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⑤④ **Device for the volumetric filling of containers.**

⑤⑦ A device for the volumetric filling of containers, comprising a vessel (1) containing the fluid to be filled, a supply line (2), at least one filling head (3) and a solenoid valve (10) for controlling the fluid flow, characterized in that it is provided with a volumetric metering (6) means inserted in the said supply line and formed by a flowmeter, the device also comprising an electronic transducer circuit (7) provided with a programmable counter. During a filling cycle the electric signal outputted by the flowmeter reaches the electronic transducer circuit, which converts it into square pulses, said pulses being counted by the said counter. When the number of pulses reaches a preset number preprogrammed in the counter, the electronic circuit sends a signal acting on the solenoid valve, to close it and thereby terminate the filling cycle.

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This invention relates to a device for the volumetric filling of containers, particularly applicable to the filling with fluids, of the type comprising a vessel containing the fluid to be filled, a supply line, at least one filling head and a solenoid valve for controlling the fluid flow.

Very many bottle filling devices are already known, but all of them are highly complex mechanically and/or pneumatically and provide at the most volumetric filling accuracy never reaching $\pm 0.5\%$, which accuracy level in many cases is quite undesirable. Furthermore, these known devices have the drawback that the majority of them may not provide high production rates, since the fluid may not be pressurized and must flow by gravity.

Against all these drawbacks, the device of the invention provides the following advantages:

- The fluid flows through a circuit practically free from obstructions and very simple to clean.
- It is very easy to handle, within the ability of any person, not requiring any special knowledge either for normal operation or for changeover of fluid or container.
- It is extremely simple mechanically.
- The device is free from constant or variable mechanical forces, since it has no pistons and no related mechanisms.
- It is practically maintenance free, since the lubrication, adjustment, etc. operations are practically completely eliminated.
- It is very easy to adjust the change of volume, when the type of the container is changed.
- The filling accuracy is better than $\pm 0.1\%$, that is, much higher than in any other known filling device.
- The fluid viscosity does not affect the system, it being possible to fill products from very low viscosities (water, alcohol, etc), up to very high viscosities (gels, mayonnaises, chocolates, etc.).
- It allows the system to be easily pressurized.

In essence the device in question is characterized in that it is provided with a volumetric metering means inserted in the said supply line and formed by a flowmeter which, by the Faraday effect, outputs a variable electric signal according to the flowrate through the flowmeter, the device also comprising an electronic transducer circuit provided with a programmable counter, all adapted so that during a filling cycle the said electric signal outputted by the flowmeter reaches the electronic transducer circuit, which converts it into square pulses, said pulses being counted by the said counter, so that when the number of pulses reaches a preset number preprogrammed in the counter, the electronic circuit sends a signal acting on the solenoid valve, closing it, and thereby terminating the filling cycle.

Other features and advantages of the device of the present invention will be evident from the following description with reference to the accompanying drawing, the single figure of which illustrates as a non-limitative example one embodiment of the inventive device.

In said figure, which comprises a schematic elevation view of the device, this may be seen to comprise a vessel 1, a supply line 2, a filling head 3 and a solenoid valve 10, which in this case is mounted on the head 3 itself, but which could be mounted at any other point along the line 2. Said solenoid valve 10 is controlled through 4 from an electronic transducer circuit 7, receiving an electric signal from a volumetric meter 6 inserted in said supply line 2.

The said meter 6 is formed by a flowmeter which, by Faraday effect, outputs a variable electric signal depending on the flowrate through the flowmeter.

When the said electric signal outputted by the flowmeter 6 reaches the circuit 7, the latter converts the said signal into square pulses which are counted by a counter comprised in the circuit 7 so that when the number of pulses reaches a preset number programmed in the counter, the electronic circuit 7 sends a signal which drives the solenoid valve 10 through 4, closing it and thereby terminating the filling cycle.

The vessel 1 receiving the fluid to be filled through the inlet 9 may be pressurized.

Although the filling of a single container 5 has been illustrated in the drawing figure, it is obvious that several filling heads 3 for respective containers 5 may be supplied from a single vessel 1. In such circumstances, a manifold 8 adapted to distribute the fluid from the vessel 1 to the different filling heads 3 is inserted in the circuit, the respective discharge ports 11 on the filling heads being alternately or simultaneously inserted in corresponding containers 5.

Claims

1.-A device for the volumetric filling of containers, particularly applicable to filling with fluids, of the type comprising a vessel containing the fluid to be filled, a supply line, at least one filling head and a solenoid valve for controlling the fluid flow, characterized in that it is provided with a volumetric metering equipment inserted in the said supply line and formed by a flowmeter which, by a Faraday effect, outputs a variable electric signal according to the flowrate through the flowmeter, the device also comprising an electronic transducer circuit provided with a programmable counter, all adapted so that during a filling cycle the said electric signal

outputted by the flowmeter reaches the electronic transducer circuit, which converts it into square pulses, said pulses being counted by the said counter, so that when the number of pulses reaches a preset number preprogrammed in the counter, the electronic circuit sends a signal acting on the solenoid valve, closing it and thereby terminating the filling cycle. 5

2.-A device for volumetric filling of containers according to claim 1, characterized in that said vessel may be pressurized. 10

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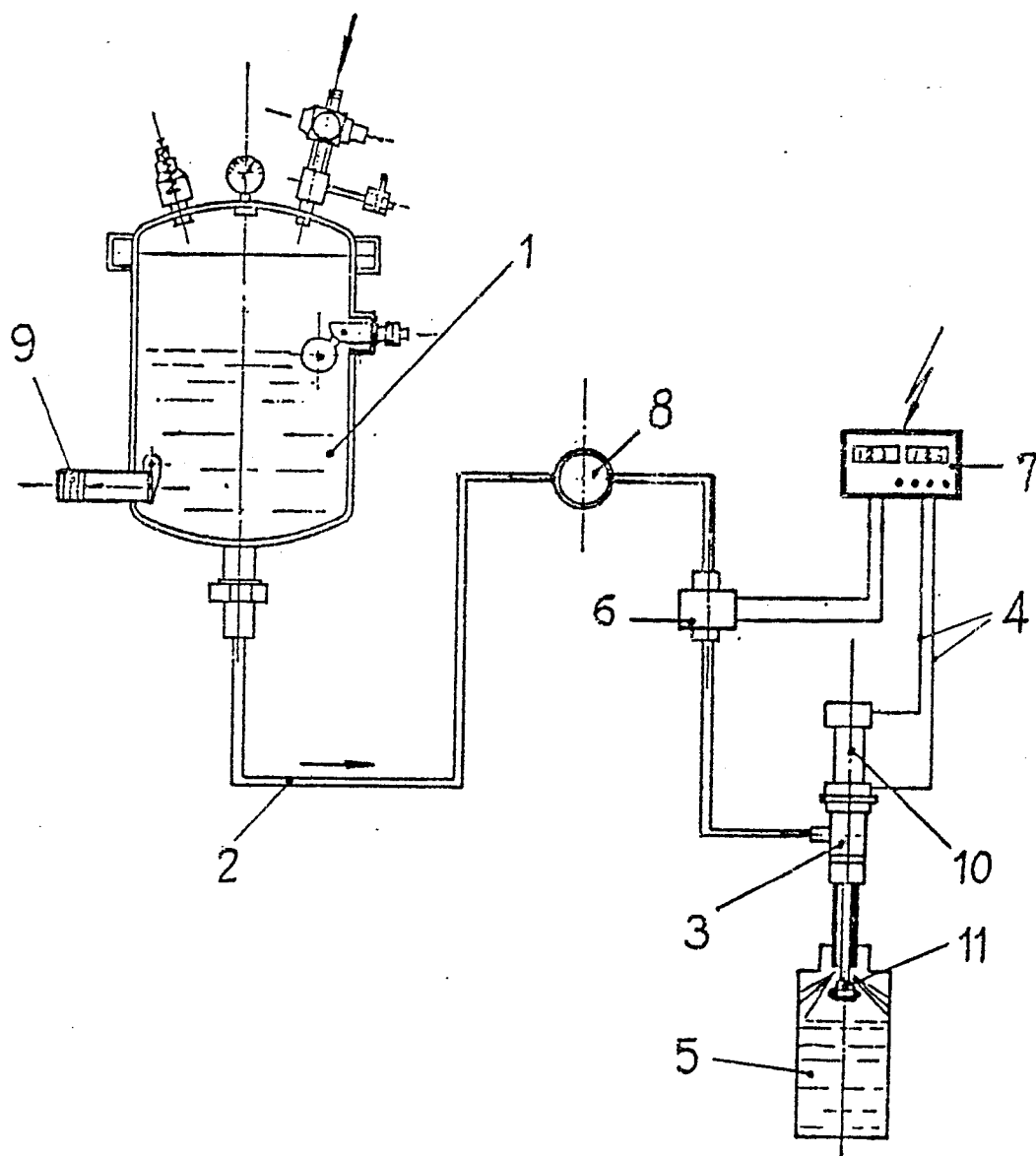
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EUROPEAN SEARCH REPORT

Application Number

EP 87 50 0087

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	EP-A-0 110 189 (PIRZER) * Page 10, line 24 - page 13, line 24; claims 1-6; figures 2-4 *	1,2.	B 67 C 3/28
X	GB-A-2 116 530 (SEITZ ENZINGER NOLL) * Figures 1,2; claims 1-13; page 3, lines 81-109 *	1,2	
X	GB-A-1 203 390 (CORRUGATED CONTAINER CO.) * Claims 1,4,5,7,8; page 11, line 69 - page 12, line 75 *	1,2	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 67 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16-03-1988	Examiner DEUTSCH J.P.M.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			