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ELECTROLYTIC APPLIANCE FOR TREATING SURFACES

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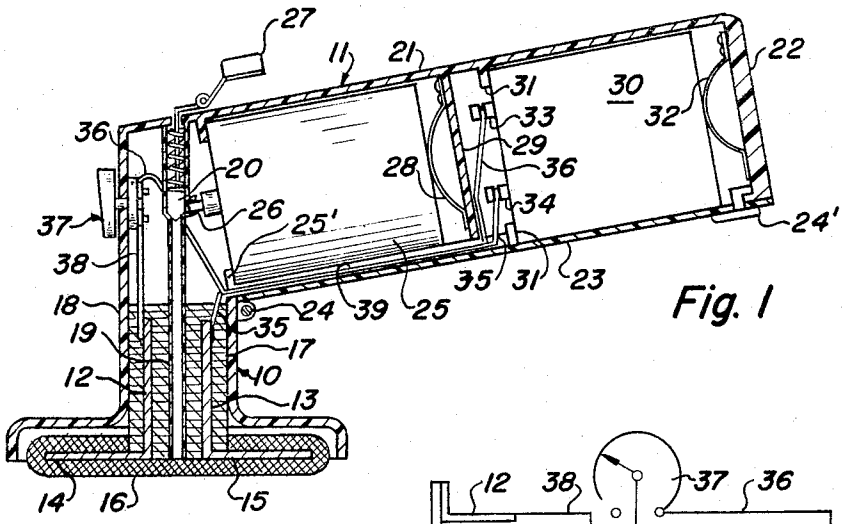


Fig. 1

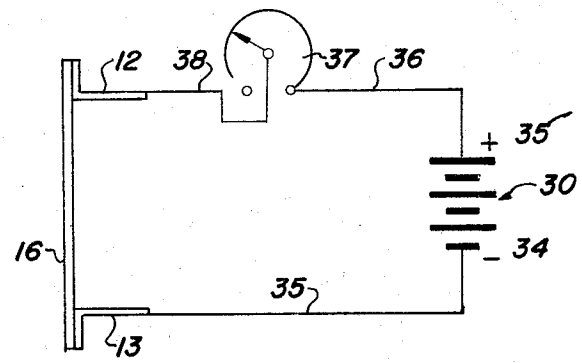


Fig. 2

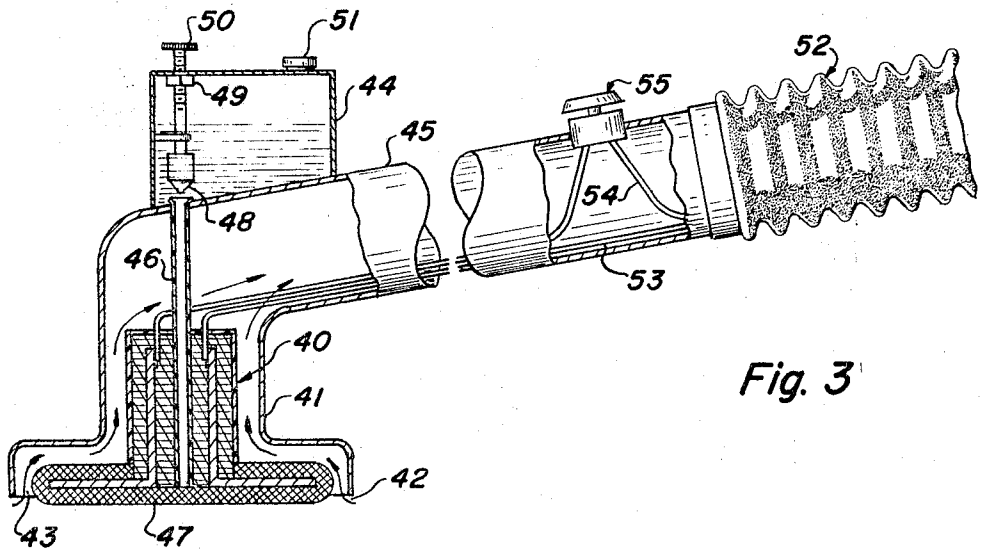


Fig. 3

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ELECTROLYTIC APPLIANCE FOR TREATING SURFACES

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The present invention relates to the method of and apparatus for treating surfaces by electrotlytic action.

The device of the invention may be used to merely clean any surface, to clean a painted surface, to brighten a painted surface by removing the dull surface skin to expose the bright paint of the original color or to polish soiled or stained metallic and other surfaces.

According to the invention direct current of about 24 volts is applied to two electrodes insulated from each other so that one forms a cathode and the other an anode. The working faces of the electrodes are covered with a cloth soaked with a water solution of sodium carbonate or sodium bicarbonate. Where the word carbonate solution is used herein it is intended to include bicarbonate solution.

The soaked cloth thus carries the electrolytic solution and when a direct current is applied, free alkali (NaOH) is liberated at the cathode.

Other products of the electrolysis are gaseous and thus aid in loosening the dirt from the surface being treated.

The free alkali is a potent cleaning agent and in order to regulate its concentration a rheostat is provided in the electric circuit to vary the current applied.

According to one form of the invention the device is a portable hand appliance, provided with a replaceable battery for supplying the direct current, and a removable container for holding the carbonate solution.

According to a second form of the invention the device is mounted on the end of a suction cleaner hose and forms the nozzle. The solution container is mounted on top of the nozzle and the electrodes are positioned within the nozzle. Direct current is supplied by means of wires extending along the hose to the suction cleaner, a rectifier-transformer being provided at the cleaner for transforming the current from A.C. to D.C. and to reduce the voltage and thus avoid shock hazards.

Other objects and advantages of the invention will become apparent as the description proceeds when taken in connection with the accompanying drawings in which:

FIG. 1 is a sectional view of one modification of the invention;

FIG. 2 is a schematic wiring diagram for the modification of FIG. 1 and

FIG. 3 is a view, partly in section showing a second modification of the invention.

Referring to FIG. 1, the device comprises an applicator section **10** and a handle section **11** extending at an angle to each other so that the device may be easily manipulated. The applicator comprises two electrodes **12** and **13**, which are preferably made of nickel or aluminum, and extend transversely of the appliance, their length being determined by the desired width of the appliance which may be of any selected width, preferably 4 to 6 inches.

The electrodes **12** and **13** are of angled formation with horizontal legs **14** and **15** presenting working faces facing the surface to be cleaned.

A wash cloth **16**, preferably made of asbestos, is applied to the legs **14** and **15** of the electrodes, and, as will appear, carries the electrolytic solution of the device.

The electrodes **12** and **13** are insulated from each other by insulating material **17** of any suitable character, and are surrounded by a plastic housing **18**.

A dispensing tube **19** of plastic insulating material, extends downwardly through the insulation **17** to discharge liquid onto the cloth or pad **16**.

A valve mechanism, generally indicated by the reference character **20** is positioned within the upper end of tube **19** to control the flow of solution to the cloth **16**.

The handle section **11** includes an extension **21** of the housing **18**. The extension **21** includes an end closure **22** and is split longitudinally the lower half **23** being pivoted at **24** to the section **10** and latched to end **22** by latch **24'**.

Housed within the handle extension **21** is a receptacle **25** having a nozzle **26** communicating with the dispensing tube **19** above the seat for the valve **20**. The receptacle **25** contains the sodium carbonate solution and may be of the aerosol type in which the liquid is under gas pressure and is dispensed when the valve **20** is opened by a manual pressure applied to the valve actuator **27**. The receptacle **25** is pressed against ribs **25'** by a spring **28** secured to the partition **29**.

A 24 volt electric battery **30** is removably mounted in the outer end of handle **11** and is held against lugs **31** by a spring **32** secured to the end **22** of the handle as shown.

The battery is provided with terminals **33** and **34**. The terminal **34** is connected to the electrode **13** by a conductor **35** and the terminal **33** is connected to one side of a rheostat **37** by a conductor **36**. The other side of the rheostat **37** is connected to the electrode **12** by a conductor **38**.

The rheostat **37** acts both as an on-off switch and as a means for varying the electric current supplied to the electrodes.

Interiorly, the wall of handle is provided with a channel **39** in which the conductors **35** and **36** are positioned.

Operation of Figs. 1 and 2

The rheostat **37** is turned to its on position but no current will flow because the cloth **16** is dry and thus non-conducting. The valve lever **27** is then depressed to wet the cloth **16** with the carbonate solution.

When the cloth **16** is wet, the appliance is applied to the surface to be treated and the rheostat **37** adjusted to supply the proper current to the electrodes. The proper amount of alkali is thus generated at the cloth **16** to perform the particular surface treating or cleaning operation desired.

When the cleaning operation is finished the rheostat is turned to its "off" position and the cloth thoroughly washed to remove any accumulated dirt.

The surface just cleaned should be wiped with wet or dry cloths to remove residual dirt from the surface just cleaned.

The valve **20** may be opened to dispense solution with the rheostat off as an aid in cleaning the surface and cloth **16** after the device has been used.

In the modification of FIG. 3, the electrolytic unit **40** is in all respects the same as that described in connection with FIG. 1.

The unit **40** is supported within a suction nozzle **41** in any suitable manner so as to support the suction mouth **42** slightly above the floor and to provide a suction opening **43** surrounding the unit **40**.

A solution tank **44** is mounted on top of the wand **45** interiorly connected to the nozzle **41**. A plastic tube **46** extends downwardly from the tank **44** to the asbestos cloth **47** as in the first modification.

The upper end of tube **46** forms a seat for a valve **48** adjustably mounted by being screw threaded through a nut **49** suitably secured to the top of the tank **44** and provided with a manipulating knob **50**. A removable cap **51** is provided on the top of tank **44** so that it may be refilled when empty.

The wand **45** is connected to the suction inlet of a suction cleaner by a flexible hose **52**. The cleaner is provided with a rectifier of known type which changes the 110 A.C. current to 24 volts D.C.

The electrodes of unit **40** are connected to the rectifier by conductors **53** and **54** which may be embedded in the wall of hose **52**. A rheostat **55** is connected in the circuit in order to control the current supplied to the electrodes.

The rheostat is preferably of the type which will open the circuit so that the suction cleaner may be operated with the electrode unit "off."

Operation of Fig. 3

The suction cleaner is started including the rectifier and a suction will be applied at the nozzle mouth **42**. As the nozzle **41** is moved about the valve **48** is set at the proper position to dispense carbonate solution at the proper rate. The rheostat **55** is set to provide the proper current to the electrodes.

As the liquid is dispensed electrolysis causes alkali water and gases to be released at the cloth **47** so as to clean the surface as the nozzle is moved about.

The dirty water and gases are immediately picked up in the suction air stream and deposited into a suitable water air separator in the suction air stream ahead of the motor-fan unit.

When one area is cleaned the nozzle is moved to another area and the process continued until the entire surface has been cleaned.

The rheostat **55** may be turned to its off position and the nozzle moved about while dispensing solution so as to sort of rinse the surface and at the same time drying it.

The joint between the wand **45** and hose is preferably detachable and after a cleaning operation is completed the wand is preferably detached and the cloth **47** thoroughly washed in clean water.

While I have shown and described but two embodiments of my invention, it is to be understood that those embodiments are to be taken as illustrative only and not in a limiting sense. I do not wish to be limited to the particular structure shown and described but wish to include all equivalent variations thereof except as limited by the scope of the claims.

I claim:

1. A surface treating appliance comprising, an applicator section for application to the surface to be treated, and a handle section, said applicator section including a vertically extending casing having an enlarged open ended lower mouth porton, a pair of angle shaped electrodes positioned in the lower end of said applicator section with the short legs of said angles extending laterally into said enlarged mouth, and with the long legs extending upwardly into the lower portion of said applicator section, insulating material insulating said electrodes from each other and from said casing, asbestos cloth surrounding the short legs of said electrodes and extending between said electrodes, a liquid dispensing tube extending upwardly from said cloth, through said insulating material and into the upper portion of said applicator casing, said tube being provided with a valve seat adjacent its upper end, a valve for opening and closing said valve seat and including a stem extending upwardly to a valve actuator positioned on top and exteriorly of said applicator casing, a port formed in said tube above said valve seat, said handle section including two compartments, the innermost of which receives a liquid carbonate container having a nozzle for entry into said port and the outermost of which receives a dry cell battery, electric conductors including a rheostat for connecting the terminals of said battery to said electrodes, the lower portion of said handle being pivoted to the upper portion whereby said receptacle and battery may be removed and replaced.

2. A surface treating appliance comprising, an applicator section and a handle section extending at an angle thereto for hand manipulation, a pair of separated electrodes positioned in said applicator section, porous solution carrying means bridging the free ends of said electrodes, said handle section containing a container for sodium carbonate solution and a dry cell battery, means for dispensing liquid from said container to said porous solution carrying means and electric conductors including a rheostat for connecting the terminals of said battery to said electrodes.

3. In combination, a suction nozzle, an electrolytic surface treating device positioned within said nozzle, said electrolytic device comprising a pair of electrodes positioned within said nozzle and each having a leg facing the mouth of said nozzle and a leg extending upwardly into said nozzle and insulated from each other, a cloth of textile material surrounding and connecting the pair of legs which face said mouth, said electrolytic device being spaced from the walls of said nozzle including said mouth to provide a passage for air about said device, a sodium carbonate solution receptacle mounted on top of said nozzle, means for dispensing liquid from said receptacle to said cloth, a manipulating wand connected to said nozzle, said wand adapted to be connected to a suction cleaner by means of a hose having electric conductors embedded in its wall and adapted to be connected to a low voltage D.C. rectifier mounted on said cleaner and a rheostat mounted on said wand, one of said electric conductors being connected to one of said electrodes, the other of said electric conductors being connected to one side of said rheostat and the other side of said rheostat being connected to the other of said electrodes.

4. An electrolytic surface treating device comprising, an applicator section and a handle section extending at an angle thereto, said applicator section including a pair of electrodes insulated from each other and having downwardly facing working faces, porous solution carrying means bridging said working faces, a solution container, means for dispensing liquid from said container to said porous solution carrying means and means for supplying a D.C. current to said electrodes.

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