# United States Patent [19]

**Collier**

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[54] **MACHINE FOR CLEANING CARPETS AND THE LIKE**


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[52] **U.S. Cl.** ..... **15/321,** 15/368, 15/415

[51] **Int. Cl.** ..... **A47l 7/00**

[58] **Field of Search** ..... 15/320, 321, 322, 368, 15/372, 401, 415, 422



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[57] **ABSTRACT**

A rug cleaning machine of the type having means for applying cleaning fluid to a rug, means for brushing said rug immediately after application of the cleaning fluid, and means for applying vacuum to the rug immediately after the brushing, characterized in that the means for brushing the rug comprises a rotary brush adjustably movable towards and from the rug pile, and the machine is provided with means for adjusting the brush.


**8 Claims, 3 Drawing Figures**

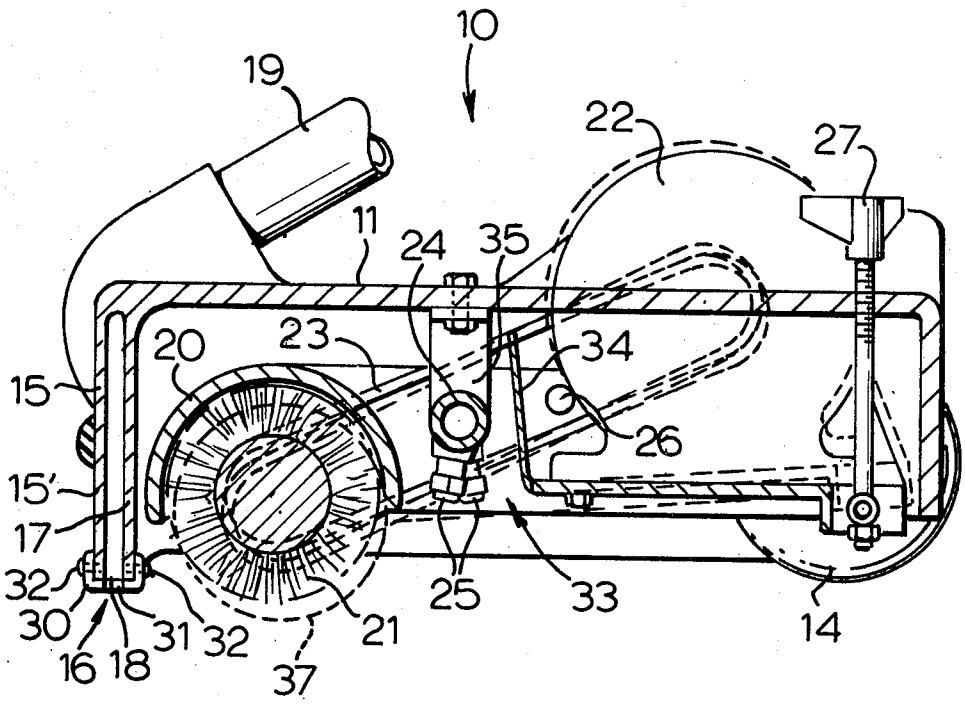


FIG. 1

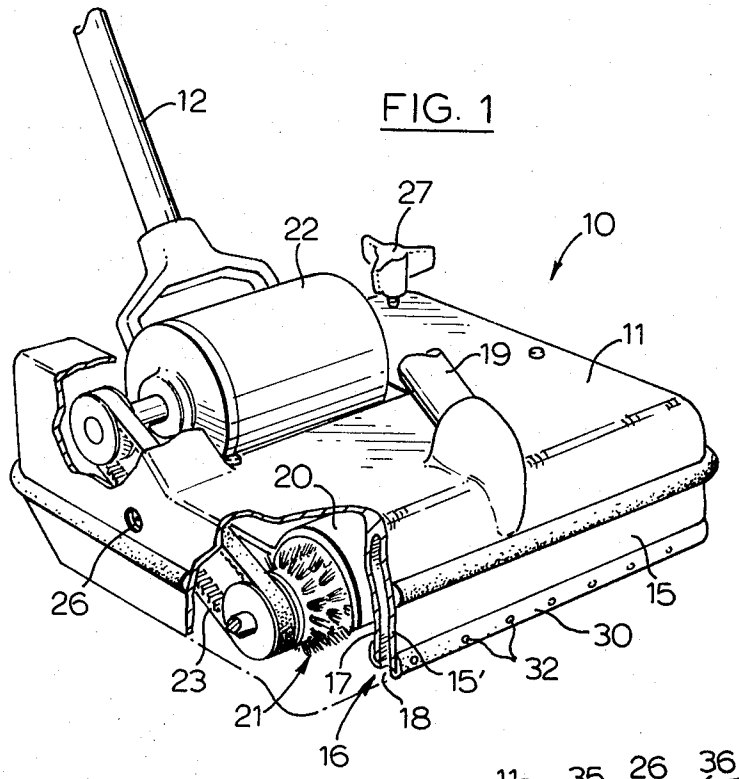



FIG. 2

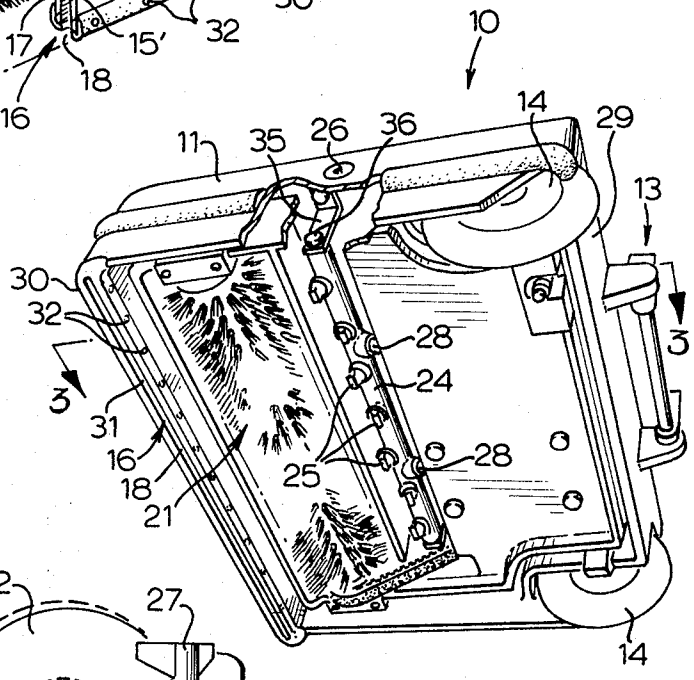
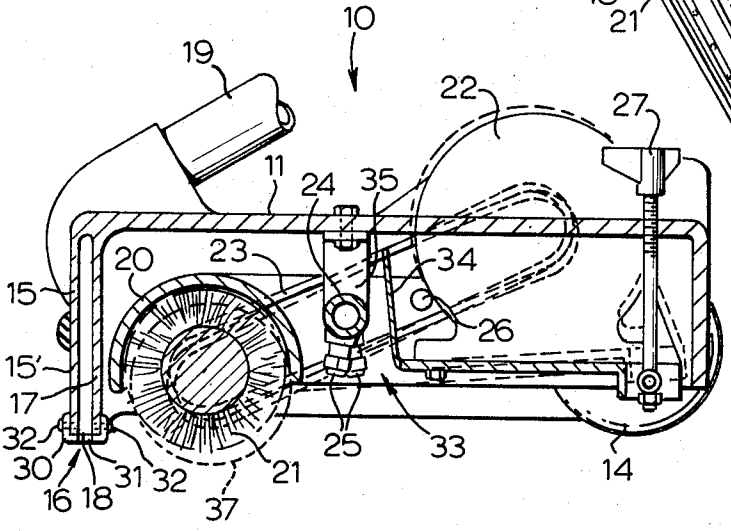



FIG. 3



# MACHINE FOR CLEANING CARPETS AND THE LIKE

## FIELD OF THE INVENTION

This invention relates to a novel rug and carpet cleaning head or machine for both domestic and commercial application.

## BACKGROUND OF THE INVENTION

With the increased use of carpeting on floors both in homes and in offices, the problem of keeping the carpets and rugs clean efficiently and inexpensively has been greatly accentuated. In the past, there have been a variety of methods used to clean carpets and rugs which heretofore have proven to be unsatisfactory. Some of these unsatisfactory methods such as using a shampoo and scrubbing were time consuming since it required a number of steps before the cleaning operation was completed. It also left the cleaning solution in the rug to dry which is detrimental to the life of the rug. Other methods were unsatisfactory when used on thick or shag carpets since the dirt at the bottom of the pile would remain essentially untouched while the dirt at the top was merely washed further down into the pile. Further, these old methods left the rugs and carpets with a shabby appearance and reduced their life expectancy due to the moisture and dirt being left in the pile. With the increased use of rugs and carpets, the need for a better cleaning method has been greatly increased, which need has not been satisfactorily met prior to the present invention.

## SUMMARY OF THE INVENTION

Accordingly, it is an object of the invention to provide a very efficient cleaning head or machine which applies hot cleaning solution to the rug in a manner to penetrate to the full depth of the rug pile, vigorously brushes the pile irrespective of its depth and vacuums the dirt and moisture (to leave a clean, essentially dry rug) in a single passage of the machine.

It is another object of the invention to provide a brush which is very easily adjusted to suit the height of pile.

It is a further object of the invention to provide jet stream outlet nozzles which provide a predetermined deep penetrating spray pattern over the carpet surface irrespective of the brush adjustment.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the cleaning machine with part of the outer casing cut away to show the brush and pulley arrangement.

FIG. **2** is a bottom perspective view of the cleaning machine showing the relationship between the vacuum nozzle, the reel-type brush and the solution-applying tube and nozzle.

FIG. **3** is a view tak along the line **3 — 3** of FIG. **2.**

## DETAILED DESCRIPTION OF THE DRAWINGS

Referring now to the drawings, there is shown a cleaning head or machine generally designated at **10** having a outer casing **11,** a handle **12** pivotally connected at **13** at the end **29** of machine **10.** Also adjacent end **29** of the machine **10** are wheels **14** for easier manoeuvering and handling of the machine to position the machine for the cleaning operation. At the opposite end **15** of machine **10** is located a narrow elongated



vacuum nozzle **16** running the width of the machine. As can be seen from FIG. **3,** the nozzle extends below the wheels **14** and brush **21** and is shaped to form a skid on which the free end of the head rides to ensure positive pile penetrating contact with the carpet to maximize the effect of the vacuum. The nozzle has two parallel spaced apart walls **15'** and **17** which are joined on three sides to form a chamber and the fourth side which is open forms a narrow elongated opening **18** adjacent the rug. Fitted over opening **18** is a channel shaped nozzle shoe **30** with opening **31** matching opening **18.** Shoe **30** is held in place by bolts **32** and is sealed by a silicone sealant to prevent leakage therearound so that the full effect of the vacuum is felt at opening **18.** Shoe **30** aids in the smooth passage of the nozzle over the carpet surface as it presses into the pile. Centrally located on the closed side opposite opening **18** is a hose **19** which is in communication with nozzle **16** through which the spent cleaning fluid and dirt is vacuumed into a recovery tank (not shown).

Located in the cavity of outer casing **11** is a platform **20** which is parallel to and spaced apart from the top of outer casing **11.** Located on platform **20** is a reel-type brush **21,** a motor **22** and belt drive **23** connecting motor **22** and reel-type brush **21.**

Platform **20** is pivotally mounted on outer casing **11** by means of pins **26** and the angle at which the platform is positioned with respect to the carpet is determined by adjusting knob **27** which adjusts the tilt of the platform **20** and locks it in place. Thus it can be seen that the reel-type brush **21** may be adjusted to accommodate different thicknesses of carpets and since the reel-type brush **21** and motor **22** are fixed on platform **20,** belt **23** will remain taut regardless of the height at which brush **21** is set with respect to the carpet. Platform **20** has an elongated rectangular opening **33** to accommodate cylindrical tube **24** which is mounted on the underside of casing **11.** Also located on platform **20** and at one edge of opening **33** is a splash guard **34** which protects the motor **22** from the sprays from outlet nozzles **25** and the brushing action.

Solution-applying cylindrical tube **24** is fixedly mounted on the under side of outer casing **11** and has located thereon spaced apart outlet nozzles **25,** each adapted to eject a fine high velocity pile penetrating spray. In mounting the tube **24,** brackets **35** are first secured to the outer casing, then tube **24** is adjusted until the sprays from the nozzles form a predetermined pattern, at which time adjusting bolts **36** are tightened. The ideal position is when the spray tangentially contacts the periphery of the brush when the brush is in its lowermost position **37.** The spray pattern is such that no liquid is applied beyond the limits of the brush and vacuum nozzle to ensure that no streaking takes place due to the solution being left in the rug. Solution-applying tube **24** is connected to a pressurized source of cleaning solution by means of inlet tubes **28.** As can be seen from FIG. **2,** and, more specifically, FIG. **3,** the outlet nozzles are arranged to direct their jet spray in diverging directions so that the jets from adjacent nozzles do not interfere with each other. If interference is allowed to take place, the diverging streams will collide with each other, thereby interrupting their velocity and creating excessively wet rug surface areas instead of penetrating uniformly deep into the carpet pile. Again, this would tend to leave streaks in the rug.

To operate the machine **10,** the operators pulls the machine by means of handle **12** across the surface to be cleaned. To maximize the vacuum pressure, the operator lifts the machine slightly to direct the weight of the machine on the vacuum nozzle which gives a more positive contact between the vacuum nozzle and the carpet. In order to reduce snagging between the sharp edges of the vacuum nozzle and the carpet piles, shoe **30** is fitted over the vacuum nozzle. Located on handle **12** is a trigger mechanism (not shown in the drawings) which controls the flow of pressurized cleaning solution from the storage tank (also not shown) to outlet nozzles **25.** Immediately after the application of the hot cleaning solution and as the machine is pulled further along the path, the reel-type brush **21,** which is powered by means of motor **22** and drive belt **23,** brushes the carpet surface to aid in the extraction of the dirt which is caught in the pile. This brushing action also tends to massage and revitalize the carpet pile to give it a fresh look. As machine **10** is further pulled along the surface being cleaned, vacuum nozzle **16,** which is in communication with a vacuum source and recovery tank through nozzle **19,** draws up the spent cleaning fluid and dirt. Thus, in one sweep of the cleaning machine the carpet is washed, brushed and vacuumed dry.

While the ebmodiment of the invention has been particularly described, it will be understood that variations may be made, as will be apparent to those skilled in the art, without departing from the scope of the appended claims.

I claim:

**1.** A machine for cleaning rugs and the like comprising a horizontal elongated cylindrical tube for applying cleaning fluid to a rug, a reel-type brush parallel to and spaced apart from said cylindrical tube, and driven by a drive belt and a motor for brushing said rug immediately after application of said cleaning fluid, and an intake nozzle in communication with a vacuum source for applying vacuum to said rug immediately after said brushing, said horizontal elongated cylindrical tube having at least one inlet means in communication with a pressurized cleaning fluid source and a plurality of axially spaced apart outlet means along the side of said tube adjacent said rug, said motor and said brush being mounted on an adjustable platform for adjusting said brush to the thickness of said rug while maintaining the distance between said brush and said motor constant at all times, irrespective of brush adjustment, said tube being fixedly secured at all times, whereby during brush adjustment the distance between horizontal tube and the rug surface remains constant; said platform being mounted on said machine to rotate about a horizontal axis, means for rotating said platform a limited distance about said horizontal axis to effect height adjustment of said brush relative to the rug surface and means for securing the platform in the adjusted position; and intake nozzle having an elongated rectangular intake opening parallel to and spaced apart from said brush and adjacent said rug, said intake nozzle being in communication with a vacuum source.

**2.** A machine as claimed in claim **1** wherein said outlet means are arranged such that adjoining outlet means provide diverging jet sprays such that the cleaning fluid jet spray from one outlet means does not interfere with the cleaning fluid jet spray from another outlet means while the cleaning fluid is being applied to said rug in a predetermined pattern.

**3.** A machine as claimed in claim **1** wherein said tube for applying cleaning fluid, said brush and said intake nozzle cover substantially the same width of rug.

**4.** A machine for cleaning rugs and the like comprising means for applying cleaning fluid to a rug, means for brushing said rug immediately after application of said cleaning fluid, and means for applying vacuum to said rug immediately after said brushing; said means for brushing the rug comprising a motor and a brush which are mounted on an adjustable platform in spaced relation, the distance between said motor and said brush being constant at all times, irrespective of brush adjustment; said brush being adjustable to the thickness of said rug, while the distance between said means for applying cleaning fluid and the rug surface remains constant, said platform being mounted on said machine to rotate about a horizontal axis, means for rotating said platform a limited distance about said horizontal axis to effect height adjustment of said brush relative to the rug surface and means for securing the platform in the adjusted position.

**5.** A machine as claimed in claim **4** in which said means for applying cleaning fluid comprises a longitudinal hollow bar having a horizontal axis and spaced a predetermined distance from said means for applying vacuum to said rug, said bar having an inlet passage and provided with a plurality of outlet nozzles spaced therealong, said bar being rotatable about its horizontal axis to adjust its spray pattern; said nozzles being arranged so that adjacent nozzles are directed in different radial directions with respect to the axis of said hollow bar.

**6.** A machine as claimed in claim **4** wherein said means for applying cleaning fluid, means for brushing and means for applying vacuum cover substantially the same width of rug.

**7.** A machine as claimed in claim **4** wherein said means for applying cleaning fluid comprises a horizontal elongated cylindrical tube, having at least one inlet means in communication with a pressurized cleaning fluid source and a plurality of axially spaced apart outlet means along the side of said tube adjacent said rug through which said cleaning fluid is applied to said rug; said outlet means being nozzles which are arranged such that adjoining outlet means provide diverging jet sprays in different radial directions with respect to the axis of the tube such that the cleaning fluid jet spray from one outlet means is proximate to the cleaning fluid jet spray from another outlet means without interference between the two jet sprays while the cleaning fluid is being applied to said rug in a predetermined manner.

**8.** A machine as claimed in claim **4** wherein said means for applying vacuum comprises an intake nozzle having an elongated rectangular intake opening adjacent said rug, said nozzle in communication with a vacuum source.

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