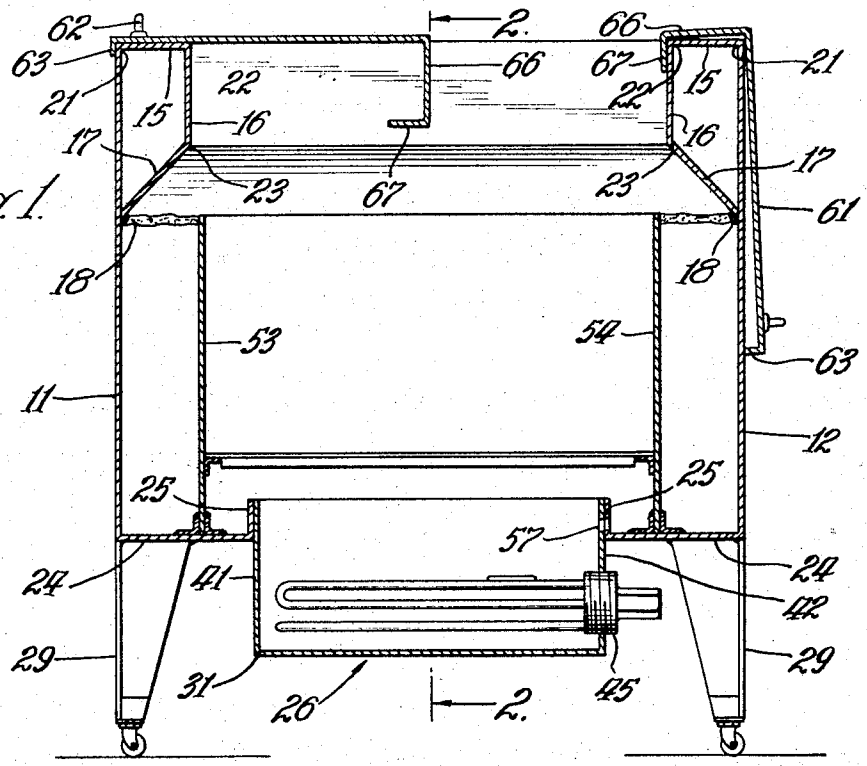
Sept. 14, 1943. W. D. PHILLIPS ET AL 2,329,674

DEGREASING APPARATUS

Filed Aug. 3, 1940

Fig. 1.



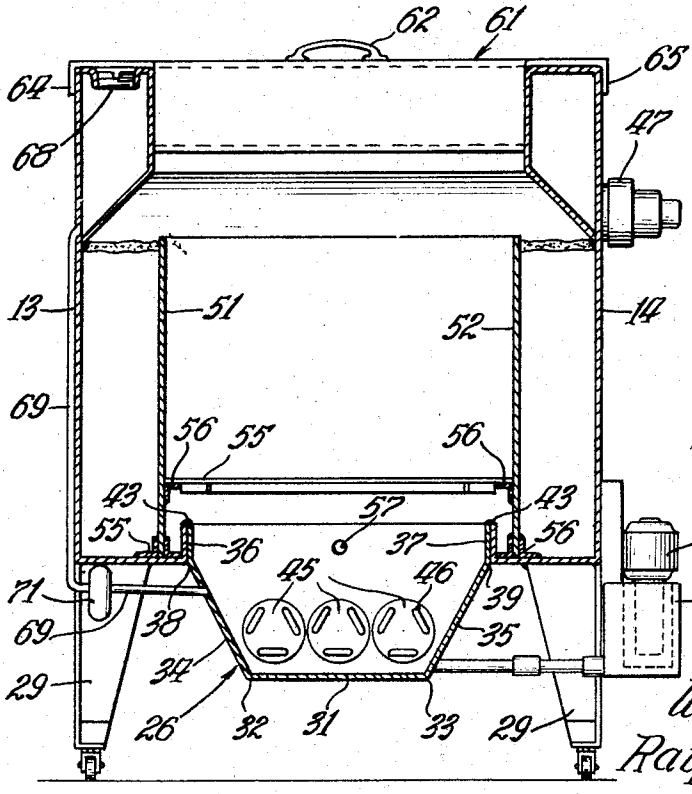
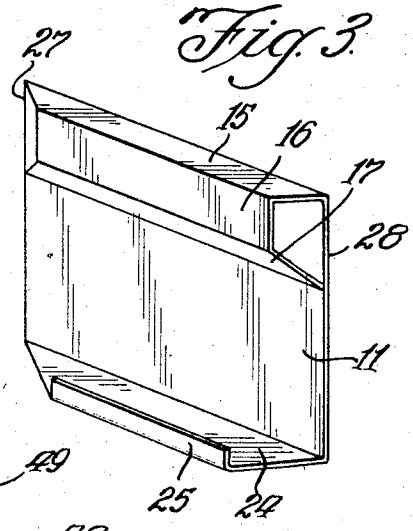


Fig. 2.

Fig. 3.



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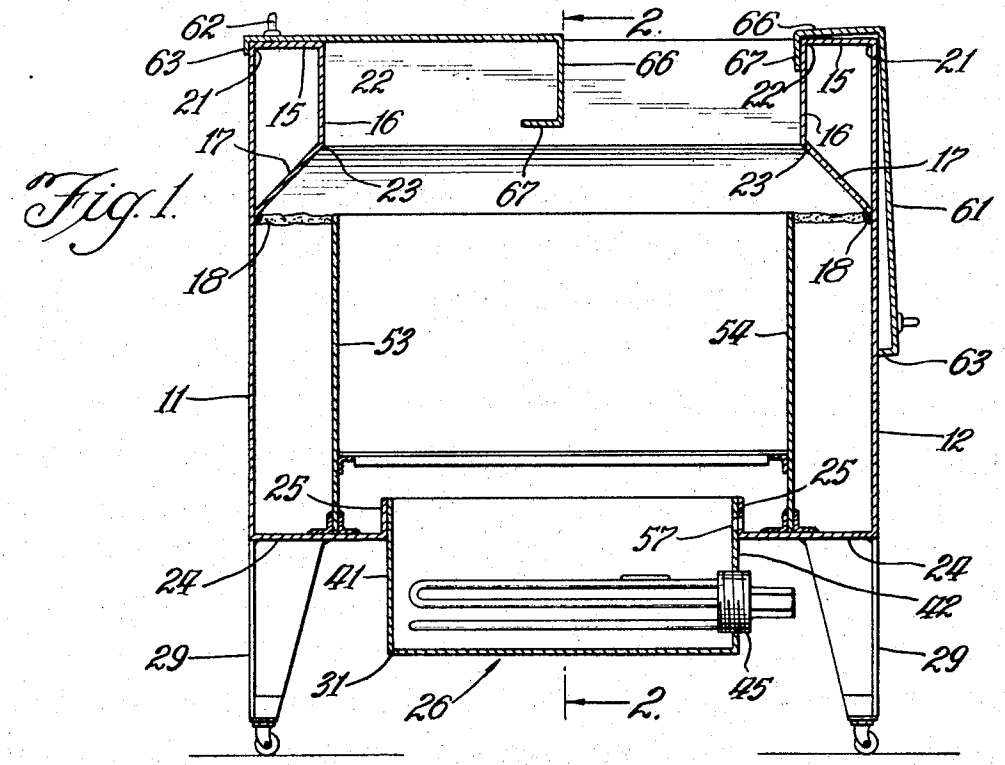


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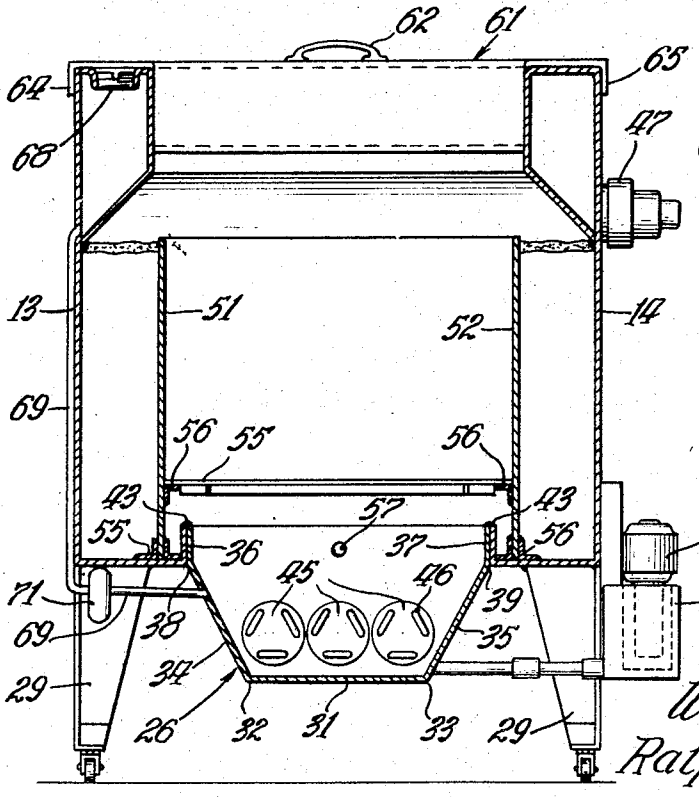


Fig. 2.

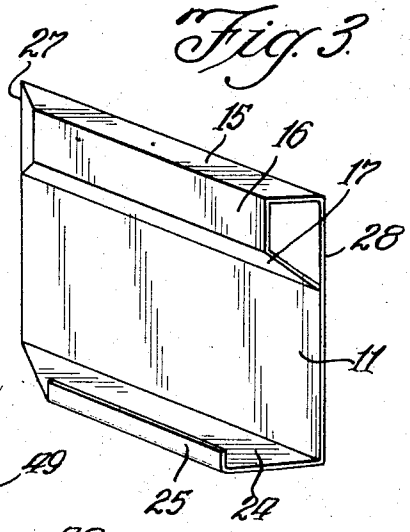


Fig. 3.

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UNITED STATES PATENT OFFICE

2,329,674

DEGREASING APPARATUS

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Application August 3, 1940, Serial No. 351,018

3 Claims. (Cl. 202—170)

This invention relates to a degreasing apparatus and particularly to a new and improved degreasing cabinet having certain inherent advantages not contemplated in the prior art. One of the particular objects of the invention is to provide a degreasing cabinet with a new and novel mechanical design wherein a cabinet of comparatively small size and weight is arranged to include a relatively large vapor treating chamber adapted to handle large and heavy machinery.

A further object of the invention is to provide a degreasing cabinet having a maximum strength at the upper rim of the cabinet to resist accidental damage resulting from possible impact of heavy machinery being hoisted into or from the vapor chamber of the cabinet.

A further object of the invention is to provide a degreasing cabinet of novel design arranged to include means to compensate for the natural expansion of the metal during extreme and rapid changes in temperature to prevent buckling or splitting of the cabinet walls when subjected to comparatively great or uneven changes in temperature.

Referring now more particularly to the drawing:

Fig. 1 is a longitudinal sectional view through a degreasing cabinet constructed in accordance with the principles of this invention;

Fig. 2 is a transverse sectional view taken substantially on the plane of the line 2—2 in Fig. 1;

Fig. 3 is a detail perspective view of one of the four wall sections of the cabinet illustrated in Figs. 1 and 2.

The cabinet structure

The degreasing cabinet illustrated in Figs. 1, 2, and 3 comprises a unitary structure consisting of four similar vertical wall plates 11, 12, 13, and 14 preferably formed of heavy sheet metal material and welded to each other at each of the four corners of the rectangular cabinet. It is contemplated that the walls 11, 12, 13, 14 may be formed of comparatively heavy iron or steel plates, but to provide maximum durability and strength it has been found advisable to provide a reinforced upper rim portion capable of withstanding great physical impact. In this connection it may be well to point out that the cabinets here illustrated are of a size sufficient to accommodate quite large and heavy castings, as for example, the main castings on large engines, and that these casings are usually placed in the chamber by means of a crane or other hoist because of their great mass and weight. In high speed production it is not an infrequent occurrence for such a casting to be lowered inaccurately or otherwise caused to strike the upper rim of the degreasing cabinet with a great impact. It is desired, therefore, to form the upper rim of the cabinet in a manner to effectively resist such blows and to this end we prefer to fold each of the metal wall plates 11, 12, 13, and 14 inwardly at their upper edge to provide a horizontal top portion 15, thence downwardly to provide a portion 16 and an inclined portion 17 joining the lower extremity of the portion 16 with the vertical surface of the outer wall. The lower edge of the inclined portion 17 is preferably welded to the wall along the weld 18, but it is to be particularly noted that this welded joint is remote from the upper rim of the cabinet and very well protected against accidental impact and that the exposed corners 21, 22, and 23 are bent or folded portions of the wall plates capable of withstanding great physical shock without danger of separation. When constructed in this manner the upper rims of the degreasing cabinet possess unusually great inherent strength and are well adapted to resist physical shock or impacts, and in addition the upper rim of the cabinet comprises a hollow chamber adapted to be used as a solvent reservoir or air cooled condenser, as will appear hereinafter.

At the lower extremity of the wall plates 11, 12, 13, and 14 each plate is bent inwardly to form a substantially horizontal bottom portion 24 extending partially across the floor of the cabinet and is then bent upwardly to provide a short marginal upstanding flange 25 between the horizontal portions 24 of the cabinet floor and a central vaporizing sump 26. From the foregoing description it will be seen that each of the wall plates is formed to include an upper rim of hollow configuration and a lower horizontal floor section 24. The opposite ends of the four wall plates 11, 12, 13, and 14 are then cut at an angle or mitred at each end, as illustrated in Fig. 3, so that they may be assembled by welding the entire length of the end edges 27 and 28 to the corresponding edges of the other wall plates of the cabinet. This arrangement possesses certain inherent advantages as far as physical strength is concerned since the only welded joints are along the weld 18 and the end edges 27 and 28 and when the cabinet is assembled, these welds are positioned in the corners comparatively well protected against impact due to careless handling of castings being

lowered into the chamber. The cabinet legs **29** are preferably welded to each corner of the cabinet.

The vaporizing sump **26** comprises a main bottom plate **31** folded at the points **32** and **33** to provide angular inclined side walls **34** and **35** joined to the short vertical side walls **36** and **37** by folds **38** and **39**. End plates **41** and **42** are welded to the main bottom plate **31** and the entire vaporizing sump **26** is of proper dimensions so that the upper marginal edges formed by the vertical portions **36** and **37** and the end plates **41** and **42** are of proper size and shape to fit closely within the central orifice defined by the four vertical sections **25** on the main wall plates **11**, **12**, **13**, and **14** of the cabinet.

The sump **26** is secured in position by welding the upper marginal edge of the sump to the upper marginal edge of the vertical portions **25** to provide a weld **43** extending entirely around the sump. It is to be particularly noted, however, that the weld **43** is at the extreme upper portion of the rim of the sump and that the vertical portion **25** lies in close relationship with the walls **36**, **37**, **41** and **42** of the sump but is not rigidly connected therewith. This arrangement provides a double upstanding flange extending entirely around the vaporizing sump **26** which by reason of its double walled construction is comparatively yieldable and may compensate for any equalities in expansion and contraction of the entire degreaser cabinet and thus prevent any unnecessary strains on the metal which might otherwise tend to split the welded joints connecting the several plates forming the cabinet.

The sump **26** is provided with a plurality of electrical heating elements **45** threaded into the wall **42** of the sump, and provided with a high temperature thermostat bulb **46** and a vapor level thermostat **47** arranged to actuate an electrical switch and control the operation of the heating elements as more fully illustrated in our co-pending application, Serial No. 338,478, filed June 3, 1940.

A sediment sump **48** and flushing pump **49** are also preferably provided, but since these structures form no pertinent part of the present invention, they will not be described in detail.

It is desirable to provide a marginal partition within the degreaser cabinet to define a vapor treating area, and for this purpose vertical walls **51**, **52**, **53**, and **54** are mounted between suitable angle irons **55** and **56** secured to the floor portion **24** of the cabinet. The walls **51**, **52**, **53**, and **54** serve to separate the central area from the outer walls of the cabinet to provide a double-walled construction in which the space between the two walls acts as a thermal insulation to prevent unduly rapid condensation of the hydro-carbon vapors. In addition to this it is to be appreciated that this arrangement assists in maintaining a proper vapor level, since whenever the vapors in the central area of the cabinet rise to a point beyond the upper edge of the walls **51**, **52**, **53** and **54**, they will overflow into the marginal chamber and condense rapidly against the relatively cool outer walls of the cabinet. A work supporting platform **55** may be provided near the lower part of the vapor treating chamber and this platform **55** is preferably supported on angle irons **56** welded or otherwise secured to the inner surfaces of the partition walls **51**, **52**, **53**, and **54**.

With this arrangement, it will be seen that all condensate formed on any work positioned within the inner partition of the chamber will fall through the platform **55** and directly into the vaporizing sump **26**, or will flow downwardly outside of the upstanding partition **25** and through the solvent port **57** into the vaporizing sump **26**.

The cabinet cover

It is desirable to provide covers for the vapor cabinet to conserve heat and to prevent cuerrnts of air from tending to disturb the normal vapor level of the device in such a manner as to cause hydro-carbon vapors to overflow into the atmosphere. It is essential, however, that these covers be of such mechanical design as to be easily operated and at the same time capable of withstanding considerable physical impact without damage. It is also desirable to arrange the covers in such a manner as to include vapor baffle surfaces designed to prevent discharge of hydro-carbon vapors into the atmosphere at the instant the cover is opened.

In the present invention these objections have been accomplished by providing a pair of relatively thin sheet metal covers **61**, each provided with a suitable handle **62**, and having outside flanges **63**, **64**, and **65** arranged to extend downwardly adjacent the wall surfaces **11**, **13**, and **14**, respectively. Inside flanges **66** are provided on one side of the rectangular covers **61** and these inside flanges extend downwardly within the walls of the cabinet and terminate in reverse hook flanges **67**.

By examination of Figs. 1 and 2, it will be seen that the inside flange **66** is of a length less than the inside dimension of the cabinet rim, so that these flanges may extend downwardly in the center of the cabinet. When the operator desires to open the covers, he may grasp one of the handles **62** and slide the entire cover **61** outwardly until the hooked flange **67** engages the inner surface of the cabinet rim. At this time the operator will lower the cover **61** into the position shown on the right-hand side of Fig. 1, where it will lie in close proximity to the walls of the cabinet. It is to be noted that the width of the inside flange **66** corresponds with the width of the cabinet rim **15**, so that when the cover is lowered into open position, it fits snugly over the cabinet rim, so that the two thicknesses of metal comprising the cabinet rim and cabinet cover, reinforce each other and provide additional resistance to physical impact. It will also be appreciated that as the cover is being opened, the inside flange **66** and reverse hook flange **67** act as vapor baffles tending to prevent any hydro-carbon vapors from being discharged from the machine as the cover is removed.

The solvent reservoir

In addition to providing a reinforced rim of great mechanical strength, the hollow upper rim of the vapor cabinet acts as a chamber which may be utilized as a reserve solvent reservoir in order to automatically maintain a predetermined solvent level in the vaporizing sump **26**. To accomplish this, I provide a filler plug **68** in the upper flat portion **15** of the hollow rim and connect the hollow rim reservoir to the vaporizing sump **26** by means of a supply tube **69** and a constant level valve **71**. The details of the constant level valve **71** are not illustrated in the drawing since they form no pertinent part of this invention, and it is believed sufficient to point out that this valve is arranged to open whenever the solvent level in the vaporizing sump **26** falls

beyond a predetermined minimum and to close and interrupt the flow of such liquid solvent through the supply tube 69 when the maximum solvent level is reached.

Having thus described and shown the invention, we claim:

1. In a high-temperature cabinet adapted for use as a vapor process degreasing chamber, the combination of a relatively rigid side wall assembly and a yieldable bottom section; said yieldable bottom section comprising a liquid sump supported in said rigid side wall assembly and a relatively flexible partition surrounding and forming a part of the sump; said flexible partition consisting of two thicknesses of metal united at their upper edge.

2. In a high-temperature cabinet adapted for use as a vapor process degreasing chamber, the combination of a relatively rigid side wall assembly and a yieldable bottom section; said yieldable bottom section comprising a liquid sump having wall portions supported in said rigid side wall assembly, and a relatively flexible partition connecting the sump and side wall assembly, said flexible partition formed of two thicknesses of metal joined only at their upper edges, one thickness of metal being continuous with or joined to the bottom of the cabinet and the other thickness being continuous with or joined to the side wall assembly.

3. In a high-temperature cabinet adapted for use as a vapor process degreasing chamber, the combination of a relatively rigid side wall assembly, a bottom section including a liquid sump and means for yieldingly supporting the bottom section in the side wall assembly including a flexible partition connecting the liquid sump to the side wall assembly, said flexible partition including two thicknesses of metal united at their upper edge surrounding and forming a part of the wall of the sump.

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