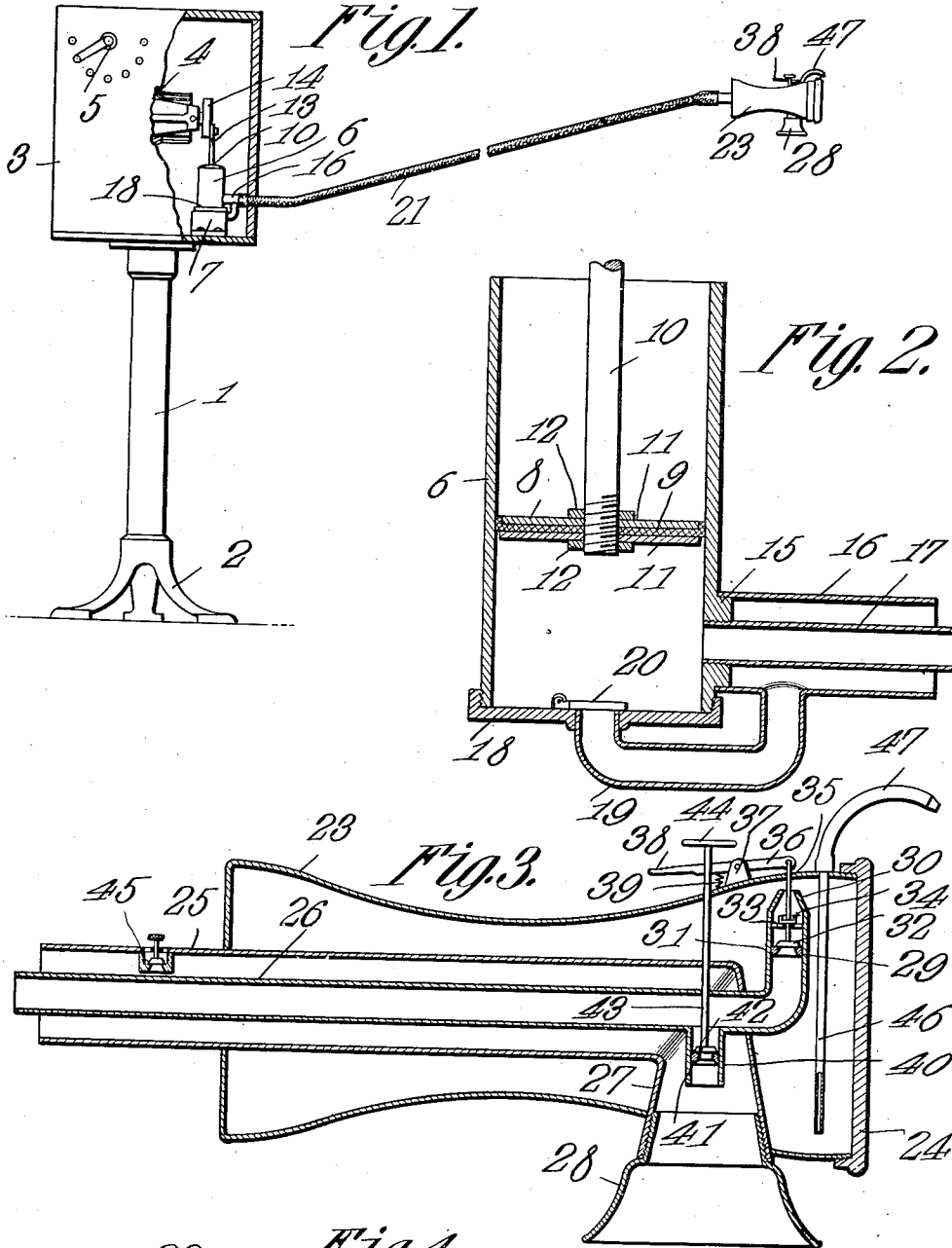


W. D. DAVENPORT.
 MASSAGE MACHINE.
 APPLICATION FILED JULY 29, 1908.

907,749.

Patented Dec. 29, 1908.



Witnesses
[Signature]
 F. J. Chapman.

Fig. 4. *Walter D. Davenport*
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UNITED STATES PATENT OFFICE.

WALTER D. DAVENPORT, OF KAUFMAN, TEXAS.

MASSAGE-MACHINE.

No. 907,749.

Specification of Letters Patent.

Patented Dec. 29, 1908.

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To all whom it may concern:

Be it known that I, WALTER D. DAVENPORT, a citizen of the United States, residing at Kaufman, in the county of Kaufman and State of Texas, have invented a new and useful Massage-Machine, of which the following is a specification.

This invention has reference to improvements in massage machines, and is designed to provide a machine whereby the massaging operation may be performed by the alternate application of air pressure and the reduction of the pressure below the normal, to produce a partial vacuum. This is accomplished by means of a suitable air pump operated by power in any suitable manner, the air pump acting when moved in one direction to compress the air to a point greater than the normal, and when moving in the other direction to exhaust the air to reduce the normal pressure sufficiently to cause a partial vacuum.

The invention is designed more particularly though not confined to use on the scalp of the patient, so as to impart to the skin a vibratory motion due to the alternate pressure and suction.

Furthermore, provision is made whereby an antiseptic or other substance in liquid form may be sprayed upon the skin of the patient, and thereby facilitate the massaging action.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, in which drawing—

Figure 1 is a view, partly in elevation and partly diagrammatic, showing the complete machine, parts also being shown in section. Fig. 2 is a section of the pump and connections leading therefrom. Fig. 3 is a section of the handle, and Fig. 4 is a detailed view of a portion of the air conduit.

Referring to the drawings, there is shown a stand 1, which may be of any appropriate design, and is provided with a suitable base 2, which may be in the form of a tripod or in any other suitable form for supporting the stand, either so that the stand may be portable, or so that the stand may be secured to the floor or other part. The stand 1, carries a box or casing 3, in which is housed an electric motor 4, of suitable type and power and adapted in the usual way to be connected up to a suitable source of electrical energy. Ex-

terior to the case is a governor 5, for the motor, so that its speed may be varied at will. In the drawings, this governor is shown on one side of the casing, but it will be understood that it may be on top of the casing, or may be situated at any other point within convenient reach of the operator. Within the casing is a pump cylinder 6, supported upon legs 7, or in any other appropriate manner. Within the cylinder 6 is a piston 8, of suitable type, and shown as formed of an ordinary cup washer 9, held to a piston rod 10, between appropriate plates 11, the piston being secured to the piston-rod 10, by means of clamp nuts 12, in the usual manner. The piston-rod 10 is connected by a link or pitman 13, to a crank disk 14, mounted on the shaft of the armature of the motor, so that when the armature is rotated the piston of the pump is given a reciprocatory movement, which may be rapid or slow, depending upon the speed of the motor armature. At one side of the lower end of the pump cylinder 6 is formed a boss 15, to the exterior of which is applied a pipe 16, having no communication at this point with the interior of the cylinder 6. Concentric and interior to the pipe 16 is another pipe 17, extending through the boss 15, and opening into the interior of the cylinder 6. A bottom or bottom cap 18, is screwed on to the corresponding end of the cylinder 6, and may be made air-tight in any appropriate manner. Communicating with the interior of the cylinder 6, through the center of the bottom 18, is a pipe 19, leading to the interior of the pipe 16, near its point of connection with the boss 15. Covering the end of the pipe 19, where it enters the cylinder 6 is a flap valve 20, opening into the cylinder 6.

Attached to the pipes 16 and 17 is a hose 21, a portion of which is shown in Fig. 4. The outer member of this hose is attached to the pipe 16, and the inner member 22, is attached to the pipe 17. For the purpose of producing a certain stiffness in the hose, and yet maintaining the same flexible, the outer portion 21 may be wire or spring lined, as is common in hose connections of this kind. The end of the hose remote from the pump 6, carries a handle 23. This handle may be substantially cylindrical in shape, being of less diameter at the center than at the ends, in order that it may be readily grasped by the hand. The handle consists of a casing inclosing a suitable chamber for the recep-

tion of any suitable liquid, antiseptic or otherwise. For the purpose of introducing liquid into the interior of the handle, one end, 24, may be made removable and shaped to screw on the end of the casing and close the same liquid-tight. The handle 23 is entered from the end remote from the end 24 by two concentric tubes 25 and 26, suitably shaped at their outer ends to receive the two members of the hose 21, the outer member of the hose fitting the tube 25, and the inner member 22 of the hose fitting the tube 26. The tube 25 terminates inside the handle 23, near the head, 24, and is there provided with an angle extension 27, passing through the outer wall of the handle 23 to the exterior thereof, and there provided with threads for the reception of a cup, 28, of suitable material and shape, to be applied to the skin of the subject. The tube 26 extends through the inner end of the tube 25, toward the end or cap 24, and is then turned at an angle, as indicated at 29, and finally terminates in a reduced end 30, opening into the interior of the handle 23, near the inner wall thereof, at a point about diametrically opposite to the point of passage of the end 27 through the wall of the handle 23.

Within the angle extension 29 is a valve seat 31, normally engaged by a valve 32, which passes through a guide 33, and terminates before reaching the reduced end 30. The free end of the valve-stem is formed into a cup or head 34, engaged by but not connected to a link 35, entering through the reduced end 30 of the extension 29, and at its other end extending to the exterior of the handle 23. Exterior to the handle 23 the link 35 is carried by one end of a lever 36, suitably fulcrumed in a bracket 37, fastened on the outer face of the handle 23. The other end of the lever is formed into a thumb-piece 38, within the reach of the hand of the operator when grasping the handle 23. The lever 36 is under the normal action of a spring 39, tending to move the lever in a direction to cause the link 35 to engage the head 34 and keep the valve 32 in firm engagement with its seat 31. The pipe 26 is also formed with a side off-set 40, concentric with and opening into the side extension 27 of the pipe 25. The off-set 40 has interior thereto a valve-seat 41, adapted to receive a valve 42 on the end of a stem 43, extending through the opposite wall of the tube 26 and also through the wall of the tube 25, and ultimately through the outer wall of the handle 23, and terminates adjacent to the lever 36, in a knob or key, 44, in convenient position to be operated by the hand of the operator.

The stem 43, as well as the link 35, where passing through the walls of the handle 23 and the rod 43 where passing through the walls of the tubes 26 and 25, are all suitably packed, to prevent the escape of air or of

liquid contained in the handle 23. The rod 43 may either screw through a suitable bearing, or may move frictionally in the supporting walls, so that the valve 42, may be moved into or out of engagement with the valve-seat 41. Exterior to the handle 23 the tube 25 is provided with a valve 45, so that the tube 25 may be opened to the external atmosphere at this point. Within the handle 23, near the head 24, is a tube 46, extending at one end in close relation to, but out of contact with, the corresponding wall of the handle 23, and opening into the interior of said handle. The other end of the tube extends through the wall of the handle 23 and there receives a pipe or nozzle 47, the end of which may be suitably formed to deliver a spray of liquid coming from the interior of the handle 23, when air pressure is caused within said handle to act upon the liquid therein contained.

When it is desired to use the massage instrument or machine, the cover or end 24 is removed and a suitable quantity of some liquid, whether antiseptic or otherwise, according to the uses intended, is introduced into the handle, after which the cap or cover 24 is replaced, and screwed down tight, so as to render the joint fluid-tight. The current is then turned on to the motor 4, and the speed of the latter is determined by the governor 5, which may be in the nature of a suitable switch, such as is commonly used in connection with motors, to regulate the speed thereof. The rotation of the motor armature will cause a reciprocation of the pump piston or plunger 8, and every time the piston moves upward the air will be drawn into the pump cylinder from the pipe 17, through its direct connection with the pump cylinder, and through the pipe 16, by way of the conduit 19 and valve 20, which opens inwardly into the pump cylinder. On the return movement of the pump piston towards the cap 18, the air is compressed within the pipe 17, but, because of the closure of the valve 20, the air in the pipe 16 is not compressed. Assuming that the valve 42 is closed, then, the compression of the air within the pipe 17 if sufficient, will cause the opening of the valve 32 against the action of the spring 39, and air will be introduced into the interior of the handle 23. This will result in the creation of an air pressure within the handle 23 on the surface of the liquid therein contained. On the return movement of the piston 8 away from the end 18, the vacuum created will cause the closure of the valve 32. The continued reciprocation of the piston will cause an accumulation of pressure within the handle 23, and thereby force the liquid contents of the handle out through the pipe 45, and nozzle 47, in the form of a spray, which may be readily directed against the skin of the patient. This tends to moisten

and soften the skin of the patient, so that, on the application of the cup 28, the massage treatment is facilitated. If the spring 39 be made too strong for its resistance to be overcome by the air forced through the pipe 17, then the thumb-piece 38 may be manipulated, and the valve 32 be allowed to open, by moving the link 35 out of its path for a distance, so that the valve 32 may readily move under the action of the incoming air, while it will readily drop back by gravity to its seat, when the air pressure is relieved. Furthermore, by placing the finger beneath the thumb-piece 38, the valve 32 may be held in its seat against any pressure of air the pump 6 is capable of supplying.

Now, let it be assumed that it is desirable to apply massage treatment to the skin of the patient. Under these circumstances, the valve 42 may be opened to any desired extent by suitable manipulation of the knob 44 and the rod 43. Now, when the pump piston rises, there is created a vacuum in the cup 28, the degree of vacuum depending upon the size of the pump piston, and when the pump piston moves on its return stroke, then the air passing through the pipe 17 will be directed towards the skin of the patient, through the off-set 40, of the said pipe 26, air passing into the cup 28, through the valve-seat 41, which is now assumed to be open. By this means, the skin of the patient is subjected alternately to pressure and to suction, and is thereby treated in a manner conducive to the production of blood-circulation, thus producing beneficial result to the patient. The degree of violence of the massage treatment is under the control of the operator through both the release valve 45 in the pipe 25, and the valve 42 in the off-set 40 of the pipe 26.

It will be understood that in place of an electric motor any other type of motor may be used for operating the pump.

What is claimed is:—

1. In a massage machine, an air pump, a vacuum cup, two pipes connecting the same, one pipe opening freely to the air pump, and a branch pipe connecting the second pipe to the air pump and containing a one way valve responsive to the pump.

2. In a massage machine, an air pump, a vacuum cup, two pipes connecting the pump and cup, one pipe opening freely to the air pump, a branch pipe connecting the second pipe to the air pump and containing a one way valve responsive to the pump, and a valve in the pipe freely connecting with the pump, said valve being at the vacuum-cup end of said pipe.

3. In a massage machine, an air pump, a vacuum-cup, two pipes connecting the pump and the cup, one pipe opening freely to the air pump, a branch pipe connecting the second pipe to the air pump and containing a

one way valve responsive to the pump, a valve in the pipe freely connecting with the pump, said valve being at the vacuum-cup end of the said pipe, and means for the operation of the said valve from the exterior of the pipe.

4. In a massage machine, a means for producing alternate compression and rarefaction of air, a conduit in which both the compression and rarefaction of air takes place, another conduit subjected to the action of rarefaction only, and means applicable to the body of a patient, and connected to both conduits.

5. In a massage machine, an air pump, a vacuum-cup, two pipes connecting the pump and cup, one pipe freely communicating with the pump, and a valve between the pump and the second pipe, responsive to the pump, to open in one direction only, a controllable valve in the second pipe opening therethrough, and a valve in the first pipe, at the vacuum cup end thereof.

6. In a massage machine, an air pump, a vacuum-cup, two pipes connecting the pump and cup, one pipe freely communicating with the pump, a valve between the pump and the second pipe, responsive to the pump, to open in one direction only, a controllable valve in the second pipe opening therethrough, and a controllable valve in the first pipe at the vacuum-cup end thereof.

7. In a massage machine, an air pump, a container for liquids, a vacuum-cup carried by said container, two pipes connected to the air pump and entering the liquid container, and both pipes leading to the vacuum-cup, a spray nozzle for the liquid container, and valves for connecting one of the pipes to the vacuum-cup and to the spray side of the liquid container.

8. In a massage machine, an air pump having means for alternately compressing and rarefying air, a container for liquids, a vacuum-cup carried by said container, two pipes, one connected to the air pump at all times, and the other during the act of rarefaction only, both pipes entering the liquid container, and both pipes leading to the vacuum-cup, a spray nozzle for the liquid container, and valves for connecting the pipe constantly acted on by the air pump to the vacuum-cup and to the spraying side of the liquid container.

9. In a massage machine, an air pump having means for alternately compressing and rarefying the air, a container for liquids, a vacuum-cup carried by said container, two pipes, one connected to the air pump at all times and the other during the act of rarefaction only, both pipes entering the liquid container, and both pipes leading to the vacuum-cup, a spray nozzle for the liquid container, a controllable valve in the pipe constantly acted on by the pump for connecting

the said pipe to the liquid container, and another controllable valve connecting the said pipe to the vacuum-cup.

10. In a massage machine, an air pump
5 having means for alternately compressing and rarefying the air, a container for liquids, a vacuum-cup carried by said container, two pipes, one connected to the air pump at all times, and the other during the action of rare-
10 faction only, both pipes entering the liquid container, and both pipes leading to the vacuum-cup, a spray nozzle for the liquid container, a controllable valve in the pipe

constantly acted on by the pump for connecting the said pipe to the liquid container, 15 another controllable valve connecting the said pipe to the vacuum-cup, and a controllable valve in the other air pipe.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature 20 in the presence of two witnesses.

WALTER D. DAVENPORT.

Witnesses:

J. F. LEE,

P. D. KRAUSS.