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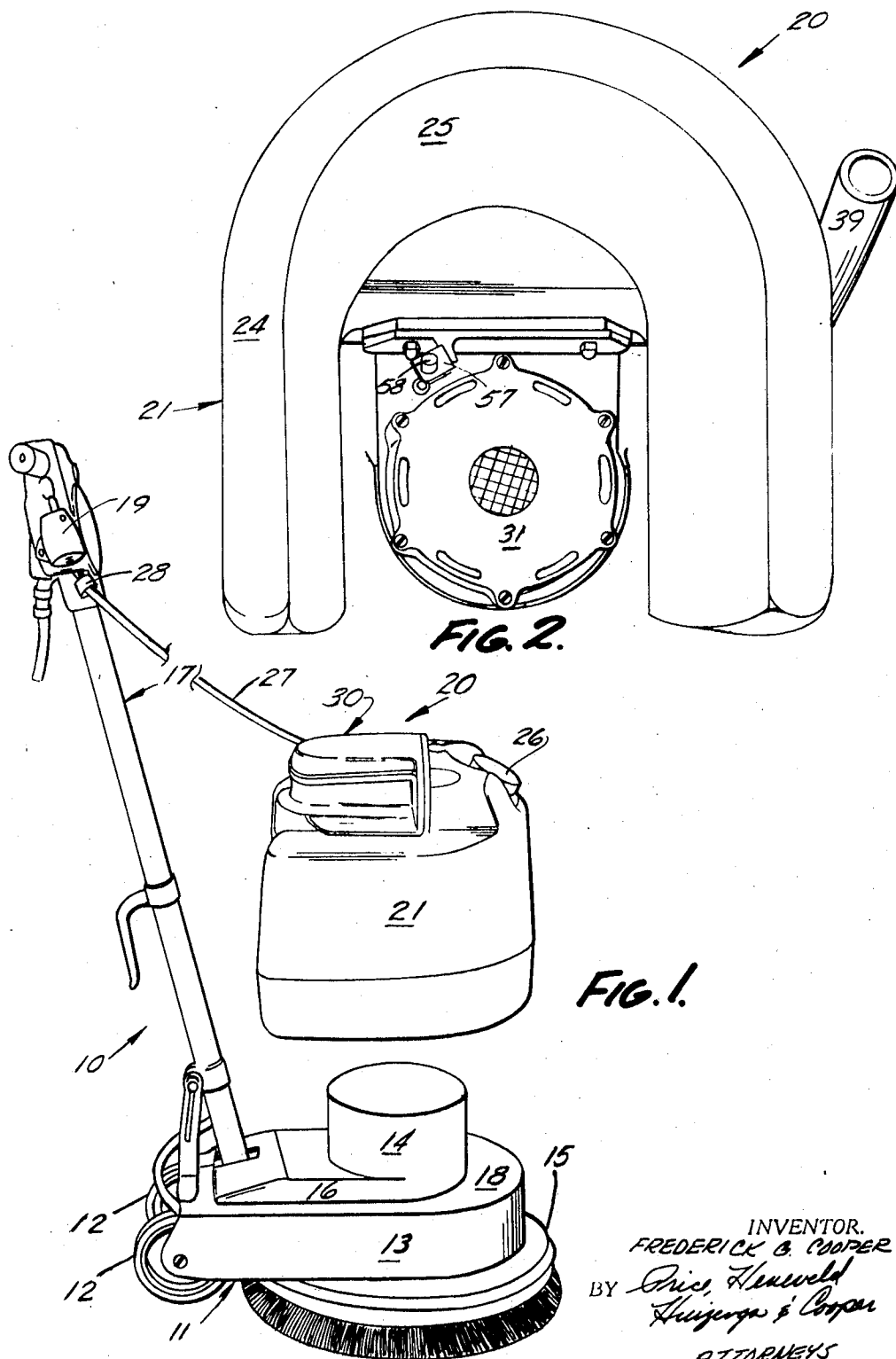
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CONVERSION UNIT FOR FLOOR SCRUBBER

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2 Sheets-Sheet 1



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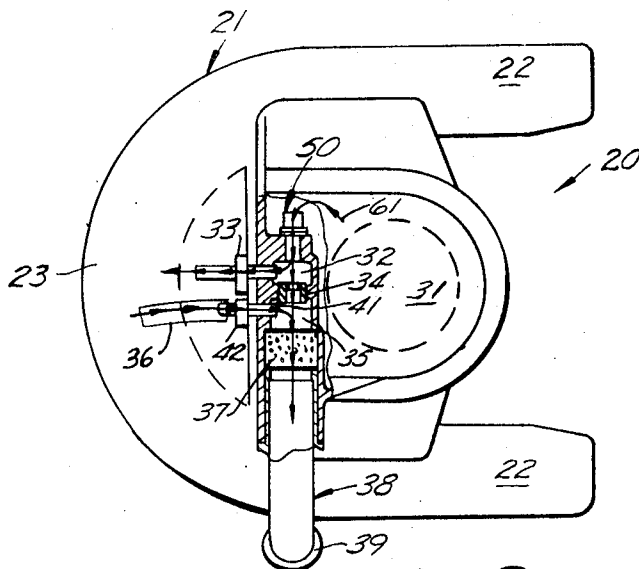


FIG. 3.

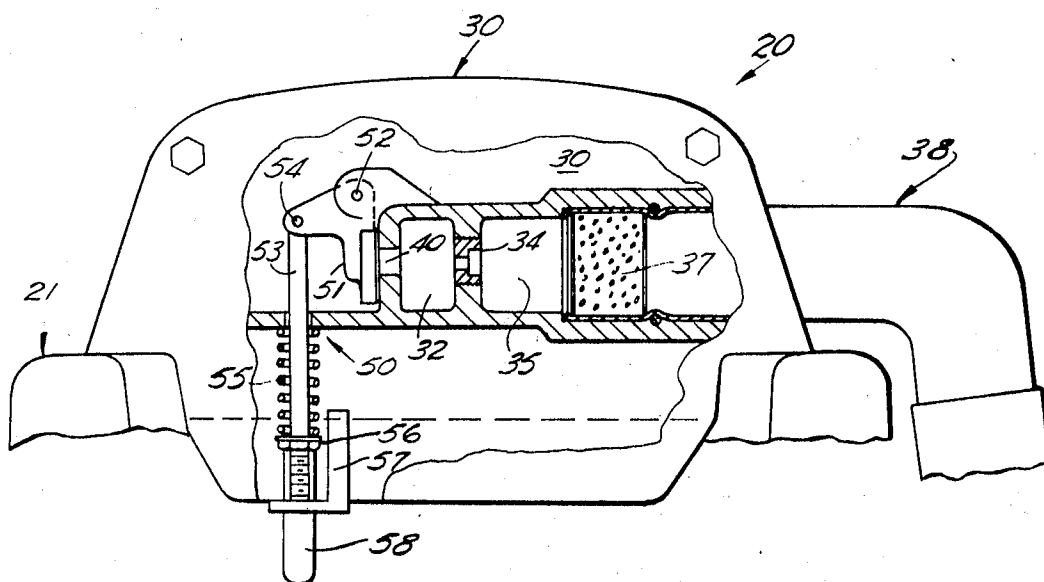


FIG. 4.

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CONVERSION UNIT FOR FLOOR SCRUBBER
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8 Claims

ABSTRACT OF THE DISCLOSURE

A unit for converting a floor treating machine such as a buffing machine into a scrubber. The unit is adapted particularly for a polisher-scrubber having an upstanding motor housing on the chassis thereof. The unit has an upstanding U-shaped tank section which is adapted to nest with and partially envelop the upstanding motor housing, depending for vertical support upon the abutment of the bottom of the tank and the polisher-scrubber chassis. The unit has a separate air blower incorporated therein which charges the foam tank with air pressure and supplies air to the foam generator in relatively conventional fashion. The resulting foam is fed onto the surface being treated via a depending downspout. A position-sensitive valve is provided for opening and closing the air inlet to the foam generator in response to the placing of the conversion unit upon the chassis of the floor treating machine which is to be converted into a scrubber.

BACKGROUND

This invention relates to conversion units for floor treating machines, and more particularly, to a conversion unit for adapting a conventional floor buffer or the like for utilization as a self-contained scrubbing unit for cleansing carpet or other types of surfaces.

Standards for proper care of carpeted surfaces or surfaces with other types of covering often dictate that the covering be scrubbed at intervals ranging from one week upward depending upon the particular environment as a means of maintaining a satisfactory appearance and, additionally, preserving the covering material. It has become customary, particularly with carpeting, to place a detergent material or shampoo onto the surface, either in a foamed or nonfoamed state, and then work it into the surface by means such as a rotating scrubber brush. Best results are obtained, unquestionably, when the shampoo or detergent material is foamed—i.e., mixed with air until of rather dry consistency—prior to its introduction onto the carpeted surface. Such premixing prevents localized overwetting of the surface and, thus, permits a uniform cleaning job.

A number of scrubbing units have been designed and marketed which integrally incorporate a foam solution tank and a foam generator mechanism. Such units are obtainable, ordinarily, only in relatively large and expensive sizes and their purchase may not be justified in situations where the amount of floor covering to be cleaned is relatively small and/or the cleaning interval is relatively lengthy. Such is particularly true where, as is usually the case, the particular business may already own a buffing apparatus for utilization on waxed floors and, thus, where the additional expenditure necessary for the purchase of an integrated foam-cleaning machine would be redundant at least insofar as its buffing capabilities were concerned.

OBJECTS AND SPECIFICATION

It is an object of this invention, therefore, to provide a conversion unit capable of converting a standard floor

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buffer or the like into a self-contained foam-generating unit.

More particularly, it is an object of this invention to provide a conversion unit which may be selectively placed on or removed from a standard buffing unit to convert the unit to a scrubbing mechanism.

Thus, it is an object of this invention to provide a conversion unit which may be purchased separately from the buffing or scrubbing unit with which it is to operate conjunctively and which may be fabricated and sold relatively inexpensively.

It is yet a further object of this invention to provide a device of the type described embodying a novel valve arrangement for preventing undesirable leakage of the detergent into the conversion-unit motor during storage of the unit.

It is still a further object of this invention to provide a conversion unit of the type described which may be placed upon the power unit in such fashion that the center-of-gravity thereof is not distorted and, thus, wherein the result and combination may be operated with relative ease.

These as well as other objects of this invention will be readily understood by reference to the following specification and accompanying figures in which:

FIG. 1 is an exploded perspective view of a conventional buffing machine and the conversion unit therefor;

FIG. 2 is a bottom perspective view of the conversion unit;

FIG. 3 is a plan view, partially in cross section, of the conversion unit; and

FIG. 4 is a fragmentary, side-elevational view, partially in cross section, of the conversion unit.

Briefly, this invention comprises a conversion unit for a floor treating machine, the machine having a chassis section with an upstanding housing thereon as is conventional in the vast majority of treatment machines which have been produced in recent years. The conversion unit has an upstanding tank section adapted to be placed upon the chassis of the treatment machine. The interior configuration of the tank section is such that it nests with and at least partially envelops the upstanding housing on the machine chassis. Foam generating means including an air compressor are affixed to the tank and supplied with detergent therefrom. Means are provided for discharging the foam thus generated onto the surface which the machine is to be utilized to treat.

Referring now to the figures, a preferred embodiment of this invention will be described in detail. FIG. 1 illustrates a relatively conventional floor treatment apparatus sold for the purposes, inter alia, of buffing a waxed floor or of working liquid detergent which has been poured onto a floor thereinto. As illustrated, the machine comprises a chassis section 11 supported by a pair of rear wheels 12 and having a forwardly extending frame section 13. Extending upwardly from the frame section 13 is a cylindrical motor housing 14 having intermediate chassis sidewalls 16. Connected to the drive shaft of the motor 14 via a gear train or other suitable means is the scrubbing or buffing brush 15. As will be readily appreciated by those skilled in the art, motor 14 causes brush 15 to rotate when the apparatus is in operation. The assembly is operated by means of handle 17.

Referring now additionally to FIGS. 2 through 4, the novel conversion apparatus 20 which is the subject of this invention comprises a U-shaped tank section 21 having rearwardly extending legs 22 and a forward curved section 23. The tank section 21 has a planar U-shaped base 24 and the interior section thereof is relatively hollow and bounded by the smooth, curved interior side walls 25 of the tank section 21 which, in the embodiment shown,

form a generally U-shaped cavity within the interior of the unit 20.

The tank section 21 is provided with a filler cap 26 (see FIG. 1) through which access is gained to the interior of the tank section for the insertion and when desirable, removal of cleansing detergent. The tank section 21 may be filled with detergent either prior to or subsequent to its placement onto the conventional treatment machine with which it is to be used conjunctively as will become more apparent hereinafter.

Formed integrally with the conversion unit 20 is the foam generator assembly 30 consisting of a blower motor or pressure impeller 31 suitably suspended between the upward reach of the U-shaped tank configuration. Air from the impeller assembly 31 is routed via an aperture 40 into a junction chamber 32 which, conveniently, may be formed integrally with the motor support housing. As shown specifically in FIG. 3, the compressed air exits from junction chamber 32 through both the pressurizing orifice 33 and the metering orifice 34. That portion of the air which passes through the pressurizing orifice 33 is utilized to pressurize the interior of the solution tank 21 to cause the detergent to be forced thru the standpipe or inlet tube 36 into the mixing chamber 35. That portion of the air which passes through the metering orifice 34 mixes with the detergent forced into the mixing chamber 35 through tube 36 and the air and liquid are passed through a conventional mixing pad 37.

As will be appreciated by those skilled in the art, the passage of the air and liquid combination through the mixing pad 37 results in the generation of a relatively dry foam material which may be scrubbed into the carpet in such a manner as to virtually eliminate localized overwetting of particular areas and which, in addition, provides much more satisfactory cleansing results than can be obtained by the utilization of liquid detergent alone.

The foam detergent issuing from the mixing pad 37 passes into a downspout assembly illustrated generally by the reference numeral 38. As shown best in FIGS. 2 through 4, the downspout assembly 38 exits from the housing and then curves to proceed toward the surface to be cleansed at approximately a right angle. Conveniently, a sleeve of plastic or like material such as that indicated at 39 may be affixed to the downspout assembly 38 as a means of routing the foam to a position closely adjacent the scrubbing brush 15 prior to its passage from the conversion unit.

The quantities of air and foam fed into the mixing chamber 35 are controlled by the size of the changeable air orifice 34 located between the mixing chamber 35 and the junction chamber 32 and, additionally, by the size of the orifice in the standpipe 36 relative to the pressure within the tank 21. It will be apparent, of course, that the amount of detergent flowing into the mixing chamber 35 during operation of the apparatus might be controlled, additionally, by the positioning of an orifice member within the hollow cap screws 33 or 42 as well as at other selected points in the liquid-detergent flow lines.

During the periods of storage of the conversion unit, some possibility exists that the detergent within the tank 21 might drain by gravity rearwardly through the air orifice 34 and the air inlet 40 into the interior of the motor 31. Such leakage, of course, is highly undesirable and will ruin the air impeller motor within a short period of time. As a means of alleviating this possibility, this invention provides a safety valve assembly indicated generally by the reference numeral 50. As shown in FIG. 4, the safety valve assembly comprises a flipper valve 51 pivotably mounted to the conversion unit frame as indicated at 52 and swingable over the air inlet 40 in sealed relationship therewith. A vertical shaft 53 is pivotably connected to a lever arm on the flipper valve as indicated at 54 and the shaft passed downwardly through a suitable guide structure 57 into the U-shaped open interior of the unit. The shaft is biased downwardly by means of a

compression spring 55 bearing against a suitable shoulder 56 and the frame of the conversion unit to hold the flipper valve 51 in closed position. When the tank is placed on the unit to be converted, however, the depending actuator 58 is pushed upwardly by the weight of the conversion unit and its bearing against the top of motor housing 14 causing flipper valve 51 to pivot about point 52 to an open position. This, in turn, permits the air generated by the impeller to flow through air aperture 40 into the junction and mixing chamber and the solution tank.

In operation, the unit is lowered onto the treating machine to be converted such that the interior surfaces 25 of the unit nests with and partially envelops the upstanding motor housing 14. The rear portions of the legs 22 of the U-shaped tank 21 nest, additionally, with the intermediate chassis sidewalls 16 of the apparatus to positively position the unit. The unit is supported by the abutment of its lower planar surfaces 24 upon that portion of the chassis of the floor treatment unit indicated by the reference numeral 18 in FIG. 1. As the unit is placed into nesting relationship with the treatment machine to be converted, the depending actuator 58 abuts the top of the upstanding motor housing 14 on the machine and is pushed upwardly under the influence of the settling conversion unit. This upward movement of shaft 53, as explained previously, opens the flipper valve 51 and the apparatus is ready for utilization.

Conveniently, a switch 19 may be provided upon the control handle of the floor treatment machine into which the air impeller motor 31 of the conversion unit may be wired by means of a removable plug 28. With this arrangement, the operator may control the discharge of foam onto the surface being scrubbed by selectively actuating and deactuating the impeller motor 31. If necessary, additionally, solenoid valves may be incorporated into either the detergent intake conduit 36 and/or the downspout assembly 38 in order to provide more positive control of the solution flow.

When the impeller motor switch is activated, the air stream, indicated generally by the arrows 61 in FIG. 3, passes through the aperture 40 and from the junction chamber 32 into the tank 21 and into the mixing chamber 35. Within the mixing chamber 35, the air is joined by the liquid detergent, the path of which is indicated generally by the arrows 62, and the two materials pass through the pad 37, through the downspout assembly 38 and onto the carpet or other surface in the form of dry foam.

When the particular scrubbing operation has been completed or when it is desirable to utilize the floor treatment unit 10 as a buffer or scrubber without the foam generator attached thereto, it is necessary only to detach the power conduit from the foam generating apparatus or the handle of the treatment machine 10 and lift the conversion unit 20 therefrom. During this lifting process, spring 55 causes flipper valve 51 to flip into its closed position to prevent detergent leakage into the motor housing during the storage period despite the position in which the apparatus is stored.

What is claimed is:

1. A conversion unit for a floor treating machine having a chassis section with an upstanding housing thereon, said unit comprising:

an upstanding solution tank section adapted to be placed upon said chassis, the interior configuration of said tank section being shaped such as to nest with and at least partially envelop said upstanding housing;

foam generating means affixed to said tank section and supplied with detergent therefrom; and

means for discharging foam from said generating means onto the surface to be treated.

2. The unit as set forth in claim 1 wherein the interior of said tank section is substantially U-shaped and wherein said foam generating means is mounted across the top thereof so as to overlie substantially the upper surface of

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said housing when said unit is positioned in nesting relationship with respect thereto.

3. The unit as set forth in claim 2 wherein the forward portion of said housing is substantially cylindrical.

4. The unit as set forth in claim 1 wherein said generating means includes an air compressor and which further comprises:

normally closed valve means in said generating means to prevent leakage of solution into said compressor during idle periods; and

means for selectively opening said valve means.

5. The unit as set forth in claim 4 wherein said opening means comprises resilient means adapted to abut said machine when said unit is placed thereon.

6. The unit as set forth in claim 1 wherein said generating means comprises;

an air compressor having an air discharge section, said section communicating with a junction chamber from which the air flows into said tank section to pressurize it and through an orifice into a mixing chamber;

standpipe means communicating between the interior of said tank section and said mixing chamber for delivery solution into said mixing chamber in response to the pressurization of said tank;

foam pad means positioned downstream of said mixing chamber for completing generation of foam from air and solution; and

downspout means for transferring said foam from said pad to the surface to be cleaned.

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7. A conversion unit for a floor treating machine having a chassis section including a brush and driving motor therefor, said unit comprising:

a solution tank section adapted to be placed removably upon said chassis and secured thereto;

foam generating means including an air compressor affixed to said tank section, said generating means being supplied with detergent therefrom;

means for discharging foam from said generating means onto the surface to be cleaned;

normally closed valve means in said generating means to prevent leakage of solution into said compressor during idle periods; and

means for selectively opening said valve means.

8. The unit as set forth in claim 7 wherein said opening means comprises resilient means adapted to abut said machine when said unit is placed thereon.

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U.S. Cl. X.R.

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