(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 119 492 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.01.2023 Bulletin 2023/03

(21) Application number: **22185179.3**

(22) Date of filing: **15.07.2022**

(51) International Patent Classification (IPC):
B67C 3/20 *(2006.01)* ***B67C 3/24*** *(2006.01)*
B67C 3/26 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B67C 3/202; B67C 3/242; B67C 2003/2668

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **16.07.2021 IT 202100018899**

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(54) SUPPORTING DEVICE FOR FILLING STATIONS OF WEIGHT FILLING MACHINES AND A FILLING STATION EQUIPPED WITH SUCH A SUPPORTING DEVICE

(57) The present invention concerns a supporting device (1) for filling stations (100) of weight filling machines and a filling station (100) provided with such a supporting device (1). The supporting device (1) comprises a support base (2) for supporting a container (C) to be filled with at least one liquid product. The support base (2) can be associated with a load cell (101) of a filling station (100) for measuring the weight of the container (C) to be filled or being filled. The supporting device (1) comprises one support rod (3) extending transversely from the support base (2) and a support mechanism (4) extending transversely from the cantilevered support rod (3) on the support base (2). The support mechanism (4) has an engagement portion (5) intended to grip and/or provide a support stop for a container (C) to be filled. The support mechanism (4) is slidable along the support rod (3) between a first minimum distance position, with respect to the support base (2) and a second maximum distance position, with respect to the support base (2) so as to adapt to the dimensions, preferably the height, of different containers (C).

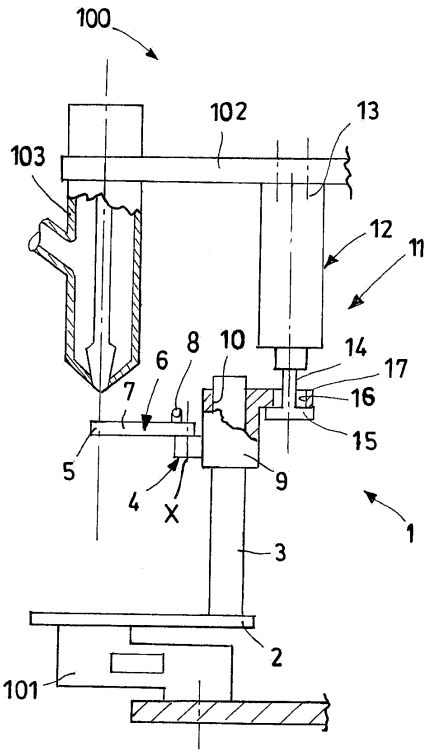

Fig.1

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Description

[0001] The present invention refers to a supporting device for filling stations of weight filling machines.

[0002] A filling station of a weight filling machine provided with such a supporting device is also an object of the present invention.

[0003] The object of the present invention is particularly used in the industrial sector of filling and packaging drums, bottles, cans and/or the like, with liquids of different nature and density.

[0004] As is known, the filling of the aforementioned containers is generally performed by weight filling machines and/or similar filling devices that manage the filling of the containers being fed by detecting and verifying the weight of the container.

[0005] In particular, the aforementioned filling machines are generally provided with corresponding load cells and/or similar weighing devices that are associated with the support bases of the containers being filled so as to instantly detect the amount of liquid entering the respective containers during the filling step thereof. Once a predetermined weight value corresponding to the filling state of the corresponding container has been reached, dispensing is interrupted to allow the filled container to be removed and a new empty container to be filled to be positioned.

[0006] In order to keep each container to be filled in a stable position below the corresponding dispensing nozzle of the filling machine, each filling place of each filling station is equipped with an appropriate supporting device capable of gripping the container to be filled and, if necessary, also providing one or more lateral support abutments to keep it in the desired position.

[0007] Generally, the supporting device of each filling place of each filling station of a weight filling machine comprises a support rod that is mounted on a respective support base of the containers to be filled, so that it is oriented vertically with respect to the latter.

[0008] A support mechanism is mounted on the support rod which comprises an upper clamp or clip for the purpose of gripping the neck or the upper spout of the respective container to be filled and at least one lower abutment for the lateral support of the container retained by the upper clamp or clip.

[0009] The upper clamp or clip extends transversally with respect to the support rod, cantilevered on the support base, and can be spread apart antagonistically to an elastic contrast mechanism to adapt to the diameter and/or to the transverse dimensions of the neck or of the spout of the container to be filled.

[0010] The lower abutment also extends transversely with respect to the support rod, cantilevered on the support base and has a conformation or shape that are designed and made according to the lower outer lateral profile of the containers to be filled.

[0011] Although the above-described supporting device enables the containers to be stably maintained in the respective filling place of the corresponding filling station of a weight filling machine, the Applicant has found that they are not exempt from certain drawbacks, and are improvable in several respects, mainly in relation to the format change of the containers to be filled, to the practicality and simplicity of adapting the supporting device to the dimensions of the different containers to be filled, to the storage volumes and spaces of supporting devices dedicated to different formats of containers to be filled, to the overall costs related to the high quantities of supporting devices dedicated to different formats of containers to be filled, as well as to the excessive and time-consuming machine downtimes required to replace the supporting devices for the implementation of each format change of the containers to be filled. In particular, the Applicant has found that supporting devices thus conceived are not suitable to being quickly adapted to container formats different from the format of the containers being filled.

[0012] In fact, when the production cycle requires a change in the format of the containers to be filled, it is necessary to stop the weight filling machine to allow the operators to disassemble all the supporting devices from the corresponding filling places so as to be able to fix the clamp or clip on the respective support rod at the height corresponding to the engagement position of the neck or spout of the new container to be filled, and to replace and/or fix in the correct position the lower abutment for the lateral support of the new containers. Subsequently, the operators must reassemble all the supporting devices adapted to the new format of the containers to be filled on the corresponding filling places of the filling stations of the weight filling machine.

[0013] Of course, the time required to perform these format change operations has a negative impact on the overall production times and costs.

[0014] In order to limit the overall time of machine downtimes required to change the format of the containers to be filled, it is common practice to prepare significant batches of supporting devices prepared for a respective format of container to be filled. In this way, the operators in charge of carrying out the format change no longer have to adjust the height of the upper clamps or clips, or replace and/or adjust the height of the lower support stops along the corresponding support rods, but they can simply replace all the supporting devices in use with the supporting devices dedicated to the new format of the containers to be filled.

[0015] However, it should be noted that, even in this case, the overall times of machine downtime are excessive, having a negative impact on overall production times and costs.

[0016] In addition, the preparation of considerable batches of supporting devices dedicated to each format of the containers that can be used during the various filling processes requires considerable storage spaces and volumes for the temporary parking of all supporting devices that are temporarily not used.

[0017] Finally, it should be considered that the preparation of significant quantities of supporting devices to be used according to the different formats of the containers to be filled presents significant costs both in terms of pieces to be made and in terms of storage space and volume necessary for their temporary parking. The main aim of the present invention is to propose a supporting device for filling stations of weight filling machines and a filling station provided with such a supporting device capable of solving the problems found in the prior art.

[0018] An aim of the present invention is to simplify and speed up the operations of changing the format of the containers to be filled.

[0019] It is also an aim of the present invention to reduce as far as possible the overall times of machine downtime that are required to perform the format change of the containers to be filled.

[0020] It is also an aim of the present invention to eliminate or reduce the storage spaces and volumes of the supporting devices as much as possible.

[0021] A further aim of the present invention is to reduce overall production costs correlated to the format changes of the containers to be filled.

[0022] The aims specified above and still others, are substantially achieved by a supporting device for filling stations of weight filling machines and by a filling station provided with such a supporting device, as described and claimed below.

[0023] Such description will be made herein below with reference to the accompanying drawings, provided for indicative only and therefore not limiting purpose, in which:

figure 1 is an elevation schematic representation of a supporting device for filling stations of weight filling machines illustrated in a waiting condition of a container to be filled, in accordance with a first embodiment of the present invention;

figure 2 is a schematic plan representation of a part of the supporting device referred to in figure 1;

figure 3 is an elevation schematic representation of the supporting device referred to in figure 1, illustrated in an engagement condition of a container to be filled;

figure 4 is a schematic plan representation of a part of the supporting device depicted in figure 3;

figure 5 is an elevation schematic representation of the supporting device referred to in figure 1, illustrated in an engagement condition of a container to be with a different format;

figure 6 is a schematic plan representation of a part of the supporting device depicted in figure 5;

figure 7 is an elevation schematic representation of the supporting device in a waiting condition of a container to be filled, in accordance with a second embodiment of the present invention;

figure 8 is a schematic plan representation of a part of the supporting device illustrated in figure 7;

figure 9 is an elevation schematic representation of a detail of the supporting device illustrated in figures 7 and 8;

figure 10 is an elevation schematic representation of a part of the supporting device referred to in figures 7 and 8, illustrated in the engagement condition of a container to be filled;

figures 11 and 12 are elevation schematic representations of the supporting device illustrated in two different operating conditions, in accordance with a third embodiment of the present invention;

figures 13 and 14 are elevation schematic representations of the supporting device illustrated in two different operating positions, in accordance with a fourth embodiment of the present invention.

[0024] With reference to figures 1 to 8 and figures 10 to 14, a supporting device for filling stations 100 of weight filling machines (not illustrated in the accompanying figures), in accordance with the present invention is collectively referred to with number 1.

[0025] As can be seen in figures 1 to 8 and 10 to 14, the supporting device 1 comprises a support base 2 for supporting a container C to be filled with at least one liquid product.

[0026] The support base 2 is associated with a load cell 101 of a filling station 100 of a weight filling machine to enable and carry out the measurement of the weight of each container C during a filling operation of the same.

[0027] Still with reference to figures 1 to 8 and 10 to 14, the supporting device 1 comprises at least one support rod 3 extending transversely, preferably perpendicularly, from the support base 2.

[0028] Since the support base 2 lies on a substantially horizontal lying plane, the support rod 3 extends substantially vertically with respect to the support base 2.

[0029] As can be seen in figures 2, 4, 6 and 8, the support rod 3 has a non-circular cross-sectional profile. Preferably, the support rod 3 has a polygonal, even more preferably square, profile in cross-section. However, it should be noted that for the purposes of the present invention, the profile of the support rod 3 may also be elliptical or any other shape other than the circular shape.

[0030] The supporting device 1 further comprises at least one support mechanism 4 extending transversely, preferably perpendicularly, from the cantilevered support rod 3 on the support base 2.

[0031] In other words, the support mechanism 4 extends substantially horizontally in superposition to the support base 2.

[0032] As can be seen in figures 1 to 8 and 10 to 14, the support mechanism 4 has at least one engagement portion 5 intended to grip and/or provide a support stop for a container C to be filled with at least one liquid product.

[0033] Advantageously, the support mechanism 4 is movable, preferably by sliding, along the support rod 3 between a first minimum distance position, with respect

to the support base 2 and a second maximum distance position (figures 1, 3, 7 and 10), with respect to the support base 2 so as to adapt to the dimensions, preferably the height, of different containers C to be filled.

[0034] In accordance with the embodiments illustrated in figures 1 to 10, the support mechanism 4 comprises a clamp or clip 6 provided with two beaks 7 defining, on the opposite side to the support rod 3, the engagement portion 5 intended to come into contact with the container C to be filled and, in particular, with a neck or spout A of the latter to retain it in a predetermined position.

[0035] The clamp 6 can be spread apart to prepare the engagement portion 5 of the support mechanism 4 to the transverse dimensions of the neck or spout A of the container C to be filled.

[0036] As can be seen in figures 2, 4, 6 and 8, in order to allow the clamp 6 to be spread apart, each beak 7 is rotatable around an axis of rotation X located on the opposite side with respect to the engagement portion 5, moving away or approaching the other beak 7. Advantageously, each clamp 6 is also provided with at least one elastic return member 8, preferably a helical spring or a similar elastic element, operatively interposed between the beaks 7 in such a way as to counteract the spreading apart of the latter and to ensure the grip of the beaks 7 on the neck or nozzle A of the container C to be filled.

[0037] At the gripping portion 5, each beak 7 has an inclined lead-in surface 7a that allows, on pushing the container C that is being loaded onto the support base 2, to spread apart the clamp 6 so that the same can retain the neck or spout A.

[0038] Each beak 7 of the clamp 6 is hinged, on the opposite side with respect to the engagement portion 5, to a slider 9, which slidably engages the support rod 3.

[0039] In detail, the slider 9 has a through opening 10 in which the support rod 3 is inserted.

[0040] Advantageously, the through opening 10 of the slider 9 has a profile substantially counter-shaped to the profile of the cross section of the support rod 3 so that it can slide on the latter without relative rotation between them.

[0041] As can be seen in figures 1, 3, 5, 7, 8, 10 and 11 to 14, the supporting device 1 further comprises at least one drive member 11 operatively associated with the support mechanism 4 to drive the movement of the latter between the first and second position.

[0042] The drive member 11 comprises at least one supporting structure 12 having at least a fixed portion 13 and at least one engaging projection 14 associated with the supporting structure 12. The engaging projection 14 of the drive member 11 has at least one abutment end 15 arranged to interact with the support mechanism 4 to move the latter along the support rod 3 at least from the first to the second position.

[0043] More and more in detail, the engaging projection 14 of the drive member 11 is switchable between a raised position (figures 1, 7, 11 and 13) wherein the corresponding abutment end 15 of the engaging projection 14 is at the maximum distance from the support base 2 of the supporting device 1 and a lowered position (figures 3, 5, 10, 12 and 14) wherein said abutment end 15 of the engaging projection 14 is at the minimum distance from the support base 2 of the supporting device 1.

[0044] Advantageously, the abutment end 15 of the engaging projection 14 of the drive member 11 engages the support mechanism 4, preferably by direct contact, to actuate the latter in movement along the support rod 3 from the first to the second position, i.e. upwards, when the engaging projection 14 of the drive member 11 is switched from the lowered position to the raised position.

[0045] The abutment end 15 of the engaging projection 14 of the drive member 11 allows the movement, preferably by gravity, of the support mechanism 4 along the support rod 3 from the second to the first position, i.e. downwards, when the engaging projection 14 of the drive member 11 is switched from the raised position to the lowered position.

[0046] More particularly, the switching of the engaging projection 14 of the drive member 11 from the raised position to the lowered position allows the movement of the support mechanism 4 from the second to the first position until the support mechanism 4 intercepts and/or rests on the container C to be filled.

[0047] With particular reference to the support mechanism 4 which provides for a clamp 6 gripping the neck or spout A of the container C to be filled, the switching of the engaging projection 14 of the drive member 11 from the raised position to the lowered position disengages the abutment end 15 of the latter from the support mechanism 4 which thus rests directly on the container C in such a way as not to distort the measurement of the weight by the load cell 101.

[0048] As can be seen in figures 3, 5, 10, 12 and 14, by translating towards the lowered position, the abutment end 15 of the engaging projection 14 of the drive member 11 disengages the support mechanism 4 which engages and/or rests on the container C to be filled. Going into further detail, the engagement portion 14 of the drive member 11 is free to translate along a through opening 16 formed through a protrusion 17 of the slider 9 extending transversely, preferably perpendicularly, to the support rod 3, on the opposite side to the clamp 6.

[0049] The transverse dimensions of the engagement portion 14 of the drive member 11 are indeed smaller than the dimensions of the through opening 16 of the protrusion 17 of the slider 9, so that the engagement portion 14 can translate within it.

[0050] Contrary to the engagement portion 14, the transverse dimensions of the abutment end 15 of the latter are greater than the dimensions of the through opening 16 of the protrusion 17 of the slider 9, whereby the abutment end 15 can only abut against the protrusion 17 of the slider 9 or detach from the latter.

[0051] The switching of the engagement portion 14 of the drive member 11 from the lowered position to the raised position determines the stop of the respective

abutment end 15 against the protrusion 17 of the slider 9 and the possible dragging of the latter along the support rod 3 from the first position to the second position. The switching of the engagement portion 14 of the drive member 11 from the raised position to the lowered position may result in a descent by gravity from the second to the first position of the slider 9 whose protrusion 17 rests on the abutment end 15 of the engagement portion 14 until such descent is stopped by the container C to be filled, or the detachment of the abutment end 15 of the engagement portion 14 from the protrusion 17 of the slider 9 because the support mechanism 4 is already engaged to or resting on the container C to be filled.

[0052] In accordance with the embodiments illustrated in figures 1, 3, 5 and 11 to 14, the drive member 11 comprises at least one actuator, preferably linear, even more preferably electric or magnetic or electromagnetic.

[0053] In this case, the supporting structure 12 of the drive member 11 comprises at least one cylinder which can be fixed to a support arm 102 of a filling nozzle 103 of the filling station 100 of the respective weight filling machine, and the engaging projection 14 comprises at least one stem sliding relative to the cylinder to allow the switching of the engaging projection 14 between the raised position and the lowered position.

[0054] In accordance with the embodiment illustrated in figures 7, 8 and 10, the supporting structure 12 comprises at least a movement mechanism 18, preferably with cams, operatively interposed between the fixed portion 13 and the engaging projection 14 to move the latter between the raised position and the lowered position.

[0055] As can be seen in figures 7 to 9, the movement mechanism 18 comprises at least one cam profile 19 having at least two support surfaces 19a, 19b arranged on different levels, preferably connected by at least one intermediate ramp 19c oblique with respect to said support surfaces 19a, 19b.

[0056] The cam profile 19 is directly or indirectly supported by the interposition of at least one supporting actuator 20, by the fixed portion 13 of the supporting structure 12.

[0057] The movement mechanism 18 further comprises at least one feeler element 21, preferably a support roller 21a, operatively engaged to the cam profile 19 to travel the latter from a support surface 19a, 19b to the other, modifying its level. The feeler element 21 is further engaged, for example by means of a pin 22, to a support plate 23 from which the engaging projection 14 of the drive member 11 extends so as to also modify the level of the support plate 23 and move the engaging projection 14 of the drive member 11 between the raised position and the lowered position.

[0058] Differently from the embodiments described above, the engagement portion 14 is fixed with respect to the support plate 23 so as to move together with the latter and with the feeler element 21 between the two levels determined by the support surfaces 19a, 19b of the cam profile 19.

[0059] The upper support surface 19a of the cam profile 19 determines the raised position of the engaging projection 14, while the support surface 19b of the cam profile 19 determines the lowered position of this engagement portion. The intermediate ramp 19c between the support surfaces 19a, 19b determines the transition of the engagement portion 14 between the raised position and the lowered position.

[0060] Advantageously, the cam profile 19 is adjustable in height to allow the adjustment of the raised and lowered positions of the engaging projection 14 of the drive member 11. This feature allows the supporting device 1 to be adapted to the different formats and, in particular, to the differences in heights of the containers C to be filled.

[0061] In particular, the adjustment of the height of the cam profile 19 can be implemented by means of an actuator 24, preferably electric, whose cylinder corresponds to the fixed portion 13 of the support structure 12 of the drive member 11 which is installed on a suitable abutment surface 104 and the stem 25 ends with a support platform 26 which supports the cam profile 19. Still with reference to figures 7 and 8, the support plate 23 is slidably guided and supported by at least one guide 27, preferably two or more, engageable with an annular structure 105 of the respective dispensing nozzle 103 or another component of the corresponding filling station 100 of the weight filling machine. In this way, the ascent and the descent of the feeler element 21 on the cam profile 19 determines the ascent and the descent of the support plate 23 that slides along the guide 27 with respect to the filling nozzle 103 and the consequent ascent and descent of the engagement element 14 that translates within the through opening 16 of the protrusion 17 of the slider 9.

[0062] In accordance with the embodiments illustrated in figures 11 to 14, the support mechanism 4 has a monobloc body where the slider 9 and the protrusion 17 of the latter are almost identical to the slider 9 and the protrusion 17 of the other embodiments illustrated and described.

[0063] Unlike the other embodiments described above that provide for a clamp 6 to grip the container C to be filled, the embodiments referred to in figures 11 to 14 provide that the monobloc body of the support mechanism 4 is provided with a plate 28 extending from the slider 9 on the opposite side to the protrusion 17 of the latter and ends with an engagement portion 5 intended to rest from above on the neck or spout A of the container C to be filled.

[0064] As can be seen in figures 11 and 12, the engagement portion 5 is defined by a substantially truncated conical lower recess 29 which is intended to rest on an upper edge B of the neck or spout A of the container C to be filled.

[0065] With reference instead to figures 13 and 14, the engagement portion 5 is defined by a substantially truncated conical lower protrusion 30 which is intended to be inserted at least partially into a mouth D of the neck or

spout A of the container to be filled.

[0066] In both cases, the plate 28 of the support mechanism 4 is arranged to rest against the container C when the support mechanism 4 slides on the support rod 3 from the second to the first position upon movement of the engagement portion 14 of the drive member 11 from the raised position to the lowered position. The container C remains then blocked in position, between the plate 28 of the support mechanism 4 and the support base 2 of the supporting device 1.

[0067] The supporting device and the filling station described above solve the problems encountered in the prior art and allow the achievement of important advantages. First of all, the supporting device described above adapts quickly to formats of containers different from the format of the containers being filled. In fact, when it is necessary to modify the format of the containers to be filled, it is sufficient to adjust the height of the support mechanism of the supporting device along the respective support rod by automatically controlling the drive member of this supporting device.

[0068] If the drive member is of the linear actuator type, the height adjustment of the support mechanism is implemented by lowering or lifting the engagement portion of the drive member and, consequently, of the slider 9 of the support mechanism.

[0069] If the drive member is of the cam-operated mechanism type, it is sufficient to raise or lower, by means of the corresponding actuator, the cam profile, which causes the switching of the engagement member from the raised position to the lowered position and the movement of the support mechanism upwards or downwards along the support rod of the supporting device.

[0070] The supporting device thus conceived eliminates a series of drawbacks that characterize the known solutions.

[0071] In particular, it is no longer necessary to disassemble, adapt and reassemble this device so that it can be adapted to the new format of the containers to be filled, as the adaptation of the supporting device is implemented directly and automatically at the filling place.

[0072] Naturally, this has a huge advantage in terms of time required to implement the format change, which are almost zero if one considers that it is simply an automatic adjustment of the actuators in charge of this task.

[0073] Consequently, the supporting device described above eliminates the very long times of machine downtime normally dedicated to format change.

[0074] It should also be noted that the elimination of machine downtimes for format changes have an extremely positive impact in terms of costs and production times since more containers are filled in the same unit of time.

[0075] In addition, the supporting device described above allows the total elimination of large and voluminous storage spaces or warehouses that were normally dedicated to the supporting devices intended for corresponding formats of containers to be filled.

[0076] This advantage also has a positive impact on overall production costs, as it reduces the costs that were significantly burdensome.

Claims

1. Supporting device (1) for filling stations (100) of weight filling machines, comprising:

   a support base (2) for supporting a container (C) to be filled with at least one liquid product, the support base (2) being associated with a load cell (101) of a filling station (100) of a filling machine for measuring the weight of the container (C) during a filling operation of the same;
   at least one support rod (3) extending transversely from the support base (2);
   at least one support mechanism (4) extending transversely from the cantilevered support rod (3) on the support base (2), the support mechanism (4) having at least one engagement portion (5) intended to grip and/or providing a support stop for a container (C) to be filled with at least one liquid product;
   characterized in that the support mechanism (4) is movable, preferably by sliding along the support rod (3) between a first minimum distance position, with respect to the support base (2) and a second maximum distance position, with respect to the support base (2) so as to adapt to the dimensions, preferably the height, of different containers (C) to be filled.

2. Supporting device (1) according to claim 1, also comprising at least one drive member (11) operatively associated with the support mechanism (4) to drive the latter between the first and second position.

3. Supporting device (1) according to claim 2, wherein the drive member (11) has:

   at least one supporting structure (12) having at least a fixed portion (13);
   at least one engaging projection (14) associated with the supporting structure (12) and having at least one abutment end (15) arranged to interact with the support mechanism (4) to move the latter along the support rod (3) at least from the first to the second position.

4. Supporting device (1) according to claim 3, wherein the engaging projection (14) of the actuating member (11) is switchable between a raised position, wherein the corresponding abutment end (15) is at the maximum distance from the support base (2) of the support device (1) and a lowered position wherein said abutment end (15) is at the minimum distance from

the support base (2) of the supporting device (1), the abutment (15) of the engaging projection (14) of the actuation member (11) engaging the support mechanism (4), preferably by direct contact, to actuate the latter in movement along the support rod (3) from the first to the second position when the engaging projection (14) of the drive member (11) is switched from the lowered position to the raised position, and allowing the movement, preferably by gravity, of the support mechanism (4) along the support rod (3) to the second to the first position, when the engagement projection (14) of the drive member (11) is switched from the raised position to the lowered position.

5. Supporting device (1) according to claim 4, wherein the switching of the engaging projection (14) of the drive member (11) from the raised position to the lowered position allows the movement of the support mechanism (4) from the second to the first position until the support mechanism (4) intercepts and/or rests on the container (C) to be filled, the abutment end (15) of the engagement projection (14) of the actuation member (11) disengaging the support mechanism (4) which engages and/or rests on the container (C) to be filled by moving towards the lowered position.

6. Supporting device (1) according to any one of claims 3 to 5, wherein the drive member (11) comprises at least one actuator, preferably a linear actuator, even more preferably electric or magnetic or electromagnetic actuator.

7. Supporting device (1) according to any one of claims 2 to 6, wherein the supporting structure (12) of the drive member (11) comprises at least one cylinder which can be fixed to a support arm (102) of a filling nozzle (103) of a respective filling station (100) of a weight filling machine and the engagement projection (14) comprises at least one stem sliding relative to the cylinder to allow the switching of the engagement projection (14) between the raised position and the lowered position.

8. Supporting device (1) according to any one of claims 3 to 5, wherein the supporting structure (12) comprises at least a movement mechanism (18), preferably with cams, operatively interposed between the fixed portion (13) and the projection engagement (14) to move the latter between the raised position and the lowered position.

9. Supporting device (1) according to claim 8, wherein the movement mechanism (18) comprises:

at least one cam profile (19) having at least two supporting surfaces (19a, 19b) arranged on different levels, preferably connected by at least one intermediate ramp (19c) oblique with respect to said support surfaces (19a, 19b), the cam profile (19) being directly or indirectly supported by the interposition of at least one supporting actuator (20), by the fixed portion (13) of the supporting structure (12),

at least one feeler element (21), preferably a support roller (21a) operatively engaged to the cam profile (19) to travel the latter from a supporting surface (19a, 19b) to the other, modifying its level, the feeler element (21) being also engaged to a support plate (23) from which the engagement projection (14) of the actuation member (11) extends in so as to also modify the level of the support plate (23) and moving the engaging projection (14) of the actuation member (11) between the raised position and the lowered position.

10. Supporting device (1) according to claim 9, wherein the cam profile (19) is adjustable in height to allow the adjustment of the raised and lowered positions of the engagement projection (14) of the actuation member (11) .

11. Supporting device (1) according to claim 9 or 10, wherein the support plate (23) is slidably guided and supported by at least one guide (27) engageable with the respective dispensing nozzle (13) or another component of the corresponding machine filler.

12. Filling station (100) of a respective weight filling machine, the filling station (100) comprising at least one filling station wherein at least one filling nozzle (103) supported by a corresponding support arm (102) is operatively arranged, the filling station comprising at least one load cell (101) designed to detect the weight of a container (C) to be filled or being filled, **characterized in that** it further comprises at least one support device (1) according to any one of the preceding claims for keeping the container (C) to be filled or being filled in a stable position below the corresponding filling nozzle (103).

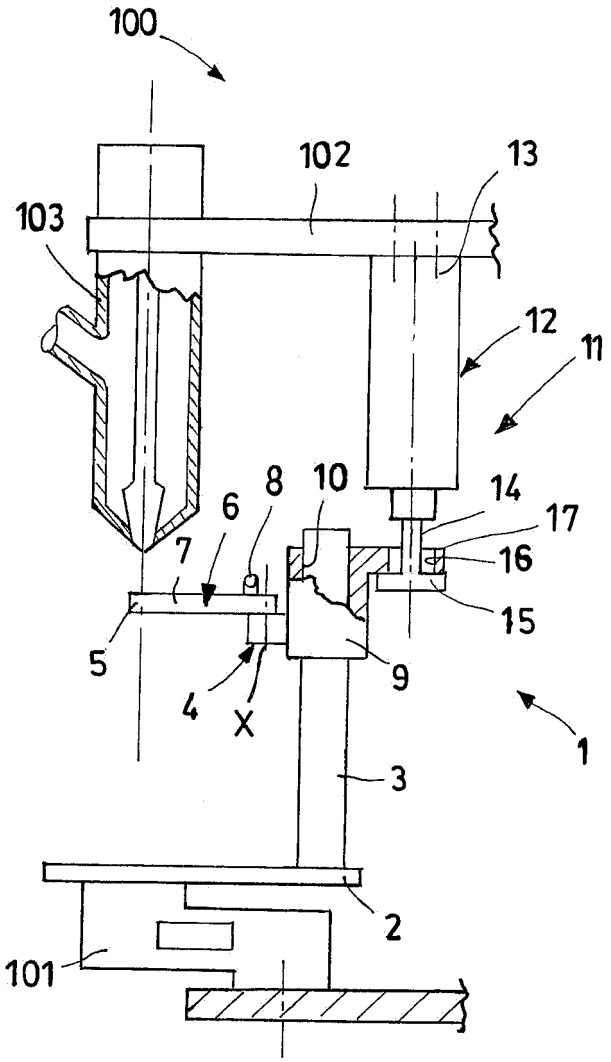
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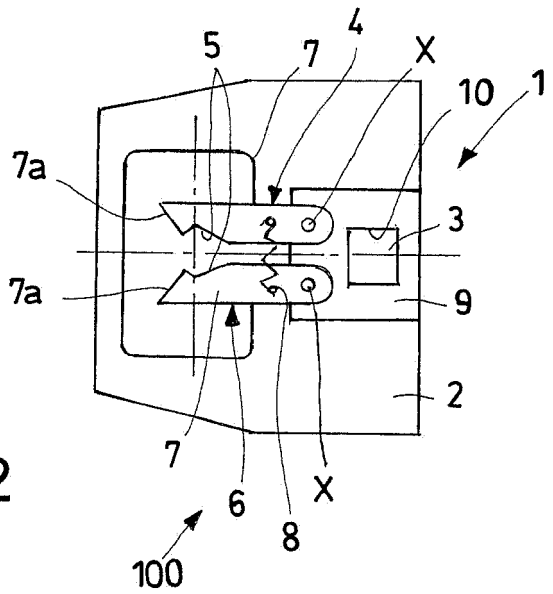
Fig.1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6
X
8
100

Fig.2

Fig.3

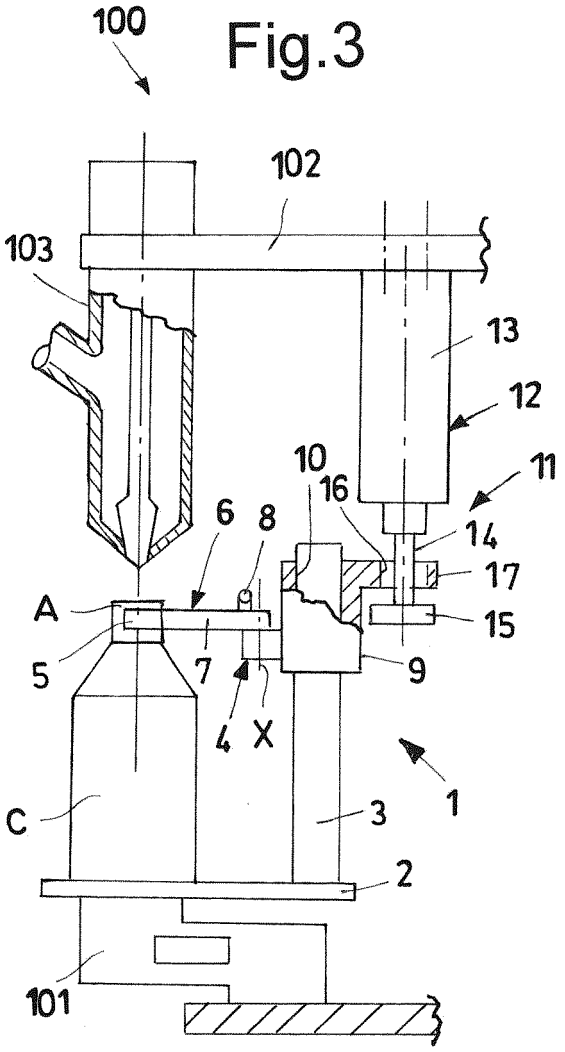
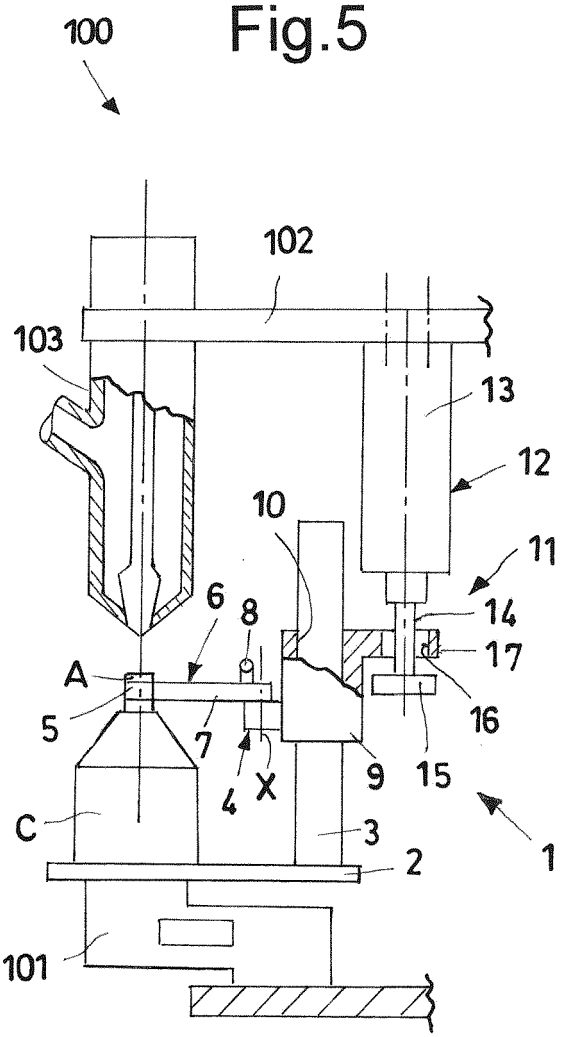


Fig.5



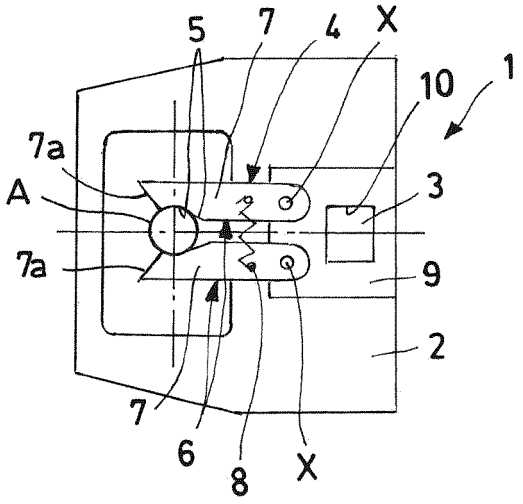


Fig.4

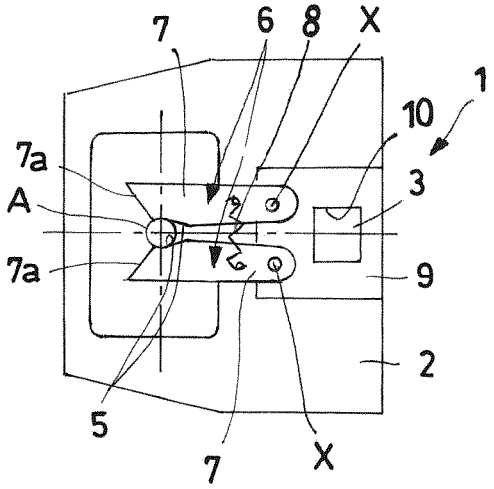


Fig.6

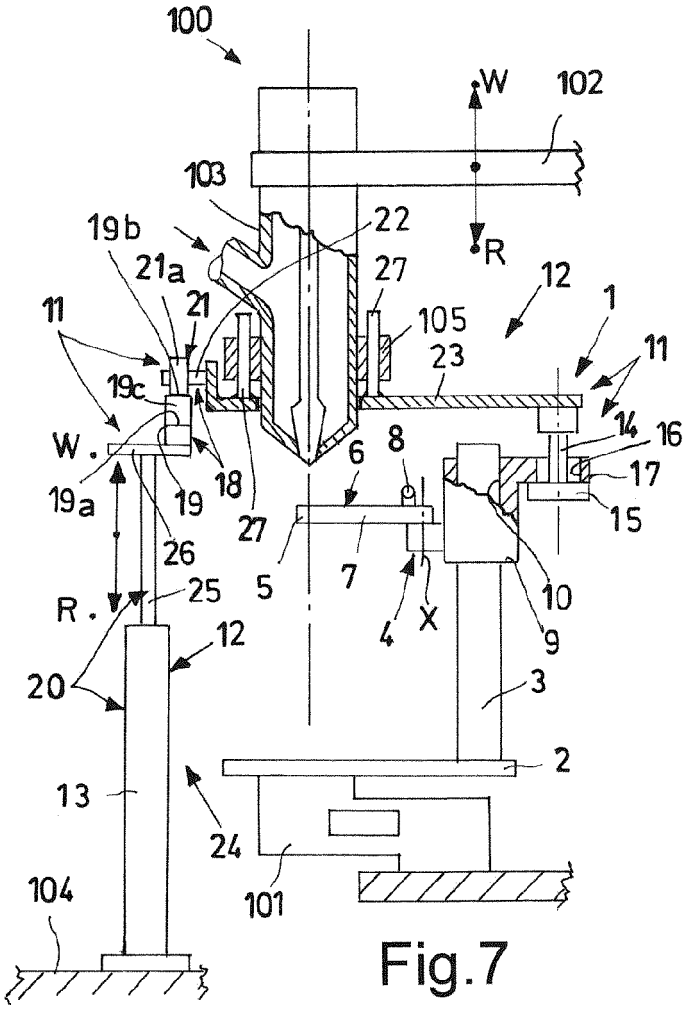


Fig.7

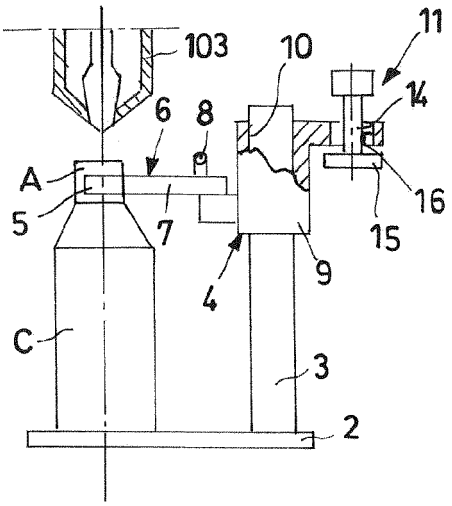


Fig.10

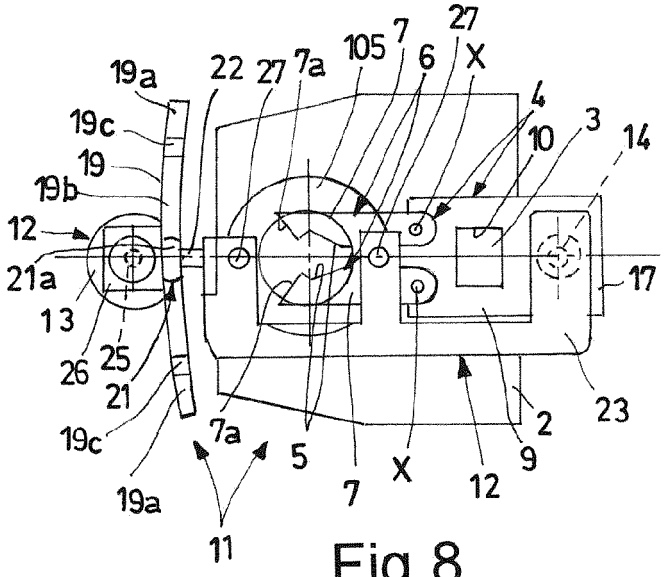


Fig.8

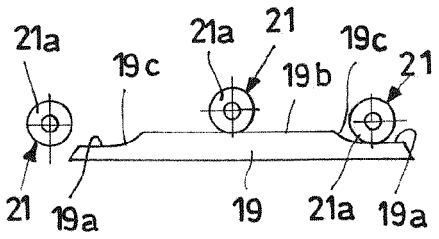


Fig.9

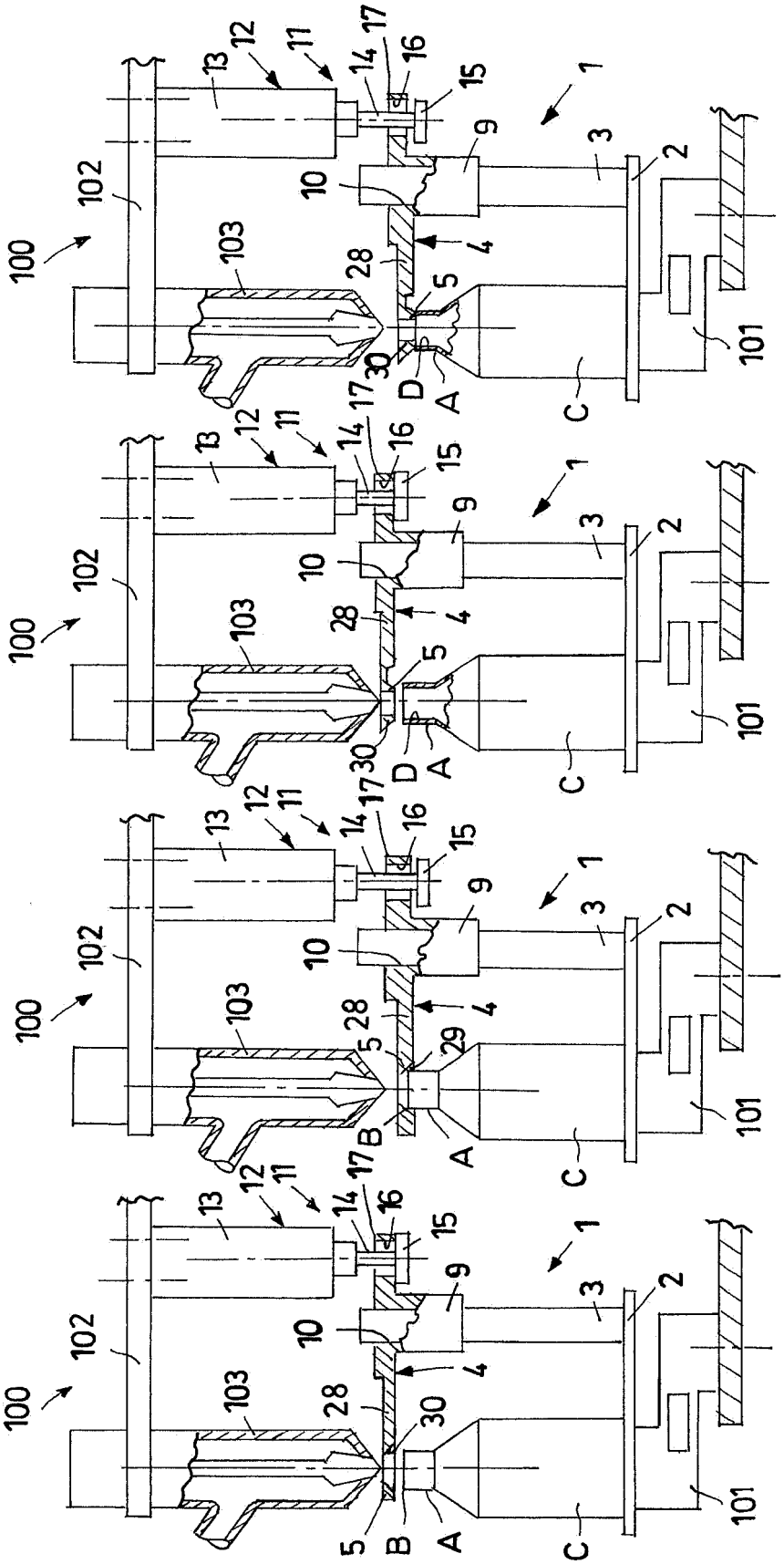


Fig.11

Fig.12

Fig.13

Fig.14

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EUROPEAN SEARCH REPORT

Application Number
EP 22 18 5179

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B67C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 November 2022	de Miscault, Xavier

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