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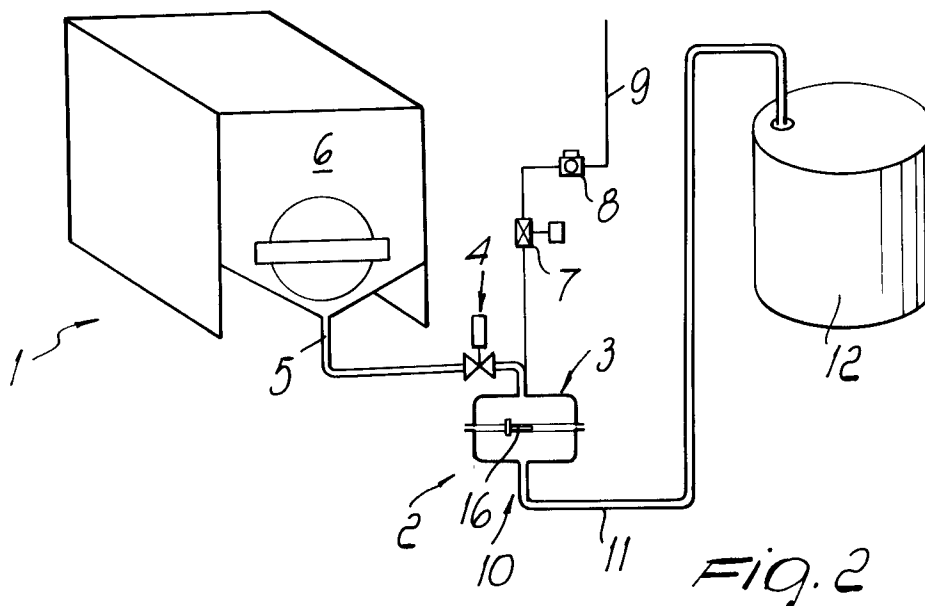
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I-20123 Milan (IT)(54) **Device for extracting sludge from a distiller of a dry-cleaning machine.**

(57) Device for extracting sludge from a distiller of a dry-cleaning machine comprising a sealed container (2) provided with an upper inlet (3), which is selectively connected to a first valve (4) sealingly connected to a lower discharge duct (5) of a distiller of a dry-cleaning machine and to a valve (7) for connection to a source of pressurized compressed air, and with a lower outlet (10), which is connected by

means of a pipe (11) to a sludge accumulation tank (12); the opening of the first valve (4) at the end of the distillation operations allows the gravity descent of the hot sludge from the distiller (6) toward the container (2), whereas the subsequent closure of the first valve (4) and the opening of the second valve (7) causes the emptying of the container into the tank (12).

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The present invention relates to a device for extracting sludge from a distiller of a dry-cleaning machine.

It is known that the washing liquid in dry-cleaning machines is periodically distilled in order to free it from the impurities extracted during washing; this operation is performed by devices known as distillers. At the end of the distillation operations, oily residues remain on the bottom of these distillers and, due to the presence of dust or the like, assume a highly viscous pasty consistency; it has been observed that sludge at the end of the distillation operations, when it is consequently hot, is rather fluid, whereas it becomes increasingly pasty as it cools.

In order to remove the sludge from the bottom of the distiller, until some time ago one acted manually by opening an upper hatch of the distiller and by operating with spatulas, shovels or the like: this operation was performed when the machine was cold in order to reduce the amount of noxious gases which the operator was forced to inhale during this operation.

Increasingly restrictive work safety and health rules require that the personnel assigned to maintenance be protected against these fumes, and devices meant to empty the sludge mechanically have therefore been devised: mechanical devices currently provided for the removal of sludge from the bottom of the distiller also operate when the machine is cold and the sludge has a very pasty consistency: this causes known sludge extraction devices to be rather complicated and strongly built and thus to entail hardly negligible costs: also, the fact remains that the handling of pasty substances is always rather awkward.

The aim of the present invention is to obviate the above described drawbacks of known devices, i.e. to provide a device for extracting sludge from a distiller which is extremely simple, has an extremely modest cost and allows to perform sludge removal operations in conditions of extreme safety and with the maximum protection of the health of the operators assigned to the task.

Within the scope of this technical aim, an object of the present invention is to achieve the above aim with a structure which is simple, relatively easy to execute in practice, safe in use and effective in operation as well as relatively modest in cost.

This aim and this object are both achieved by the present device for extracting sludge from a distiller of a dry-cleaning machine, characterized in that it is constituted by a sealed container provided with an upper inlet, which is selectively connected to a first valve sealingly connected to a lower discharge duct of a distiller of a dry-cleaning machine and to a valve for connection to a source of pressurized compressed air, and with a lower out-

let, which is connected by means of a pipe to a sludge accumulation tank, the opening of said first valve at the end of the distillation operations allowing the gravity descent of the hot sludge from the distiller toward the container, whereas the subsequent closure of said first valve and the opening of the second valve causes the emptying of the container into the tank.

Further particularities will become apparent and evident from the detailed description of a preferred but not exclusive embodiment of a device for extracting sludge from a distiller of a dry-cleaning machine according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a sectional side view, taken along a diametrical plane, of a device according to the invention;

figure 2 is a schematic view of the connection of the device to a dry-cleaning machine.

With particular reference to the above figures, the reference numeral 1 generally designates the device for extracting sludge from a distiller of a dry-cleaning machine according to the invention.

The device 1 is constituted by a sealed container 2 which is provided with an upper inlet 3 which is selectively connected to a first valve 4, which is sealingly connected to a lower discharge duct 5 of a distiller 6 of a dry-cleaning machine, or to a second valve 7 which is connected, with the interposition of a pressure reduction unit 8, to a pipe 9 for the supply of compressed air.

The container 2 is provided, in a downward region, with a lower outlet 10 which is connected by means of a pipe 11 to a sludge accumulation tank 12.

The sealed container 2 is constituted by two dome-shaped half-shells 13a, 13b which have respective mutually facing lips 14 compressed against each other by a shaped perimetric strap 15 which is tightened by means of a screw clamp 16; a sealing gasket 17, made of deformable material, is arranged between the lips; the half-shells are provided with respective threaded sleeves 18a, 18b for connection to the pipes for feeding and removing the sludge and the compressed air.

Means for the mutual connection of said valves are provided and allow the connection of the compressed air source to the container only when the first valve is closed, in order to prevent air from flowing toward the distiller.

The first valve is circuitally connected to the machine programming circuit so that it is opened toward the distiller at the end of the distillation step for a preset distiller emptying time; the second valve is also opened for a preset time in order to empty the container 2 into the tank 12. The opening of the first valve at the end of the distillation

operations allows the gravity descent of the hot sludge from the distiller toward the container, whereas the subsequent closure of said first valve and the opening of the second valve produces an overpressure condition in the container 2 and thus the emptying of the container into the tank 12 by pumping.

The device according to the invention acts on the sludge at high temperature, which is an extremely fluid liquid which can be processed practically like water: the device according to the invention does not have moving parts meant to make contact with the sludge and does not have regions subject to the accumulation or forming of deposits when the solidified sludge assumes a pasty consistency.

In practice, the operation for eliminating the sludge from the distiller occurs at the end of each distillation step, when the sludge is still hot and fluid: the sludge cools only in the accumulation tank 12: the operation takes place automatically without manual interventions, and the only dissipation into the environment is due to the excess pumping air, which is discharged from an appropriate opening of the plug of the tank, which can be provided with a filter if necessary; in any case the fact is stressed that this air which arrives from 9 is clean and affects the sludge for a short time in 12 and is therefore very poor in pollutants.

It has thus been observed that the device according to the invention achieves the intended aim and object.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details may furthermore be replaced with other technically equivalent ones.

In practice, the materials employed, as well as the shapes and dimensions, may be any according to the requirements without thereby abandoning the scope of the protection of the following claims.

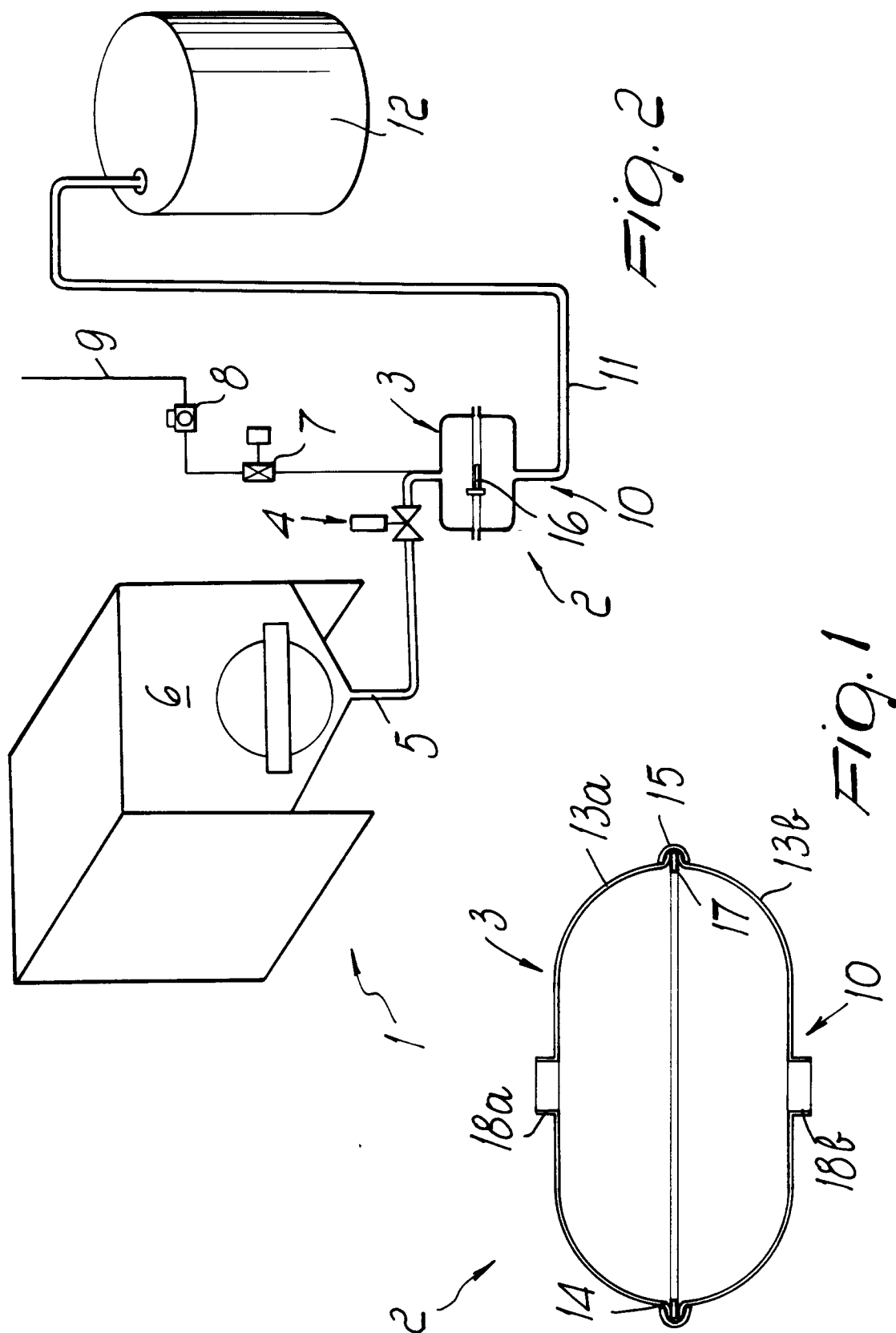
Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Device for extracting sludge from a distiller of a dry-cleaning machine, characterized in that it is constituted by a sealed container (2) provided with an upper inlet (3), which is selectively connected to a first valve (4), sealingly connected to a lower discharge duct (5) of a

distiller (6) of a dry-cleaning machine and to a valve (7) for connection to a source of pressurized compressed air, and with a lower outlet (10), which is connected by means of a pipe (11) to a sludge accumulation tank (12), the opening of said first valve (4) at the end of the distillation operations allowing the gravity descent of the hot sludge from said distiller toward said container (2), whereas the subsequent closure of said first valve (4) and the opening of said second valve (7) causes the emptying of said container (2) into said tank (12).

2. Device according to claim 1, characterized in that said sealed container (2) is constituted by two half-shells (13a,13b) which have respective lips (14) pressed against each other by a perimetric strap (15), a sealing gasket (17) made of deformable material being advantageously arranged between said lips (14).
3. Device according to claim 1, characterized in that means for interconnecting said valves (4,7) are provided and are suitable to allow the connection of said pressurized compressed air source to said container (2) only when said first (4) valve is closed in order to prevent air from flowing towards said distiller (6).
4. Device according to claim 1, characterized in that said first valve (4) is circuitally connected to the machine programming circuit and is suitable to be opened toward the distiller (6) at the end of the distillation step, and in that the second valve (7) is subsequently opened after a preset time and for a preset time.





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EUROPEAN SEARCH REPORT

Application Number

EP 93 10 3408

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.5)
A	DE-C-3 818 844 (W. JOST) * column 5, line 44 - line 59; figure 2 * ---	1	D06F43/08
A	GB-A-1 338 607 (KINGSDOWN INSTRUMENT COMPANY LIMITED) * claim 1; figures * ---	1	
A	US-A-2 979 375 (DETREX CHEMICAL INDUSTRIES) * column 7, line 10 - line 41; figures 2,3 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D06F F04F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 JUNE 1993	Examiner COURRIER G.L.A.
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			