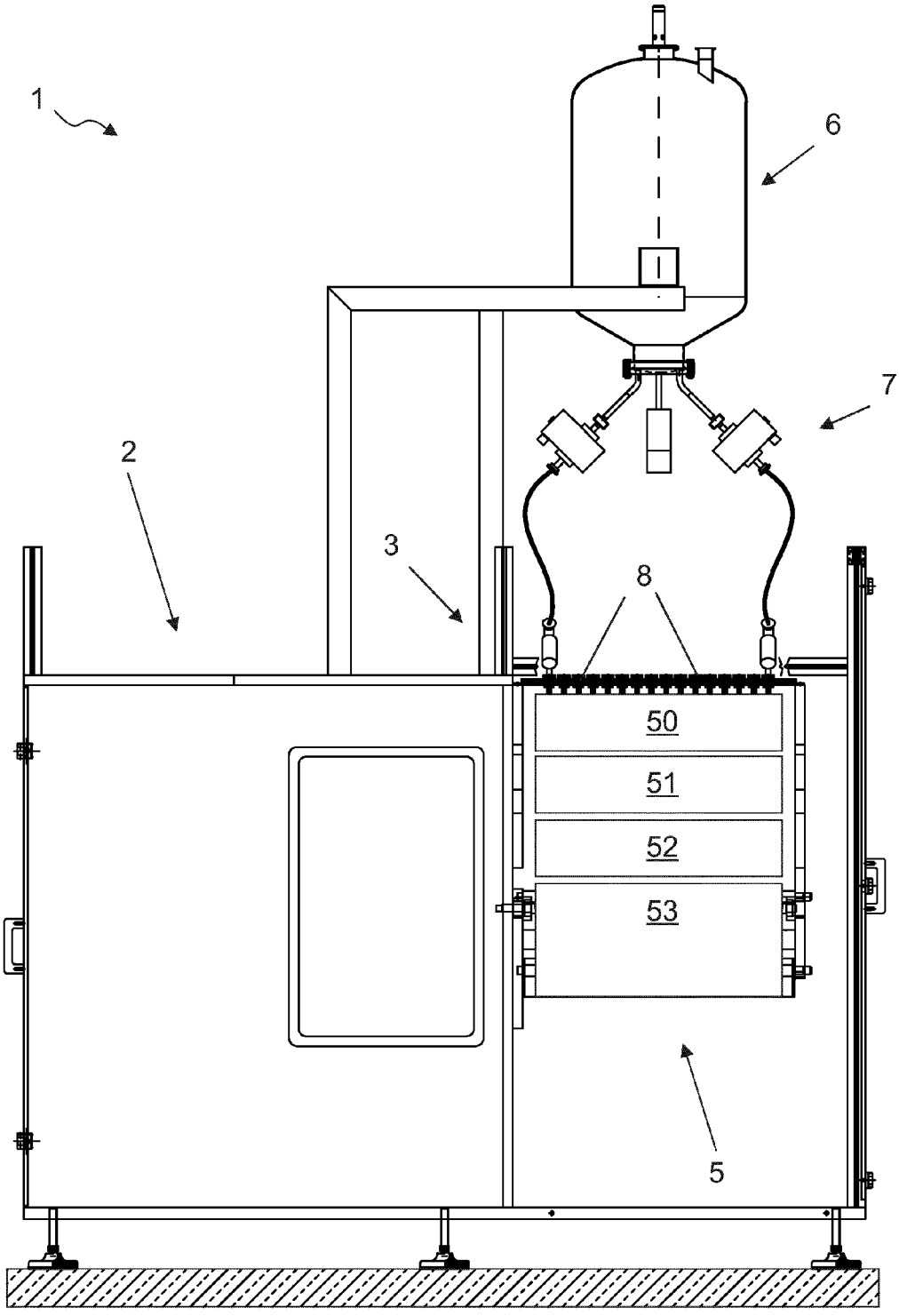
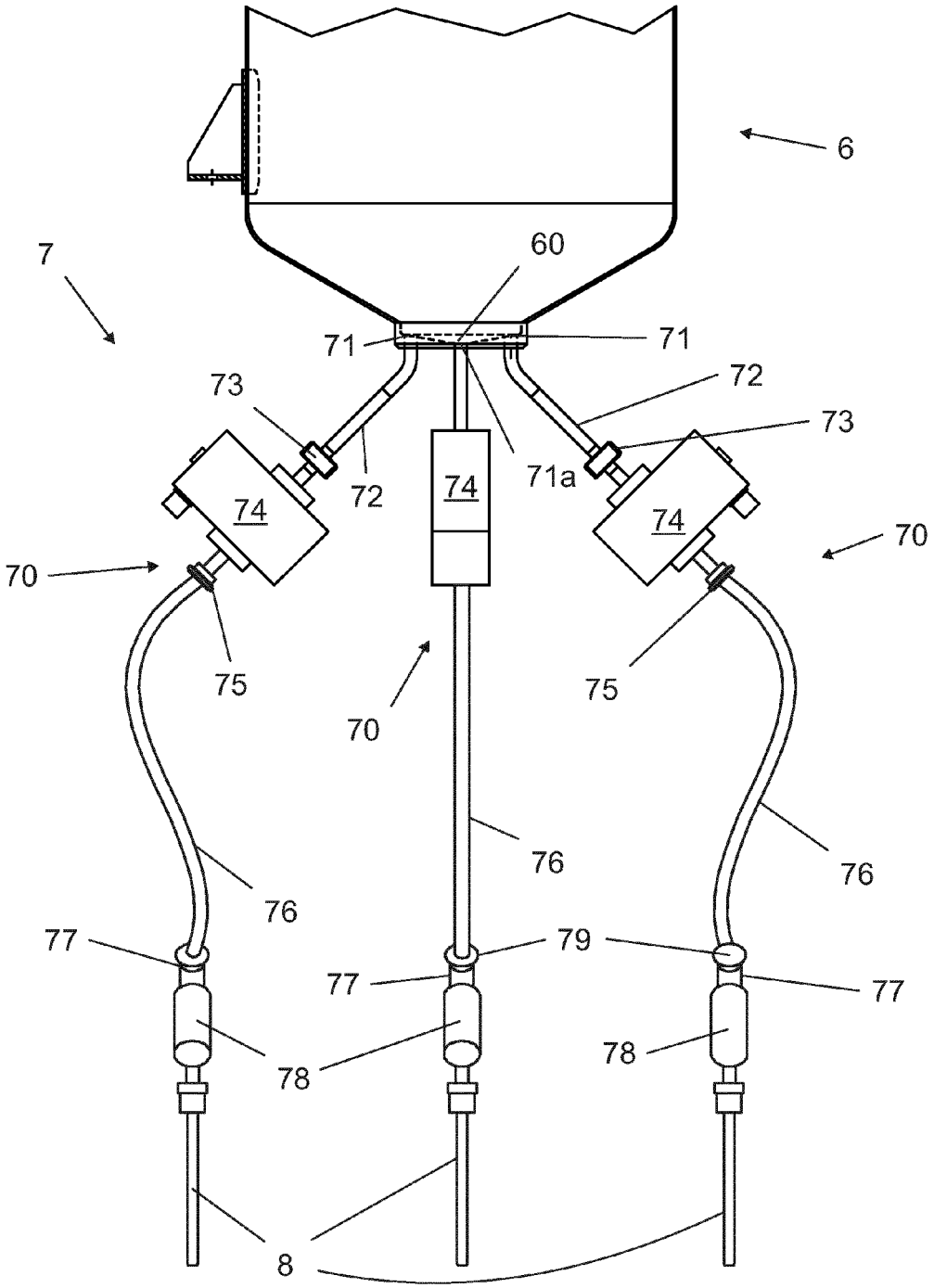


Fig. 2

Fig. 3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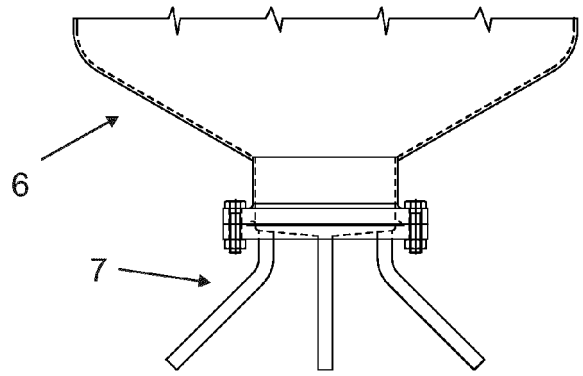
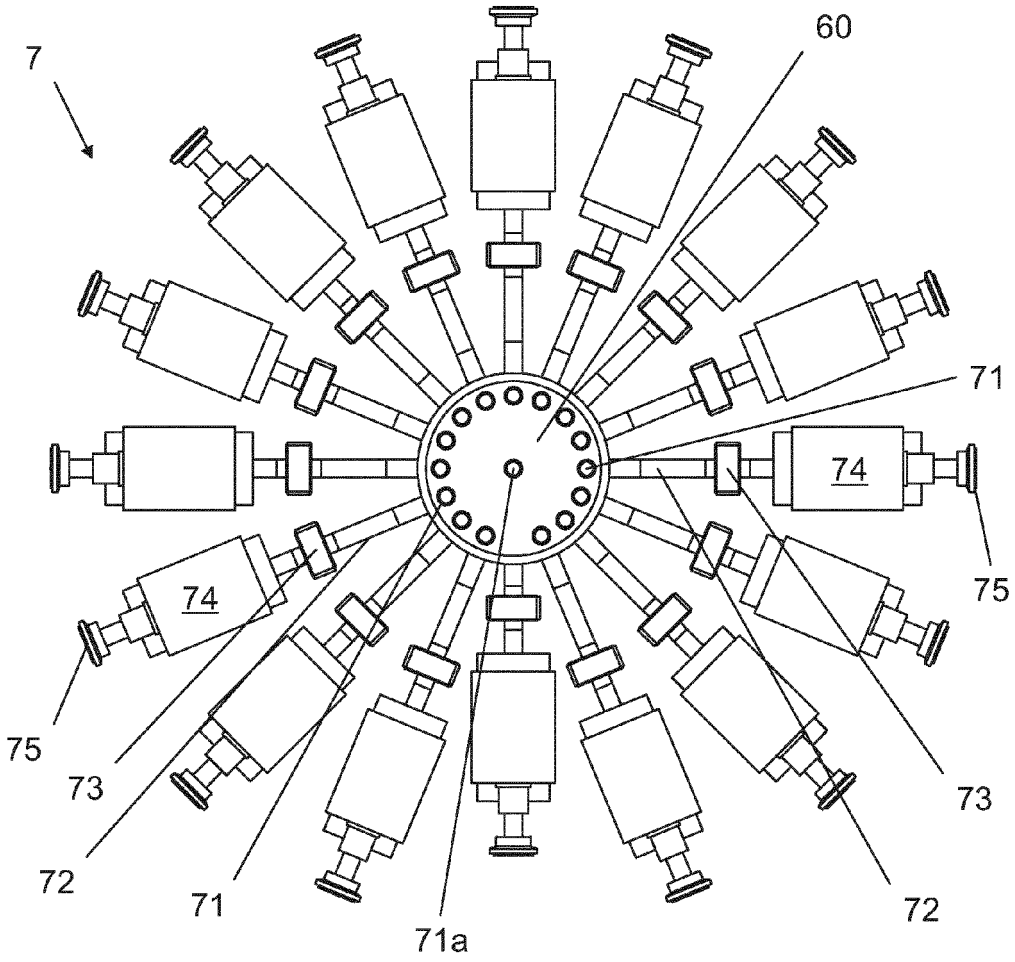


Fig. 5

Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 2795

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 June 2012	Schelle, Joseph

CATEGORY OF CITED DOCUMENTS

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