May 1, 1951 L. McGIHON 2,551,033

FILLING MACHINE

Filed Nov. 19, 1946 3 Sheets-Sheet 1

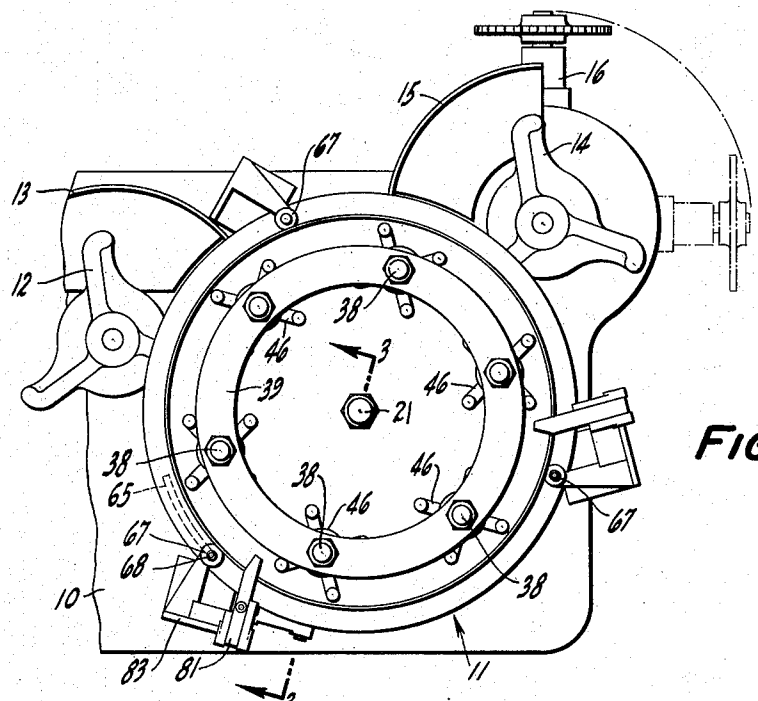


FIG. 1

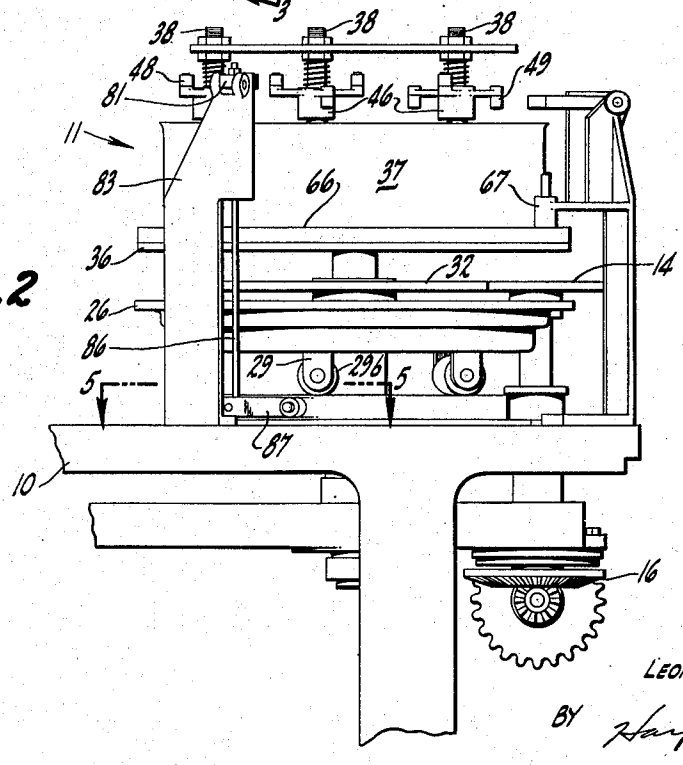


FIG. 2

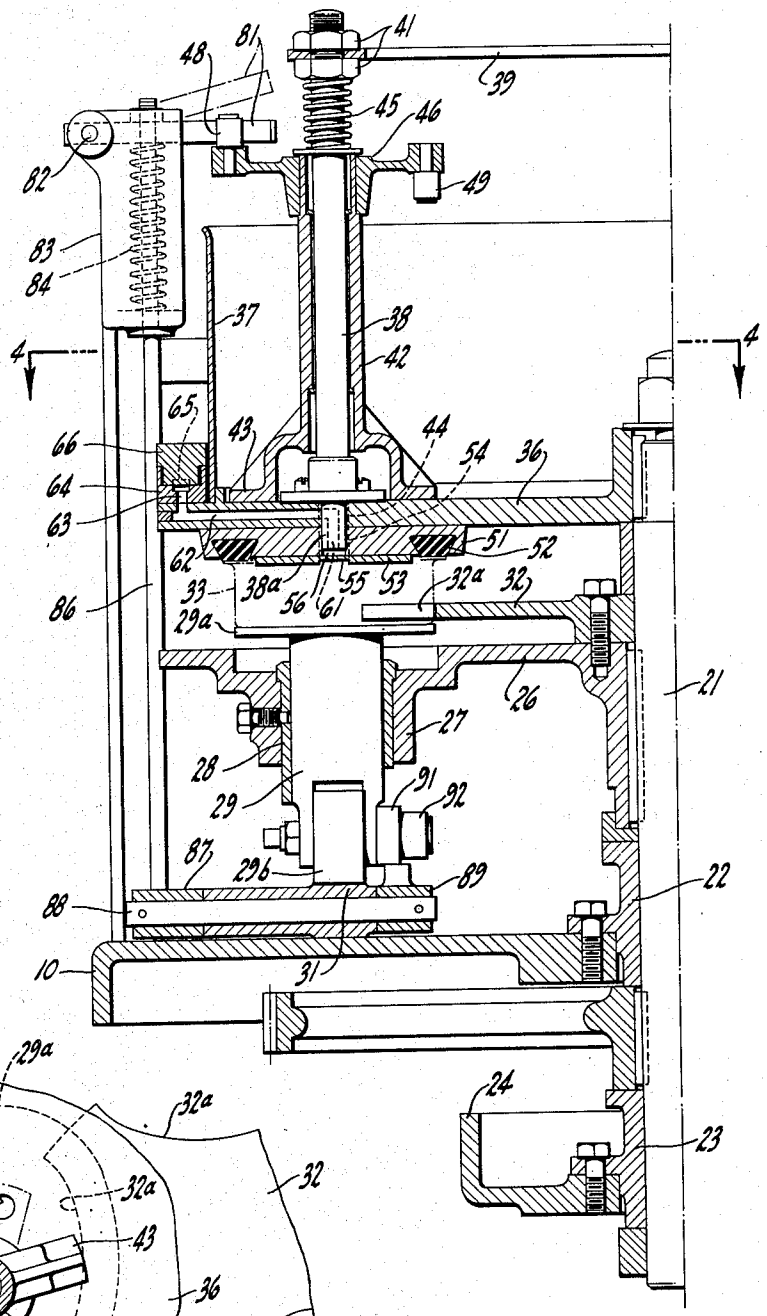
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May 1, 1951 L. McGIHON 2,551,033

FILLING MACHINE

Filed Nov. 19, 1946 3 Sheets-Sheet 2

FIG. 3



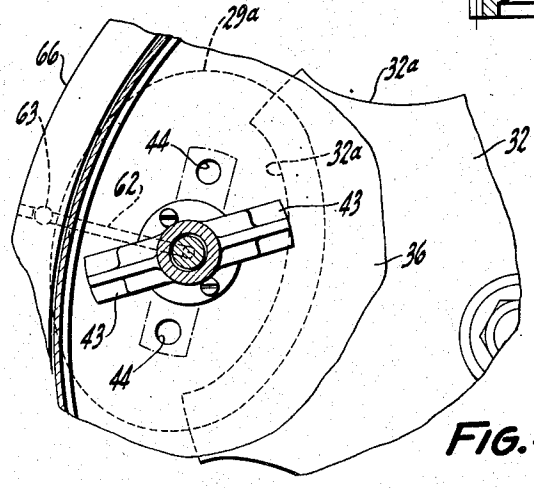


FIG. 4

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May 1, 1951 L. McGIHON 2,551,033

FILLING MACHINE

Filed Nov. 19, 1946 3 Sheets-Sheet 3

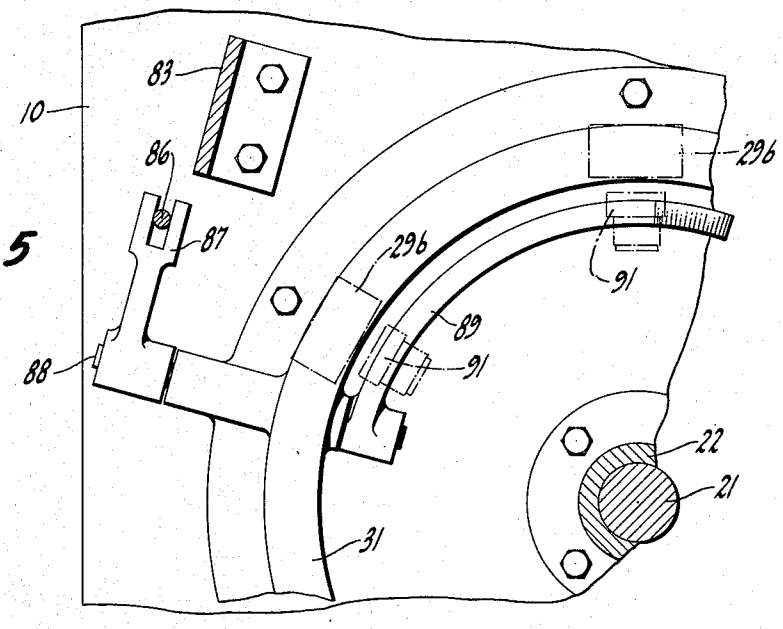


FIG. 5

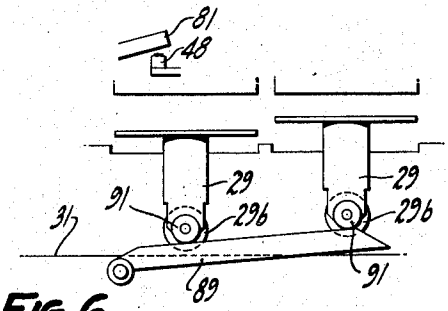


FIG. 6

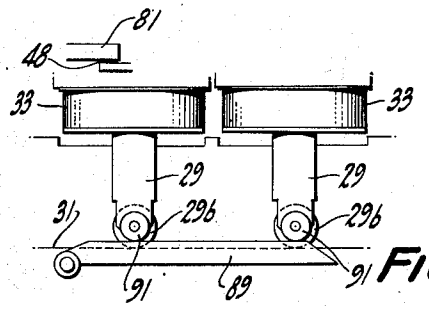


FIG. 7

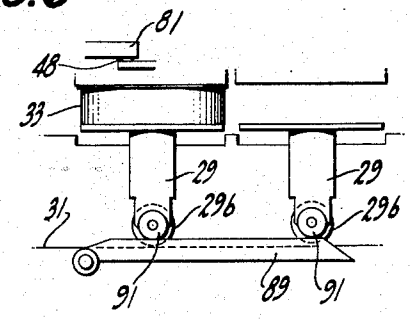


FIG. 8

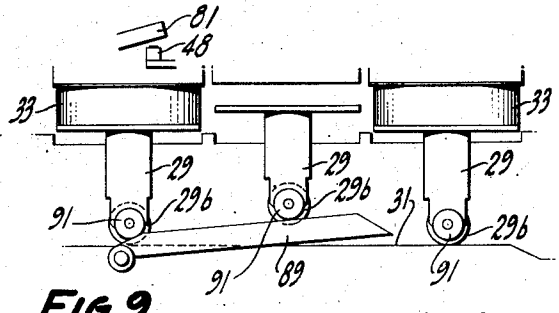


FIG. 9

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Patented May 1, 1951

2,551,033

UNITED STATES PATENT OFFICE

2,551,033

FILLING MACHINE

Leonard McGihon, San Leandro, Calif., assignor to King Sales & Engineering Co., San Francisco, Calif., a corporation of California

Application November 19, 1946, Serial No. 710,813

8 Claims. (Cl. 226—80)

1

The present invention relates to filling machines and is concerned more particularly with the provision of an improved no-can-no-fill device for such machines.

In the operation of filling machines it is customary to provide a control to prevent opening of a filling valve or other filling device when there is no can present to receive the material being filled. In accordance with conventional procedure, these no-can-no-fill devices operate in response to each can as it is presented to the filling station so that the devices operate at the same rate as the rate of can feed during normal operations.

It is a general object of the present invention to provide a non-can-no-fill device for filling machines which will change its adjustment only in response to an interruption in the can flow or the beginning of can flow after an interruption.

Another object of the invention is to provide a no-can-no-fill device which is operative to sense ahead of the actual can filling station to determine whether or not the control condition of the no-can-no-fill device is to change.

A further object of the invention is to provide a device of the above character which is subject to control from a plurality of can support posts.

Other objects and advantages of the invention will be apparent from the following description of a preferred embodiment thereof as illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a filling machine embodying the invention.

Figure 2 is a side elevational view of the machine.

Figure 3 is a vertical sectional view of the machine taken as indicated by the line 3—3 in Figure 1.

Figure 4 is a fragmentary plan view of a filling valve taken as indicated by the line 4—4 in Figure 3.

Figure 5 is a fragmentary plan view of a portion of a no-can-no-fill device taken as indicated by the line 5—5 in Figure 2.

Figure 6 is a schematic view of the no-can-no-fill control means as viewed from the inside of the machine and showing the device in connection with two empty can lift members.

Figure 7 is a view similar to Figure 6 in which two occupied can lift members are shown.

Figure 8 is another schematic view showing an occupied can lift member followed by an empty can lift member.

Figure 9 is another schematic view showing an occupied can lift member followed by an empty

2

can lift member which is in turn followed by an occupied can lift member.

Referring to the drawings, the filling machine includes a frame 10 (Figures 1 and 2) which is broken away at the left. The frame 10 carries a filling turret 11 to which cans are fed by means of a feed star wheel 12 and suitable cooperating means including a rail 13 and from which cans are discharged by means including the discharge star wheel 14 and a rail 15.

A drive unit 16 for the machine is connected in any suitable manner to the star wheel 14 which is in turn geared to the turret 11 and the feed star wheel 12.

The filling turret 11, as shown herein, is of the type to receive oval cans commonly employed for sardines, and to complete the fill of these cans with an appropriate amount of sauce to a desired head space within the can. The turret includes a series of filling valves and cooperating can lift stations which are progressed past a filling station for opening the associated valve and then past a closing station which closes the valve after the filling operation is performed.

The filling turret includes a support and drive shaft 21 (Figures 1, 2 and 3) which is journalled in a bearing member 22 carried on the frame 10 and in a lower bearing member 23 supported on the frame by means including a frame bracket 24. Between the bearings 22 and 23 a drive gear 25 is keyed to the shaft 21. The shaft 21 has keyed thereto a filling table 26 having a plurality of bosses 27 around the perifery thereof containing bearing supports 28 for a series of can lift members 29. Each can lift member 29 includes an upper can support plate 29*a* and a lower roller 29*b* which cooperates with a cam track 31 on the frame 10. The filling table 26 also carries a can positioning spider 32 having a series of recesses 32*a* about the perifery for engagement by a can as shown, for example, in dotted lines at 33 in Figure 3.

The shaft 21 (Figures 1, 2 and 3) at its upper end has secured thereon a tank for containing the sauce to be filled and the tank includes a bottom wall 36 having a side wall 37 secured thereon. The bottom wall 36 provides a support for a series of similar filling valves, each filling valve including a center post 38 having a lower guide extension 38*a* seated in a cooperating recess in the bottom wall 36 of the tank. At its upper end each post 38 is secured to a ring 39 by means of clamping nuts 41. Disposed about the center post 38 is a valve sleeve 42 having a pair of opposite valve extensions 43 (Figures 3 and 4) in

engagement with the bottom wall 36 of the tank and adapted to selectively open and close respective diametrically opposed openings 44 therein upon successive 90° rotations of the sleeve. A spring 45 urges the sleeve 42 downwardly to seat its extensions 43 against the bottom tank wall 36.

For the purpose of controlling the rotated position of the valve sleeve 42, it is provided with a four-armed spider 46 at the upper end thereof. Each alternate arm of the spider 46 carries a roller 48 extending upwardly therefrom, while the other alternate pair of arms thereof carry rollers 49 extending downwardly therefrom. The rollers 48 comprise valve opening elements disposed in one plane, while the rollers 49 are valve closing elements disposed in another plane.

Each filling valve mechanism also includes a can engaging head in the form of a plate 51 (Figures 3 and 4) which carries a resilient can engaging seal member 52 in a shape conforming to the oval shape of the can and a head space plate 53 within the outline of the seal member 52. The head plate 51 is provided with a pair of passages 54 aligned with the passages 44 in the tank wall and also with corresponding passages in the head-space plate 53 which lead to suitable grooves 55 in the bottom surface thereof.

To provide for vacuum filling of the cans, the lower surface of the head plate 51 has a diagonal groove 56 therein to establish communication between the central opening therein and the end portions of a can. Also, the guide extension 38a of each guide post 38 has a passage 61 opening into a radial passage 62 in the bottom tank wall 36. The passage 62 opens upwardly into a counterbored aperture 63 formed in a vacuum ring 64 secured on the tank wall 36. A cooperating vacuum ring 66 is held against the ring 64 by a plurality of conventional presser members 67 (Figures 1 and 2). The ring 66 has a groove 65 for connection successively with the apertures 63 of the filling valves. As seen in Figure 1, the vacuum ring 66 has a connection 68 leading to a suitable source of vacuum and the extent of the vacuum recess 65, as seen in Figure 1, is such that an appropriate vacuum is applied to a can before a valve is opened.

The above-described mechanism is of conventional construction and is of the character disclosed in my co-pending application, Serial No. 710,814, filed November 19, 1946, for Filling Machines.

In order to control the operation of the filling valves, a no-can-no-fill device of special character is provided which is responsive to the presence of a container in cooperation with a filling valve to cause adjustment of the filling valve from closed to open condition and which senses the presence or absence of the next succeeding container, so that if an uninterrupted series of containers are presented to the filling station no change in adjustment of any of the parts is required. Correspondingly, if a series of empty can supports are presented to the filling station, no change in adjustment is required. As seen in Figures 1, 2, 3 and 4, at the filling or opening station of the filling turret there is provided an arm 81 pivoted at 82 in a suitable mounting bracket 83 supported on the frame 10 and spring urged upwardly by a compression spring 84 surrounding a pull rod 86 guided in the bracket. The pull rod 86 extends downwardly and is connected to an arm 87 secured on a shaft 88 journalled in the cam track 31 and carrying an arm 89 at its other end for engagement by a roller 91 supported coaxially with the roller 29b. Adjacent the roller 91 is a can lift depressing roller 92.

Referring to Figure 5, it will be noted that the no-can-no-fill control arm 89 is of sufficient length that two rollers 91 of adjacent can lift members 29 are engaged therewith at the same time. The arm 89 is spring urged upwardly and the strength of the associated spring 84 is so selected that it can raise a can lift member 29 if the member is unoccupied so that the valve opening arm 81 will remain in its normal dotted line position shown in Figure 3 and the associated roller 48 will pass beneath the arm and the filling valve will not be opened.

However, when a can is interposed between the lift member 29 and the valve head 31, a positive block is provided against further lifting of the can lift member 29 by the arm 89 and spring 84 so that the arm 89 will be depressed and correspondingly the control arm 81 will also be depressed and will occupy the full line position shown in Figure 3. As a result, the roller 48 of the valve in active position will strike the arm 81 and the valve will be rotated from closed to open condition. Because the can sensing arm 89 is of sufficient length to cooperate simultaneously with two can lift members if the arm has been depressed by an occupied can lift member and the succeeding can lift member is also occupied, the succeeding can lift member will continue to hold the arm 89 depressed after the first occupied member has moved out of operative relation thereto so that the condition of the no-can-no-fill device will not be changed as long as an uninterrupted series of occupied can lift members occurs. This condition is illustrated, for example, in Figure 7.

Figure 6 illustrates the condition in which a series of empty can lift members are presented and again the lever 89 does not change its adjustment and the can lift members merely ride up over the control arm 89.

Figures 8 and 9 illustrate a condition in which an empty can lift member rides on to the control arm 89 while it is still held down by an occupied can lift member, while Figure 9 illustrates the operation which will take place a short time later when the occupied can lift member is riding off of the control arm so that it rides upwardly in sensing the empty can lift member so that the valve opening arm 81 will be raised momentarily to allow passing thereunder of the control roller 48 of the valve associated with the empty can lift member.

While I have shown a preferred embodiment of the invention, it will be understood that the invention is capable of variation and modification from the form shown so that its scope should be limited only by the scope of the claims appended hereto.

I claim:

1. In a filling machine, a filling station, means for presenting containers successively to said filling station including a support for a container in filling position and an adjacent support at the rear of said first mentioned support for the next succeeding container to be filled, a no-can-no-fill device at said station, and control means therefor including means responsive to the presence or absence of a container on said filling position support and also in cooperative relation with said adjacent rear support for immediate response to the presence or absence of a container at said adjacent rear support upon removal of the container from the filling position support.

2. In a filling machine, a filling station, means for presenting containers successively to said filling station including a support for a container in filling position and an adjacent support at the rear of said first mentioned support for the next succeeding container to be filled, a no-can-no-fill device at said station, and control means therefor including means extending along said supports and responsive to the presence or absence of a container on said filling position support for controlling said device and in cooperative relation for response to the presence or absence of a container on said adjacent rear support upon removal of the container from said filling position support.

3. In a filling machine, a filling turret having a series of filling mechanisms thereon, a corresponding series of container supports associated with said filling mechanisms for receiving and presenting containers thereto, a station for controlling opening of a filling mechanism passing thereby including a no-can-no-fill device, said no-can-no-fill device having an operating arm for yieldably applying a lift to said can supports and a normally ineffective mechanism operative upon yielding of said arm for operating a related filling mechanism to open condition, said arm being of a length to cooperate with two adjacent can supports at the same time.

4. In a filling machine, a filling turret having a series of filling mechanisms thereon, a corresponding series of container supports associated with said filling mechanisms for receiving and presenting containers thereto, a station for effecting opening of a filling mechanism passing thereby including a no-can-no-fill device, said no-can-no-fill device having an operating arm extending along said station and of a length to cooperate with two adjacent can supports at the same time, said operating arm being responsive to the presence or absence of a container on a support at said station and in cooperative relation to respond to the presence or absence of a container on the next succeeding support upon removal of the first support from operative relation with said arm.

5. In a filling machine, a filling turret having a series of filling mechanisms thereon, a corresponding series of container supports associated with said filling mechanisms for receiving and presenting containers thereto, a station for effecting opening of a filling mechanism passing thereby including a no-can-no-fill device, means at said station for lifting said supports to engage containers thereon with said filling mechanisms, said no-can-no-fill device having an operating arm for yieldably applying a lift to said can supports in excess of the lift of said lifting means whereby said arm yields in response to a container on a support blocking further lifting of the support, and a normally ineffective mechanism for operating the filling mechanism to open condition rendered effective by yielding movement of said operating arm, said arm being of a length to cooperate with two adjacent can supports at the same time.

6. In a filling machine, a filling turret having a series of filling mechanisms thereon, a corresponding series of container supports associated with said filling mechanisms for receiving and presenting containers thereto, a station for effecting opening of a filling mechanism passing thereby including a no-can-no-fill device, means at said station for lifting said supports to engage containers thereon with said filling mechanisms, said no-can-no-fill device having yieldable means for applying a lift to said can supports in excess of the lift of said lifting means whereby said means yields in response to a container on a support blocking further lifting of the support, and a normally ineffective mechanism for operating the filling mechanism to open condition rendered effective yielding movement of said yieldable means, said yieldable means being disposed in cooperative relation with two adjacent can supports at the same time.

7. In a filling machine, a filling station, means for moving containers successively to said filling station including a support for a container in filling position and an adjacent support at the rear of said first mentioned support for the next succeeding container to be moved toward said filling station and be filled, a no-can-no-fill device at said station, and control means therefor including an elongated movably mounted control member cooperating with both said filling positon support and said adjacent rear support so as to be responsive to both the presence or absence of a container on said filling position support and to the presence or absence of a container on said rear support upon removal of the container from the filling position support.

8. In a filling machine, a filling station, means for moving containers successively to said filling station including a support for a container in filling position and an adjacent support at the rear of said first mentioned support for the next succeeding container to be moved toward said filling station and be filled, means for mounting said supports for up and down movement, a no-can-no-fill device at said station, and control means therefor including an elongated pivotally mounted control member engageable with an element associated with each of said supports for cooperating with both said filling position support and said adjacent rear support so as to be responsive to both the presence or absence of a container on said filling position support and to the presence or absence of a container on said rear support upon removal of the container from the filling position support.

LEONARD McGIHON.

REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Name	Date
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