

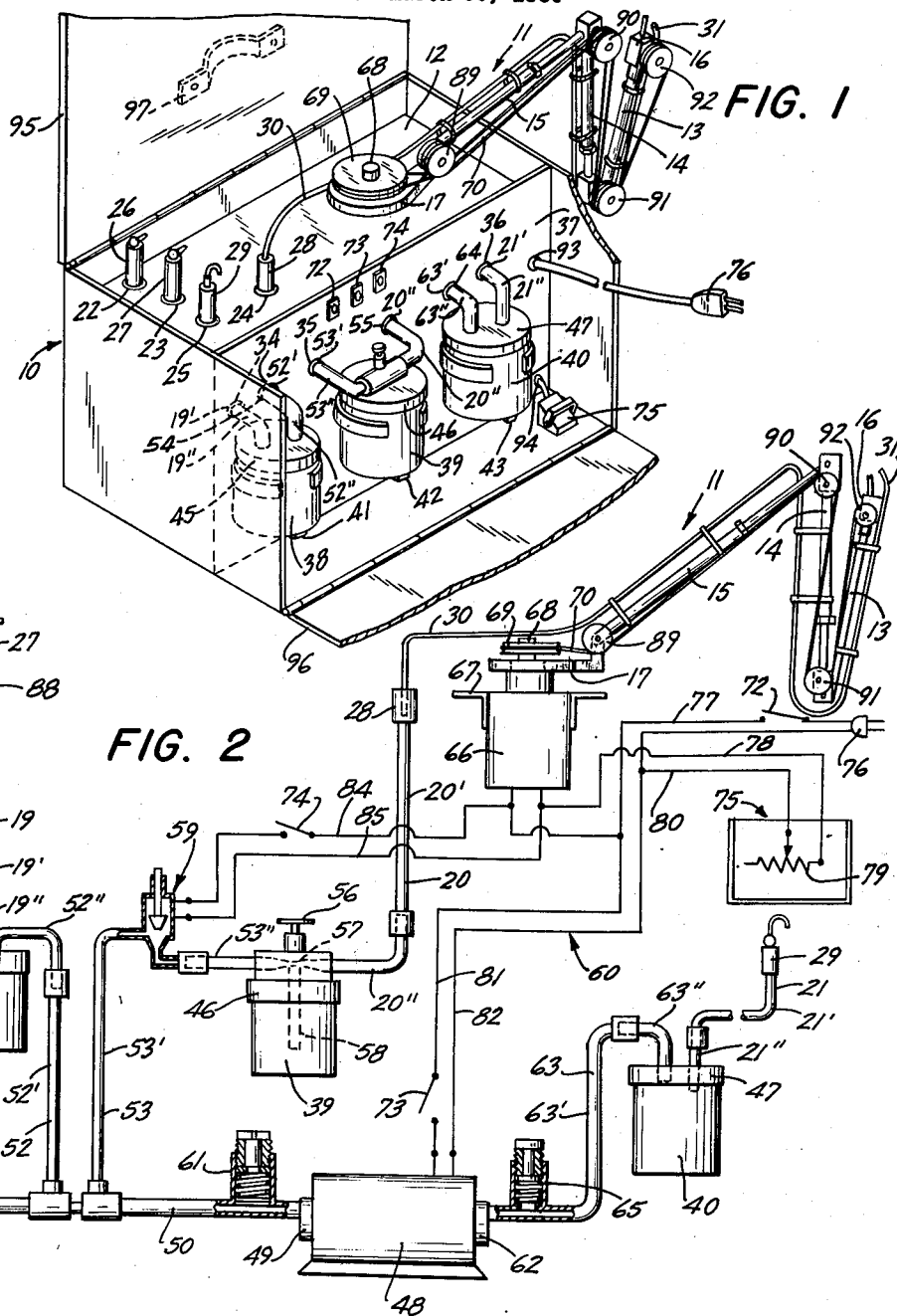
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PORTABLE DENTAL OUTFIT

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PORTABLE DENTAL OUTFIT

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4 Claims. (Cl. 32-22)

This invention relates to a portable dental outfit including a dental unit and means for supplying an air stream, water stream, water spray and air suction for use during dental treatment.

The invention has particular reference to a portable dental outfit with motor driven pump means arranged in an electric circuit with the motor for operating the dentist drilling unit and with flexible conduits connecting the pump means with an air gun, water gun, water spray head and an aspirator for use thereof during dental treatment.

The invention further comprehends a portable case having means on a wall thereof for mounting receptacles for supplying water for the water gun and spray head and for collecting fluids taken by the aspirator during the dental treatment and which are connected by conduits with the pump means and may readily be removed for refilling or cleaning.

Still another object of the invention is to provide an apparatus of said character which provides the necessary requirement for a dentist for conducting dental treatment and in which air, water, water spray and an aspirator are available by the closing of electrical switches conveniently located when the case is set up for use and which puts in operation the motors for the dentist unit and the pump means for creating the air and water flow and suction for the aspirator.

With the foregoing and other objects in view, reference is now made to the following specification and accompanying drawings in which the preferred embodiment of the invention is illustrated.

In the drawings:

FIG. 1 is a perspective view of a portable case which houses a complete dental outfit constructed in accordance with the invention and constitutes a stand for mounting receptacles on a wall thereof for supplying water and water spray, and receiving fluids drained from the mouth of the patient.

FIG. 2 is a schematic view of the dental outfit.

Referring to the drawings, a case 10 is provided for portably carrying a complete dental outfit which may be set up for use by a dentist for any desired dental treatment.

The outfit includes a dental unit 11 which is adapted to be arranged in operative relation on a wall 12 disposed in the upper portion of the case 10 so as to provide an upper compartment for containing the dental unit in collapsed condition. The dental unit 11 consists of pivotally and telescopically associated linkage sections 13, 14 and 15 and a head 16 mounted on the outer section 13 for receiving drills and the like. The inner section 15 is pivotally mounted on a base 17 above the wall 12 and which base is mounted for turning movement for universal movement of the dental unit.

Flexible conduits 18, 19, 20 and 21 are provided for supplying an air stream, a water stream, a water spray and a suction. The said conduits slidably protrude through openings 22, 23, 24 and 25 in the wall 12 and are respectively provided at the outer ends thereof with an air gun 26, a water gun 27, a coupling 28 and an aspirator 29. The conduit 20 is adapted to be connected with a smaller flexible conduit 30 extending along and affixed to the linkage sections 13, 14 and 15 and with a water spray nozzle 31 at the outer end thereof directed toward the drill or other instrumentality carried by the

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head 16. When not in use the conduits 18, 19 and 21 are retracted within the case 10 with the air gun 26, water gun 27 and aspirator 29 being of a size to prevent retraction through the openings 22, 23 and 25 whereby the same are disposed in upstanding relation above the wall 12 and may be lifted from position thereon as desired for use. The coupling 28 permits of the disconnecting of the conduits 20 and 30 and when disconnected the coupling 28 may be disposed in upstanding relation at the opening 24.

The conduits 19, 20 and 21 protrude through openings 34, 35 and 36 in an inner wall 37 at one side of the case 10 and extend downwardly into receptacles 38, 39 and 40 through covers which seal the receptacles. The receptacles are mounted on said wall by brackets 41, 42 and 43 respectively which permit of the removal of the receptacles for filling or cleaning. The conduit 19 includes an upper section 19' and a lower section 19''. The upper section 19' has its lower end slightly enlarged and secured in said opening 34. The section 19'' is secured in the cover 45 of the receptacle 38 with the lower end thereof disposed adjacent the bottom of the receptacle. The upper end of said section is slidably and releasably secured in the open lower end of the section 19' for connecting said sections together. Similarly the conduit 20 includes an upper section 20' and a lower section 20''. The upper section 20' has its lower end slightly enlarged and secured in said opening 35. The lower section 20'' is secured in the cover 46 of the receptacle 39 with the lower end thereof located adjacent the bottom of said receptacle. The upper end of the section 20'' is slidably and releasably secured in the open lower end of the section 20' for connecting said sections together. The conduit 21 also includes an upper section 21' and a lower section 21''. The upper section 21' has its lower end secured in said opening 36 and the section 21'' is secured in the cover 47 of the receptacle 40 with the open end thereof terminating adjacent said cover. The upper end of the section 21'' is slidably and releasably secured in the open lower end of the section 21' for connecting said sections together when the dental outfit is to be set up. The receptacles 38 and 39 are adapted to contain water for supplying water through the water gun 27 and water spray through the nozzle 31. For this purpose an electric motor 48 is affixed to the bottom wall of the case 10 and operatively connected with said motor at one end thereof is an air pressure pump 49. The outlet from the air pressure pump is connected to a header 50 from which branches the flexible conduit 18 for supplying air under pressure to the air gun 26. Air under pressure is also supplied to the receptacles 38 and 39 through flexible conduits 52 and 53 which branch from the header 50 and extend through the covers 45 and 46 respectively. The conduit 52 includes a lower section 52' and an upper section 52'', the lower section 52' is connected to the header and has its upper end slightly enlarged and secured in an opening 54 in the side wall 37 of the case 10. The upper section 52'' is secured in the cover 45 of the receptacle 38 with the open end thereof terminating adjacent said cover. The outer end of the section 52'' is slidably and releasably secured in the open upper end of the section 52' for connecting said sections together when the dental outfit is to be set up. Similarly the flexible conduit 53 includes a lower section 53' and an upper section 53''. The lower section 53' is connected to said header and has its upper end slightly enlarged and secured in an opening 55 in the side wall 37. The section 53'' is connected with a volume control valve 56 and with the flexible conduit section 20'' through a venturi 57. A suction pipe 58 is connected with the venturi and is secured in the cover 46 with the lower end thereof disposed adjacent the bottom

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of the receptacle 39 for drawing water from the receptacle by the action of the venturi and forcing the same through the conduits 20 and 30 to be discharged in the form of a spray through the spray nozzle 31. The upper end of the conduit section 53' is slidably and releasably secured in the open upper end of the section 53'. A solenoid valve 59 is arranged in the conduit 53' for automatically closing off the flow of air to the venturi when the electric circuit 60 is disconnected. An air pressure relief valve 61 is arranged in the header 50 which is set to provide the desired air pressure in the header 50 and conduits 18, 52 and 53 and to relieve the build up of air pressure in the header when the air gun 26, water gun 27 or water spray 31 are not in active use since the pump 49 is in constant operation when the outfit is set up.

The receptacle 40 is connected with a suction pump 62 by means of a flexible conduit 63, the pump 62 being operatively connected to the motor 48 at the opposite end from the pump 49. The conduit 63 includes conduit sections 63' and 63'', the section 63' being connected with the inlet end of the suction pump 62 and the upper end thereof being slightly enlarged and secured in an opening 64 in the side wall 37. An air suction relief valve 65 is arranged in the conduit 63 for relieving the suction in the conduit 63 if the aspirator 29 becomes clogged during use. The section 63'' is secured in the cover 47 of the receptacle 40 with the lower end thereof located adjacent the cover and the upper end thereof slidably and releasably secured in the open upper end of the section 63' for connecting said sections together.

The base 17 of the dental unit 11 is mounted for manual turning movement on the protruding upper end of the housing of an electric motor 66 which is secured by brackets 67 to the under side of the wall 12 with the armature shaft 68 thereof protruding through said wall and having a pulley wheel 69 affixed to the end of said shaft. This provides means by which the base 17 and the dental unit 11 may be manually turned concentrically about the shaft 68. The pulley wheel 69 affixed thereto has an endless belt 70 trained thereabout and about pulley wheels carried by the linkage sections 13, 14 and 15 and about the head 16 for turning the drill or other instrumentality secured in said head.

The electric motor 66 is connected in the electric circuit 60 and three single pole single throw electric switches 72, 73 and 74 are arranged in said circuit together with a foot treadle switch 75. The switches 72, 73 and 74 protrude through openings in the wall 37 so that the same may be readily actuated for closing and opening the same. The circuit also includes a plug 76 adapted to be connected with a source of current supply and leading therefrom is a conductor wire 77 connected with one side of the electric motor 66. The other side of the electric motor is connected by a conductor wire 78 with one side of a resistance 79 in the foot treadle 75. A conductor wire 80 connects the switch of said treadle with the plug 76. The switch 72 is arranged in the conductor line 77 and the circuit 60 is open unless the switch 72 is closed. The motor 48 of the pumps 49 and 62 is connected by conductor wires 81 and 82 with the conductor wires 77 and 80. The switch 73 is interposed in the conductor 81 for selectively closing the circuit to energize the motor 48. The solenoid valve 59 is connected by conductor wires 84 and 85 with the conductor wires 77 and 78 and the switch 74 is interposed in the conductor line 84 for selectively closing the circuit with the solenoid.

When the dental unit 11 is set up with the sections of the several flexible conduits connected together, the plug 76 is inserted in an outlet connecting the same with a current supply. The motor 66 may then be placed in operation by manipulating the foot treadle 75. The motor 48 may be placed in operation by closing the switch 73 and the switch 74 may be closed so as to close the circuit with the solenoid valve 59. The solenoid valve

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59 remains closed when the motor 66 is not in use. When, however, the foot treadle 75 is actuated to start the motor, the solenoid valve 59 is energized to open the valve to thereby allow the air pressure to flow through the venturi 57. The water spray nozzle 31 is open at all times and when the solenoid valve 59 is open, water will flow through the spray nozzle 31. The aspirator 29 is also open at all times and a suction will be created at the open end thereof when the switches 72 and 73 are closed.

10 The air gun 26 and the water gun 27 are normally closed and have trigger releases 87 and 88 respectively which are biased to maintain the said members in closed relation and to permit of the manual actuation of said trigger releases for the discharge of fluid therefrom.

15 The dental unit 11 is of standard construction and includes pulley wheels 89, 90 and 91 at each side about which is trained the endless belt 70 which is also trained about a pulley wheel 92 carried by the drill head 16 for rotating the drill or other instrumentality carried thereby.

20 The electrical wires to the foot treadle 75 and to the plug 76 slidably protrude through openings 93 and 94 in the wall 37 whereby the plug 76 will be available for insertion in an electrical outlet and the foot treadle 75 will be available for use for starting the motor 66 when the case is opened up. These electrical wires may be retracted through said openings for disposing the plug and foot treadle in the compartment formed at the side of the case when not in active use.

The case 10 includes a cover 95 hinged to the rear wall thereof for closing the compartment in the upper portion of the case and which projects beyond the wall 37 to form the top wall of the side compartment in which the said receptacles are located. A cover 96 is hinged to the bottom wall of the case and is adapted to close the side of said side compartment. The covers 95 and 96 have latch means (not shown) releasably latching the same together and a handle member 97 is affixed to the upper face thereof for facilitating the carrying of the case.

What is claimed is:

1. In a portable dental outfit, a carrying case having a first partition wall adjacent the top thereof and a second partition wall adjacent one side thereof thereby providing compartments in the top and at one side of said case respectively, a first normally closed receptacle removably mounted on the outer face of said second partition wall and adapted to contain water for use during dental operation, a second normally closed receptacle removably mounted on the outer face of said second partition wall adapted to receive liquid during dental operation, flexible conduit means slidably protruding through openings in said first partition wall and having their upper ends supported thereon when not in active use, said conduit means extending through said second partition wall with their outer ends extending into said receptacles respectively, motor driven air and suction pump means mounted in said case on the bottom wall thereof, flexible conduit means connecting said pump means with said receptacles respectively adapted for producing a discharge of water from said first receptacle through the upper end of one of said first mentioned conduit means during dental operation and for creating a suction at the upper end of the other first mentioned conduit means adapted for discharging liquid into said second receptacle during dental operation, and cover means for closing said compartments.

2. In a portable dental outfit, a carrying case having a first partition wall adjacent the top thereof and a second partition wall adjacent one side thereof providing compartments in the top and at one side of said case respectively, a plurality of normally closed receptacles removably mounted on the outer face of said second partition wall and adapted to contain liquid, electric motor driven pump means mounted in said case on the bottom wall thereof, a plurality of first flexible conduit means slidably protruding through openings in said first partition wall

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and having their outer ends supported thereon when not in active use, said conduit means extending through said second partition wall and connected with said receptacles respectively, a plurality of second flexible conduit means connected with said receptacles respectively and protruding through said second partition wall and operatively connected with said pump means for supplying a liquid stream through the outer end of one of said first conduit means from one of said receptacles and for supplying a liquid spray through the outer end of another of said first conduit means from another of said receptacles and for producing a suction for drawing liquid through another of said first conduit means and into another of said receptacles when said pump means is in operation, an electric circuit connected with the electric motor of said electric motor driven pump means and including an electric cord adapted to be connected with a source of current supply for energizing said motor, and cover means hingedly connected with said case for closing said compartments when said outfit is not in use.

3. In a portable dental outfit, a carrying case having a first partition wall adjacent the top thereof and a second partition wall adjacent one side thereof providing compartments in the top and at one side of said case respectively, a plurality of normally closed receptacles removably mounted on the outer face of said second partition wall and adapted to contain liquid, electrically driven pump means mounted in said case on the bottom wall thereof, a plurality of flexible conduit means connected with said pump means and extending through said second partition wall and connected with said receptacles respectively with the outer ends of said conduit means slidably protruding through said first partition wall and having their outer ends supported thereon when not in active use and adapted for discharging liquid from said

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receptacles respectively through the outer ends of said conduit means when said pump means is in operation, and cover means hingedly connected with said case for closing said compartments when said outfit is not in use.

4. In a portable dental outfit, a carrying case having a first partition wall adjacent the top thereof and a second partition wall adjacent one side thereof providing compartments in the top and at one side of said case respectively, three normally closed receptacles removably mounted on the outer face of said second partition wall and adapted to contain liquid, electrically driven pump means mounted in said case on the bottom wall thereof, three flexible conduit means connected with said pump means and extending through said second partition wall and connected with said receptacles respectively with the outer ends of said conduit means slidably protruding through said first partition wall and having their outer ends supported thereon when not in active use and adapted for discharging liquid from two of said receptacles respectively through two of said conduit means and for sucking liquid into one of said receptacles from one of said conduit means when said pump is in operation, and cover means hingedly connected with said case for closing said compartments when said outfit is not in use.

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