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H. FILSS

2,104,454

FILLING DEVICE

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Fig. 1

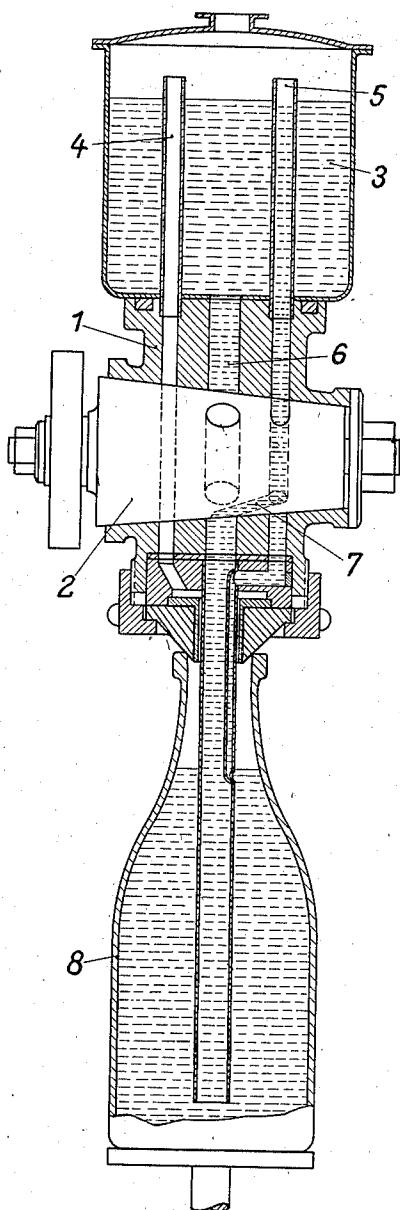


Fig. 2

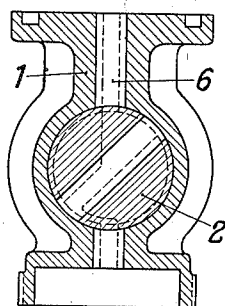
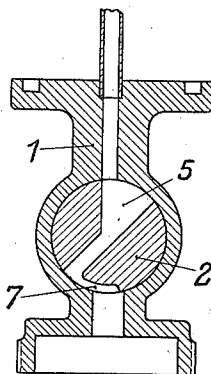


Fig. 3



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FILLING DEVICE

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4 Claims. (Cl. 226—115)

This invention relates to a filling device for counter-pressure filling machines for bottles and other vessels of the type in which the liquid column contained in the return air pipe is fed back into the vessel or bottle still pressed against the said filling device.

In the case of filling machines of this type it is of paramount importance, particularly with sensitive liquids, that the liquid which has risen in the return air pipe be fed back into the bottle pressed against the filling device, as slowly and as free of shock as possible in order that the liquid contained in the bottle is not disturbed.

Attempts have been made to do this by the return air pipes being e. g. provided with a narrower portion so that the velocity of discharge was reduced correspondingly. The same effect can be attained when instead of the return air pipe the feed air pipe is throttled.

Contractions of the cross section of this class however result in various inconveniences; they are difficult to clean and moreover liable to obstruction.

There further exists a type of filling device in which not the whole column of liquid contained in the return air pipe is returned into the bottle pressed against the said device but only that portion of the liquid which is below the cock plug. Finally in another type of filling device already existing a connection is established in the filling position between the return air and liquid pipes, while in other filling devices of a similar type having such connecting ducts the liquid raised in the return air pipe is not discharged into the bottle pressed against the device but into the subsequent bottle.

The subject matter of the present invention is distinguished from the types of filling devices already known by the fact that the feed and return air pipes preserve their full cross section over their whole length and that the liquid which had risen within the return air pipe above the cock plug is not returned directly through the return air pipe but through the liquid pipe into the vessel still pressed against the filling device. For this purpose the cock must be adapted to occupy a special position, and provided with a short transverse duct in the plug which duct connects the return air pipe with the liquid pipe. This arrangement not only does away with the inconveniences above referred to but also affords the advantage that the liquid is not discharged within the narrow neck portion of the vessel to be filled but close to the bottom thereof. In this way the liquid raised in the return air

pipe is allowed to escape tranquilly within and above the cock plug since it is opposed by a certain resistance due to the liquid already contained in the bottle. On the other hand the liquid contained in the return air pipe below the cock plug will, in the closed position of the cock, flow back into the bottle since in this position the feed air, return air and filling pipes are connected with one another in a well-known way by a cross duct.

The accompanying drawing represents an embodiment of the invention by way of example and shows in—

Fig. 1 a longitudinal section through the filling device with a bottle pressed against the latter,

Fig. 2 a section through the liquid duct, and Fig. 3 a section through the return air duct in the plane of the duct connecting the return air pipe with the liquid duct.

All these figures show the filling device in the position in which the liquid raised in the return air pipe is caused to flow back into the vessel pressed against the device. Into the body 1 of the filling device, which is secured to the container 3 for the liquid, there is fitted the cock plug 2. The feed air pipe is designated by 4, the return air pipe by 5 and the liquid pipe by 6. The duct 7 disposed in the plug 2 connects the return air duct 5 with the liquid duct 6. The bottle is designated by the numeral 8.

The modus operandi is as follows:

After the bottle has been put under tension in a well-known manner by feed air and has been filled by the liquid duct being opened, the liquid rises, as is known, into the return air pipe or duct 5 until it has arrived at the level of the liquid contained in the container 3. During turning of the cock plug 2 the liquid duct 6 is closed while the return air duct 5 remains in its open position. In order that this condition may be attained the corresponding duct in the said plug 2 is enlarged in a fan-like manner, as is shown by Fig. 3, while in the bottom portion of the said plug the connecting duct 7 establishes a connection between the return air duct and liquid duct respectively within the cock plug. While this is done, at the same time the feed air duct 4 is opened. In this position of the said cock plug 2 an equilibrium will be established between the pressure still prevailing within the container 3 and that in the bottle 8, still pressed against the filling device because the air contained in the said bottle above the level of the liquid therein is allowed to escape into the container 3 through

the feed air pipe 4 and the return air pipe 5 can now be emptied within and above the cock plug 2.

What I claim as my invention, and desire to secure by Letters Patent, is—

- 5 1. Counter-pressure filling apparatus including a liquid pipe, a return air pipe, and a plug cock interposed in and controlling said pipes, said plug cock having within its plug a duct for establishing connection between the parts of said liquid
- 10 pipe above and below the cock, a second duct for establishing connection between the parts of said return air pipe above and below the cock, and a third duct positioned to establish communication between the part of said return air pipe
- 15 above the cock with the part of said liquid pipe below it at a time during the closing of the cock when the lower parts of said pipes are cut off from their upper parts and while a filled vessel is still in position.
- 20 2. In a filling device, a container containing the liquid to be filled into a vessel, an air return pipe adapted to discharge liquid therein into the said vessel while the same is still pressed against the said device for the filling operation, a liquid
- 25 pipe extending almost to the bottom of said vessel during filling and discharging thereinto, a cock plug having ducts controlling said air return pipe and said liquid pipe, said cock plug having a duct adapted to connect the part of said
- 30 air return pipe above said plug with the liquid duct comprised in the said plug when the plug closes the liquid pipe.

3. In a filling device, a container containing the liquid to be filled into a vessel, a feed air pipe adapted to put the said vessel under pressure, an air return pipe adapted to discharge liquid there-
 5 in into the said vessel while the same is still pressed against the said device for the filling operation, a liquid pipe extending almost to the bottom of said vessel during filling and discharging thereinto, a cock plug adapted to open and
 10 close the said feed air pipe and the said liquid pipe, said plug also having a duct adapted to connect the part of said air return pipe above said plug with the portion of the said liquid pipe be-
 15 low the said plug when the plug closes the said liquid pipe.

4. In a filling device, a container containing the liquid to be filled into a vessel, a feed air pipe adapted to put the said vessel under pressure, an air return pipe adapted to discharge liquid there-
 20 in into the said vessel while the same is still pressed against the said device for the filling operation, a liquid pipe extending almost to the bottom of said vessel during filling and discharging thereinto, a cock plug adapted to open and
 25 close the said feed air pipe and the said liquid pipe, said plug also having a duct with a fan shaped enlargement, adapted to connect the part of said air return pipe above said plug with the
 30 portion of the said liquid pipe below the said plug when the plug closes the said liquid pipe.

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