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Cost Effective Carpet Cleaning and Drying Machine

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Abstract: In modern days interior decorations are becoming important. Carpets are used extensively these days to give a good ambience in buildings. Cleaning of carpets and drying those poses difficulties and only heavy machines are available at present. A portable carpet cleaning machine, both dry and wet, is designed to make carpet cleaning easier. It is very simple in construction, easy to operate and reduces manual labor. This machine uses soap oil, water, a sweeping brush run by a motor, a suction motor is used to absorb water from the wet carpet and a heater is used to dry it. The machine is cost effective.

I. INTRODUCTION

Carpet cleaning machine is used to cleaning carpet in houses, auditorium, hotels and industries etc. Cleaning of waste is a very important one for our health and also for our surroundings. Many of carpet cleaning machines are available but a machine developed is very simple in construction and low cost. Anybody can operate this machine easily. The time taken for cleaning is very less when compared to the manual cleaning process .It need not continues maintenance for this machine. In our project we have made the machine to operate in a fully mechanical way with a little amount of electrical components. The carpet cleaner is of very simple construction and is very easy to operate; anyone can operate it without any prior training of any sorts with safety.

Cleaning is essential need of this generation. Basically in industries and hotels for carpet cleaning regularly different techniques are used to clean the different types of carpets. The reasons for carpet cleaning are:

It help to free the carpet from the bacteria's, germs and dust particles. To clean the stain in carpet. Debris and obstructions are to be removed. Allergens and dusts are to be removed. Traction should be maintained at optimum level, so that no slip will occur.

A carpet is a textile floor covering typically consisting of an upper layer of pile attached to a backing. The pile was traditionally made from wool, but, since the 20th century. Synthetic fibers such as polypropylene, nylon or polyester are often used, as these fibers are less expensive than wool. The pile usually consists of twisted tufts which are typically heat treated to maintain their structure. The term 'rug', although the term 'carpet' can be applied to a floor covering that covers an entire house, whereas a 'rug' is generally no bigger than a single room, and traditionally does not even span from one wall to another, and is typically not even attached as part of the floor. A carpet is a textile floor covering typically consisting of an upper layer of pile attached to a backing. The pile was traditionally made from wool, but, since the 20th century. Synthetic fibers such as polypropylene, nylon or polyester are often used, as these fibers are less expensive than wool. The pile usually consists of twisted tufts which are typically heat treated to maintain their structure. The term 'rug', although the term 'carpet' can be applied to a floor covering that covers an entire house, whereas a 'rug' is generally no bigger than a single room, and traditionally does not even span from one wall to another, and is typically not even attached as part of the floor.

Therefore to make this cleaning and drying of carpet easier, a low cost machine is designed.

II. LITERATURE SURVEY

A. Charlesf. Webb And Peter Feldman

A combination of foam and steam carpet cleaning machine incorporating separate storage compartments for the hot water and the foaming liquid, automatic control of vacuum wands positioned ahead and to the rear of the steam jets to permit forward and reverse motion during the steam cleaning operation, individual height adjustments for the cleaning brush and the vacuum wand and spring loading of the vacuum wand to insure adequate pressure of the wand against the carpet for maximum vacuuming efficiency. The machine is self-propelled in both forward and reverse directions.

This method usually consists of applying soapy or detergent-based foam to the surface of the carpet and brushing it in with a powered brush. The carpet is then left to stand for a period of time ranging from a few hours to a day before the dried foam and entrapped soil is removed by vacuuming. Shampooing in this manner is effective in removing surface soil and stains, but it has little or no effect in removing embedded dirt and sand

B. Geoffrey B. Rench, Racine and Stephen Jacobs

An improved machine convertible for brush-aided cleaning or vacuuming includes a pair of powered brushes counter-revolving for stroking solvent-dampened carpet cleaning particles through the carpet and along carpet fibers during initial cleaning. A separately powered pod is detachable from the machine during brush-aided carpet cleaning and attached to a machine mounted vacuum nozzle for carpet vacuuming to pick up the dirt-laden particles. The pod has first and second media selected to remove particles of differing sizes from air flowing through the pod. During initial carpet cleaning when vacuum is not needed, the pod may be detached and used in another area for hand-vacuuming carpeted stairs and other "small-area' places.

C. Timothye. Kasen, Luke Allahan and Grandyle Charles

A portable Carpet cleaning apparatus has a base for movement along a carpet Surface to be cleaned and an upright handle pivotally attached to a rearward portion of the base. A fluid dispensing nozzle for applying fluid to the carpet Surface and a Suction nozzle for picking up fluid and debris from the carpet Surface are associated with the base. Clean water holding tank and a detergent holding tank are removable mounted to the handle while a recovery tank is removable mounted to the base. A mixing valve is fluidly connected between the holding tanks and the Spray nozzle for changing the mixing ratio of the detergent with respect to the water. The fluid recovery tank includes an integrally molded conduit that extends from the Suction nozzle and a mounting for an accessory hose that interrupts the fluid path from the Suction nozzle in the conduit and redirects fluid flow through the hose. A pump is fluidly connected between the mixing valve and the dispensing nozzle and includes a pump priming Valve that operates on negative air pressure to clear air from the fluid lines during pump operation. A free floating brush is pivotally attached to the base for automatically adjusting to different carpet Surface conditions during cleaning operations.

D. Terry L. Zahuranec, Brett Atime, Robert A. Salo and Nordeen Mark E

A carpet extractor includes a base assembly including a housing which selectively receives a recovery tank for Field of collecting dirty cleaning fluid. A nozzle assembly is mounted to the base housing and provides a fluid flow path for dirty cleaning fluid from the floor surface to the References Cited recovery tank. The nozzle assembly is pivot able from a first Position, in which the fluid flow path communicates with the recovery tank, to a Second position, in which the nozzle assembly is spaced from the recovery tank to allow the recovery tank to be removed from the base housing. A second flow path is formed on the recovery tank between the tank and a nozzle plate. The flow paths have openings, respectively, at their lower ends, which are located either Side of two longitudinally spaced brush rolls. A flap valve selectively closes both flow paths during above floor cleaning

III. CONSTRUCTION

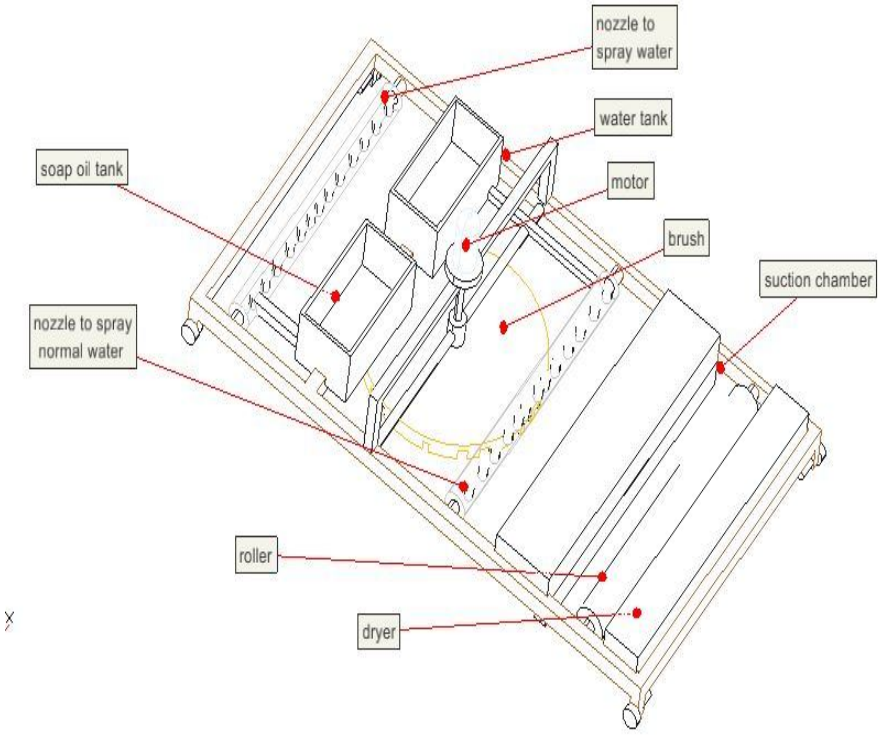
The carpet cleaning machine consist of various elements such as, AC motor, suction chamber, hose, roller, dryer, brush, frame ,fresh water tank and soap oil tank. Switch mode power supply is used to supply the power from main source to A.C motor, suction motor and dryer. The fresh water tank is used to store the water in it. While doing wet cleaning it provides water as per the requirement. The switch board is fixed on the handle. It is used to start and stop the machine as per operator's wish, different buttons are provided to operate the different components. Frame is a Main part of machine which holds all other parts on it. It is made up of mild steel because it satisfies all the required conditions. Water is stored in a storage chamber that has a opening controlled by a gate valve. By opening the gate valve position water or cleaning liquid starts flowing from the tank. Hose pipe is connected at bottom of the tank to allow the liquid to flow on the carpet. It has a number of holes arranged sequentially which can be modified manually. Roller is placed before the dryer and use to extract the water from the carpet and also help suction chamber to suck the water on carpet, by exerting pressure on the carpet to squeeze the liquid. Heater is used to dry the carpet by passing a hot air on the carpet. Heater can maintain the temperature at 90c-100c.

IV. WORKING

Cost effective carpet cleaning and drying machine is used to clean the carpet by brush which is held in the bottom of the frame it is circular shape and connected to the AC motor which has the specification of 1440 rpm and 0.25 HP. Two separate tanks are placed on the top of the machine. In that tank soap oil and normal water is stored and sprayed on the carpet. While spraying the soap oil on the carpet, foam is created and it helps to remove the stain in the carpet.

The fresh water is sprayed on the carpet to reduce the foam. After this force roller is used to squeeze the water from the carpet. The suction chamber will absorb the exeess water on the carpet through nozzles in the pipe. Heater is placed at the end of the frame to dry the carpet at temperature of 90 C to 100 C. Switch mode power supply is used to supply the power to AC motor, suction motor, and dryer from the main source.

Line Diagram



V. ADVANTAGES

A. Manual effort is reduced: This carpet cleaning machine has the electrically operating system that reduces the manual effort of cleaning the carpet.
B. Operating time is less: As we are using the motorized brushes and dryer in this machine this will reduce the operating time and cleaning work can be done faster.
C. Cleaning and drying can be done at same time:
D. This machine requires low Maintenance cost.
E. In this machine Easy control of cleaning solution supply by controlling valve.
F. By further modification the drive or movement can be made automatic.

VI. DISADVANTAGES

A. Carpet cleaning machine produces vibrations when used on rough carpet.
B. Carpet cleaning machine is Suitable for only flat surfaces.
C. Carpet cleaning machine is Semi-automated machine.

VII. APPLICATIONS

1) Computer centers – To maintain the desired cleaning the carpet.
2) Industries – it is mainly used to clean the dust which gets deposited on the carpet.
3) Auditoriums & Hotels
4) Residences

VIII. CONCLUSION

The carpet cleaning machine was designed and fabricated. The machine is efficient in cleaning the carpets in dry mode and also in wet mode. It also dries the carpet after cleaning. It removing stains and dust deposited on the carpet. It is portable and therefore can be used anywhere in the buildings and rooms. It is easy to operate and is cost effective. Manual labor is drastically reduced. This product can further be developed to be completely automatic and remote controlled.

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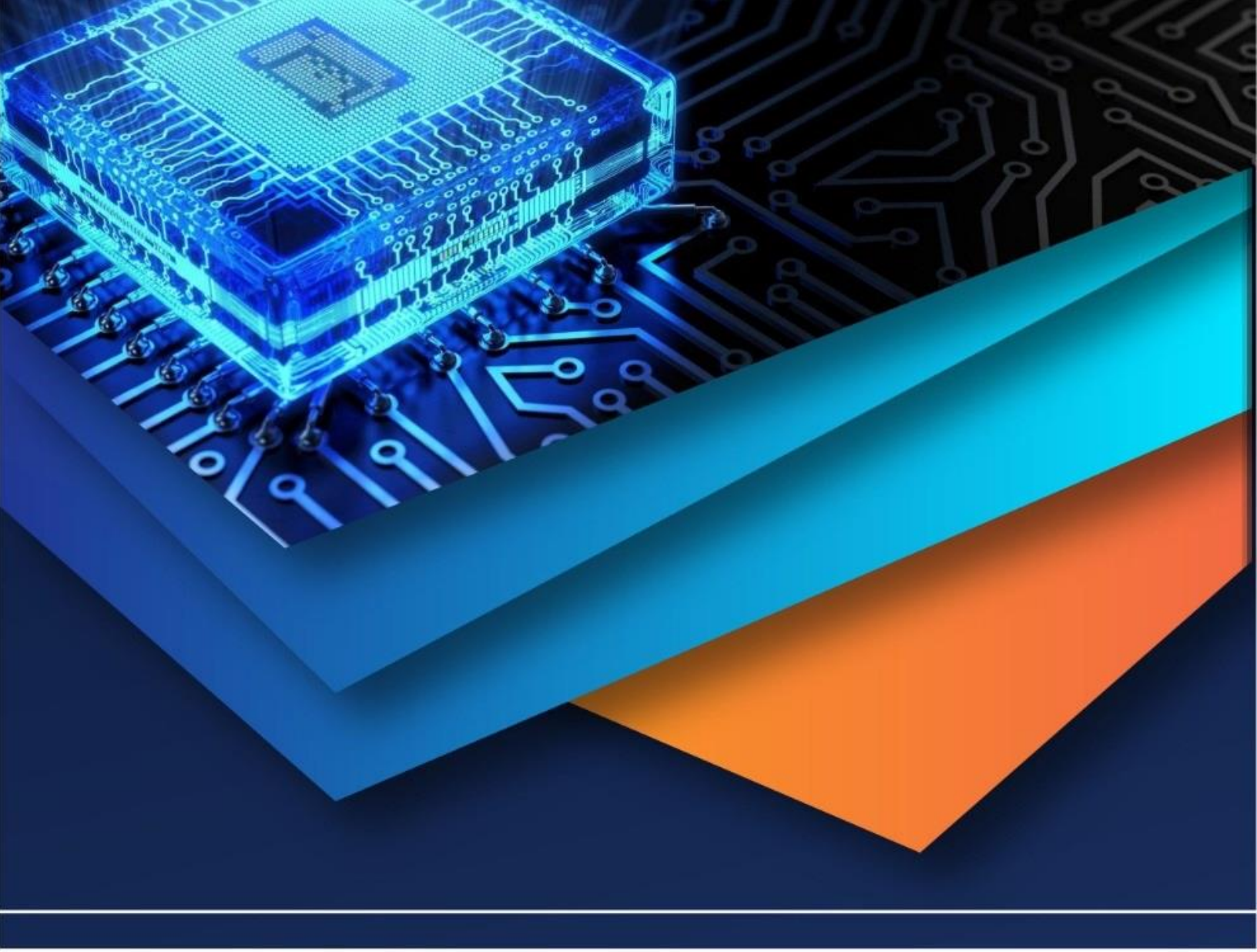

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