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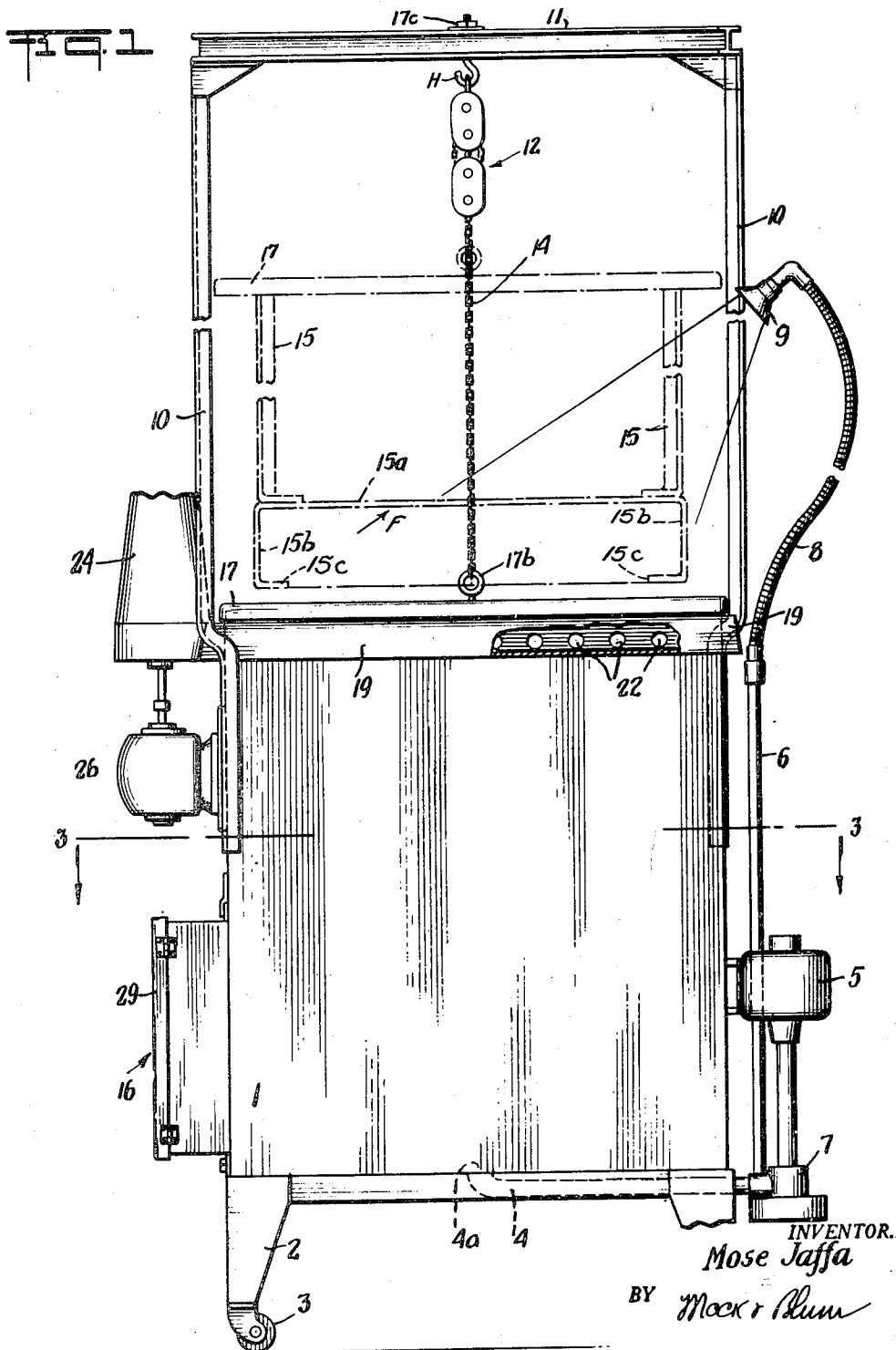
M. JAFFA

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DEGREASING APPARATUS EMBODYING MEANS FOR CONFINING SOLVENT VAPOR

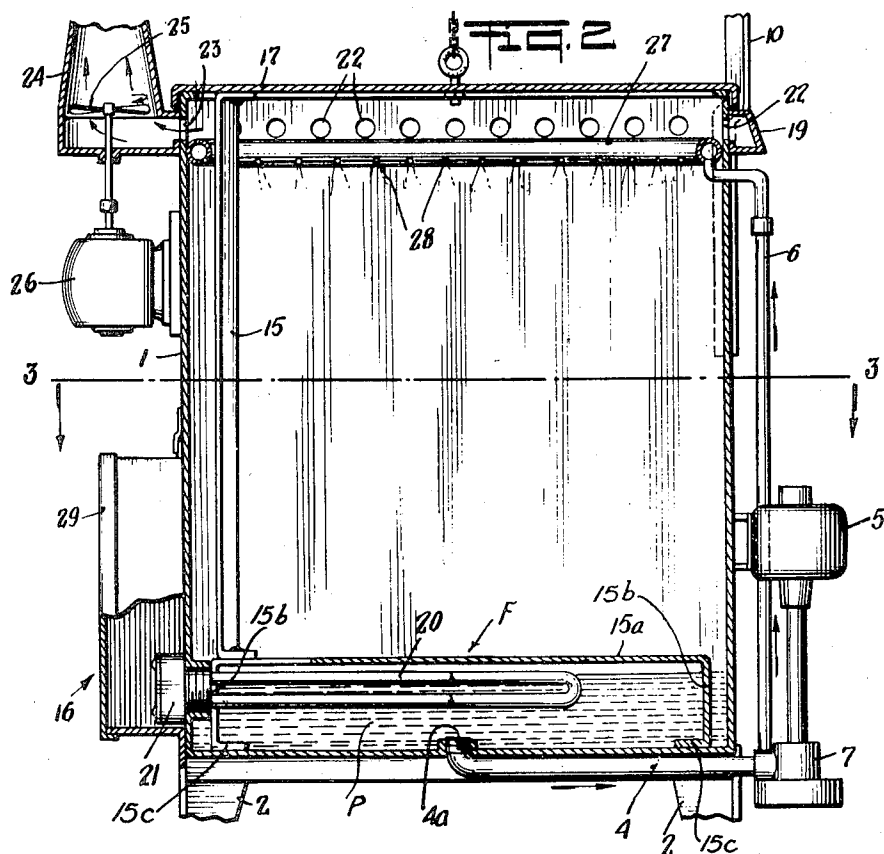
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3 Sheets-Sheet 2



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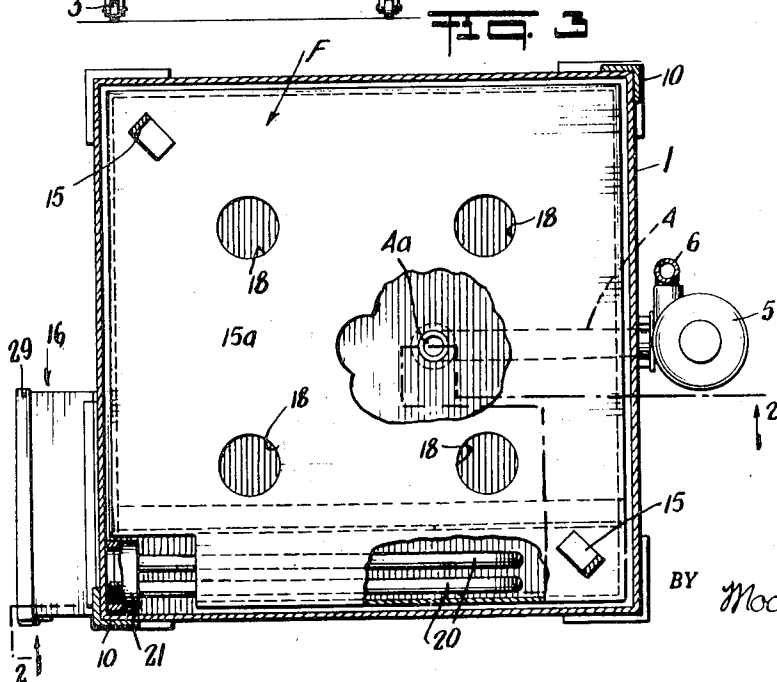
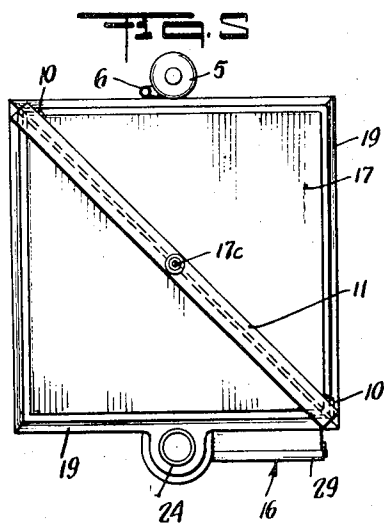
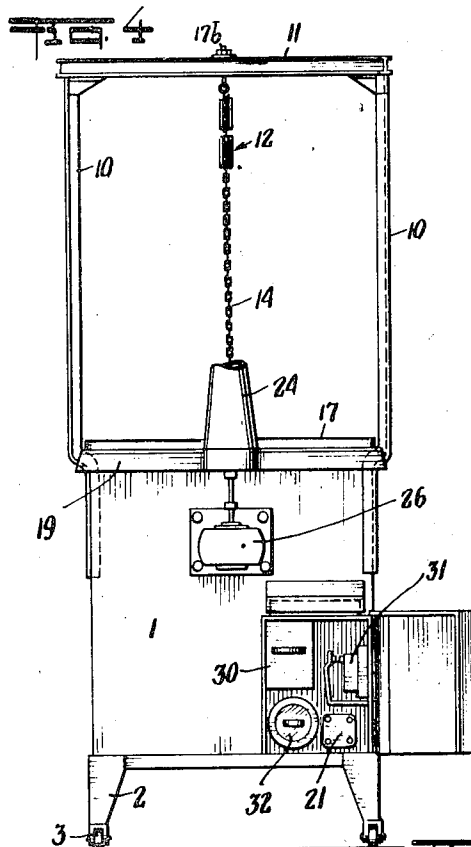
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2,442,272

DEGREASING APPARATUS EMBODYING
MEANS FOR CONFINING SOLVENT
VAPOR

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Application March 21, 1944, Serial No. 527,513

2 Claims. (Cl. 202-170)

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My invention relates to a new and improved degreasing apparatus for degreasing metal articles or the like.

One of the objects of my invention is to provide a portable degreasing apparatus which utilizes a grease-solvent which is or may be vaporized under operating conditions. Such solvent may be tetra-chloro-ethylene, $\text{CCl}_2:\text{CCl}_2$, which is also designated as perchloroethylene. This has a boiling point of 121°C .

Another object of my invention is to provide a portable degreasing unit which has means for preventing the vapor of the solvent from entering the work-room.

Another object is to provide an apparatus which has a tank whose upper end has an outer and laterally extending exhaust casing, and a cover for the tank which is located above said casing.

Numerous additional objects of my invention will be stated in the annexed description and drawings, which illustrate preferred embodiments thereof.

Fig. 1 is a front elevation of one embodiment which is provided with a spray head. The upper positions of the cover for the tank and of the frame on which said cover is supported, are shown in broken lines.

Fig. 2 is a vertical section, partially in elevation, of a second embodiment.

Fig. 3 is a section on the lines 3-3 of Fig. 1 and Fig. 2, part of the representation of the frame 15a being omitted.

Fig. 4 is a side elevation of Fig. 1, on a smaller scale.

Fig. 5 is a top plan of Figs. 1 and 2, taken at a level directly above the cover.

Both embodiments are the same, save that the embodiment of Fig. 1 has a spray-head 9 and the embodiment of Fig. 2 has a spray pipe 27, which has spraying perforations 28.

The tank 1, which is rectangular in horizontal cross-section, has a bottom tank-wall, in which the end 4a of pipe 4 is fixed by means of a liquid-tight joint. The other end of said pipe 4 is connected to the casing of a pump 7, which is operated by motor 5. Said casing has a discharge pipe 6. The solvent, such as perchloroethylene or the like, is forced out of the casing of pump 7, upwardly through pipe 6.

In the embodiment of Fig. 1, the pipe 6 is connected to a flexible pipe 8, to which spray-head 9 is connected.

The heater is of the conventional electric type. The control box 16 is provided with a movable door 29. This box 16 is provided with the usual switch 30, relay 31, and thermostat 32 for controlling the supply of current to the electric resistance coil or coils (not shown), which supply heat to the

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electric heater 21, whose heat is communicated to the tubes 20. These tubes 20 are closed at their free ends, and they are laterally disposed. These parts and the control whereby a substantially uniform temperature of the solvent is maintained, are standard equipment, so that no detailed description thereof is necessary. The tubes 20, which are closed to save adjacent the heater, conduct the heat to the interior of the tank.

The solvent is maintained at the bottom of the tank 1, in a pool P whose height is maintained at about four inches. This pool of solvent is maintained at a temperature which is below and close to its boiling point by means of the heater and thermostat. Some of the solvent will vaporize and some of said vapor will condense on the thin vertical metal walls of tank 1, which radiate heat very freely so that the temperature of said walls is normally below the boiling point of the solvent.

A small amount of the vaporized solvent may escape from the top of the tank, if this is open, into the work-room.

The heat-conducting tubes 20 are located in the pool P.

A frame F can rest upon the bottom wall of tank 1. Said frame F has a top wall 15a which is provided with a lateral slot or slots, adjacent heater 21. The respective vertical wall 15b of said frame F which is adjacent heater 21, is vertically slotted, in order to clear tubes 20 when the frame F is raised and lowered. Said frame F has horizontal supporting flanges 15c at the bottom ends of its vertical walls 15b. The horizontal flange 15c which is adjacent heater 21 is horizontally slotted, so that the tubes 20 will not obstruct the free raising and lowering of frame F.

Standards 15 are fixed to the top wall 15a of frame F.

As shown in Fig. 3, top wall 15a of frame F is provided with a series of openings 18, so that the vaporized solvent can pass from the bottom of the tank 1 to the interior thereof.

A cover 17 is fixed to the top horizontal flanges of standards 15.

When frame F is supported upon the bottom wall of tank 1, said cover 17 closes the open top of tank 1.

An eye 17b is fixed to the top wall of cover 17. The lower end of a chain 14 is connected to eye 17b. Said chain 14 can be raised or lowered by a conventional hoist 12, which is supported from a hook H which is fixed to diagonal bar 11. The top of said hook H is threaded and said hook is fixed to bar 11 by nut 17c. Said bar 11 is fixed to the tops of standards 19, whose bottom end-portions are fixed to the outer wall of tank 1.

As shown in broken lines in Fig. 1, the frame

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F and the standards 15 and the cover 17 can be raised as a sub-unit, until frame F is located wholly above tank 1.

Adjacent the top of tank 1, its walls are provided with perforations 22. There can be one or more of said perforations. These perforations 22 communicate with the interior space of an external exhaust casing 19, which is fixed to the outer wall of tank 1. Said exhaust casing 19 has an outlet port 23, which is connected to exhaust pipe 24, which is provided with a blower 25, which is operated by motor 26.

When the cover 17 is in its closing position, any vapor which rises to the top of tank 1 will escape through perforations 22 into the interior space of the exhaust casing 19, and such vapors will be discharged through exhaust pipe 24 to any convenient outlet, so that such vapor cannot enter the work-room.

Only a small amount of vapor will be produced under normal working conditions, so that the fan-blower 25 will be operated at low speed, and the internal pressure in tank 1 can be kept close to atmospheric pressure. The vapor which is forced through pipe 24 can be condensed and returned to the tank.

In the embodiment of Fig. 2, the liquid solvent will be discharged downwardly through the holes 28, upon the metal objects which are supported on the top wall 15a of frame F, or which are held in perforated baskets which are supported on said top wall of frame F.

The metal objects will thus be supported above the top of pool P.

In the embodiment of Fig. 1, when the spray-head 9 is used, the articles can be located in perforated baskets which are located in tank 1. The frame F can be raised high enough so that it will not be in the path of the spray of solvent which is produced by spray-head 9.

As an alternative, the objects can be supported on frame F, or in perforated baskets which are supported on frame F, and said frame can be raised to any convenient height, at which cover 17 is located above spray-head 9. When the cover 17 is above spray-head 9, frame F can be located within the tank 1, at any desired distance below the top of tank 1, or frame F can be located above the top of tank 1, at any desired height above said top of tank 1.

When the spray-head 9 is utilized in the embodiment of Fig. 1, the motor 26 and blower 25 can be operated, if desired, or the operation of motor 26 and blower 25 can be stopped.

The spray-pipe 27 is shaped and located so that the frame F and the uprights 15 can be raised until said frame F is above the tank, without contacting with said spray-pipe. Said spray-pipe can be of rectangular shape, located close to the upstanding tank-walls of tank 1. The spray openings 28 are directed so as to spray the solvent over the entire horizontal cross-section of the tank 1.

I have described preferred embodiments of my invention, but numerous changes and additions and omissions can be made without departing from its scope, as defined in the appended claims.

I claim:

1. A degreasing device comprising a tank, said tank having upstanding tank-walls and a bottom tank-wall, an electric heater associated with said tank, heat-transmitting means associated with said heater, said heat-transmitting means being located in said tank adjacent its bottom tank-wall and being fixed to said tank, a frame located in

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said tank, said frame being movable relative to said tank, said frame being shaped to rest on said bottom tank-wall, said frame having upstanding frame-walls and a top frame-wall, one of said upstanding frame-walls having a slot therein, said heat-transmitting means extending through said slot and being located between said top frame-wall and said bottom tank-wall when said frame rests on said bottom tank-wall, said frame being open at its bottom to clear said heat-transmitting means when said frame is raised and lowered, said frame having upstanding supporting means fixed thereto, a cover for said tank, said cover being connected to the top of said upstanding supporting means, said cover closing said tank when said frame rests on said bottom tank-wall, said tank having an external exhaust-casing fixed to said tank adjacent the upper end of said tank, the top of said exhaust casing being below said cover when said cover is in closing position, the upstanding tank-walls having perforations at said exhaust casing to provide communication between said tank and the interior space of said exhaust-casing, said exhaust-casing being closed save at an outlet port in the outer wall of said casing, a spray pipe located in said tank below said perforations, pumping means for pumping liquid from the bottom of said tank to said spray pipe.

2. A degreasing device comprising a tank which has a bottom tank wall and upstanding tank walls, said tank being open at its top, heater tube means located in said tank, a frame which is shaped to be located in said tank, said heater tube means being located in said tank above said bottom tank wall and extending inwardly into said tank from an upstanding tank wall, said frame being vertically movable up-and-down relative to said tank, said frame having a top wall and a bottom supporting flange and an upstanding wall which connects said top wall and said bottom supporting flange, said frame being downwardly movable relative to said tank to a lower position in which said bottom supporting-wall rests on said bottom tank wall, said tube means being located in a vertical zone between said top wall and said bottom supporting-wall when said frame is in said lower position, said bottom supporting-wall and said upstanding wall being shaped to clear said tube means, said frame being upwardly movable above the top of said tank, a cover for said tank, said cover being located above said frame and being fixed to said frame, said cover closing the top of said tank when said bottom supporting-wall rests on said supporting means, said top wall of said frame having an opening therein, a pump which has an inlet which is connected to said bottom tank wall, said pump having an outlet which is located to communicate with the interior of said tank above said frame when said frame is in said lower position.

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