July 16, 1935. C. L. KUBISTA 2,008,556

DRY CLEANING APPARATUS

Filed Oct. 24, 1932

Fig. 1.

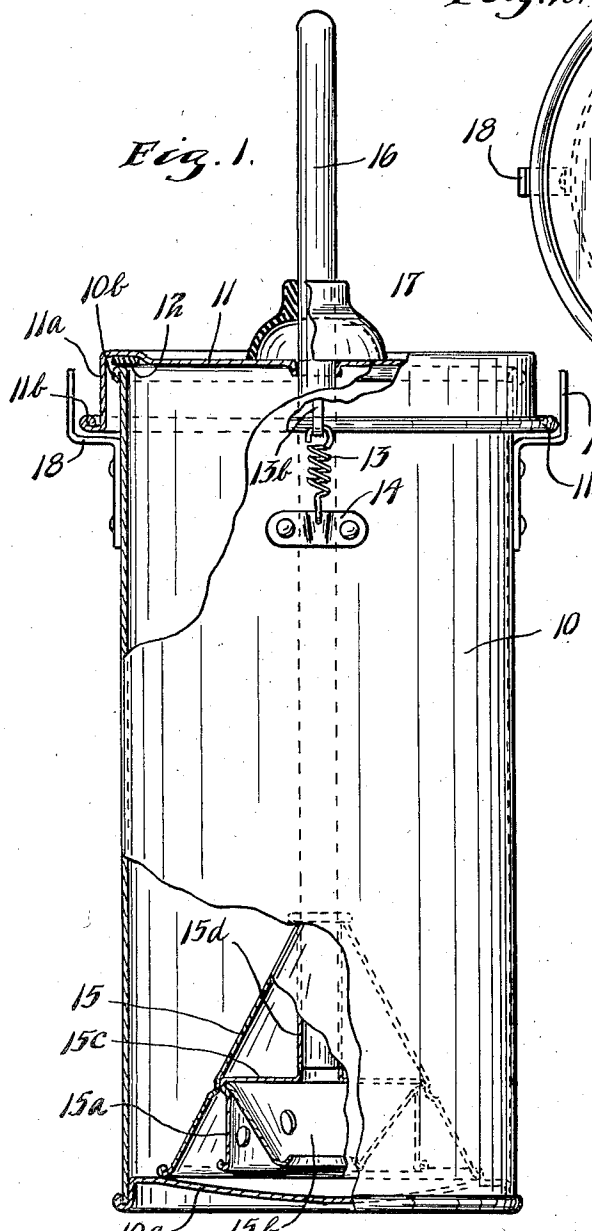


Fig. 2.

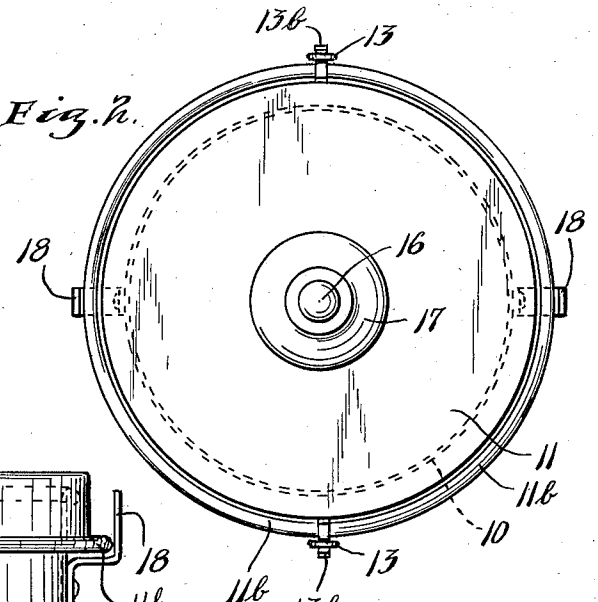


Fig. 3.

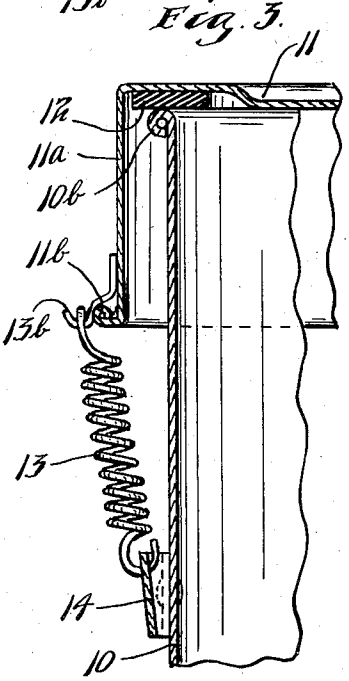
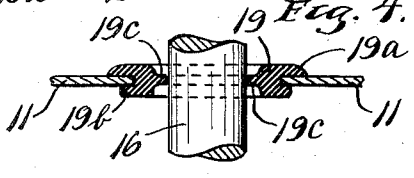


Fig. 4.



INVENTOR.
CHARLES L. KUBISTA.
BY HIS ATTORNEYS.
Williamson & Williamson

Patented July 16, 1935 2,008,556

UNITED STATES PATENT OFFICE

2,008,556

DRY CLEANING APPARATUS

Charles L. Kubista, Le Sueur, Minn., assignor of one-half to Clarence M. Boelter, Le Sueur, Minn.

Application October 24, 1932, Serial No. 639,193

2 Claims. (Cl. 68—38)

My invention relates to apparatus for use in cleaning articles of clothing and the like and more particularly to such apparatus wherein highly inflammable fluids are used as cleaning agents.

Many housewives employ volatile and highly inflammable cleaning liquids in cleaning articles of clothing and the like, and the use of such liquids has in many instances caused fires or explosions which have resulted in infliction of fatal or at least painful burns upon the user and in damage to property. The movement or rubbing of the articles being so cleaned, particularly when such articles are made of silk, results in the accumulation of charges of static electricity, which, when discharging, will ignite the vapor emanating from the cleaning liquid and thus cause a fire or explosion. Nearby exposed flames have also caused similar mishaps.

It is an object of my invention to provide such apparatus wherein inflammable cleaning fluids may be safely used and wherein, should the fluid or vapor therefrom, become ignited, no explosion of any consequence can occur and any fire within the apparatus will be automatically and immediately extinguished.

Another object is to provide such apparatus which is simple and inexpensive of construction, which is easily operated, and which is particularly adapted for home use.

Yet another object is to provide such apparatus wherein articles being cleaned will not be scorched or damaged should vapors therein become ignited.

A further object is to provide such apparatus wherein highly volatile cleaning fluids may be kept without evaporation and loss of such fluids.

A still further and more detailed object is to provide such an apparatus comprising an open topped receptacle containing a movable handled plunger and having a cover yieldingly secured to the upper end thereof and provided with an aperture through which the handle of the plunger extends.

These and other objects and advantages of the invention will be more fully set forth in the following description made in connection with the accompanying drawing, in which like reference characters refer to similar parts throughout the several views, and in which:—

Fig. 1 is a side view of an embodiment of my invention partially broken away to show the interior parts thereof;

Fig. 2 is a top view;

Fig. 3 is a vertical sectional detail view of a portion of my apparatus, and

Fig. 4 is a vertical sectional view showing a modified form of sealing means between the cover and handle portions of my device.

Referring to the drawing, the embodiment shown includes an open topped cylindrical receptacle 10 having a bottom closure 10*a* rigidly secured thereto and a rolled bead 10*b* at the upper end thereof. A circular cover 11 for the open top of the receptacle 10 is somewhat larger in diameter than the receptacle 10 and has at its periphery a flange 11*a* depending to a substantial distance below the periphery. A rolled bead 11*b* projects radially outwardly from the lower edge of the flange 11*a*. A flat annular gasket 12 is interposed between the bead 10*b* of the receptacle and the cover 11 to normally provide a seal therebetween.

Helical tension springs 13, having the ends thereof formed respectively into hooks, are hooked at their upper ends onto hooks 13*b* secured to the bead 11*b* and are anchored at their lower ends in apertured portions of outwardly projecting anchoring members 14 which are secured to the outer peripheral surface of the receptacle 10. The springs 13 are normally under tension so as to firmly and yet yieldingly secure the cover 11 to the upper end of the receptacle 10.

A plunger 15, formed of sheet metal or other suitable material, is conical in shape, has an open lower end. In the interior of the plunger 15 is a depending skirt 15*a* and therewithin a depending and downwardly converging skirt 15*b* as shown. Medially located with respect to the height of the plunger is a horizontally disposed annular member 15*c* from the central portion of which a tubular member 15*d* extends to the upper end of the plunger 15. The periphery of the lower end of the plunger 15 has a diameter only slightly less than the diameter of the interior of the receptacle 10. It is to be understood that plungers of various other types may be successfully used in my apparatus.

A handle 16 is secured at its lower end in the tubular portion 15*d* of the plunger 15 and extends upwardly therefrom through a centrally located aperture in the cover 11 to a point some distance above the cover 11. The aperture in the cover 11 is of suitable size to closely fit about the handle 16 and yet permit vertical movement of the handle. A sealing member 17, having an upper portion adapted to encircle and frictionally engage the handle 16 and having a resilient skirt portion depending from its upper portion and formed integrally therewith, is mounted on the

handle 16 above the cover 11 as shown in Figs. 1 and 2.

Guide or centering members 18, secured to the exterior of the receptacle 10 at diametrically opposite sides thereof, are shaped as shown and, in cooperation with the springs 13, serve to center the cover 11 with respect to the upper portion of the receptacle 10.

A modified form of sealing means between the handle 16 and the cover 11 is shown in Fig. 4. In this form the aperture in the cover 11 is somewhat larger in diameter than the periphery of the handle 16. The aperture is provided with a resilient bushing 19 having a pair of spaced radially outwardly projecting flanges 19a and 19b defining a groove around its periphery in which the edge of the aperture is engaged and a thin radially inwardly projecting flange 19c proportioned so as to make firm contact with the handle 16 to form a seal between the handle 16 and the cover 11 regardless of the position of the handle. The bushing 19 may be suitably coated or treated to prevent damage thereto from the cleaning fluid used.

In use, articles of clothing and the like, to be cleaned, are placed in the lower portion of the receptacle and are immersed in a cleaning fluid such as gasoline, cleaner's naphtha, benzine, or Stoddard's solvent. The plunger 15 is then placed in the receptacle above the articles to be cleaned and the cover 11 is placed on the receptacle. The springs 13 are placed in operative position to yieldingly hold the cover 11 on the receptacle 10.

The cleaning operation is performed by vertically reciprocating the plunger 15 by means of the handle 16. As the plunger is moved downwardly the article or articles being cleaned are crushed or compressed so as to force most of the cleaning liquid absorbed thereby and entrapped between the folds thereof through the material and upwardly between the outer periphery of the lower portion of the plunger and the inner periphery of the receptacle to the space above the plunger. Due to the small annular space through which the liquid passes, the liquid will travel with considerable velocity and will eddy and swirl in the space above the plunger. As the plunger is raised the swirling liquid will pass downwardly between the plunger and the wall of the receptacle to forcefully strike and traverse the surfaces of the articles being cleaned and penetrate the same and again be absorbed therein. As the plunger is raised the partial vacuum therewithin will raise the articles and tend to separate the folds thereof. The cycle described is, of course, repeated a number of times in the process of cleaning an article. It has been found that the best results are attained when the plunger is reciprocated relatively slowly.

If, due to accumulation and subsequent discharge of static electricity generated by movement of the cleaning fluid and the articles being cleaned, the cleaning fluid or the vapors thereof become ignited, the cover 11 will be raised against the tension of the springs 13 by any pressure produced within the receptacle to relieve the pressure and thus eliminate the possibility of an explosion of any consequence. The escaping gases are directed downwardly along the exterior of the receptacle by the depending flange 11a of the cover 11 and any flame emitted will follow the same path. When the pressure has been relieved, gravity and the spring 13 will pull the cover 11 downwardly to seal the upper end of the receptacle 10 and hence snuff out any fire within the receptacle, thus eliminating danger of fire. Products of combustion remaining within the receptacle when the cover has reseated assist in extinguishing the fire within the receptacle and the closure of the receptacle prevents entrance of air for supporting combustion.

My cleaning apparatus has been constructed and used in practice and has been found by repeated tests to perform its intended functions with entire satisfaction. It has been found capable of use for very efficiently and thoroughly cleaning articles of clothing and the like. In repeated tests wherein highly inflammable cleaning fluids were used and wherein means were provided for purposely igniting the mixture of air and vapor within the apparatus, the cover raised slightly and immediately returned to its normal position and neither an explosion capable of causing damage nor a fire occurred. Audible and visible effects noted consisted respectively of only a mild puff and the ejection of a moderate quantity of smoke. Delicate fabrics contained in the apparatus during the above mentioned tests were found to show not even the slightest trace of scorching or damage of any kind.

When cleaning liquid of a volatile nature is to be left in my device during the preiod of time intervening between occasions when the device is used, the sealing member 17 may be slid downwardly on the handle 16 to a position wherein the flanged portion thereof makes contact with the surface of the cover 11. When this has been done the receptacle 10 is obviously entirely sealed and hence evaporation and loss of cleaning liquid will not take place.

When the sealing means 19 shown in Fig. 4 is used in my apparatus, it is obvious that the handle 16 is sealed to the cover 11 at all times.

The provision of sealing means, such as described above, makes it possible to use a filling of cleaning liquid more than once and hence makes for great economy in the use of my cleaning apparatus.

It is, of course, obvious that my apparatus, although particularly suited for use with highly inflammable cleaning liquids, may be used with efficiency and satisfaction with non-inflammable cleaning liquids, such as carbon tetrachloride and others.

It is apparent that I have invented a novel, efficient, inexpensive, and safe apparatus wherein articles of clothing and the like may be very efficiently cleaned, and wherein highly inflammable cleaning fluids may be used without danger of explosion or fire.

It will, of course, be understood that various changes may be made in the form, details and proportions and arrangement of the parts, without departing from the scope of my invention, which, generally stated, consists in a device capable of carrying out the objects above set forth and in the novel parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:—

1. In dry cleaning apparatus, a container for inflammable cleaning liquids, said container having an opening in the upper end thereof, a cover for said opening, a depending annular flange on said cover normally overhanging the upper end of said container and radially spaced therefrom, and means for normally yieldingly urging said cover into closing relation with said opening, said yielding means being of such strength that it releases the explosive force of ignited cleaning fluids yet

immediately closes the container upon said release being effected.

2. In dry cleaning apparatus, an open topped receptacle, a cover for said receptacle, a flange depending from said cover and disposed outwardly of the periphery of the upper portion of said receptacle, tension springs connecting said cover to points therebelow on said receptacle, a plunger located within said receptacle and adapted for vertical movement therein, a handle secured to and extending upwardly from said plunger, said cover being provided with a centrally located aperture therethrough, said handle extending upwardly through said aperture, said aperture being arranged to fit closely about said handle and said tension springs being of such strength that they will release the explosive force of ignited cleaning fluids yet immediately close the container upon said release being effected.

CHARLES L. KUBISTA.