

April 7, 1953

S. M. McKENDREE
RUG CLEANING DEVICE

2,633,728

Filed April 18, 1949

2 SHEETS—SHEET 1

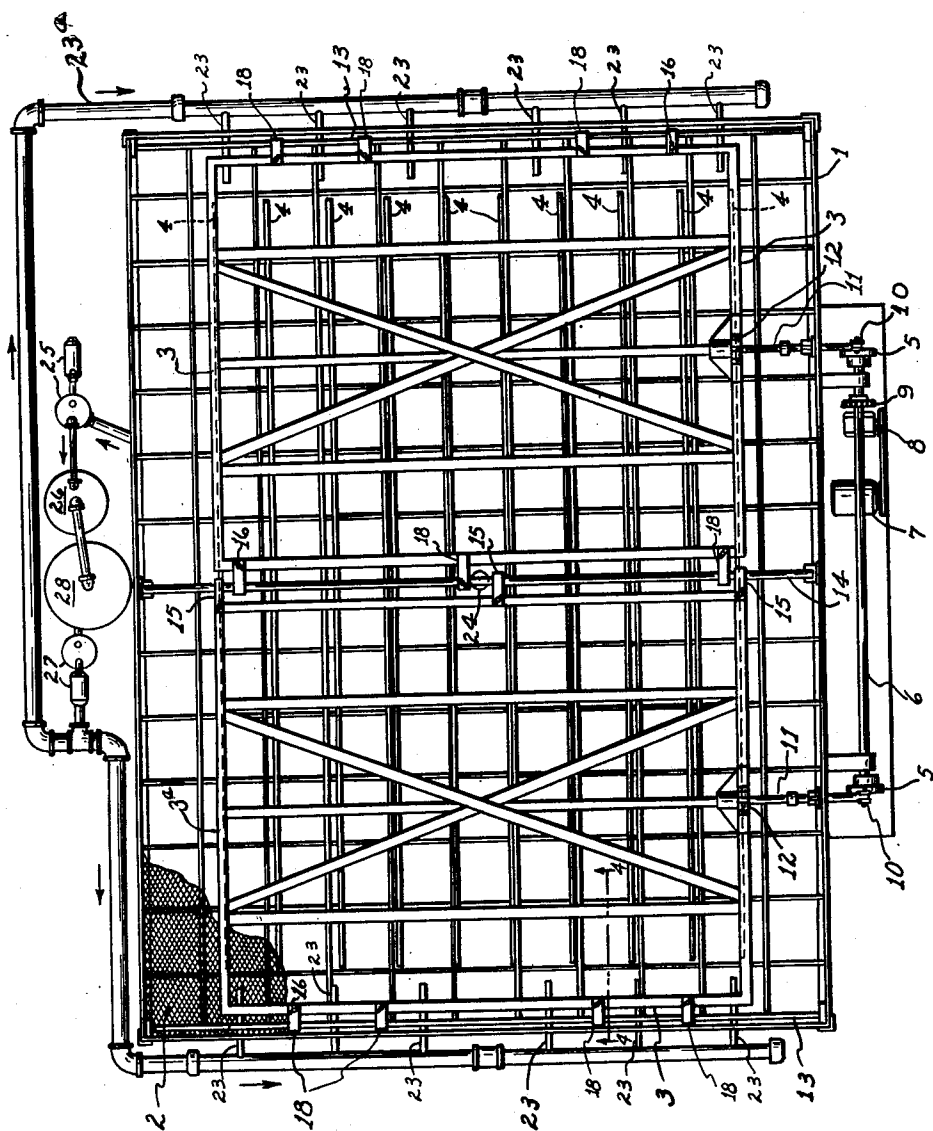


FIG. 1

INVENTOR.
SAMUEL M. McKENDREE
BY Burns, Doane & Benedict
ATTORNEYS

April 7, 1953

S. M. McKENDREE

2,633,728

RUG CLEANING DEVICE

Filed April 18, 1949

2 SHEETS—SHEET 2

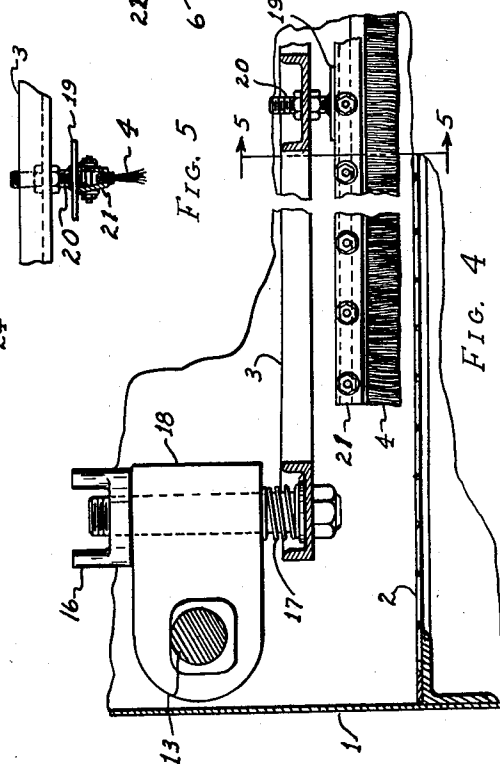
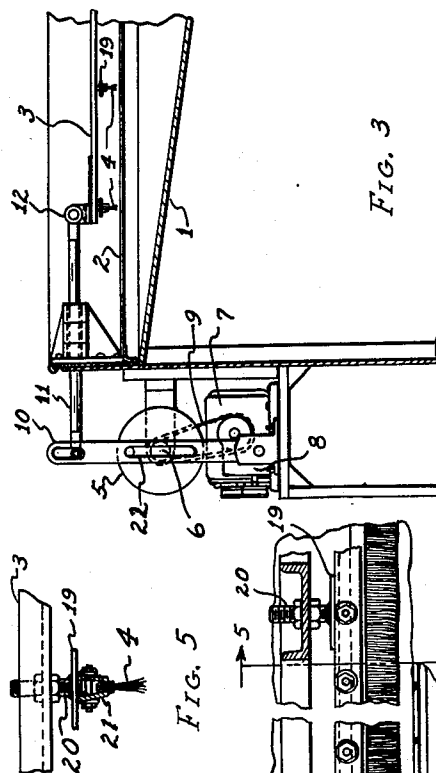
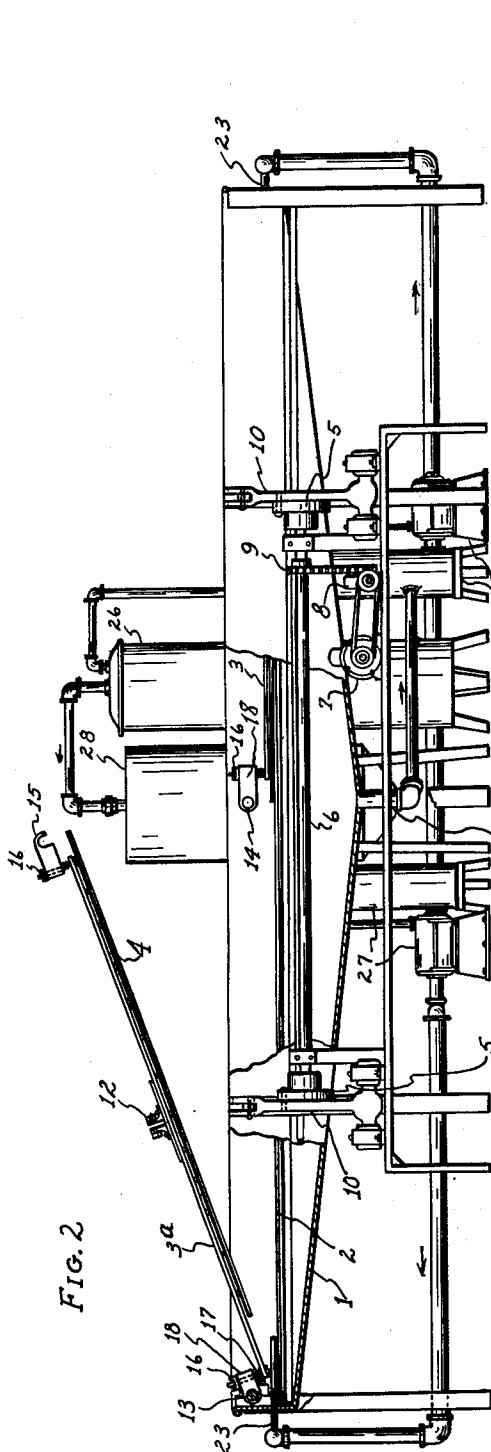


FIG. 5

INVENTOR.
SAMUEL M. McKENDREE
BY Burns, Doane & Benedict
ATTORNEYS

UNITED STATES PATENT OFFICE

2,633,728

RUG CLEANING DEVICE

Samuel M. McKendree, Danville, Ill.

Application April 18, 1949, Serial No. 88,071

4 Claims. (Cl. 68—81)

1

This invention relates to a rug cleaning device for cleaning room size rugs.

It is a purpose of the invention to provide a complete and self-contained rug cleaning unit which may be set up at any point desired requiring only the availability of a power source.

It is a further purpose and object of the invention to provide a rug cleaning device for room size rugs in which the complete rug is subjected at one time to the same uniform cleaning action while the same is lying flat.

It is a more specific purpose and object of the invention to provide a rug cleaning device so constructed as to agitate the pile of the rug during the cleaning operation through the medium of brushes adjustably held in relation to a rug being cleaned.

Further and more detailed objects of the invention will become apparent as the description thereof proceeds, which will be given in relation to the accompanying illustrated drawings, wherein

Figure 1 is a top plan view with certain parts broken away to better exemplify the invention,

Figure 2 is a side elevation taken from the bottom of Figure 1 and with parts broken away,

Figure 3 is a detailed sectional view illustrating means for oscillating the brush carrying frame,

Figure 4 is a detailed sectional view on the line 4—4 of Figure 1, and

Figure 5 is a detailed sectional view on line 5—5 of Figure 4.

Referring to the drawings, a rectangular tank 1 of suitable dimensions to accommodate room-size rugs is provided. The bottom of the tank 1 is so formed as to slope to a central point as more clearly shown in Figure 2. The tank 1 is supported from the floor on legs which may suitably take the form of angle irons welded to the corners of the tank 1. Positioned within and supported along the marginal edges of the tank 1 is a rug supporting rack 2, which may take the form of a skeletonized frame covered by a relatively coarse wire mesh screen, a portion of which is illustrated in Figure 1. The skeletonized frame of the rug supporting rack 2 may embody marginal angle iron members carrying an open grill comprised of horizontal and transverse bars.

A two-part oscillatable brush carrying frame comprised of sections 3 and 3a is positioned above the rug supporting rack 2, with the multiple parallel brushes 4 suspended below the oscillatable frame embracing sections 3 and 3a, as more particularly shown in Figures 4 and 5. The oscillatable frame embracing sections 3 and 3a is

2

adapted to move as a single unit. The means for actuating the oscillatable frame embracing sections 3 and 3a includes the two spaced apart rotating cams 5 mounted on the motor driven shaft 6, which is driven from the electric motor 7 through appropriate intermediate reducing gears housed in the box 8, and thence by the chain and sprocket connection 9. The arrangement is such that the spaced cams 5 rotate in the same direction. Each cam carries an eccentric pin which extends through an elongated slot in the associated pivoted arms.

A pair of arms 10, each having a fixed pivotal mounting in its lower end, are provided as will be seen by reference to Figures 1 and 3. The upper or free end of each arm 10 is provided with a slot for receiving a pin carried by the associated cylindrical bar 11. Two of the bars 11, one for each arm 10 and cam 5 are provided, as will be seen by reference to Figures 1 and 2. The bars 11 are adapted to reciprocate within bushed bearings carried by the wall of the tank 1. The inner ends of the cylindrical bars 11 are adapted to be releasably secured to the oscillatable frame embracing sections 3 and 3a by the pins 12. It will be noted that two pins 12 are provided, that is, one for each cylindrical bar 11. The arrangement is such that upon removal of the pins 12 the cylindrical bars 11 may be retracted so that they are wholly free from interconnection with the oscillatable frame sections 3 and 3a, allowing the latter to be raised about their respective pivotal mountings on the transverse bars 13 to permit the placing of a rug on the rug supporting rack 2 and the removal of a clean rug from the device.

A central supporting bar 14 for the oscillatable frame sections 3 and 3a is provided. The central supporting bar 14 has its ends resting in open-topped supporting sockets carried on opposite sides of the tank 1. The oscillatable frame section 3a is adapted to be raised into the position shown in Figure 2 by virtue of the notched supporting elements 15 held thereon by the wing nuts 16. It will be appreciated that the open notched supporting elements 15 rest on the central supporting bar 14 when the oscillatable frame section 3a is in its lower or operative position.

The pivotal mountings for the sections 3 and 3a of the oscillatable brush carrying frame comprise bars 13 secured at their ends to the opposite walls of the tank 1 together with elements which will now be described. The sections 3 and 3a of the oscillatable brush carrying frame each carries along one marginal side thereof a

3

plurality of bearing block units, each unit embracing the adjustable wing nut 16 threaded onto a bolt locked in the marginal channel bar of the associated section 3 or 3a, the coil spring 17 and the block 18 all as more specifically illustrated in Figure 4. Each block 18 is provided with an opening for the reception of one of the bars 13. The blocks 18 are assembled on the bars 13 before the latter are fixed in position in the tank 1. The bolts are then passed through the vertical openings in the blocks 18 and the wing nuts 16 threaded onto the bolts to yieldably clamp the frame sections 3 and 3a thereto. It will be appreciated that by loosening or tightening the wing nuts 16, the springs 17 will be placed under greater or lesser compression, and the vertical position of the frame 3 with reference to the rug carrying rack 2 controlled. The springs 17 act to maintain a yielding contact between the brushes 4 carried by the frame sections 3 and 3a and the pile of a rug supported on the rug rack 2. The bearing blocks 18 are free to move longitudinally of the bars 13 with a minimum of frictional resistance to thereby facilitate ready oscillability of the brush supporting frame sections 3 and 3a.

The oscillable frame section 3 carries a similar set of blocks 18 along its opposite edge which are in turn mounted on the central supporting bar 14. The same adjustable feature prevails along the meeting edges of the sectional frames 3 and 3a, as prevails along their hinged or pivotally mounted edges. It will be appreciated that the central supporting bar 14 moves with oscillable section 3 when the latter is raised about its pivotal mounting.

The brushes 4 are individually mounted on the respective oscillable frame sections 3 and 3a. These individual mountings embrace plates 19 affixed to bolts 20, which are vertically adjustable through the channel bars of the respective oscillable frame section 3 or 3a by appropriate nuts provided for this purpose. For each brush 4 there is provided a channel clamp 21 rigidly secured to the associated plates 19. The arrangement is such that each individual brush 4 may be adjusted vertically with reference to its associated oscillable frame section 3 or 3a. It will be appreciated that this adjustment of the individual brushes 4 is in addition to and supplements the adjustment of the frames 3 and 3a provided through the medium of the wing nuts 16 and their associated elements.

Returning to the mechanism for oscillating the oscillable sections 3 and 3a, it will be noted that the pivoted bars 10 are slotted as indicated at 22 (Fig. 3) to receive the eccentric pins carried by the cams 5. The arms 10 are also slotted at their free ends for connection to transverse pins carried by the cylindrical rods 11. The arrangement is such that when the shaft 6 carrying the cams 5 is rotated, the cam pins are caused to traverse the slots 21 and swing the pivoted arms 10 about their lower pivotally mounted ends. This action forces the cylindrical rods 11 to move back and forth through the bearing bushings in the wall of the tank 1 and imparts an oscillatory movement to the frame sections 3 and 3a. The magnitude of the oscillatory movement of the frame sections 3 and 3a corresponds substantially to the chord of the circle described by the free ends of the bars 10. In practice it has been found practicable to limit the magnitude of oscillation of the frames 3 and 3a to about twelve inches.

4

Any appropriate dry cleaning solution may be supplied above the surface of a rug supported on the rug rack 2 through the multiple spaced delivery pipes 23, all of which communicate with a common header 23a. The dry cleaning fluid is thus delivered so that it flows toward the center of the device above a rug supported on the rug rack 2. It is agitated over the entire surface of the rug being cleaned by the rows of nylon brushes 4, which in the illustrated embodiment are ten in number. These brushes are preferably spaced about eleven inches apart and are about twelve feet, two inches long, these being appropriate dimensions for a device for cleaning conventional nine feet by twelve feet rugs. In as much as the dry cleaning fluid is supplied at a uniform rate, it will be maintained at the same depth over the entire area of the rug throughout the cleaning process. The dirty cleaning fluid which is passed downward through the rug and over the marginal edges thereof, flows to the central outlet 24 in the bottom of tank 1 and is drawn by the circulating two-part piston pump 25 from the tank 1 and forced by pump 25 through the filter tank 26, which contains an adequate charge of a filtering medium requisite to remove all of the entrained and dissolved dirt from the cleaning fluid.

The cleaning fluid is initially supplied to the common header 23a by the two-part piston pump 27, which takes suction from the clean fluid storage tank 28. During the rug cleaning operation when the circulating pump 25 is in operation, cleaning fluid which has been drawn from the tank 1 through line 24 and forced by pump 25 through filter 26 is circulated back to tank 28 for recirculation and reuse. In this mode of operation, there is a continuous flow of fresh cleaning fluid over the surface of the rug, the dirty fluid is drawn off from the tank 1, filtered and returned. During this period the brushes 4 are moved back and forth through their limited stroke across the pile of the rug being cleaned. The process is continued until the fluid draining out of tank 1 compares as to cleanliness with the fluid being supplied to the header 23. Appropriate sight-glasses, not shown, may be provided for observing the condition of the fluid at these two points in the system.

After a given rug has been cleaned, the motor 8 for oscillating the brush carrying frame and the cleaning fluid supply pump 27 are shut off. The circulating pump 25 is continued in operation and drains all of the fluid from the tank 1 and returns via filter 26 to storage tank 28. It will be appreciated that during operation the storage tank 28 may be bypassed once the requisite amount of cleaning fluid is present in the system. The cleaning cycle preferably extends over a period of from about 30 to 40 minutes. After the cleaning fluid has been drained from the tank 1, the rug is left on the supporting rack 2 for several minutes and allowed to drain into the tank. At this time the cylindrical rods 11 may be disconnected from the frame sections 3 and 3a and the latter opened. A suitable vacuum suction nozzle can then be run over the rug to pick up any surplus or adhering fluid, leaving the rug in a comparatively dry state, at which point it is removed from the rack for final drying and deodorizing.

Having thus described my invention, what I claim is:

1. A portable rug cleaning device adapted to agitate cleaning fluid over the surface of a rug

5

placed therein and having means adapted to reciprocate brush-carrying frames comprising, a supported tank for the reception of excess cleaning fluid, said tank having a first and second bar extending transversely at either end thereof and having a bar-supporting means centrally located on either side thereof, said bars and said supporting means together defining first and second sections, a perforate rug-supporting rack mounted above the bottom of said tank and below said bars and said bar-supporting means, a third bar positioned transversely of said tank and resting at either end on said bar-supporting means, first and second brush-carrying frames positioned within the boundaries of said sections and carrying a plurality of aligned brush elements extending in the direction of said rug-supporting rack, means carried by said frames adapted to permit said frames to be vertically adjusted with respect to said rug-supporting rack and adapted to permit said frames to be reciprocated transversely within the boundaries of said sections, said last named means comprising bearing elements carried on the opposite ends of each of said frames and being freely axially movable on said bars with said frames and adjustable spring means compressed between said bearing elements and said frame ends, said first and second bars extending through the bearing elements carried on the remote corresponding ends of said frames whereby said frames are pivotable upwardly thereabout.

2. A portable rug-cleaning device adapted to agitate cleaning fluid over a rug and having means adapted to reciprocate brush-carrying frames comprising a tank for the reception of used cleaning fluid, first and second frame members having a plurality of aligned brush elements extending therefrom in the direction of said tank and having remote ends and facing ends, a perforate rug-supporting rack supported between said brush elements and the bottom of said tank, three substantially equally spaced apart bars supported transversely across the top of said tank and engageable with bearing elements fixed to the remote and facing ends of said frame members, first and second ones of said bars being located adjacent the ends of said tank and said three bars together defining two sections in which said frame members are positioned, the bearing elements carried on said remote ends of said frame members being freely coupled to said first and second ones of said three bars whereby said frame members are respectively pivotable upwardly thereabout and said facing bearing elements engaging said third bar whereby said frame members are positioned in spaced relationship with respect to each other and said rug-

6

supporting rack, all of said bearing elements being freely movable axially of said bars whereby said frames can be reciprocated while supported on said bars to cause said brush elements to move relative to said rug-supporting rack.

3. A rug cleaning device comprising a tank adapted to receive cleaning fluids, a perforate rug-supporting rack coextensive in outline to said tank, and being positioned in said tank above the bottom thereof, a bar extending transversely of said tank and positioned adjacent an end thereof, a brush-carrying frame having one end freely mounted on said bar for axial movement thereon, said one end having a length less than the length of said bar whereby said frame is movable axially with respect to said rack, means adapted to permit said frame to be pivoted upwardly about said bar and positioned vertically with respect to said rack, said means comprising bearing elements fixed to said one end of said frame and being freely linked about said bar, and supporting means fixed in said tank and adapted to be engaged by the other end of said frame, said frame being connected to reciprocable means whereby said frame may be reciprocated on said bar.

4. A portable rug-cleaning device comprising a tank, a perforate rug-supporting rack located above the tank, a reciprocable brush-carrying frame supported above said rack, means to reciprocate the frame transversely with respect to the tank, a guiding bar extending transversely of said tank and supported adjacent one end thereof in parallel relationship with respect thereto, bearing elements carried at one end of said frame and freely engaging said bar for vertically pivotal and axially reciprocal movement thereon, the length of said one end of said frame being less than the length of said bar and said bearing elements being fixed relative to said frame whereby said frame may be reciprocated on said bar a predetermined extent by said means, and supporting means carried on said tank for engagement by the other end of said brush-carrying frame.

SAMUEL M. McKENDREE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
220,733	Sargent	Oct. 21, 1879
1,152,460	Williams	Sept. 7, 1915
1,738,541	Shampay	Dec. 10, 1929
2,179,831	Sedwick	Nov. 14, 1939
2,301,803	Davis	Nov. 10, 1942