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DEGREASER WITH TWO SUMPS

Filed Feb. 15, 1943

Fig. 1.

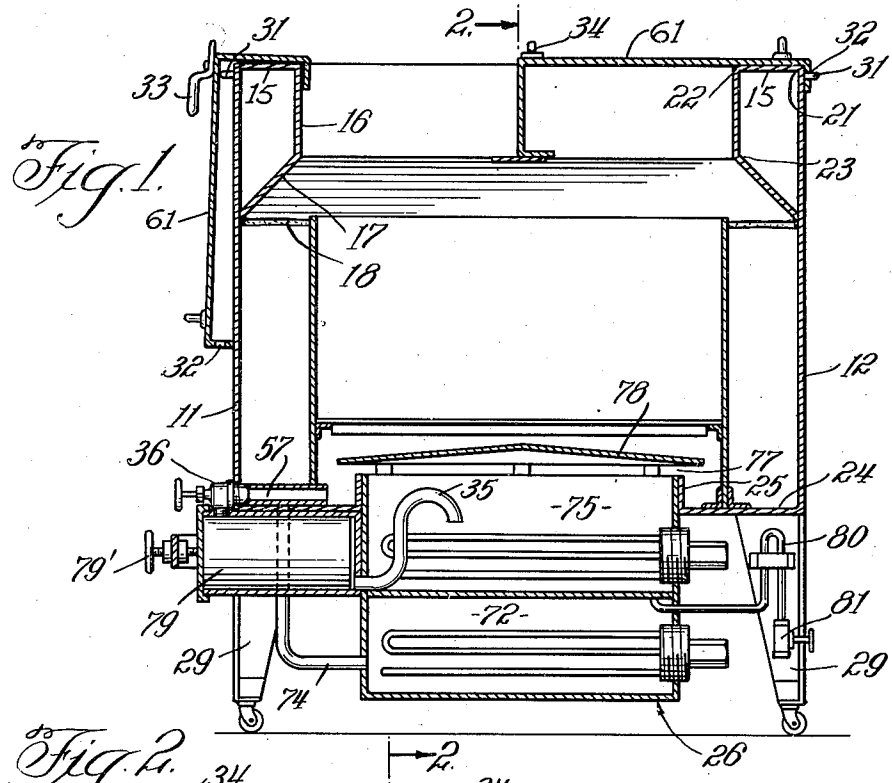


Fig. 2.

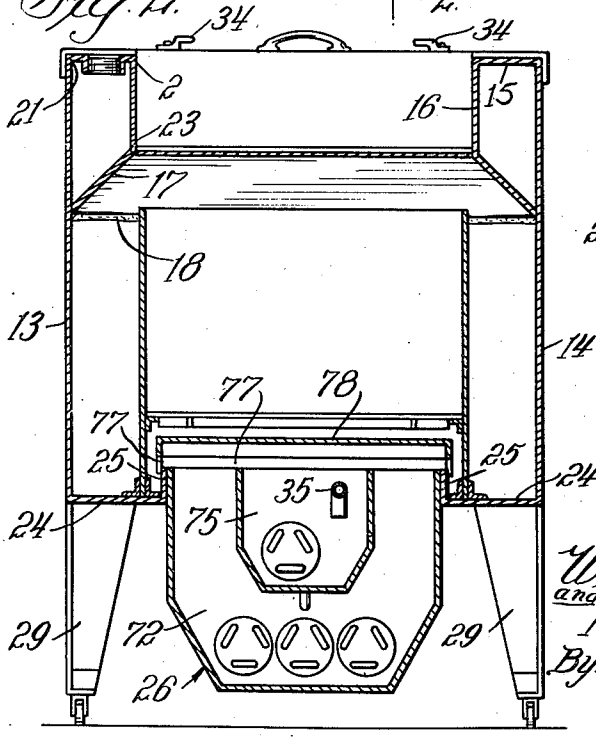
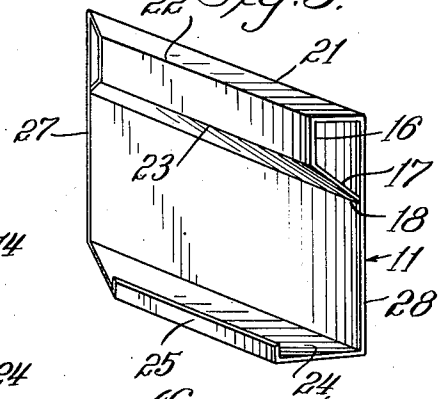


Fig. 3.



Inventors:
Willard D. Phillips
and
Ralph A. Van Fossen
By: Tefft + Tefft
Att'ys.

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DEGREASER WITH TWO SUMPS

Willard D. Phillips and Ralph A. Van Fossen, Chicago, Ill., assignors to John M. Bash, Chicago, Ill.

Application February 15, 1943, Serial No. 475,914

6 Claims. (Cl. 202—170)

This application is a continuation-in-part of our co-pending application 351,018, filed August 3, 1940. 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.

The object of this invention is to provide a degreasing cabinet adapted for continuous and simultaneous filtration and redistillation of the solvent, including a marginal outer condenser separated from the work treating chamber and dual vaporizing sumps interconnected with the work treating chamber and the marginal condensing surfaces respectively.

Referring now to the drawing in which

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; and

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

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 castings 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.

It has been pointed out that one of the objects of the present invention is to provide a mechanism adapted to be operated continuously without the necessity of interrupting the opera-

tion to clean the sumps or purify the solvents as has been necessary with prior art apparatus. This desirable result is accomplished in the structures illustrated in Figs. 1 to 3, inclusive, by providing a plurality of vaporizing sumps arranged so that the impurities removed from the work are directed into one sump and a constant supply of pure distilled solvent is directed into the other. By this arrangement, it is possible to interrupt the operation of the sump into which the impurities of the work have been directed and to drain the adulterated solvent from this sump while maintaining a continuous supply of vapor in the vapor chamber by means of the second vaporizing sump. It is contemplated, of course, that desirable results may be obtained by utilizing two vaporizing sumps, each of which is arranged to receive impurities from the work and to maintain continuous operation by alternatively draining each of these sumps, but it has been found preferable to direct all the impurities from the work into one sump and thus eliminate the necessity of draining the other sump at any time.

Referring now to Figs. 1 and 2 the desired result is accomplished by providing a relatively large pure solvent by means of a solvent duct 74 and a smaller adulterated solvent vaporizing sump 75 interconnected with the vapor treating area 76 by means of an orifice 77 formed under the baffle plate 78. A baffle plate 78 is provided in the vapor treating chamber to prevent impurities from the work from entering the pure solvent sump 72 and to direct these impurities through the orifice 57 into a conventional form of removable bag filter 79. The removable bag may be withdrawn from the filter by means of the quick opening closure 79'. It will be appreciated that any metal chips, shavings and other insoluble matter will be gathered in the filter bag, and may thus be quickly removed to permit continued operation of the degreaser. It has been found that metal chips, shavings, etc., are particularly bad in clogging up the sumps and thus the addition of our filter eliminates most of these difficulties. The filtered solvent enters the sump 75 through the tube 35. Entry of the solvent into the filter 79 is controlled by a valve 36.

In order to provide the filtering operation in a closed pressure system, we arrange to lock the dual lids 61 onto the cabinet 11, and to accomplish this, we provide coacting pins 31 and openings 32 in the outer flanges of the lids and hinged handles 33 and latches 34 on the inner edges of the lids 61. It will be appreciated that when in closed position, the lid is locked securely on the cabinet 11, and thus pressure may be generated within the degreasing cabinet with the dirty solvent going through the filter 79.

By the foregoing construction, it will be appreciated that we have provided a dual sump structure wherein the condensed and distilled solvent is returned to the large outer sump 72 for recirculation of vapor while the dirtier solvent is filtered of all insoluble materials and returned to the inner sump 75. This arrangement and structure permits long continuous periods of operation without the necessity of interrupting the operation to clean the sumps or to purify the solvents as has been necessary with the prior art apparatus. A sump drain, arranged to draw off solvent contamination to any desired level is provided for the sump 75, by the adjustable drain tube 80 and the valve 81.

We claim:

1. In a degreasing apparatus, a chest having a hollow upper rim adapted to act as a condenser, spaced inner walls within the chest below the hollow rim forming an inner vapor treating chamber and an outer condenser trap, a pair of vaporizing sumps mounted in the bottom of the treating chamber, a shed cover over the sumps to prevent dirty solvents from falling into the sumps while permitting vapors from the sumps to enter the treating chamber, a dirty solvent trap in the bottom of the treating chamber, means to deliver clean solvent from the condenser trap to one vaporizer, and means to deliver dirty solvent to the other vaporizer.

2. In a degreasing apparatus, a chest having condenser means mounted adjacent its upper rim, spaced inner walls within the chest below the hollow rim forming an inner vapor treating chamber and an outer condenser trap, a pair of vaporizing sumps mounted in the bottom of the treating chamber, a shed cover over the sumps to prevent dirty solvents from falling into the sumps while permitting vapors from the sumps to enter the treating chamber, a dirty solvent trap in the bottom of the treating chamber, means to deliver clean solvent from the condenser trap to one vaporizer, and means to deliver dirty solvent to the other vaporizer.

3. In a degreasing apparatus, a chest having condenser means mounted adjacent its upper rim, spaced inner walls within the chest below the hollow rim forming an inner vapor treating chamber and an outer condenser trap, a pair of vaporizing sumps mounted in the bottom of the treating chamber, a shed cover over the sumps to prevent dirty solvents from falling into the sumps while permitting vapors from the sumps to enter the treating chamber, a dirty solvent trap in the bottom of the treating chamber, means to deliver clean solvent from the condenser trap to one vaporizor, means to deliver dirty solvent to the other vaporizer, and means to drain and clean the dirty solvent vaporizer while permitting continued operation of the degreaser by the clean solvent vaporizer.

4. In a degreasing apparatus, a chest having a hollow upper rim adapted to act as a condenser, means to adapt the hollow rim to serve as a solvent reservoir, spaced inner walls within the chest below the hollow rim forming an inner vapor treating chamber and an outer condenser trap, a pair of vaporizing sumps mounted in the bottom of the treating chamber, a shed cover over the sumps to prevent dirty solvents from falling into the sumps while permitting vapors from the sumps to enter the treating chamber, a dirty solvent trap in the bottom of the treating chamber, means to deliver clean solvent from the condenser trap to one vaporizer, and means to deliver dirty solvent to the other vaporizer.

5. In a degreasing apparatus, a chest having a hollow upper rim adapted to act as a condenser, cover means for the chest lockable thereon to create vapor pressure in the treatment chamber, spaced inner walls within the chest below the hollow rim forming an inner vapor treating chamber and an outer condenser trap, a pair of vaporizing sumps mounted in the bottom of the treating chamber, a shed cover over the sumps to prevent dirty solvents from falling into the sumps while permitting vapors from the sumps to enter the treating chamber, a dirty solvent trap in the bottom of the treating chamber, means to de-

liver clean solvent from the condenser trap to one vaporizer, and means to deliver dirty solvent to the other vaporizer.

6. In a degreasing apparatus, a chest having a hollow upper rim adapted to act as a condenser, cover means for the chest lockable thereon to create vapor pressure in the treatment chamber, spaced inner walls within the chest below the hollow rim forming an inner vapor treating chamber and an outer condenser trap, a pair of vaporizing sumps mounted in the bottom of the treating chamber, a shed cover over the sumps to prevent dirty solvents from falling into the sumps while permitting vapors from the sumps to enter the treating chamber, a dirty solvent trap in the bottom of the treating chamber, means to deliver clean solvent from the condenser trap to one vaporizer, means to deliver dirty solvent to the other vaporizer, and filter means connected between the dirty solvent trap and the second vaporizer to remove impurities from the solvent.

WILLARD D. PHILLIPS.
RALPH A. VAN FOSSEN.