March 31, 1925. 1,531,501

M. E. POPKIN

GARMENT CLEANING METHOD AND APPARATUS

Filed Oct. 1, 1924 2 Sheets-Sheet 1

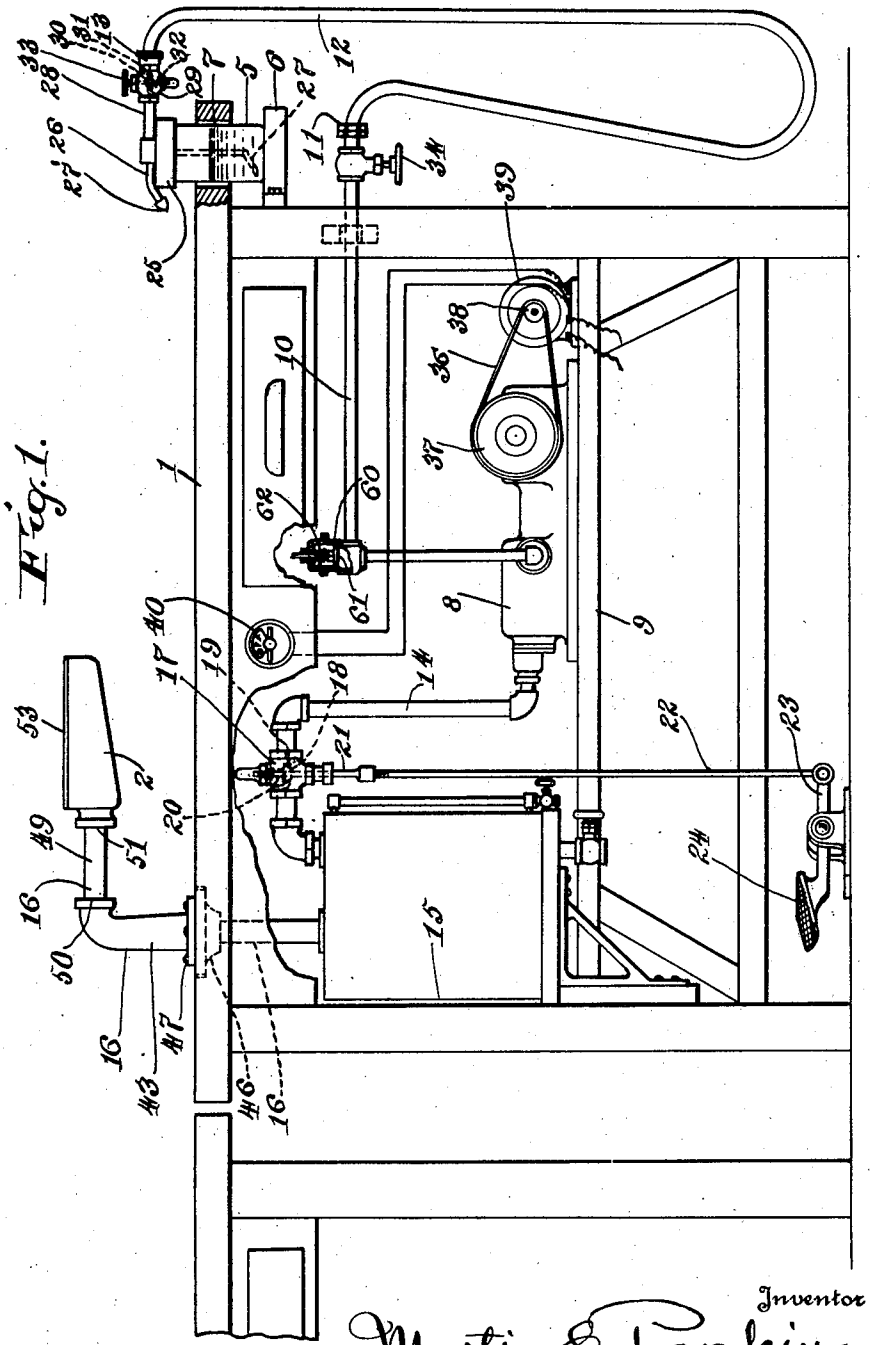


Fig. 1.

Inventor

Martin E. Popkin

By Edwin Hamuels

Attorney

Witnesses

Porter S. Flautt.

E. Wehmeyer

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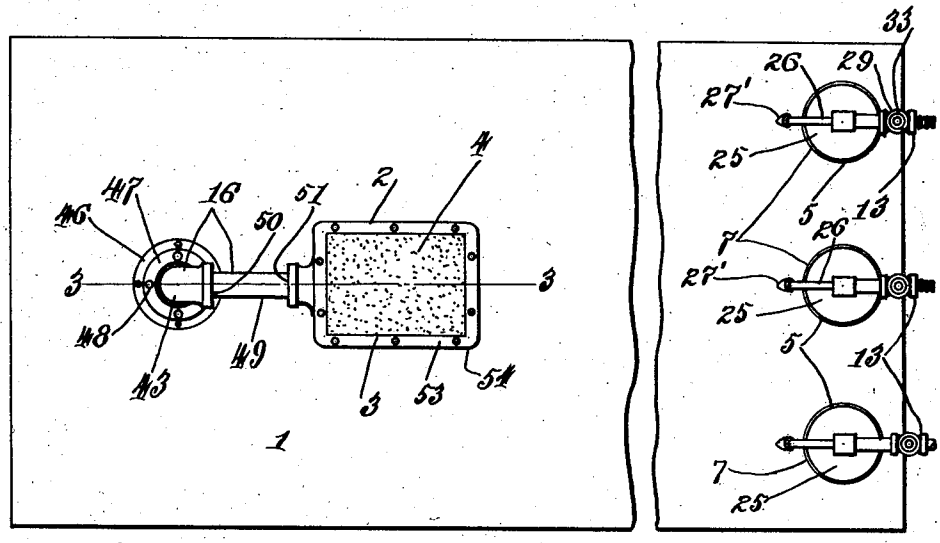


Fig. 2.

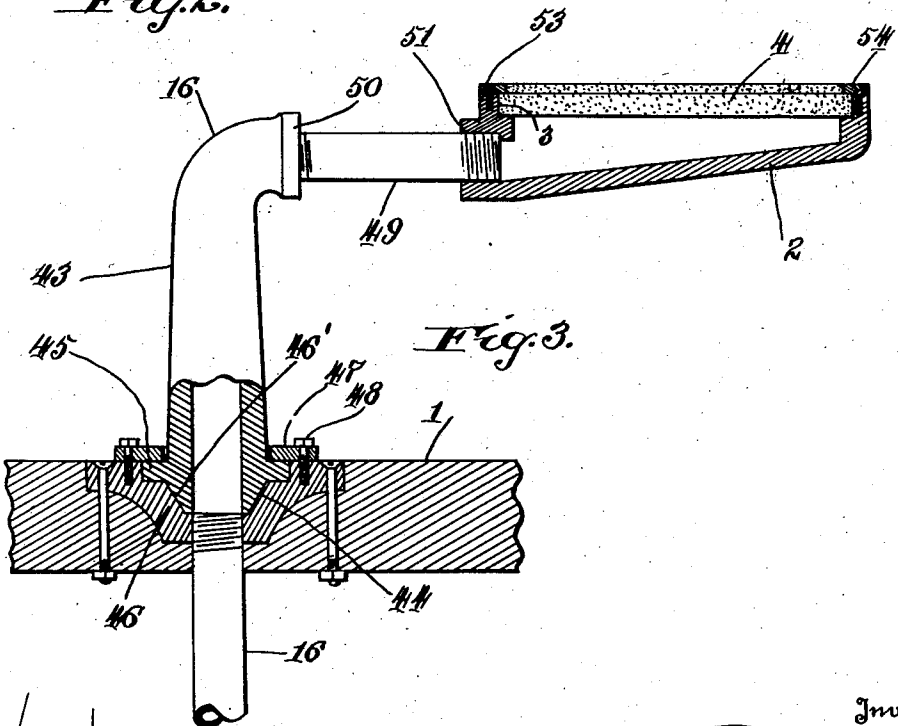


Fig. 3.

Witnesses
Porter W. Flautt.
E. Wehmeyer

Inventor
Martin E. Popkin
By Edwin L. Sammons
Attorney

Patented Mar. 31, 1925. 1,531,501

UNITED STATES PATENT OFFICE.

MARTIN E. POPKIN, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO J. SCHOENEMAN, INCORPORATED, A CORPORATION OF MARYLAND.

GARMENT-CLEANING METHOD AND APPARATUS.

Application filed October 1, 1924. Serial No. 741,088.

To all whom it may concern:

Be it known that I, MARTIN E. POPKIN, a citizen of the United States of America, residing in the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Garment-Cleaning Methods and Apparatus, of which the following is a specification.

The operation of cleaning outer garments of woolen and worsted, flannel, silk, mohair, and similar materials, and cleaning fabrics of this nature by "spotting", as the process is known to cleaners, which refers to the operation of removing individual spots by local application of a solvent, as distinguished from washing or immersing the entire garment or piece of fabric in the solvent, has proved unsatisfactory, particularly as applied to the lighter colored fabrics, on account of the tendency to spread the foreign matter forming the spot, without completely removing it, so that the drying of the solvent leaves a noticeable line of demarcation between the untouched area of cloth and the portion of the cloth wetted by the solvent containing in solution the foreign matter dissolved from the spot.

The present invention relates to a method of and apparatus for treating such garments and fabrics locally for the removal of spots whereby the foreign material and the solvent are completely removed from the garment, avoiding the spreading of the foreign matter and the drying of the solvent on the fabric which has produced the undesirable effect described.

The cleaning operation referred to, described in a general way, consists in spraying the solvent upon the soiled or discolored portion of the fabric and simultaneously sucking it through and withdrawing it from the opposite side of the fabric by means of a vacuum applied to the opposite side of the fabric, preferably at the will of the operator, the application of the vacuum and the spraying of the solvent being limited to the particular area being treated.

The apparatus preferably includes a suitable table to hold the fabric or garments being treated, the table being provided with one or more containers to which air pressure may be connected by a flexible tube, and each provided with a spray nozzle through which the solvent is forced by the application of air pressure.

The principal feature of the cleaner is a suction member or nozzle having an opening several inches square and having a support for the fabric around and in the opening. The latter may to the best advantage be a porous block as shown. The apparatus also includes means for maintaining a vacuum at the nozzle with connections to said suction nozzle and a separator to prevent the passage of the solvent and the foreign matter dissolved thereby to the pump by which the vacuum is maintained. There is also in the present form of the invention a valve controlling the vacuum whereby the suction is cut off or applied instantaneously at the will of the operator, the same being preferably controlled by a pedal within easy reach of the operator's foot as he works on the apparatus.

In the accompanying drawing I have illustrated an apparatus for cleaning fabric locally which may be otherwise termed a spotting apparatus embodying my invention in the preferred form.

In the drawings—

Figure 1 is a side elevation of the apparatus.

Figure 2 is a plan view of the same.

Figure 3 is a cross-section on line 3, 3, Figure 2, showing the suction member or nozzle.

Referring to the drawings by numerals, each of which is used to indicate the same or similar parts in the different figures, the appliance as shown preferably includes a bench or table 1 upon which the garments or fabric may conveniently rest during treatment. Mounted on the bench at a convenient point is a suction member or nozzle 2 preferably having an enlarged opening 3 in which is placed a porous supporting member 4 which in the present form of the invention as used by the applicant is in the form of a block of a silicon dioxide slab, but any support which will cause the fabric

to span the nozzle opening during treatment is regarded as within the scope of the invention.

At one side or end of the table I have shown a spray bottle or a series of spray bottles 5 which may rest on a suitable support 6 beneath the table above which are apertures 7 in the top of the table in which the bottles are seated. The bottoms of the bottles rest on the support 6 as aforesaid, though the exact manner of supporting the bottles is not essential to the invention in its broadest scope.

Suction or sub-atmospheric pressure is communicated to the nozzle, and air under pressure is supplied to the spray bottles in any suitable manner. In the preferred form of the invention as shown there is an air pump 8 mounted on a suitable support 9 beneath the bench or table 1. As shown, the suction end of the pump is connected by a pipe 14 to a separating chamber or separator 15 from the top of which a suction pipe 16 leads to the nozzle 2, the passage or connection by way of the pipe 14 from the pump 8 to separator chamber 15 being controlled by a valve 17 which as shown comprises and includes a poppet valve 18 normally pressed against its seat 19 by means of a spring 20. The valve stem 21 is attached to and extended downwardly in the form of a connecting rod 22 which is pivotally connected to a pedal lever 23 actuated by a foot pedal 24 within convenient reach of the operator. The compression end of the pump is connected by the pipe 10 to a fitting or coupling 11 to which is connected a flexible hose 12 adapted to be connected at its opposite end by means of a fitting 13 to any one of the spray bottles 5.

Referring to the apparatus in more specific terms, each of the spray bottles or jars 5 is provided with a removable cover 25 to which is secured a T pipe or tube 26 having a nozzle 27′ at one end of the transverse bar of the T. A depending tube 27 leads down into the bottom of the bottle forming the upright member of the T, the fitting 13 being at the other end of the transverse arm 28 of the T. The passage through said arm is controlled by a valve 29 shown as including a poppet valve member 30 which opens downwardly and is pressed upwardly against its seat 31 by means of a spring 32 and opened by means of a thumb button 33 which is conveniently actuated at the will of the operator.

The air pipe 10 is provided at any convenient point with a pressure releasing and regulating and releasing valve 60, consisting of a valve proper 61 normally seated by a spy 62 and is also controlled by a screw-valve or any suitable valve 34. It is easily apparent that the valves 33 and 34 being open, the rush of air through the T arms 28 and 26 to the nozzle 24 will raise sufficient of the liquid from the bottom of the bottle by way of the pipe 27 to give the desired spraying effect from and at the nozzle 24.

In the form of the invention shown the pump 8 is driven by way of a belt 36 and pulleys 37 and 38 from an electric motor 39 controlled by means of a switch button 40, though it is of course apparent that the desired pressure and suction may be obtained from any suitable source without departure from the principle of the invention.

As aforesaid, the suction pipe 14 leads from the suction end of the pump 8 to the top of the separator chamber 15, and is controlled by the valve 17 which is normally closed by a spring 20 and opened at the will of the operator by the pedal 24 or in any suitable manner. The pipe 16 leads from the top of the chamber 15 to the nozzle 2 which nozzle may to advantage be mounted to swing in a horizontal plane, the pipe 16 being to this end made to include a goose-neck 43 above the table and having a ground frusto-conical base 44 with a horizontal flange 45, the base and flange being seated in a suitable female fitting 46 with a frusto-conical socket 46′ secured to the table and preferably flush therewith, and having a removable collar 47 taking over the flange 45 on the base, and secured to the top of the female fitting by cap-screws 48, it being understood that the female fitting 46 is ground as to the hollow frusto-conical portion 46′ to co-operate with the ground frusto-conical member 44. The pipe or connection 16 also includes a short piece of piping 49 which connects the horizontal upper opening of the goose-neck at 50 with the nozzle 2. The latter is in the form of a shallow dish provided with a lateral threaded opening 51 to receive the pipe section 49 and an upwardly disposed opening 3, as aforesaid, enlarged in a horizontal plane, the same being preferably, as shown, of rectangular shape and of considerable cross-sectional area and containing the porous block or support 4 held in position by a thin metal frame 53 secured to the nozzle opening by screws 54, which frame also helps to support the fabric and contacts the same at the edges of the nozzle, limiting the application of the suction.

In the practice of my method the garment or fabric is laid on the table and the soiled portion which will be assumed to be a comparatively small spot, is spread over the nozzle opening resting on the support 4, preferably being held tightly in position. The bottles 5 are supplied with various cleaning fluids adapted to the cleaning of the different fabrics to be treated, as mohair, palm beach, silk, and the different varieties of woolens, as worsted, flannel and the like. The material is then sprayed with a suitable liquid from the bottles, the spraying

operation being controlled by pressure of the thumb on the button 33, and the vacuum or suction is at the same time applied to draw the cleaning fluid and dirt through the fabric by pressing on the pedal 24 at intervals corresponding to the intervals of spraying. The fabric may if desired be rubbed with a clean cloth if cleaning proves to be more than usually difficult, but this is undesirable and may in most instances be avoided, as a continuous application of the cleaning fluid and the likewise continuous application of suction, drawing it through the fabric, ordinarily serves to remove the foreign matter, and as it does not permit the cleaning fluid to spread over the fabric or to dry in the fabric, there is no spreading of the foreign matter thus dissolved and no tendency to form a spot with a line of demarcation between the wetted and unwetted portions of the fabric.

I have thus described specifically and in detail a single embodiment of the apparatus of my invention, and of my method of treating fabric, in order that the nature and manner of applying the same may be clearly understood; however, the specific terms herein are used descriptively rather than in a limiting sense, the scope of the invention being defined in the claims.

What I claim and desire to secure by Letters Patent is:

1. The method of cleaning fabric which consists in spraying a liquid solvent on one side of the fabric and simultaneously applying suction to the opposite side of the fabric.

2. The method of removing spots from fabric which consists in supporting the soiled portion of the fabric and applying suction to a limited area of one side of the fabric in the vicinity of and including the soiled portion and at the same time spraying the opposite side of the same area of the fabric with a solvent whereby the foreign matter and solvent are immediately removed from the fabric, the solvent not being permitted to evaporate therefrom.

The method of removing spots from fabric which consists of applying suction to a limited area of one side of the fabric in the vicinity of and including the soiled portion and spraying the opposite side of the same area of the fabric with a solvent whereby the foreign matter and solvent are immediately removed from the fabric, the solvent not being permitted to evaporate therefrom, and separating the solvent and foreign matter from the air.

4. An apparatus for removing spots from fabric which consists of a suction member having an opening with a support for the fabric, means for applying suction to said member, a receptacle for the solvent with means for spraying the same on the fabric when placed on said support.

5. An apparatus for removing spots from fabric consisting of a suction member having an enlarged opening with a support for the fabric, a pipe leading to said suction member, a separator in said pipe, a second pipe leading to said separator, means for applying suction to said second pipe, a container for solvent with a spray nozzle, and means for applying pressure to the solvent to spray the same on the fabric on the suction member, means for controlling the suction at the will of the operator, and means within the control of the operator for controlling the application of pressure to the solvent sprayer.

6. An apparatus for removing spots from fabric consisting of a suction member having an enlarged opening with means for supporting the fabric covering and contacting said opening, a pipe leading to said suction member, means for creating suction in said pipe, a separator in the pipe, a valve in said pipe with means for closing the valve, means controlling the valve to open the same at the will of the operator, and means for spraying solvent on the fabric on the suction support.

7. An apparatus for removing spots from fabric consisting of a suction member having an enlarged opening with means for supporting the fabric over said opening, a pipe leading to said suction member, a separator in the pipe, a valve in said pipe with means normally closing the valve, means controlling the valve to open the same at the will of the operator, means for applying suction to said pipe, and means for spraying solvent on the fabric on the suction support, said means consisting of a movable container for the solvent, a spray nozzle, means for applying compressed air to the nozzle and means for controlling the supply of compressed air.

8. In an apparatus for removing spots from fabric comprising a suction member having an enlarged opening, and means for supporting the fabric, an air pump with means connecting the suction of the air pump to said suction member, a container for the solvent with a spray nozzle, a valve in said suction pipe with means normally closing the same, and means within reach of the operator for opening said valve, and a connection from the pressure end of the pump to said spray nozzle, and means for controlling the application of pressure to the spray nozzle, a separator in the line between the suction member and the pump.

9. A fabric spotting appliance comprising a support for the fabric, a suction member having an opening in a horizontal plane, an upright pipe with a lateral arm connected to and supporting the suction member, means for applying suction to said pipe, the upright pipe having a swivel joint to permit the suction member to swing laterally.

10. In an apparatus for cleaning spots from fabric, a suction member having an enlarged opening, means for applying sub-atmospheric pressure to the suction member, creating a suction at the opening and a porous support for the fabric in said opening.

Signed by me at Baltimore, Maryland, this 3rd day of September, 1924.

MARTIN E. POPKIN.

Witnesses:
PORTER H. FLAUTT,
E. WEHMEYER.