Dec. 10, 1957 R. W. LEGLER 2,816,065

VAPOR DEGREASOR

Filed April 18, 1955

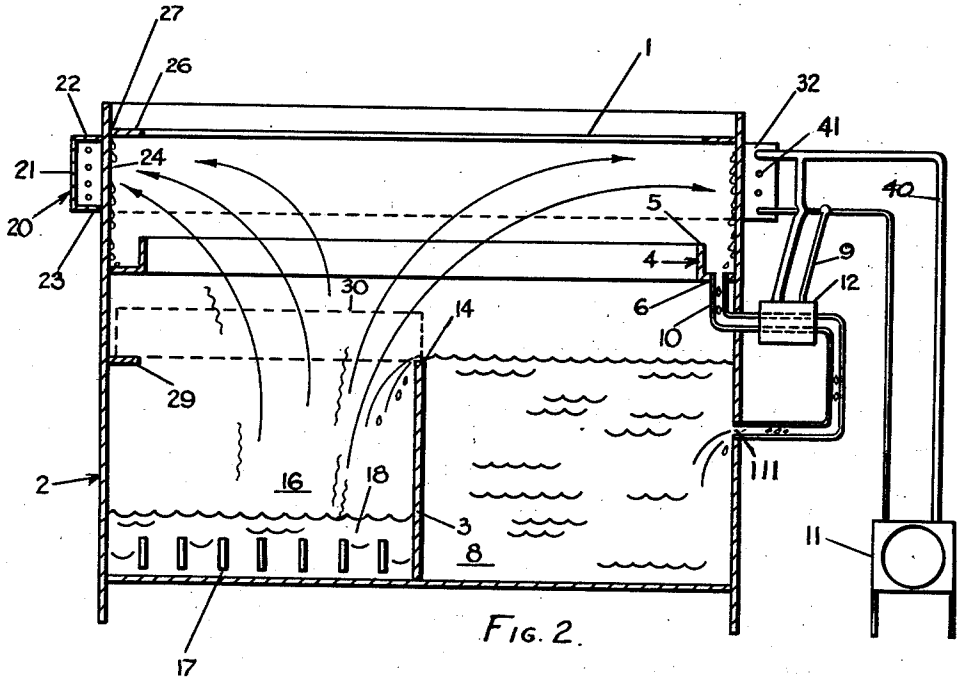

FIG. 2.

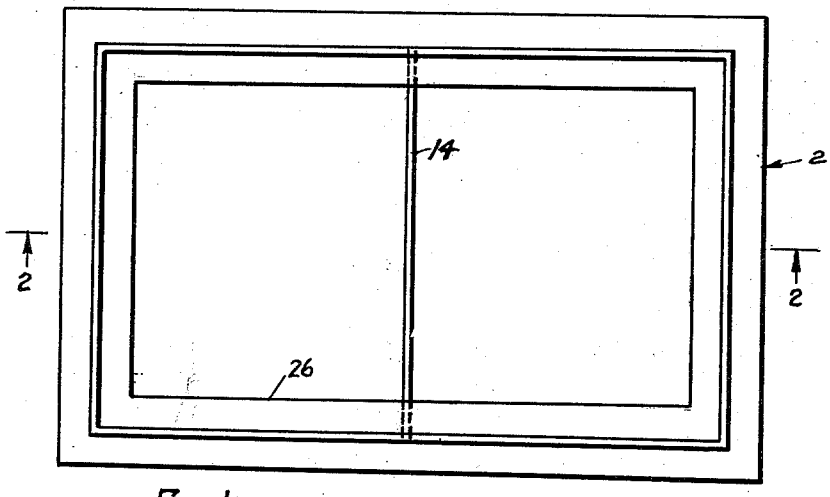

FIG. 1.

Inventor

Raymond W. Legler

By

Charles L. Lorenchek

Attorney

United States Patent Office 2,816,065 Patented Dec. 10, 1957

2,816,065

VAPOR DEGREASER

Raymond W. Legler, Erie, Pa.

Application April 18, 1955, Serial No. 501,945

2 Claims. (Cl. 202—170)

This invention relates to degreasers and more particularly to degreasers for removing foreign substances from articles of manufacture.

In degreasers made according to previous designs, the vapor used in the degreaser was heated and the vapor passed up over the work and through cooling coils which were cooled by water which flowed through the cooling coils and then wasted. This condensed the vapor and caused it to fall back into the tank. It is difficult to obtain low temperature cooling water in some localities. In other localities, water shortages prevail and it is desirable to conserve water. In the present invention, a refrigerated jacket is provided around the outside of the upper edge of the tank which cools the inside surface of the tank and as vapor flows up from the heated reservoir, it engages the refrigerated surface and is condensed and falls back into a trough which conveys the condensate through a refrigerated pipe and thence into a reservoir tank from which it spills over into a heated tank.

It is, accordingly, an object of this invention to provide a degreaser which overcomes the defects in prior degreasers and, further, to provide a degreaser which is simple in construction, economical to manufacture, and simple and efficient to use.

Another object of this invention is to provide a degreaser wherein the vapor is condensed by means of a refrigeration system which enables a higher temperature to be used in boiling the solvent without any greater resulting loss of solvent than is ordinarily used in degreasers.

Another obect of the invention is to provide a degreaser wherein the vapor is condensed by a refrigeration device and a novel type of baffle is disposed above the refrigeration device whereby the vapor is directed onto the refrigerated walls.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawing and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:

Fig. 1 is a top view of a degreaser; and

Fig. 2 is a cross sectional view taken on line 2—2 of Fig. 1.

Now with more specific reference to the drawing, a degreaser 1 is disclosed wherein a tank 2 has a partition or baffle 3 intermediate the length thereof. The partition 3 extends upward to a point just below a trough 4 and approximately midway of the height of the degreaser 1. The trough 4 forms a channel around the inner periphery of the degreaser tank 2 and has a side wall 5 and a bottom wall 6. The trough 4 is connected to a reservoir 8 through a pipe 10 which is connected to the bottom of the trough 4 and flows through the pipe 10 and discharges through an opening 111. A jacket 12 surrounds

the pipe 10 at a point thereon outside the tank 2 and is connected to a refrigeration system 11 through pipes 9 and 40. The condensate flowing from the trough 4 to the pipe 10 is cooled before it discharges through the opening 111 into the reservoir 8. If the reservoir portion 8 fills up, the liquid therein will spill over the top edge 14 of baffle 3 and into a heating portion 16. Electrical heating elements 17 are disposed in the heating portion 16 to heat the liquid to boil the liquid 18 in the lower portion thereof.

A duct 20 having a side portion 21, an upper portion 22, and a lower portion 23 is welded to the outside edge of the tank 2 so that the portion 24 of the inside of the tank 2 is constantly cooled to a low temperature. A plate like shelf 26 is welded to the side walls along the inner surface at 27 and forms a shelf around the inner periphery thereof just above the refrigerated portion 24. Vapor boiled off of the heating portion 16 in the direction of the arrows engages the cooled portion 24 and is condensed and falls down into the trough 4. The convection currents due to the condensing of the fluids will be in the direction of the arrows and, therefore, little or no vapor will escape from the tank 2. The shelf 26 forms a belt along the inner periphery of the tank 2 and, therefore, directs the fluid 18 into engagement with the cold wall downward into the trough 4. A container 30 of parts to be degreased can be supported at one end thereof on the upper edge 14 and the other end can be supported on the edge of a bracket 29.

The refrigeration coils 41 are disposed in the duct 20 and are connected to the pipe 40 which is the gas line from the refrigeration system 11. The refrigeration system 11 is made up of a conventional motor driven compressor, liquid line 9, and gas line 40. The coils 41 connected between the line 40 and the line 9 constitute the evaporator of the refrigeration system 11 and the compressor has associated therewith the usual expansion valves.

In operation, the reservoir 8 is filled to overflowing with solvent such as trichloroethylene. The solvent from the reservoir portion 8 spills over into the heating portion 16 and is heated by the heating coil 17 and vapors are boiled off.

Parts to be degreased are put in the basket 30 and the vapors pass up through the basket 30, condensing thereon and washing the grease and other foreign materials therefrom. Any vapors which escape past the basket 30 of parts will blow upward and the vapors along the edge of the container 30 will pass by the cooled edge 24 and be cooled, causing them to condense and fall back into the trough 4. This will set up convection currents which will draw the vapor down below in the direction of the arrows. The shelf 26 will help direct the vapors into engagement with the cold surface 24. As pointed out above, the refrigeration unit 11 will be operatively connected to the duct 20 by means of the refrigeration coils and the duct 20 itself will be filled with some low freezing liquid such as ethylene glycol. The refrigeration pipes are likewise connected to the units which help to further condense the liquid 18 as it returns to the reservoir 8.

The foregoing specification sets forth the invention in its preferred practical forms but the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A vapor degreaser comprising a tank, the lower portion of said tank having a partition therein extending upward from the bottom thereof and terminating between

the top and bottom and dividing said tank into a heated portion and a reservoir portion, a duct formed around the upper edge of said tank around the outside thereof, said duct adapted to contain a liquid having a low freezing point, a refrigeration coil in said duct, a refrigeration compressor operatively connected to said refrigeration coil, a trough attached to the inside of the wall of said tank disposed at a height intermediate the height of said partition and said duct, conduit means connecting said trough to said reservoir portion, and refrigeration means adapted to cool condensate flowing through said conduit from said trough to a container.

2. The degreaser recited in claim 1 wherein a narrow plate shaped shelf is disposed around the inside of said tank at a greater height than said refrigeration duct.

References Cited in the file of this patent

UNITED STATES PATENTS

2,020,335	Savage	Nov. 12, 1935
2,036,261	Dinley	Apr. 7, 1936
2,057,177	Wolff	Oct. 13, 1936
2,091,187	Savage	Aug. 24, 1937
2,220,124	Seaton	Nov. 5, 1940
2,223,595	Blakeslee	Dec. 3, 1940
2,369,050	Helfenstein	Feb. 6, 1945
2,447,840	Boss	Aug. 24, 1948

OTHER REFERENCES

Perry's Handbook of Chemical Engineering, 3rd ed., page 16797.