

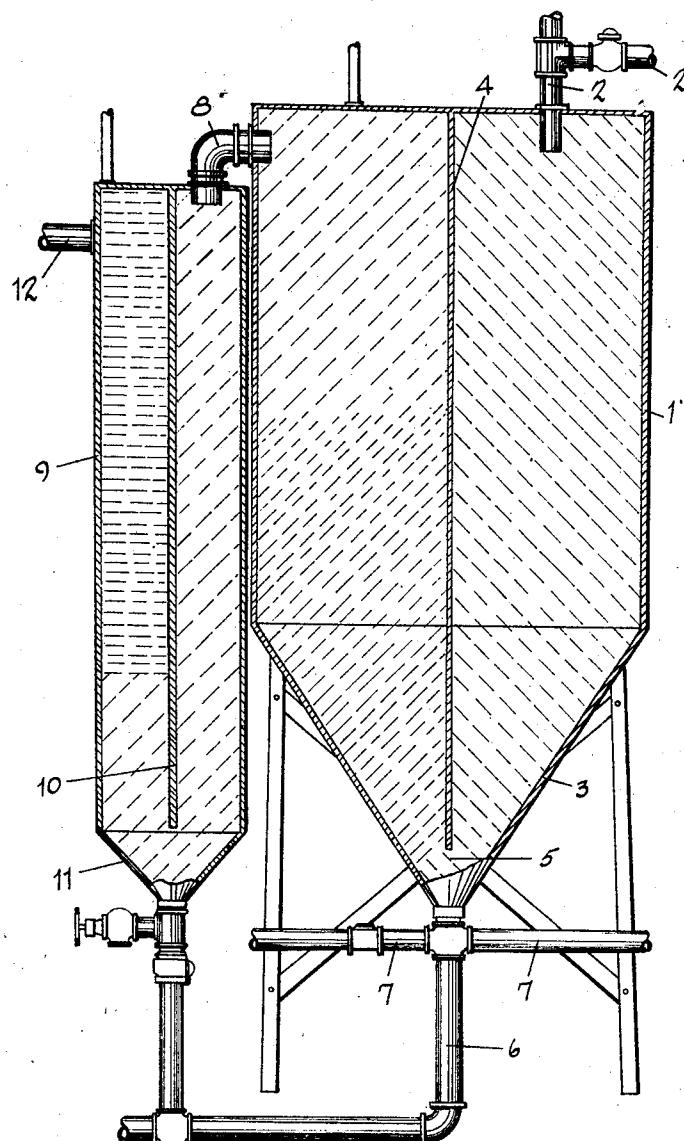
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CLEANSING LIQUID RESTORING MEANS

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## CLEANSING-LIQUID-RESTORING MEANS.

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Our invention has for its object to provide means for removing foreign material from a cleansing liquid for use in dry cleaning systems for clothing and fabrics of different kinds, wherein a cleansing liquid of any kind, which, however, is usually more volatile than water, and of the general type of liquids similar to gasoline, is used for cleansing the clothes and is ordinarily a solvent for greases and some forms of dirt. The cleansing liquid becomes charged with the greases and with dirt, some of it in solution and some of it in flotation, and in order to use again the cleansing liquid it is necessary to remove the greases and oils and also the matter that is foreign to the cleansing liquid, such as the dirt that is removed from the clothes. In such systems the cleansing liquid is run through caustic solutions such as sodium or potassium hydroxides or other similar caustic to remove by precipitation the oils or greases which are dissolved by the cleansing liquid. By our invention a more thorough contact is brought about between the caustic and the cleansing liquid and also opportunity is given for permitting the discharge of the precipitant and lodgment of the dirt from the cleansing liquid.

The invention may be utilized in continuous dry cleaning systems of different forms and to illustrate a practical application of the invention, we have selected as an example of structures containing the invention, a pair of vats embodying the invention and wherein the cleansing liquid may be purified and its cleansing power or property substantially restored to its original condition before being again applied to the fabric. The connected vats selected as an example are shown in the accompanying drawing and their construction is described hereinafter.

The figure of the drawing illustrates a vertical section of a pair of connected vats for restoring the cleansing liquid of the dry cleaning system.

The dry cleaning system of which the vats illustrated form a part, is connected in the system by suitable pipes in the manner well known in the art. Certain of the pipes are for directing the cleansing liquid to the vats, for draining the vats, for maintaining a proper pressure and for preventing the pressure within the vats from rising beyond a certain point. The cleansing liquid is caused to flow by means of certain pressure means,

such as, a pump which causes it to circulate through the system, namely, through the agitator, wherein the cleansing liquid is brought into intimate contact with the clothes or fabrics that are to be cleansed, through the vats for cleansing purposes and into reservoirs or containers used for storage or for different purposes as in the manner well known in the art.

The cleansing liquid is directed into the caustic vat 1 by means of the pipe 2. The vat 1 has an inverted conical bottom 3 and the vat is supplied with a caustic solution, of the character well known in the art, up to substantially the level of the base of the cone of the bottom 3. The vat 1 is provided with a partitioning wall 4 that extends from the top of the vat to the bottom 3 and which protrudes into the cone 3 to near the apex of the cone, leaving a small opening 5 within the apex of the cone. The partitioning wall 4, which may be formed of metal, is sealed along its edges to the side wall of the vat 1 and to its top and bottom so that liquids that are directed into the vat 1, through the pipe 2, will, in order to seek their level, pass through the opening 5 formed between the lower short edge of the partition 4 and the apex of the cone 3. Except for drainage through the pipes 6 and 7, the outlet of the container 1 is through the pipe 8 which is located on the side of the partitioning wall 4 opposite to that on which the pipe 2 is located or connects with the vat 1.

The caustic solution is first directed into the vat and filled therewith to the desired depth, preferably, as stated above, to about the base of the cone 3 and then the cleansing liquid is directed into the vat 1. The caustic solution has a specific gravity that is considerably greater than that of the cleansing liquid. The cleansing liquid does not readily penetrate the caustic solution and, consequently, the pressure to which the cleansing liquid is subjected to, will cause substantially all of the caustic solution to be forced into that portion of the container 1 located on the side of the partitioning wall 4 opposite to that to which the pipe 2 is connected. The cleansing liquid will pass up through the caustic solution of the other side of the partition 4. As the cleansing liquid reaches the opening 5 it, by reason of the semi-cone shape of the large portion of the caustic liquid, spreads as it rises through the caustic solution until it reaches

the semi-cylindrical portion of the caustic solution as determined by the cylindrical walls of the vat 1 until it reaches the surface of the caustic solution. By this arrangement with a given amount of caustic solution, the length of travel of the cleansing liquid through the caustic solution is nearly double that of the precipitating device that has heretofore been used and yet at the same time the material in flotation is given opportunity to settle in advance of penetration of the liquid into the solution which locates a large proportion of the foreign matter at the bottom of the cone shaped container and in the apex of the cone, since the first precipitation that is produced by the caustic solution is produced at the apex of the inverted cone. As the liquid rises and distributes itself within the caustic solution, the precipitate settles to the cone. Thus a large part of the foreign matter is discharged before the liquid passes out of the container 1 through the pipe 8.

The liquid passes into the settling tank 9 to which the container 1 is connected by the pipe 8. The settling tank has a diameter that is very much smaller than that of the vat 1 although it has a depth that is substantially the same. It is also provided with a partitioning wall 10 that extends from the top of the tank 9 to near the bottom of the tank. The bottom of the tank is in the form of an inverted cone 11. The lower end of the partition 10 leaves a wide area of communication within the cone and between the chambers on the opposite sides of the partition 10. The liquid descends in one of the chambers, moving slowly downward by reason of the fact that the cross sectional area of each of the chambers of the tank 9 is much larger than the cross section of the pipe 8, although it moves in the chambers more rapidly than it moves in the chambers of the vat 1. The movement, however, is such as to carry down any foreign material that may exist in the liquid after it leaves the vat 1, giving it such a downward movement that will cause the material to remain within the cone 11 and become deposited on the surface of the cone 11. The

area between the lower edge of the partitioning wall 10 being sufficiently great as not to disturb the foreign material, substantially all of it, deposits in the apex of the cone 11. The apex of the cone 11 forms a recess wherein there is substantially no current and the current beneath the edge of the partition 10 is maximum at the edge of the partition and diminishes to nothing at a point somewhat remote from the apex which forms the space wherein the sediment will be deposited. The cleansing liquid then rises and deposits the material as it passes upward through the chamber on the other side of the partition 10 until it finds exit through the pipe 12. Thus the foreign material contained in the liquid is removed.

We claim:

In a cleansing liquid restoring means, a pair of vats, each of the vats having inverted cone shaped bottoms and partitioning walls extending from the tops of the vats towards the bottoms, the partitioning wall of one of the vats extending well within the cone bottom and to near the apex of the cone, the other of the partitioning walls extending to near the bottom of the other vat, means for causing the fluid to enter the top of the first vat, flow down through one chamber and pass through the small opening in the apex of the cone of the bottom of the vat, then to rise and precipitate greases of the liquid in a caustic solution in the other chamber of the first vat and to pass off into the second vat, flowing down through one chamber and passing slowly through the space between the lower edge of the partitioning wall of the said vat and the cone bottom of the vat to carry down the precipitated foreign material to the bottom of the vat and change the direction of flow of the liquid from the downward movement of the precipitated material to an upward movement of the liquid through the other chamber of the vat, leaving the precipitated material in the second named vat.

In witness whereof we have hereunto signed our names to this specification,

SAMUEL S. SCHWAB.  
MAURICE M. SCHWAB.