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(54) Machine for and method of washing and/or filling containers.

(57) A keg in an inverted position is lifted from a horizontal track 12 by a head 20 under the action of fluid pressure and is then forced back into engagement with the track by a clamp (31,32) operated by fluid-pressure and acting on the inverted bottom of the keg, the clamp overcoming the fluid-pressure applied to the head and sealing the head to the keg.

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TITLE MODIFIED
see front page

79.036/BCR Machine for Washing and/or Filling Containers

This invention relates to machines for washing the interiors of containers and/or filling containers with liquid, the containers having spring-loaded closure units.

5 Specifically, the invention has been developed for the washing and/or filling of beer kegs. Such a keg has a closure unit which has one or two spring-loaded valve members which act to seal the keg. The closure units are arranged so that the valve members may be opened to fill the keg or
10 dispense beer from the keg with the closure unit in place in the keg. Such a keg is filled against a counter-pressure of carbon dioxide and beer is dispensed from a keg under a top pressure of carbon dioxide.

15 The present invention has for its object to provide a machine for the above purpose having improved means for clamping a container during washing and/or filling.

According to the invention we provide a washing and/or filling machine for containers and comprising a fixed support having an apertured, generally horizontal, supporting surface for a container; a washing and/or filling head arranged
20 in alignment with the aperture in the supporting surface and arranged to seal with a container to wash or fill the latter; first fluid-pressure operated means to move the head vertically between upper and lower positions in which the head is
25 above and below the supporting surface respectively, the arrangement being such that as the head moves from its lower to its upper position it will lift a container on the supporting surface and aligned with said head above said surface; and second fluid-pressure operated means above the
30 support to engage a container which has been lifted by the head and to force the container down onto said supporting surface thus over-riding the action of the first fluid pressure means and sealing the container to the head.

In operation, the sealing pressure between the container and the head is that applied to the first fluid-pressure operated means. The container is supported, during washing or filling, on the supporting surface. Thus, particularly
5 during filling, the weight of the container plus the liquid filled into it is taken by this fixed supporting surface rather than by the head.

Preferably the support is in the form of an apertured track and has a number of washing and/or filling stations
10 spaced along the track, each such station having a washing and/or filling head with associated first and second fluid-pressure operated means, the machine further including means to move the containers along the track between the stations.

Normally the first and second fluid-operated means will
15 be pneumatic rams.

The invention also includes a method of washing or filling a container through a washing or filling head in sealing contact with the container, the method comprising supporting the container on a generally horizontal supporting
20 surface, moving a washing or filling head by fluid pressure to engage the container and to lift the container from the surface, engaging the container while lifted by the head and moving the container under fluid-pressure back into engagement with the surface thus overcoming the fluid-pressure
25 applied to the head and causing the latter to seal with the container, washing or filling the container while the latter is held engaged with said surface and disengaging the head from the container.

The invention will now be described in detail by way of
30 example with reference to the accompanying drawings in which:-

FIGURE 1 is a side_elevation of a washing and filling machine embodying the invention; and

FIGURE 2 is a section on the line A-A of Figure 1.

Referring to Figures 1 and 2, the machine has a main frame indicated generally at 10. The frame carries an apertured track consisting of two rails 11 having horizontal flanges 12 which provide horizontal supporting surfaces for a container such as is shown at 13.

Spaced along the track are a number of stations, thus there is a waiting station 14, a first washing station the centre line of which is shown at 15, a second washing station the centre line of which is shown at 16, a waiting/cooling station whose centre line is shown at 17 and a filling or racking station whose centre line is shown at 18. Means, indicated generally at 19 is provided for moving containers between the stations.

At each of the washing stations and at the filling or racking station there is a head to engage a container whereby the latter can be washed or filled and there is also clamping means for the container as will now be described.

The means for moving each of the heads is similar and it will be described in relation to the head at the filling or racking station 18. This head is indicated at 20 and includes a cylinder 21 within which is mounted a piston, not shown, for moving a probe, also not shown, within the head to open the closure unit of a container engaged with the head. The lower end of the cylinder is secured to a mounting plate 22 which in turn is secured to a bridge piece 23. The bridge piece is connected to two vertical guide rods, one of which is shown at 24 and each guide rod slides in a bush 25 secured to the main frame. The bridge piece 23 is also connected to the piston rod of a pneumatic ram 26, the cylinder of which is secured to the main frame.

The head 20 is shown in its lower position below the flanges 12; the ram 26 can be operated to move the head to an upper position in which it is above the surfaces 12. When a container has its neck engaged by the head 20 and the latter is moved to its upper position it will lift the container from the flanges 12 on which it has been resting.

Extending upwardly from the aperture track on the centre line 18 of the filling and racking station is a pair of channel guides 27, the channels of which face inwardly as is clear from Figure 2. The main frame is extended by these guides and with other uprights and has cross members 28 in its upper part which support a pneumatic ram 29. The piston rod 30 of the ram 29 is connected to a cruciform member having opposite arms 31 and a further pair of opposite arms, one of which is shown at 32, the ends of the arm 32 being guided within the channels 27.

The operation of filling at the station 18 is as follows:-a container such as 13 is moved by the moving means 19 until it is in alignment with the head 20, the latter at this stage being in its lower position as shown. The head 20 is now raised by the ram 26 and lifts the container off the flanges 12. The cruciform member 31, 32 is now moved down by the ram 29 to engage the bottom of the container which is uppermost. The fluid-pressure applied to the ram 29 is greater than that applied to the ram 26 so that the container is forced downwardly by the ram 29 until it rests on the flanges 12. It will be appreciated that the fluid-pressure of the ram 26 has been overcome by that of the ram 29. The sealing pressure between the head 20 and the container is that exerted by the ram 26.

The container is now filled and during filling the weight of the container and its contents is taken on the flanges 12 rather than on the head 20. After filling is completed, the head 20 is retracted by the ram 26 and the cruciform member 31, 32 is also retracted, the container can

then be moved by the moving means 19 onto the outlet conveyor 33.

5 The operation of the machine at the first washing station 15 is as described above for the racking station except that the head 34 and the cruciform member 35 clamp the keg while washing is carried out via the head 34. As with the racking head the keg is clamped against the rails 12 by the cruciform member 35. Similarly, at the second washing station the keg is washed via a head 36 while clamped against the flanges by a cruciform member 37. The means for moving the cruciform members 35 and 37 are the same as that described in relation to the cruciform member 31, 32 and the means for moving the heads 34 and 36 are the same as the means for moving the heads 20.

15 It will be appreciated that the moving means 19 move the kegs between the stations while the kegs are resting on the flanges 12 so that at all times except when the kegs are lifted by the heads the weight of the kegs is taken by the flanges 12.

20 If desired, a keg having left the second washing station 16 can be cooled by a water spray before moving to the racking or filling station 18. The water spray comprises a pipe 38 of inverted U-shape which is fed with cooling water via a conduit 39 and has inwardly facing nozzles directed to spray water on a keg at the station 17.

25 It will be seen that the machine has the advantage that during filling the weight of the keg and its contents is taken on the fixed rails 11 being supported by the flanges 12 thereof. This relieves the filling head 20 of any weight. Also the sealing pressure between the keg and the filling head, or either of the washing heads, can be predetermined by the pressure difference between the pressures applied to the

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pneumatic rams 26 and 29 or the corresponding rams at the washing stations.

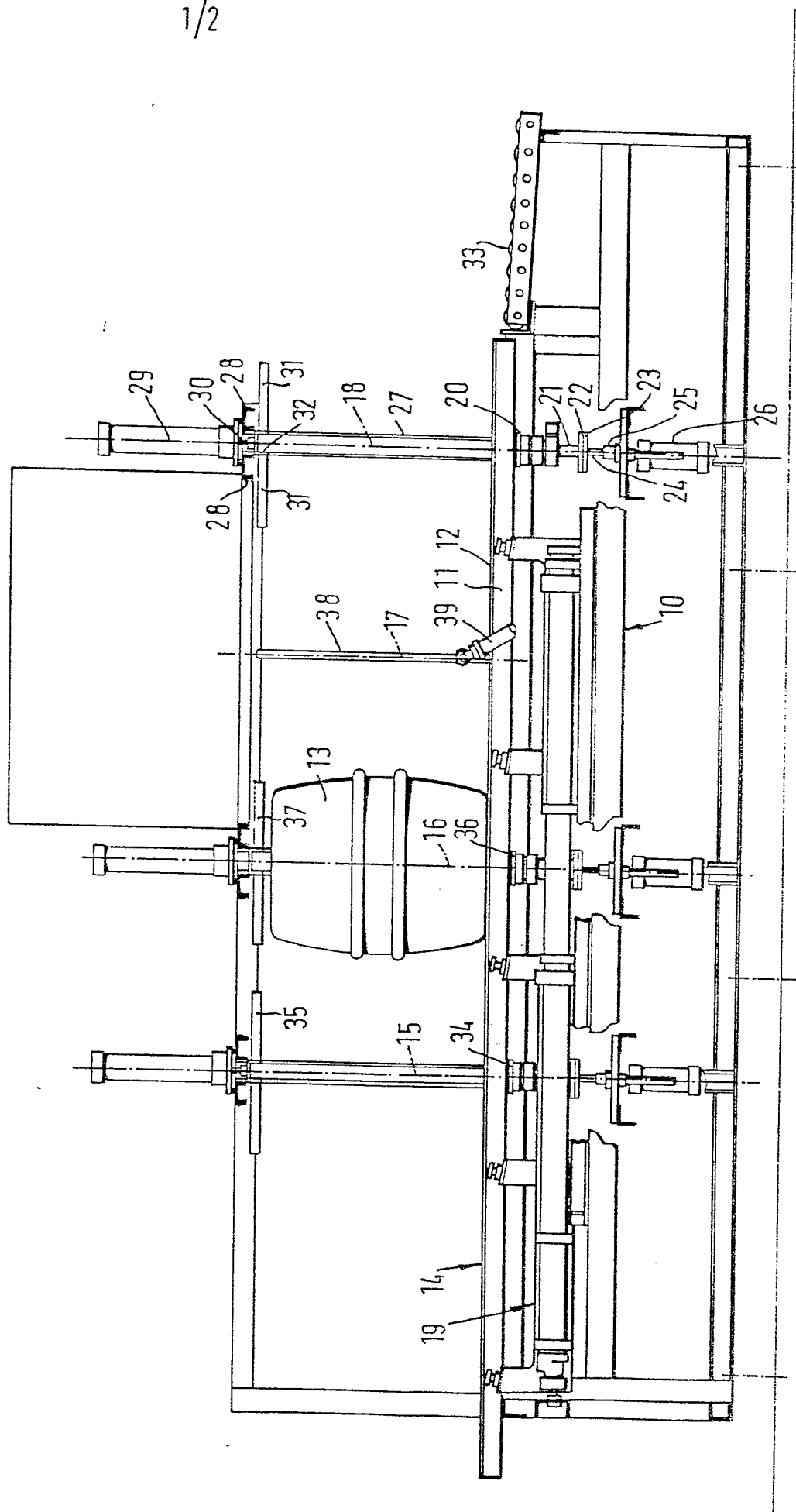
CLAIMS

1. A washing and/or filling machine for containers characterised in that the machine comprises a fixed support having an apertured, generally horizontal supporting surface 12 for a container; a washing and/or filling head 20 arranged in alignment with the aperture in the supporting surface and arranged to seal with a container to wash or fill the latter; first fluid-pressure operated means 26 to move the head vertically between upper and lower positions in which the head is above and below the supporting surface 12 respectively, the arrangement being such that as the head moves from its lower to its upper position it will lift a container on the supporting surface and aligned with said head above said surface; and second fluid-pressure operated means 29 above the support to engage a container which has been lifted by the head and to force the container down onto said supporting surface 12 thus over-riding the action of the first fluid-pressure means 26 and sealing the container to the head 20.
2. A machine according to Claim 1 further characterised in that the support 12 is in the form of an apertured track and has a number of washing and/or filling stations 15, 16, 18 spaced along the track, each such station having a washing and/or filling head 34, 36, 20 with associated first and second fluid-pressure operated means 26 and 29 the machine further including means 19 to move containers along the track between the stations.
3. A machine according to either one of Claims 1 or Claim 2 further characterised in that said first and second fluid-pressure operated means 26 and 29 are pneumatic rams.
4. A method of washing or filling a container through a washing or filling head in sealing contact with the container

characterised by the steps of supporting the container 13 on
a generally horizontal supporting surface 12 moving a washing
or filling head 20 by fluid-pressure to engage the container
and to lift the container from the surface, engaging the
5 container while lifted by the head 20 and moving the
container 13 under fluid-pressure back into engagement with
the surface 12 thus overcoming the fluid-pressure applied to
the head and causing the latter to seal with the container,
washing or filling the container while the latter is held
10 engaged with said surface and disengaging the head from the
container.

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FIG. 1.



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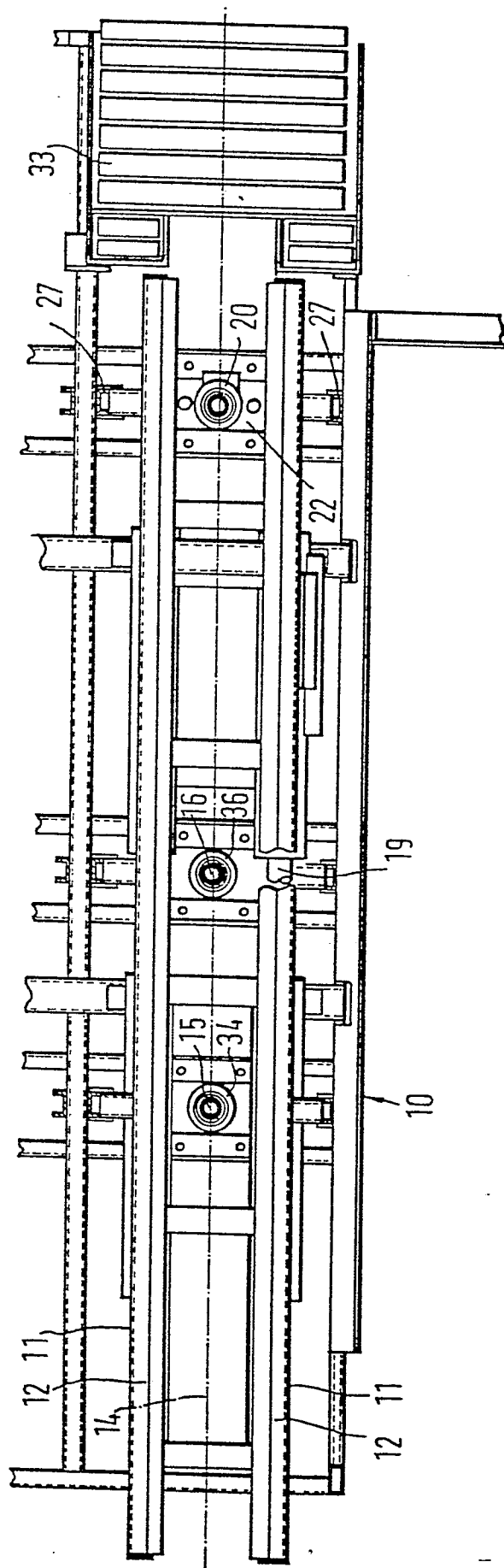


FIG. 2.



European Patent
Office

EUROPEAN SEARCH REPORT

0019406

Application number

EP 80 30 1467

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<u>FR - A - 2 002 084</u> (BURNETT) * Page 6, line 18 to page 7, line 12; figures 1-3 * <u>GB - A - 1 115 223</u> (DOW) * Page 4, line 105 to page 5, line 81; figures 5-7 *	1,3,4 2	B 67 C 3/34 B 08 E 9/12 TECHNICAL FIELDS SEARCHED (IPC) B 67 C B 08 E CATEGORY OF CITED DOCUMENTS X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reason The present search report has been drawn up for all claims
Place of search		Date of completion of the search	Examiner
The Hague		15.08.1980	VROMAN