June 11, 1918. H. F. GRAY 1,268,962

CARPET WASHING MACHINE

Filed June 25, 1917 2 Sheets-Sheet 1

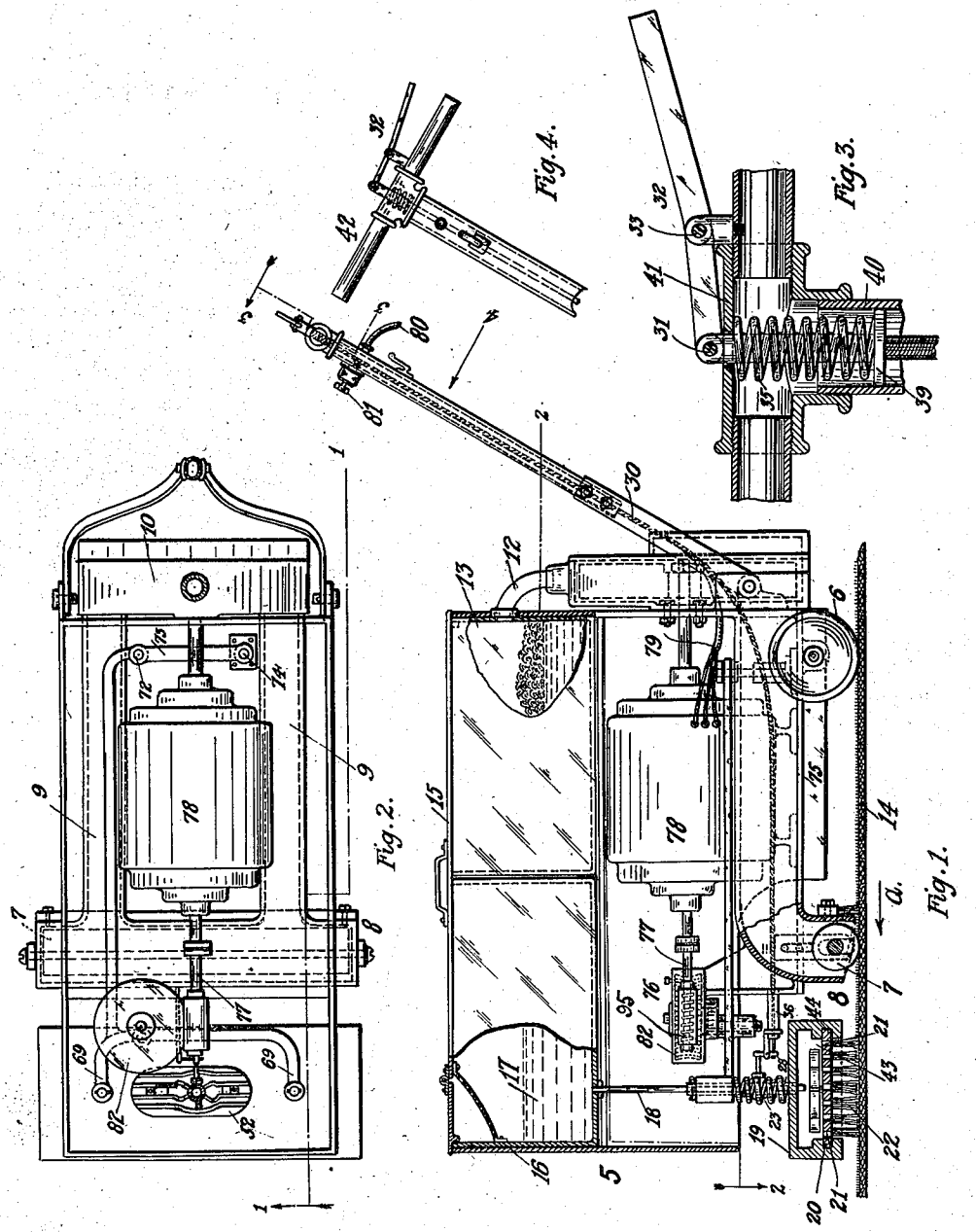

Fig. 4.

Fig. 3.

Fig. 2.

Fig. 1.

Inventor
H. F. Gray.

By A. J. Booth
Attorney

June 11, 1918. H. F. GRAY 1,268,962

CARPET WASHING MACHINE

Filed June 25, 1917 2 Sheets-Sheet 2

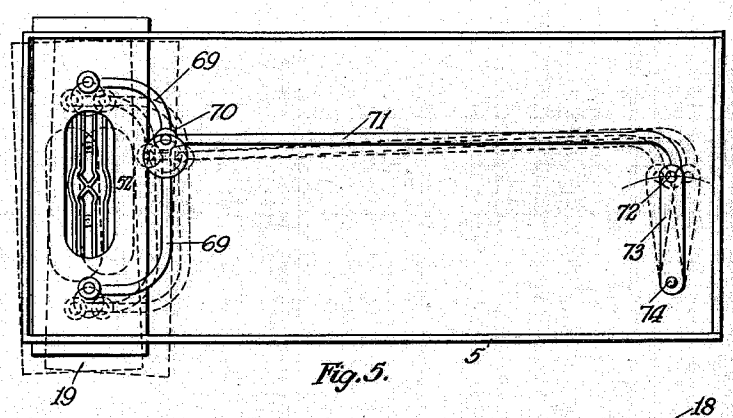

Fig. 5.

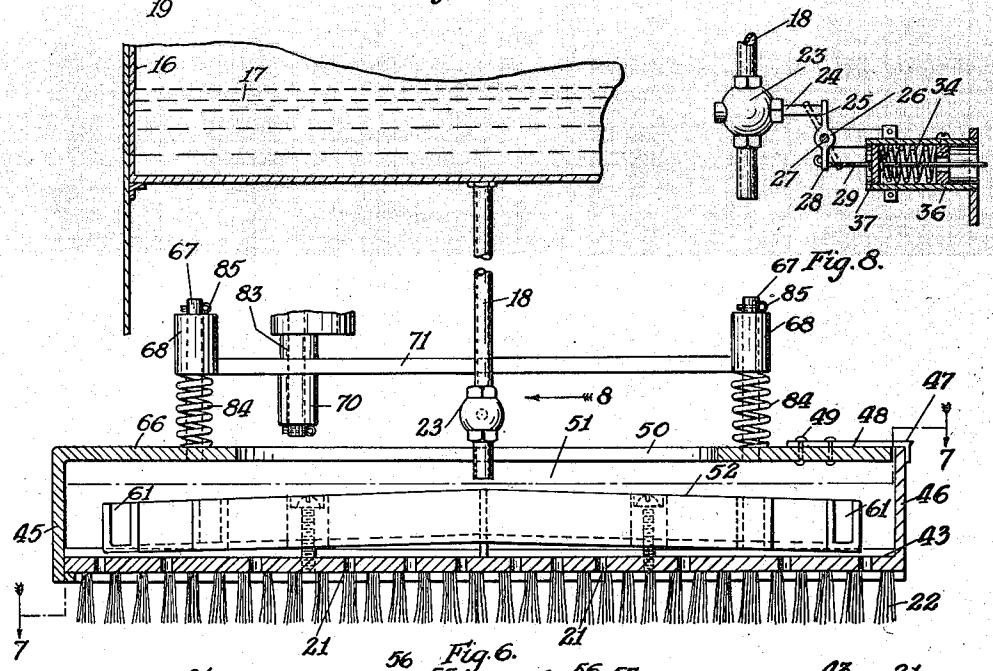

Fig. 8.

Fig. 6.

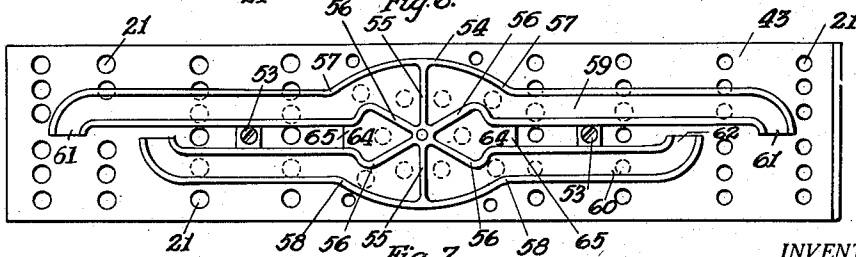

Fig. 7.

INVENTOR.
H. F. Gray
ATTORNEYS.

UNITED STATES PATENT OFFICE.

HALLA F. GRAY, OF DENVER, COLORADO.

CARPET-WASHING MACHINE.

1,268,962. Specification of Letters Patent. Patented June 11, 1918.

Continuation in part of application Serial No. 145,351, filed January 30, 1917. This application filed June 25, 1917. Serial No. 176,670.

To all whom it may concern:

Be it known that I, HALLA F. GRAY, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Carpet-Washing Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates generally speaking to machines for washing carpets, rugs, etc., while they are on the floor, either fastened or loose according to the condition in which they are found. In other words, where my machine is employed there is no necessity for removing the carpets or rugs from their natural or normal position.

This application is for the most part a continuance of my previous application for carpet washer and rinsing machine patented Sept. 18, 1917, #1,240,799, since the construction which will be claimed in this application is substantially disclosed in said prior application. The feature to which this application will be directed consists of the scrubbing mechanism, the specific scrubber illustrated consisting of a brush of the fountain type to which is imparted a gyratory movement, which is substantially similar to that which may be given by the human hand. The construction of the brush, the mechanism for imparting the movement thereto and the means for controlling the passage of a soapy liquid to the brush constitute the subject matter set forth in this application, though I have illustrated on a comparatively small scale a complete machine of the construction with which I prefer to employ the mechanism to which this application is particularly directed, said machine including the scrubber, a suction nozzle and the squeegee coöperating with the nozzle, the nozzle and the squeegee being located in the rear of the brush and arranged to act simultaneously for the purpose of removing the dirty, soapy liquid from the nap or pile of the carpet or rug after the scrubbing function has been performed by the brush. These three features together with a nap-comber, constitute the subject matter of my aforesaid previous patent.

Having briefly outlined my improvement I will proceed to describe the same in detail reference being made to the accompanying drawing, in which is illustrated an embodiment thereof. In this drawing:

Figure 1 is a side elevation partly in section, showing my improved machine equipped with the scrubbing mechanism, to which this application is directed.

Fig. 2 is a horizontal section taken on the line 2—2, Fig. 1, looking downwardly.

Fig. 3 is a detail view on a larger scale illustrating a part of the connection between a manually operated lever on the handle and the check-valve for controlling the passage of the soapy liquid to the brush. This is a section taken on the line 3—3 Fig. 1.

Fig. 4 is a fragmentary elevation of the upper part of the handle, being a view looking in the direction of the arrow 4, Fig. 1.

Fig. 5 is a top plan view of the casing, illustrating the brush, and, the jointed arm construction through the medium of which the gyratory movement is imparted, all of the other mechanism of the casing being removed to facilitate clearness of illustration.

Fig. 6 is a front view of the brush and its connections shown partly in section and on a larger scale than in the other views.

Fig. 7 is a top plan view of the brush removed from its holder.

Fig. 8 is a detail view partly in section, shown on a larger scale than in Fig. 1 illustrating a part of the connection between the operating lever mounted on the handle, and the check valve which controls the passage of liquid to the fountain brush. This is a view looking in the direction of the arrow 8, Fig. 6.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a casing which is mounted on a pair of wheels 6, which support what I will term the rear part of the machine, while the forward part is supported by a roller squeegee 7, which is journaled in a nozzle 8, which is connect-

ed by means of a pair of conduits 9 with a suction producing device 10 consisting of a centrifugal pump whose upper portion communicates by means of an elbow-shaped pipe 12 with a tank or receptacle 13 for the dirty liquid which is removed from the carpet 14 when the machine is in use. The receptacle 13 is removably mounted in the casing 5, the latter having a cover 15, which when removed exposes the receptacle 13 and also a similar receptacle 16 which contains the soapy liquid 17 which is delivered to the brush through the medium of a depending open-ended pipe 18, which passes through the top of the holder 19 of a brush 20, which is removably mounted in the holder and whose top is perforated, as shown at 21, to allow the liquid from the tank to pass into the bristle portion 22 of the brush, from which it is delivered to the nap or pile surface of the carpet or rug 14.

The pipe 18 is equipped nearest the discharge extremity with a check valve 23, which is normally closed, the valve, however, being provided with an exteriorly protruding stem 24 adapted to be acted on by an arm 25 of a lever 26, which is fulcrumed at 27 and whose opposite arm 28 is connected with one extremity of a rod or wire 29, which passes through a flexible conduit 30, preferably composed of a closely wound coil of wire, the opposite extremity of the rod being connected, as shown at 31, with a manually operated lever 32, which is fulcrumed on the handle of the machine, as shown at 33. The inner or forward extremity of the rod 29 acts upon the lever 26, to move the latter to the dotted line position (see Fig. 8), when the lever 32 is actuated to move the rod 29 rearwardly or toward the handle extremity of the machine. This movement of the lever 26 acts upon the stem 24 of the check valve 23, to open the said valve and allow the liquid to pass in suitable quantities to the fountain brush construction. The lever 26, however, is normally held in the inactive position, or that shown by full lines in Fig. 8, by the action of two spiral springs 34 and 35. The spring 34 is located at the forward extremity of the rod and is mounted on a cylindrical casing 36, one of its extremities bearing on a stop 37 made fast to the rod, while the other extremity engages a stop 38 fast in the casing 36, the last-named stop being perforated to allow the rod to pass freely. The spring 35 is located at the handle extremity of the machine, and its inner extremity engages a stop disk 39 fast on the rod 29 and freely movable in a cylindrical casing member 40, while the opposite extremity of the spring 35 bears against a cylindrical part 41, constituting the central portion of the handle 42. The two springs 34 and 35 are normally under tension to actuate the rod 29 to maintain the lever 25 in the inactive position. However, when the machine is in use the operator in grasping the handle 42 actuates the lever 32 to operate the rod to hold the check-valve 23 in the open position through the medium of the construction just explained.

The brush, which is shown on a relatively large scale in Figs. 6 and 7, consists of a head-plate 43 carrying the bristles 22, which are set into the head-plate in any suitable or well-known manner. The head-plate of this brush engages grooves 44 formed in the opposite side walls of the brush holder 19, the said holder being closed at one end, as shown at 45, while the brush at the opposite end of the holder is provided with an upright end member 46, which closes the holder at this end, and is engaged by a depending lip 47 of a retaining spring 48, the latter being secured to the top of the brush-holder, as shown at 49. The top of the brush holder is provided with an opening 50 which is elliptical in shape, being elongated in the direction transverse of the machine when the latter is in use. This opening is necessary in order to make room for the lower extremity of the depending pipe 18, which is stationary and passes through the opening 50 in order to properly discharge the soapy liquid into the chamber 51 of the brush holder. This lower extremity of the pipe 18 terminates a short distance above the central portion of a distributer 52 secured to the top of the brush by means of screws 53, or other suitable fastening devices. This distributer is raised slightly above the perforated head-plate of the brush, and its central portion 54 is highest while the distributer is slightly inclined downwardly toward the opposite extremities of the brush in order to facilitate the perfect distribution of the soapy liquid. As shown in the drawing, the central part of the distributer is divided into a number of compartments by means of two ribs 55, and two pairs of ribs 56, said last-named pairs being arranged on opposite sides of the ribs 55. The distributer is provided with two outer walls 57 and 58 and two inner walls 59 and 60, the inner walls being continuous with the ribs 56 and forming with the walls 57 and 58, channels 59 and 60, which extend outwardly in both directions from the central portion of the distributer, said channels being respectively provided with outlets 61 and 62, whereby the liquid is allowed to pass directly to the perforated head-plate 43, and thence through the perforations 21 of the head-plate, to the bristle portion 22 of the brush. It will be understood that the channel portion of the distributer, as well as the central portion thereof, is closed at the bottom so that the only outlets for the channels are at the open ends 61 and 62. However, the central por-

tion of the distributer is provided with two compartments 64 arranged between the two pairs of ribs 56. These compartments 64 are provided with bottom closures, but the liquid passes therefrom to the bottom plate of the brush between the ribs 59 and 60, this portion of the distributer being open at the bottom; since the closed bottoms of the compartments 64 terminate a short distance from these compartments, as shown at 65.

By virtue of the fact that the distributer is supported a short distance from the head-plate of the brush, it will be understood that the soapy liquid is free to pass underneath the closed bottom portions of the distributer, and thence through the perforations in the head-plate of the brush, said perforations being well distributed throughout the entire area of this head-plate.

Hence, it will be understood that the head-plate 43, together with the bristle portion 22, the distributer 54 and the brush 45 constitute the fountain scrubber feature of the machine, the chamber 51 of the scrubber being closed to prevent the escape of the soapy liquid, except through the perforations 21 of the head-plate 43.

The top 66 of the holder is provided at suitable points, beyond the extremities of the opening 50, with upwardly projecting stems 67 which pass through sleeves 68 formed at the opposite extremities of the two-curved arms 69 which extend outwardly and forwardly from a sleeve 70 to which is rigidly secured a rearwardly extending member 71, whose rear extremity is pivotally connected, as shown at 72, with one extremity of a link 73, the opposite extremity of the link 73 being pivotally connected, as shown at 74, with a pin extending upwardly from the bottom-plate 75 of the casing. The movement is imparted to the brush through the medium of a worm gear 76, the worm portion 95 of which is mounted on the armature shaft 77 of a motor 78, which, as illustrated in the drawing, is operated by electricity through the medium of suitable conductors 79 and 80, the latter being so arranged as to be connected with a suitable source of electricity, the current being controlled by means of a switch 81 mounted on the handle member of the structure. As shown in the drawing, the worm and worm wheel are both inclosed in a casting 82 which may be filled with a suitable lubricant. The worm wheel is provided with a wrist pin 83 which passes through the sleeve 70 at the junction of the three arms 69 and 71, whereby as the worm wheel rotates, a sort of gyratory movement is imparted to the brush through the medium of the jointed structure composed of parts 71 and 73, these parts being respectively similar to the portions of the arm forward and in the rear of the elbow, the joint at 72 being similar to the elbow joint of the human arm while the joint 74 is similar to the shoulder joint. By virtue of this construction a gyratory movement of the precise character required in washing carpets, is obtained, since the movement of the brush is relatively slight, thus relieving the carpet from any substantial wear due to the scrubbing action, said movement at the same time being sufficient to perform the required function of loosening the dirt in the nap or pile of the carpet and thoroughly mixing it with the soapy liquid, which as the brush passes on, is acted on by the squeegee roller 7, which removes this dirty, soapy liquid from the nap of the carpet bringing it to the top where it is advantageously acted on by the suction of the nozzle. Attention is called to the fact that the forward sleeved extremities of the arms 69 are supported above the top 66 of the brush-holder by spiral springs 84 which surround the stems 67 below the sleeves 68, thus allowing the brush or fountain scrubber the necessary vertical vibration during the carpet cleaning operation. The upper extremities of the stems 67 extend above the sleeve 68 and are perforated, as shown at 85, to receive cotter pins or other suitable fastening devices, which will properly limit the upward movement of the sleeves 68.

From the foregoing description the use and operation of my improved fountain scrubber mechanism in connection with the machine with which it is well equipped for use, will be readily understood.

Assuming that the structure is assembled, as shown in Fig. 1, and that the tank 16 contains the necessary quantity of soapy liquid 17, the operator will grasp the handle 42, and as he does so will operate the lever 32, to open the check valve 23, which controls the passage of liquid from the receptacle 17 to the fountain brush, and as soon as this is done, this liquid will pass into the chamber 51 of the brush-holder, thence into the distributer and thence through the perforations 21 of the head-plate of the brush, to the bristles 22 thereof. At the same time the operator will turn on the electric current through the medium of the switch 81, which will start the motor and set the brush in operation through the medium of the worm gear mechanism heretofore described. This movement of the brush is comparatively slight in any direction, but still, as heretofore indicated, is of such character as to thoroughly loosen the dirt in the nap or pile of the carpet and incorporate it in a sort of lather which the movement of the brush in connection with the soapy liquid produces. As the machine is moved along in the direction of the arrow A (see Fig. 1), the nozzle and squeegee act on the dirty soapy liquid, first to bring this liquid or lather out of the nap or pile and then to carry the

same by virtue of the influence of the centrifugal pump, from the carpet or rug and discharge it into the tank or receptacle 13.

Having thus described my invention, what I claim is:

1. A machine of the class described, including a frame, a scrubber, a yoke connected with the scrubber, the yoke having a jointed arm pivotally connected with the frame and means connected with the yoke for imparting body travel to the scrubber in a circular path.

2. A machine of the class described, including a frame, a scrubber, a yoke having two arms connected with the scrubber and a third arm rigidly connected with the first named arms, a link connected with the third arm and with the frame, and means pivotally connected with the yoke for imparting a crank arm movement to the scrubber.

3. A machine of the class described, comprising a frame and a scrubber movably connected therewith and comprising a hollow holder and a brush carried thereby having a head open for the passage of liquid, means for imparting orbital travel to the brush, and a conduit in fixed relation to the frame and projecting into the hollow holder which is open at the top to prevent interference with the conduit during the movement of the brush.

In testimony whereof I affix my signature.

HALLA F. GRAY.