April 21, 1931. T. E. PERKS 1,802,034

APPARATUS FOR USE IN DRY CLEANING OPERATIONS

Filed Nov. 13, 1929

FIG. 1

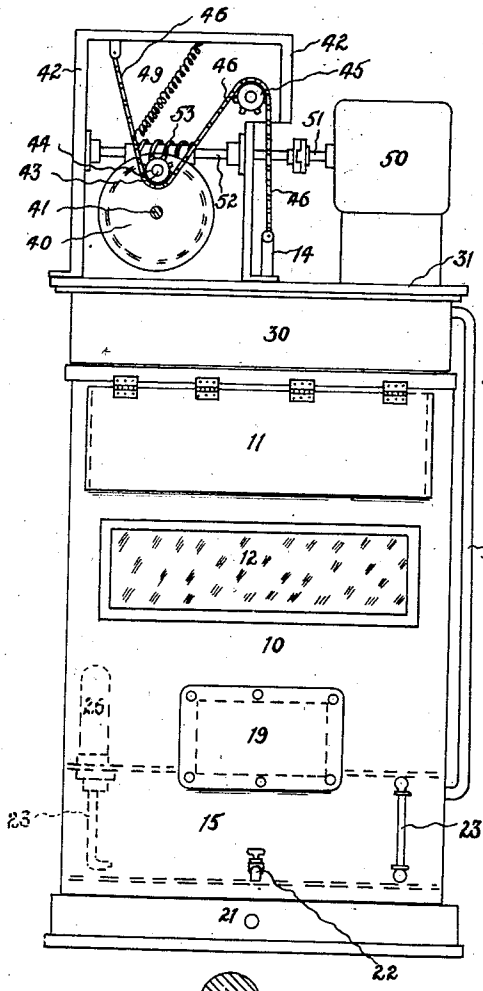


FIG. 2

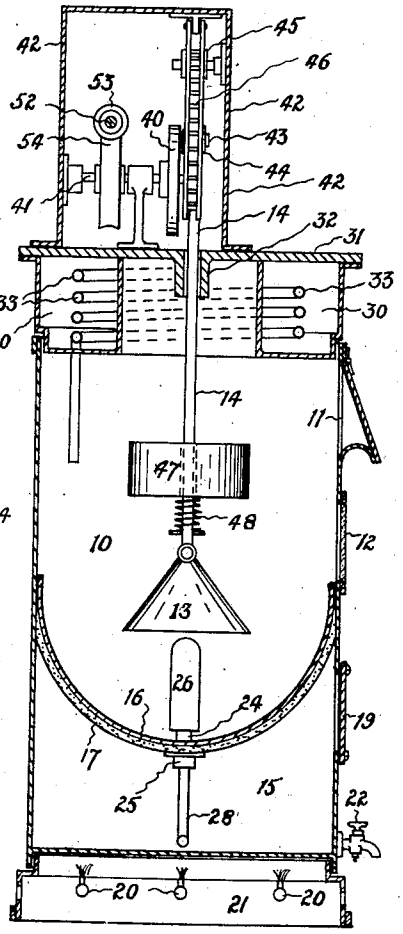
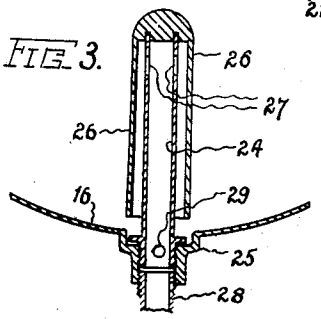


FIG. 3.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR USE IN DRY-CLEANING OPERATIONS

Application filed November 13, 1929, Serial No. 406,879½, and in New Zealand June 7, 1929.

This invention relates to apparatus designed for giving effect to the known methods of dry cleaning employed in cleaning clothes and other articles, in which the articles are subjected to the action of a cleansing solvent while within a receptacle and in which such articles are kneaded or agitated. The said solvent is added to the receptacle from time to time as required and collects therein and is removed periodically as it becomes charged with dirt and other foreign matters.

The solvent, which is generally of a light volatile nature, as benzene, or carbon tetrachloride, or trichlorethylene, may then be freed from its foreign matters by a distillation and condensation process in a well known manner, so that it may be used over and over again in the cleaning operations.

The object of the present invention is to provide a construction of apparatus by which there is combined with the cleaning or washer means, distilling and condensing means for restoring the cleansing solvent to its purified condition, and to provide that the supply of solvent to the washer and the discharge of solvent from the washer is effected automatically and continuously throughout the working of the machine. Such discharge is designed to be effected to the distilling means when a pre-determined amount of solvent collects in the washer, while the supply of solvent to the washer is effected from the condensing means acting in conjunction with such distilling means.

The invention consists in a special construction of apparatus of this combined nature by which a self contained unit is produced that occupies a relatively small amount of floor space, and embodies the aforesaid automatic charging and discharging of the cleaning solvent into and from the washer chamber.

This construction of apparatus is shown in the accompanying drawings, in which:—

Figure 1 is a front elevation of the combination, the casing containing the washer operating gear being shown open.

Figure 2 is a sectional side elevation of the machine.

Figure 3 is a sectional elevation of a suitable form of siphon for use in the machine.

In giving effect to the invention in the manner shown in the drawings, a washer chamber 10 is provided and such is furnished with the usual requirements in this class of apparatus under which a door covered opening 11 is made in the front for the insertion and removal of the articles to be cleaned, and a glass covered inspection opening 12 is also made in the front. It is also provided with a dolly, or beater, 13 of any known design for operation upon the articles placed within it through the up and down movements of a vertical spindle rod 14 to which it is attached and which passes out through the top of the machine for connection with the actuating mechanism, hereinafter more fully referred to.

The washer chamber 10 has combined with it a bottom chamber or still 15 which may be made in one with the washer chamber as in the drawings, or separate therefrom so that the washer chamber fits over its top to enclose it. In either instance the bottom 16 of the washer chamber is covered on its underside with a layer 17 of a suitable heat insulating material to prevent the heat from the still 15 being communicated to the washer chamber. The still 15 is itself heated by means of any suitable and convenient heating agency, as for instance by the gas burners 20 arranged in a heater space 21 situated beneath. The still is also fitted with a draining tap 22, a liquid lever gauge glass 23, and with a manhole and cover 19 for use in the cleaning out of sediment collecting in the still in the operations of the machine.

Communication is established between the washer chamber 10 and the still 15 by means of a siphon fitted into the apparatus to provide that upon the level of the cleansing fluid within the washer chamber reaching a predetermined point, the whole of the fluid will siphon over into the still. Such a siphon fitting is shown in Figures 2 and 3, and comprises a vertical tube 24 the lower end of which screws into a ring 25 let into the washer bottom 16, and a hood 26 covering the upper end of the tube and extending down round

it to near the bottom. The tube is made with perforations 27 near its upper end so that liquid may pass up between the tube and the hood and in through these perforations to pass down the tube and through the ring 25, into the lower end of which a pipe 28 is screwed to lead the liquid into the bottom of the still. The tube is suitably made to form a liquid tight joint in the ring 25 and thus will effect the siphoning of the washer chamber's liquid contents into the still when the level overflows through the holes 27, on a well known principle. In order that the residue may be drained from the washer bottom whenever desired, the tube 24 is made with a hole 29 near its lower end, which normally is closed by the screwing of the tube into the ring 25, but which may be opened by partially unscrewing it to raise the hole above the ring. Any liquid then in the chamber bottom will thereby be free to drain away into the still.

A condensing chamber 30 is positioned above the top of the washer chamber 10 and may form a top therefor, such chamber in turn being covered by a cover plate 31, having a bearing 32 through which the spindle rod 14 passes upward. A condenser coil 33 is arranged within the chamber 30 and such is connected at one end by the pipe 34 with the top of the still 15 and at the other end opens down into the washer chamber 10. Any approved cooling medium is caused to pass through this chamber 30 so that cleansing liquid vaporized in the still 15 and passing therefrom and through the condenser coil 33 will be condensed into liquid form and flow into the washer.

There is thus an automatic cycle of operations under which the cleansing liquid is periodically siphoned from the washer chamber into the still, is converted into vapor in the still, depositing all dirt and foreign matters within the still and passing away as vapor into the condenser to be liquefied and fed in a pure state again into the washer. It is essential that the cross sectional area and capacity of the coil 33 should be such as to ensure of the free escape of the vapor from the still, in order thus to prevent any accumulation of pressure in the still that would act to blow the liquid and vapor back, through the siphon, into the washer chamber.

The means for actuating the spindle rod 14 will be such as to provide for the required movement of the washer or agitating or kneading means employed in the washing operations, such means being mounted on the top of the machine to gear with the upper end of such rod.

The means for this purpose shown in the drawings are of a nature to provide for the rod being lifted longitudinally through a distance and dropped to fall in repeated alternation, so that dollies or kneaders attached to its bottom end may be caused to act upon articles placed within the bottom of the washer with a pressing or kneading action, or a basket attached to it may, with the articles placed within it, be raised and lowered within the cleansing fluid contained in the washer.

For this purpose a disc 40 is mounted upon a spindle 41 positioned upon one side of the rod 14 and journalled in the casing 42 erected on the machine top 31. Such disc has a crank pin 43 on one face on which a sprocket wheel 44 is mounted. A second sprocket wheel 45 is mounted in the casing at a position vertically above the top of the rod 14. A sprocket chain 46 has one of its ends fastened to the top end of the rod 14 and is then carried up over the sprocket wheel 45, down round beneath the sprocket wheel 44 upon the disc crank, and then upward again and has its other end made fast to the top of the casing. The rotation of the disc will therefore cause the chain 46 to be alternately drawn on and released, and thus cause the rod 14 and its attachments to be drawn upward for a distance corresponding with twice the throw of the crank pin 43, and dropped again correspondingly, on each rotation. To aid the downward movement of the rod and its attachments, a weight 47 (Figure 2) may be mounted on the rod, such weight being supported upon a spring 48 which will serve to absorb any jars or shock on the fall of the rod. The weight and its spring, however, will not be required if the articles being treated are suspended in a basket upon the rod bottom. Any slackening of the chain 46 during the falling action of the rod, may be prevented by means of a tension spring 49 attached to the chain above the sprocket 44 and to the top of the casing, such spring serving to keep the chain closely upon the sprocket 44. This also will not be required should a basket be employed.

Rotation is imparted to the disc spindle 41 from an electric motor 50 arranged upon the machine top, the spindle 51 is coupled to a spindle 52 mounted to extend across within the casing 42, and having a worm 53 thereon which gears with a worm wheel 54 fixed upon the disc spindle 41.

The details of construction and assembly together of the chambers embodied in the combined apparatus, and also the fittings thereon, may be such as to suit the circumstances of each special case and may vary accordingly. The arrangement and grouping of the parts as shown in the drawings and hereinbefore described will adapt the machine to installation in an establishment where a number of machines are employed, as they may be assembled side by side in a row within a minimum of space.

The level at which the liquid will be siphoned from the washer chamber to the still

may be provided for and altered at will by having siphons of different heights that are interchangeable with one another. This will provide for economy in the use of the cleansing solvent as ensuring of the correct amount required for different articles being employed.

Articles treated in this washer, on removal, will be treated in the known manner for the extraction of the liquid with which they are charged.

I claim:—

Dry cleaner apparatus comprising in combination, a washer chamber, a still having means for heating it arranged beneath the washer chamber, a connection between the washer chamber and the still, formed by a siphon fitted into the bottom of such chamber and opening into the still, and a condenser arranged upon the top of the washer chamber and embodying a cooling coil one end of which is connected to the top of the still while the other end is arranged to enter the washer chamber.

In testimony whereof, I affix my signature.

THOMAS EDGAR PERKS.