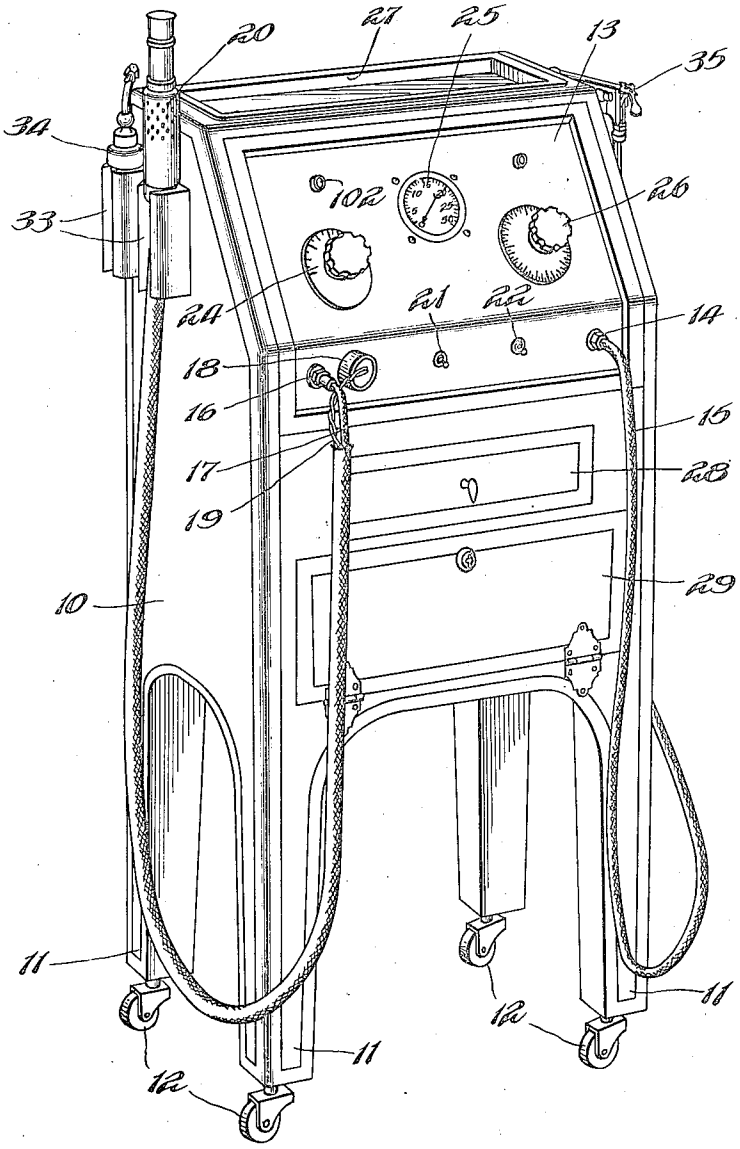
March 4, 1941. L. J. ANDRES 2,234,101

TREATMENT MACHINE

Filed Feb. 15, 1937 4 Sheets-Sheet 1

Fig. 1.



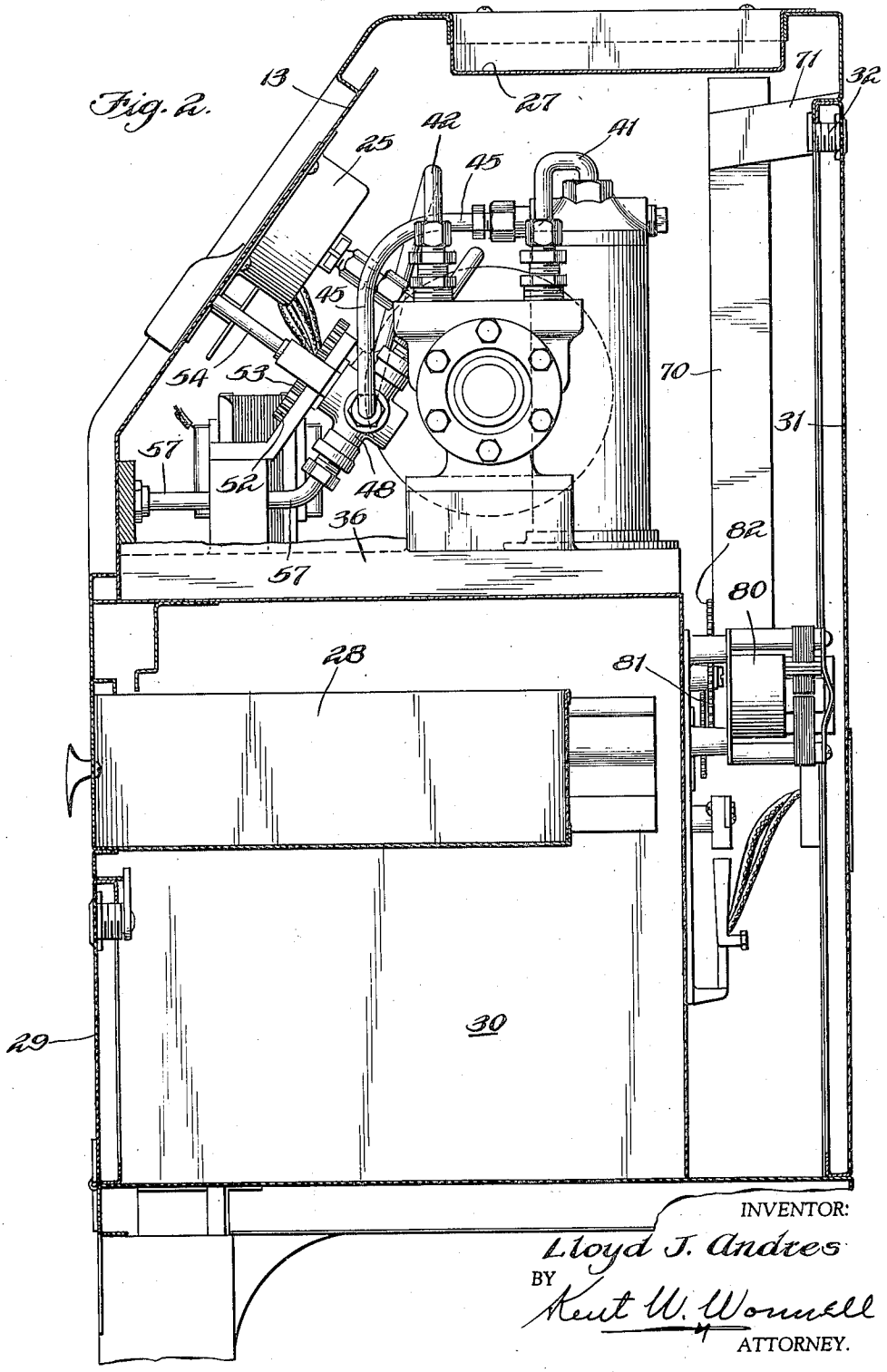
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TREATMENT MACHINE

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Fig. 2.



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TREATMENT MACHINE

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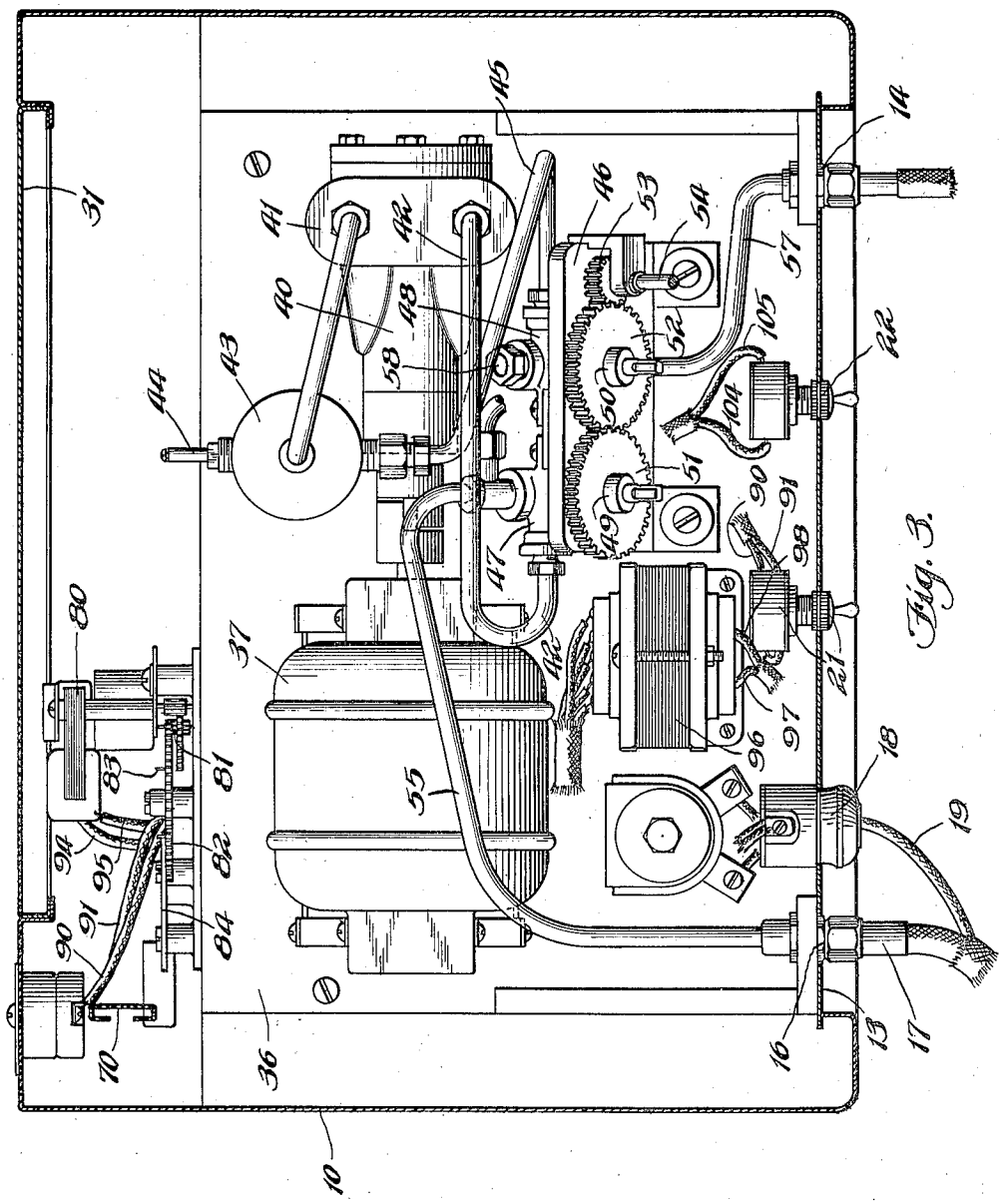


Fig. 3.

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Fig. 4.

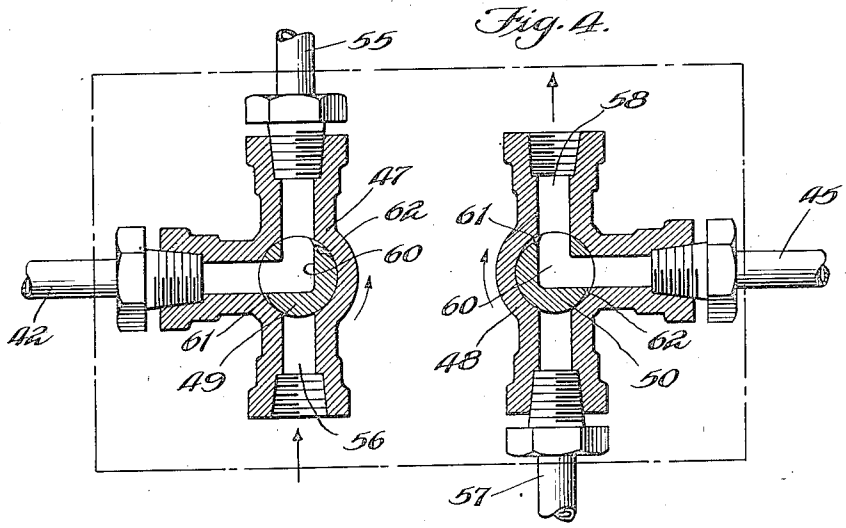
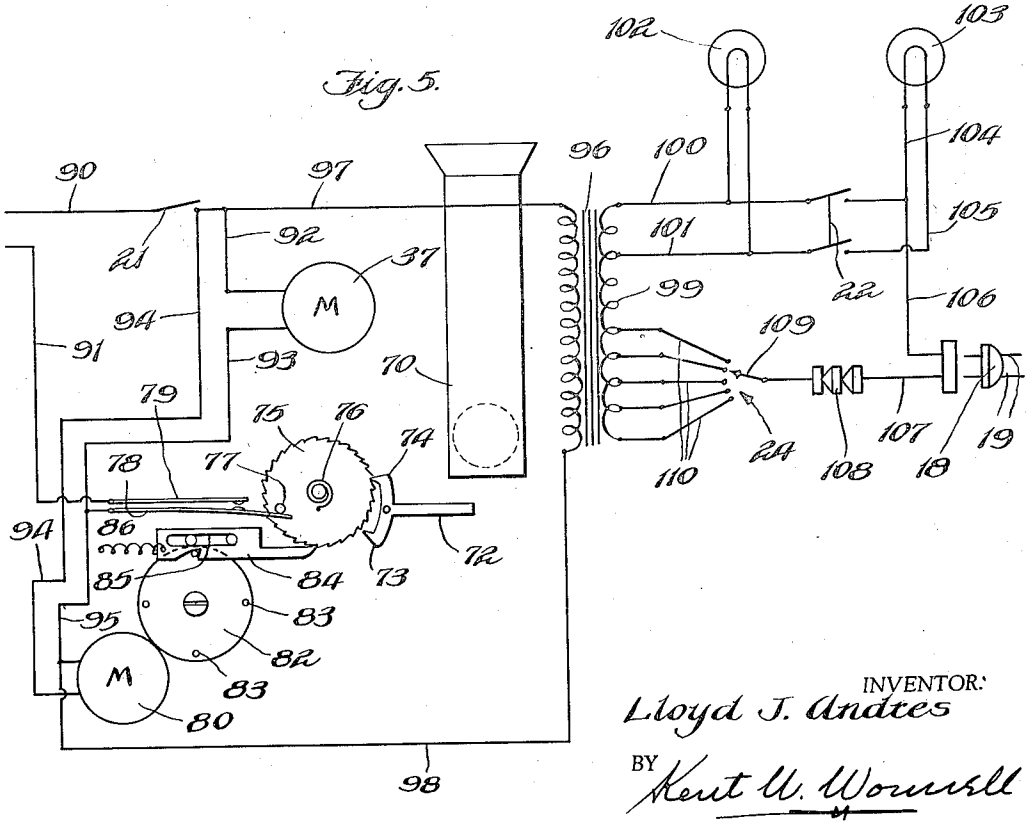


Fig. 5.



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Patented Mar. 4, 1941

2,234,101

UNITED STATES PATENT OFFICE

2,234,101

TREATMENT MACHINE

Lloyd J. Andres, Chicago, Ill., assignor to Automatic Instrument Company, a corporation of Michigan

Application February 15, 1937, Serial No. 125,781

5 Claims. (Cl. 128—297)

This invention relates in general to a portable machine for applying pressure, vacuum and vibration in the treatment of various complaints and ills. The invention comprises a motor driven compression and vacuum device for applying either pressure or suction, either separately or in connection with a vibrator, which is preferably electrically operated; and the mechanism is timed for use by a coin controlled time switch. The invention consists in the construction, combination and arrangement of the several parts in a compact portable machine which may be readily changed from the application of pressure to the application of suction for operating various types of spraying devices, vacuum and pressure massage devices, either alone or in connection with an electrically operated vibrator.

In the accompanying drawings illustrating a preferred embodiment of the invention,

Fig. 1 is a perspective of a machine embodying my invention;

Fig. 2 is a sectional view through the casing of the machine showing an end elevation of the mechanism;

Fig. 3 is a top plan view of the mechanism;

Fig. 4 is a detail sectional view showing the pressure and suction valves; and

Fig. 5 is a wiring diagram for illustrating the operation of the mechanism.

This invention is particularly designed and intended for use by doctors, barbers, hair-dressers, cosmeticians and the like, and comprises a portable cabinet or receptacle in which motor-driven mechanism is mounted for producing pressure and suction, with plug-in connections for various operating implements, either suction or pressure, a vibrator, and with external operating means. The cabinet may also be provided with one or more drawers and the outside has a plurality of receptacles or holders for the various implements which may be used.

Referring now more particularly to the drawings, a cabinet 10 of the desired type is preferably constructed and formed of sheet metal with supporting legs 11 and freely turning casters 12 by which it may be easily moved from place to place. At the top and front of the cabinet is a panel 13 having a vertical portion with a plug-in socket 14 for a pressure hose 15, a plug-in socket 16 for a suction hose 17; an electrical plug connection 18 for conductors 19 leading to an electric vibrator 20; an electric switch 21 for controlling the pressure motor and an electric switch 22 for controlling the electric vibrator; and in an inclined portion of the panel is a rheostat dial 24 for varying the impulses of the vibrator; an indicator 25 to show the vacuum which is produced and a dial 26 for controlling the geared valve arrangement for producing pressure or vacuum.

At the top of the cabinet is a shallow tray 27, and in the intermediate portion at the front is a drawer 28 below which is a hinged and locked door 29 for access to a closed storage space 30 within the receptacle. Back of the cabinet is a removable panel 31 having a lock 32 for securing it in place and at the sides of the cabinet near the top are containers 33 for holding various treatment devices such as the vacuum vibrator 20 and atomizer 34, and a sprayer 35.

Within the cabinet adjacent the top and suitably mounted upon a supporting base 36 is an electric motor 37 having the necessary electrical connections from its control switch 21 and a suitable source of power.

Connected to the shaft of the motor 37 is an air pressure pump 40 which may be either of the reciprocating or rotary type having a pressure outlet pipe 41 and a suction pipe 42. Connected directly with the pressure pipe 41 is a pressure storage tank or filter receptacle 43 having a pressure relief valve 44 and a pressure discharge pipe 45 leading therefrom.

A controlling valve mechanism for the pressure and suction pipes is located below the inclined portion of the panel 13 and comprises a supporting plate 46 to which T-shaped valve fittings 47 and 48 are secured at one side. In these casings are valves 49 and 50 having shafts extending through the plate and with intermeshing gears 51 and 52 mounted on the other side of the plate and one of them meshing with a pinion 53 mounted on a shaft 54 extending to the controlling dial 26 for operating the gears and also the valves 49 and 50 in unison.

The valve 49 may be called the vacuum valve for the vacuum pipe 42 and is connected to one extremity of the casing 47; a pipe 55 connects another extremity of said casing to the suction fitting 16 and the third outlet of the casing forms a vacuum vent 56. For the pressure valve the casing 48 has one extremity connected to the pressure pipe 45, another extremity connected to a pressure pipe 57 which leads to the pressure fitting 14 of the panel and a third outlet 58 which forms a pressure vent.

The valves 49 and 50 are disposed so that they are operated simultaneously to utilize the pump either as a pressure device or as a suction de-

vice, but not both at the same time. For this purpose each valve has a 90-degree opening or passage 60 therein, the edges 61 and 62 of the major segment of the valve being cut or rounded away as shown to prevent a sharp cut off of pressure or exhaust in operating the valves. As the gears 51 and 52 for the valves are directly connected and are the same size the valves are operated oppositely at the same speed. When the valves are operated to the position shown in Fig. 4 a suction or vacuum is produced in the suction hose 17 as the valve 49 connects the pipes 55 and 42 to the suction side of the pump 40 and the pressure side of the pump is connected by the pipe 41 to pressure tank 43 and pipe 45 connects through the valve 50 to the pressure vent 58. Thus there is no back pressure and the full suction of the pump is applied to the suction tube 17 depending upon the speed of the motor 37.

A reverse movement of the valves 49 and 50 by means of the dial 26 moves their openings or passages out of register with the pipe 55 and vent 58 and into register with the vent 56 and pipe 57 respectively. In this position a pressure connection is made for the pressure outlet 14 by way of the pipe 57 to the pressure fitting 48 and through its valve 50 to pipe 45 and thence through the pressure tank 43 and pipe 41 to the pressure side of the pump 40. At the same time the exhaust side of the pump is connected by pipe 42 to valve casing 47 and valve 49 with the vacuum vent 56 so that there is no drag on the vacuum side of the pump in producing the pressure.

In changing the pump to produce pressure or exhaust it is desirable that the change be not too sharp as it may unduly wear the parts, and the valves are therefore provided with cut-away portions 61 and 62 which taper off the valve edges but do not affect the tightness or operation of the valves in their limiting positions as the cut-away portions are greatly overlapped in the casings. In a treatment machine of this type it is desirable to limit the operation of the machine to certain intervals or it may be left running for an indefinite period, thereby wearing out the mechanism and unnecessarily continuing the operation of the motor and supplying current therefor. A coin-controlled timing mechanism is therefore incorporated in the cabinet as a part of the controlling mechanism and comprises a coin chute 70 having a vertical portion connected to an inclined portion 71 opening at the rear of the cabinet. At the bottom of the chute is a release lever 72 engaged by a coin inserted in the chute and having escapement teeth 73 and 74 for engaging an escape wheel 75 pressed to rotate, in a direction opposed by the teeth, by a spring 76. This wheel carries a stop 77 for engaging one blade 78 of a control switch which has a fixed blade 79.

A small motor 80 is connected by a reduced timing gearing 81 with an operating disk or wheel 82 which has a number of projections 83 thereon. These projections are adapted to engage an operating pawl 84 having a mounting slide 85 and a spring 86 for retracting it, but with the pawl engaging the teeth of the wheel 75, so that each time a projection 83 engages and moves the pawl 84 the wheel 75 is moved one tooth. Thus if the movement of the motor 80 is suitably timed with respect to the wheel 82, one of the projections 83 will advance the wheel 75 one tooth for each period of time, say 15 minutes.

The operation then is that for each suitable coin inserted in the chute 70 the ratchet wheel 75 is moved backwardly one notch, thereby allowing the fixed and movable contacts 78 and 79 to close an operating connection to the motor 80. If only one coin is deposited, the movement of the motor 80 to engage the next projection 83 with the pawl 84 operating the ratchet wheel 75 one notch, brings the contact 77 into engagement with the movable contact 78 opening the switch and thus stopping the motor 80. If more than one coin is deposited it will take a corresponding number of similar movements of the ratchet wheel 75 to bring its contact into engagement with the switch member for operating the switch.

In tracing the circuits for controlling the operation of the mechanism, a closure of the switch 21 closes a circuit from the supply mains 90 and 91 through conductors 92 and 93 and the switch contacts 78 and 79. If these contacts are separated no current will flow through the motor and it will require the insertion of a suitable coin in the chute 70 to release the wheel 75 and close the switch 78, 79. When this switch 78, 79 is closed a circuit will also be closed from the main 90 through the switch 21, conductor 94 through motor 80 and conductor 95 to the switch contact 78 and thence through the switch to the other supply main 91. The small motor 80 will continue to operate until one of the contacts 83 opens the connection between the switch contacts 78 and 79, thereby open-circuiting both motors and requiring the insertion of another coin before they can be re-operated.

To indicate the condition of the mechanism the primary winding of a transformer 96 has a conductor 97 connecting it through the switch 21 to one of the supply mains 90 and a conductor 98 connecting the other side of the same winding to a conductor 95 and thence through to the switch 78, 79, to the other supply main 91. To the other winding 99 of the transformer are connected conductors 100 and 101 for lighting an electric lamp 102 of designating color, preferably green, which indicates, when it is lighted, that the motors 37 and 80 are in operation.

The electric vibrator 20 is also connected to the secondary winding of the transformer 99 through the rheostat 24 and through the switch 22 which also connects an indicating lamp 103 through conductors 104 and 105 and switch 22, a double pole switch, with conductors 100 and 101 lighting the lamp 103 which may be a different color, say red, to indicate when the electric vibrator is in operation. To energize the vibrator one of the conductors 104 is connected by a conductor 106 with one contact of the terminal plug 18 and the other contact of the terminal plug is connected by a conductor 107 through a dry disk rectifier 108 with a movable arm 109 of the rheostat 24 which is connected with various leads 110 from the winding 99 to vary the potential applied to the vibrator. Thus whenever the electric vibrator is plugged in and the vibrator switch 22 is closed, the red lamp will be lighted and by varying the rheostat 24 the vibrations of the vibrator may be controlled.

As soon as the lapsed time for energizing the machine has expired, the operation of the motor 80 opening the switch contacts 78, 79 will cut off all current to the lamps 102, 103, as well as the motors, and they are not again re-lighted until the motors are again started as before explained.

It will be undertsood that various devices for either pressure or vacuum may be connected and

operated by this machine either with or without a vibrator and that the vibrator may be used either with pressure or with vacuum.

I claim:

1. In a combined electric vibrator and pressure treatment apparatus, the combination with a pump driving motor, of a timing apparatus comprising a second driving motor, a switch and a coin-operated means for closing the switch, means operated by the second motor to open the switch, a transformer having one winding and its circuit closed by the switch in parallel with both of said motors, an indicating lamp of distinguishing color for designating when the motors are in operation, a vibrator circuit receiving current from the transformer when the said motors are in operation and a separate lamp of distinguishing color receiving current from the same source as the other distinguishing lamp and of a different color for indicating when the vibrator is receiving current.

2. In a combined electric vibrator, pressure-vacuum treatment apparatus comprising a driving motor for the pressure vacuum apparatus, a timing apparatus also including a separate operating motor, a switch operated by the timing apparatus to cut off a circuit to both motors for a predetermined time, a transformer having one winding also connected to said switch, a lighting circuit connected to the other side of the transformer having two lamps of distinguishing color, one separately connected to the transformer by a switch, a vibrator circuit for the electric vibrator also variably connected to the second winding of the transformer and to the lamp circuit controlled by said switch so that one lamp will indicate when the motors are operating and the other lamp will indicate when the vibrator circuit is closed.

3. An electric vibrator pressure-vacuum apparatus according to claim 2, including a portable vacuum pressure device combined with an electric vibrator at the outside of the casing, the vibrator having a rheostat within the casing and a controlling device for the rheostat on the outside of the panel, an electrical connection for the vibrator with a switch on the panel for controlling it, an indicating lamp also in the panel for showing when the vibrator is energized in addition to the pump operating indicating lamp.

4. In a combined pressure-vacuum electric vibrator treatment apparatus comprising a casing having a controlling panel, a motor driven pressure and vacuum pump within the casing, valve means within the casing for supplying pressure and vacuum separately therefrom; a fluid pressure vacuum device and an associated electric vibrator at the outside of the cabinet having tubular hose and electrical conductors respectively therefor extending through the panel; electric switch devices on the panel for controlling the motor and vibrator, controlling knobs on the panel for operating the valve connections for supplying pressure or vacuum to the outside hose; and lighting means also in the panel for indicating separately when the pump motor is operating and when the electric vibrator is energized.

5. A portable treatment apparatus comprising a wheeled cabinet having a motor driven pressure and vacuum pump therein, valve means for supplying pressure and vacuum therefrom, pressure and vacuum devices having flexible hose connections with the pump controlled by the valves, means for supplying electric current to the motor, said means including a coin-controlled motor operated timing switch, an electric vibrator also incorporated in the pressure vacuum device outside of the cabinet, switch means for separately controlling the pump motor and the vibrator and indicating lamps for separately showing when the pump motor is operated and when the vibrator is energized at the same time the pump motor is operated.

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