ABSTRACT: A device for mixing and dispensing liquid resin and catalyst in predetermined quantities for filling battery case tops or other like devices wherein the contents of, and the connections thereon, are encased and sealed in solidified resin material.
RESIN MIXER AND DISPENSER

DESCRIPTION OF THE INVENTION

The machine for carrying out the invention comprises containers for liquid resin and catalyst with pumps to simultaneously withdraw resin and catalyst therefrom and pass same through heated conduits to a dispenser head. The resin and catalyst may be continuously circulated through the heated conduits to maintain same in nonviscous fluid state and a dispenser head may be connected therewith by a foot control wherein the catalyst and resin are agitated, mixed and dispensed therefrom in selected quantity. Thermostatic controls are provided for maintaining the resins and catalysts at different temperatures if desired, and temperature gauges are provided to indicate the temperature of each ingredient. Pressure indicator gauges are provided to indicate safe operating limits. The mixing head includes a rotatable spiralled agitator which may be easily replaced and the mixing head may be quickly disassembled for cleaning. Liquid level indicators are provided for the supply tanks. A purge system is provided wherein purging fluid may be directed through the mixing head to clean same by the simple manipulation of valves. When the valve is in one position, air pressure for the purge tank is exhausted and when in the other position, air pressure is exhausted from the mixing head valve mechanism so as to avoid any possibility of solvent or purging agent mixing with the resin while the device is in run position.

The system may be purged of resin and catalyst without the necessity of disconnecting or reconnecting lines thus assuring that the mixing head can be easily and quickly flushed at any time.

It is, therefore, a primary object of the invention to provide a liquid resin-catalyst mixing and dispensing device wherein the catalyst and resin are continuously circulated and maintained in heated state ready for use and may be quickly and thoroughly mixed and dispensed by simply closing a foot pedal operated switch.

Another object of the invention is to provide a liquid resin-catalyst mixing and dispensing device wherein the mixing and dispensing head may be quickly and easily purged and cleaned to prevent the setting up of resin-catalyst mixture therein by the simple manipulation of a valve.

Still another object of the invention is to provide a liquid resin-catalyst mixing and dispensing device wherein the resin-catalyst mixture may be tested at any time.

Still another object of the invention is to provide adjustable heating means in a liquid resin-catalyst mixing and dispensing device wherein the resin and catalyst may be separately heated at selected temperatures as it is circulated therethrough and wherein the resin and catalyst is agitated as it is circulated.

A still further object of the invention is to provide a mixing and dispensing head for a liquid resin-catalyst mixing and dispensing device which thoroughly mixes the resin and catalyst as it is dispensed, and wherein the mixing head may be quickly and easily disassembled for cleaning or replacement of parts.

Still another object of the invention is to provide a liquid resin-catalyst mixing and dispensing device with visual and audible warning means thereon to indicate when the device is functioning or is not functioning to the extent to allow resin-catalyst to set up therein.

A general object of the invention is to provide a simple, portable liquid resin-catalyst mixing and dispensing device which is relatively inexpensive to manufacture, safe and foolproof.

Other and further objects of the invention will become apparent upon reading the detailed specification hereinafter following and by referring to the drawings annexed hereto.

DESCRIPTION OF THE DRAWINGS

A suitable embodiment of the invention is shown in the attached drawings wherein,

FIG. 1 is a front perspective view of the machine incorporating the improvements described and claimed herein,
FIG. 2 is a perspective isometric view of a typical battery with cover to be filled with liquid resin and catalyst to seal and set the connections therein when the resin sets and hardens,
FIG. 3 is a cross-sectional elevational view of the machine showing the interior parts thereof,
FIG. 4 is a transverse sectional view taken along the line 4-4 of FIG. 3,
FIG. 5 is a vertical sectional view taken along the line 5-5 of FIG. 3,
FIG. 6 is a transverse sectional view taken along the line 6-6 of FIG. 5,
FIG. 7 is a vertical sectional view taken along the line 7-7 of FIG. 3,
FIG. 8 is an exploded isometric view of the mixer and dispensing head assembly and rack gear and air cylinder drive therefor,
FIG. 9 is a vertical sectional view taken on the line 9-9 of FIG. 6,
FIG. 10 is a front perspective view of the upper end of the device taken from the opposite side of that shown in FIG. 11,
FIG. 11 is a perspective view of the sample box,
FIG. 12 is semidiagrammatic, partially sectionalized, view of the air system operating the dispenser head and purge devices, and
FIG. 13 is a diagrammatic view of the electrical circuit for operating the device.

DESCRIPTION OF A PREFERRED EMBODIMENT

Numerical references are employed to indicate the various parts shown in the drawings and like numerals indicate like parts throughout the various figures of the drawings.

The numeral 1 indicates the general frame for the machine which includes an appropriate housing and support for the various parts hereinafter described.

In the bottom of the housing are provided a catalyst tank 2 and a resin tank 3 wherein liquid catalyst and resin are disposed. Appropriate screens 2a and 3a are provided across the containers 2 and 3 to prevent suspended solid or coagulated material from being dispensed through the system.

The housing 1 includes an upstanding portion 4 which supports the heaters, dispensing head motor, thermostats, pressure gauges and other parts as will be hereinafter described.

The containers 2 and 3 have heating elements 5 and 6 thereon which may be located about the hinges 5a and 6a therefor to fill the containers and to clean same when necessary and desirable.

The liquid level in the containers 2 and 3 may be visually indicated by means of floats 7 and 8 suspended on indicator arms 9 and 10 which have appropriate markers thereon to indicate the level in the containers on the indicator scales 11 and 12.

Fluid return lines 13 and 14 have sight glasses 15 and 16 disposed therein to visually indicate when fluid is flowing therethrough. A support and work table 17 is provided underneath the mixing and dispensing head 24, hereinafter described, on which battery cases or other devices to be filled with mixed resin and catalyst may be deposited for filling same.

In FIG. 2 there is shown a battery 18, and a battery cover 19 which fits thereon, so that the connections 18a extend through appropriate holes in the cover 19. A mixture of liquid resin-catalyst may be deposited in the top of the cover 19 to fill same and extend about the connections 18a, and when set and hardened thereon provides a seal and support for the connections which is absolutely watertight so as to prevent acid from the battery from escaping through the top and causing corrosion of the terminals and surrounding parts.

A mixer motor 20, which may be operated by electrical power, is mounted on the upstanding portion 4 of the housing, and has a blower in the upper end thereof which expels through an outlet scoop 21 to cool the motor and is directed
3,540,626

3

downwardly so as to cause the more rapid cooling and setting of the resin-catalyst mixture after it is deposited in the battery case or other device, and provides fresh air for the operator, and blows away fumes.

A rotating shaft 23 extends from the motor and is secured to 4

a chuck 22.

A mixing bit 25, hereinafter described, may be disengagably secured in the chuck 22. The mixing bit 25 rotatably extends into a mixing chamber or head 24 (FIG. 9) in the manner as will be hereinafter described in more detail.

A gear support platform 26 is secured to the upstanding portion 4 of the housing and the mixing chamber 24 is secured to same by machine screws 26a, extending thereinto.

The mixing head assembly includes a pouring spout generally indicated at 27, (FIG. 9) which includes a spout 27a suspended in the retaining nut 27b. The retaining nut 27b is threadedly engaged to a bushing 27c, which in turn is threadedly engaged in a lower cover plate 27d. The lower cover plate 27d is secured to the mixing chamber 24 by machine screws 27e. O-ring seals 27f are provided above and below the flanges 27g on the spout 27a and are sealingly pressed thereagain.

The sealing rings 27 provide an appropriate seal to prevent leakage of fluid about the spout 27a and to direct the fluid through the central passage therethrough.

Pressure gauges 28 and 29 (FIG. 1) for indicating the pressure in the catalyst and resin systems are mounted on the front face of the upper portion 4 of the housing.

A sample oven 30 (FIG. 11) is mounted on the upper surface of the lower portion of the housing 1 and has a thermometer 31 with a thermocouple 31a extending into the housing for indicating the temperature within the housing to which the lower portions of the sample cups are exposed. Electric light bulbs 32 are disposed within the housing 30 to provide heat to the sample cups.

The sample oven 30 is supported on the housing 1 by means of appropriate mounting legs 33.

Sample cups 34 with a mixture of catalyst and liquid resin therein may be inserted in the holes 35 and suspended in the upper wall of the sample oven 30.

A cup dispenser 36 is secured to the outer side of the housing from which cups 34 may be withdrawn.

A switch 37 may be pressed to energize a timer circuit for applying electrical power to light bulbs 32 in the heater oven 30 to provide heat for desired time to which material in the cups 34 is exposed.

A sample of resin-catalyst mixture may be withdrawn from the dispenser head 24 through the pouring spout 27a and placed in one of the sample cups 34. The switch 37 may be energized to provide heat for sufficient length of time to set the resin-catalyst mixture in the cup 34. Thereby the proper mixture and temperature may be pretested prior to using the mixture to fill and seal a battery or other article.

A high pressure warning light 38 is provided on the outer face of the housing to indicate when the system is not properly functioning so that it may be turned off or changed.

The thermometers 39 and 40 are exposed on the outer face of the housing to indicate the temperature of the liquid resin and catalyst as is circulated through the system. The thermometers 39 and 40 are exposed to the return lines 13 and 14 to indicate the temperatures therein.

Purge solvent valves 41 and 42 are provided to direct solvent through the mixing and dispensing head 24 to clean same when desired in the manner hereinafter described.

The conduits as indicated at 70 in FIG. 7 for the catalyst and liquid resin are encased in heat resistant casings 43 and 44 which may be suitably made of asbestos composition material.

Positive displacement pumps 45 and 46 are provided for pumping catalyst and liquid resin through the system. The pumps 45 and 46 are operated in unison through a transmission box 47 which is driven by an electric motor 52 through appropriate pulleys 55 and 56 about which extend a drive belt 54. The shaft 54a is rotated with the pulley 56, and the speed ratio of transmission 47 may be adjusted by the variable speed control 53 by rotating the crank 53a.

Intake lines 48 and 49 extend into the lower portions of the containers 2 and 3 and have check valves 50 and 51 therein. Fluids are drawn from the containers 2 and 3 by the pumps 45 and 46 through the intake lines 48 and 49 and are discharged through the discharge lines 48a and 49a and into the lines 57 and 58 which communicate with the vertical circulation conduits 70 in the manner hereinafter described.

Check valves 59 and 60 are disposed in the discharge lines 57 and 58 to prevent backflow of fluid into the pumps 45 and 46 when the system is not in operation. Pressure sensitive switches 61 are electrically connected to the warning lights to give warning and indication when the pressure in the system rises excessively, indicating a restriction of circulation.

Pressure relief valves 62 and 63 are provided in communication with the pump outlet lines 57 and 58 so that if the pressure rises excessively in the system the valves 62 and 63 will open to discharge and relieve the pressure and prevent damage to the system.

The heater wire junction box 64 (FIG. 4) is electrically connected to the heater wires 69 disposed within the heater casings (FIG. 7). The conductor wires 64a and 64b extend from the junction box 64 and are electrically connected to the resistance heater wires 69.

Outlet lines 65 and 66 are provided to the conduits 70 for the catalyst and liquid resin, said outlet lines being connected in communication therewith through fittings 76 secured to the outer end thereof.

Referring to FIG. 4, identical four-way valves 67 and 68 are provided in communication with the circulation passages for the catalyst and liquid resin and the purging fluid which are constructed and operated in the manner hereinafter described.

The resistance heater wire 69 is wound about each of the conduits 70 for the catalyst and liquid resin for imparting heat thereto. A rod 71 extends centrally through the conduits 70 and is secured at the upper end by threaded connection within the fitting 76. A central passage 71a extends through the rod 71. Spiral ribs 71b extend about the rod 71 so as to provide a swirling rotary motion to the fluid as it passes through the annular space thereabout thereby agitating same and uniformly exposing it to the heater elements.

A thermostat 72 is secured to the outer end of the fitting 76 and includes suitable heat sensor means, such as a thermocouple 73, suspended within the passage 71a. The thermostat may be adjusted by flexible shaft 74 which may be rotated through appropriate adjustment fittings 75 secured to the outer face of the upper portion 4 of the housing 1.

The gear support platform 26 (FIG. 8) is secured to the upstanding portion 4 of the housing by means of channel members 77 and 78 which have slots 77a and 78a on the inner sides thereof which embrace the outwardly extending portions 11a and 12a and are secured thereto by appropriate bolts. The channel members 77 and 78 are secured to the upstanding portion of the housing by appropriate bolts which pass through holes 78b provided therein.

An air actuated cylinder 79 is mounted on the platform 26 and has inlet and outlet air pressure lines 80 and 81 commencing therewith on opposite sides of the piston 82 therein (FIG. 12). The piston 82 is attached to a piston rod 83. The outer end of the piston rod 83 is attached to one end of a link 84. The other end of the link 84 is attached to the outer end of a rack 85.

The rack 85 is slidably disposed in a slot 86 provided in the upper surface of the platform 26.

Gears 87 and 88 are rotatably disposed in gear recesses 93 and 94 provided in the upper surface of the platform 26. Recesses 93 and 94 are provided with openings 93a and 94a in the wall thereof through which the peripheries of the gears 87 and 88 extend and mesh with the teeth on the rack 85.

The gears 87 and 88 are provided with square holes 90 therethrough into which a complementary square keys 89 may
be inserted. The square keys 89 have transverse slots 91 in the lower surfaces thereof, said slots being arranged to engage correspondingly shaped engaging pins 92 provided on the operating shafts of the four-way valves 67 and 68.

It will thus be seen that upon lateral movement of the rack 85 the gears 87 and 88 will be rotated to thereby rotate the operating shafts 67 and 68 to thereby selectively provide communication or noncommunication between the passages in the valves as hereinafter explained.

The inner liner 96 in the mixing chamber 24 is preferably made of a plastic material such as Teflon or Dehlin and has a central bore 96a therethrough in which the mixing bit 25 is rotatably disposed. The liner 96 has lateral passages 96b and 96c through the wall thereof communicating with the central bore 96a.

Nipples 97 are attached to the outlet openings 67a and 68a in the four-way valve 67 and 68 which may be brought into communication with the catalyst and resin supply lines respectively to cause mixing of same in the mixing head 24. The nipples 97 are inserted through passages 98 in the wall of the mixing chamber 24 and are sealed therein by O-rings 97a, and are in communication with the lateral passages 96d and 96e through the wall of the liner 96.

It will be seen that when the valves 67 and 68 are manipulated to allow the passage of catalyst and liquid resin through the nipples 97, same is discharged into the central bore 96a, and as the bit 25 is rotated therein the liquid materials are thoroughly mixed and agitated before being discharged under pressure through the nozzle 27.

A seal gland nut 100 is threadedly engaged in a passage through the upper wall of the gear support platform 26. The shaft 25a rotatably extends through the gland nut 100 and is sealed thereabout by means of an O-ring seal 101 which is pressed into engagement with a flange 101a provided about the passage through the platform 26. A cover plate 102 (FIG. 8) is secured to the outwardly extending portion 26c of the platform 26 to thereby cover and protect the gears 87 and 88.

A solvent purge tank 103 is mounted to the back wall of the housing 1 and includes a filler spout 104 (FIG. 12) extending outwardly of the housing.

A discharge line 105 communicates with the solvent tank and is connected to lines 106 by means of a T connection 105a (FIG. 4). The branch lines 106 communicate with the solvent control valves 41 and 42.

A four-way air valve 107 (FIG. 12) is arranged to be selectively placed in communication with the solvent tank in purge position or to the air cylinder 79 in run position in the manner hereinafter described. The four-way air valve 107 is manually operated by means of an operating handle 108 (FIG. 10) located exteriorly of the housing.

Resin and solvent return lines 109 and 110 may be caused to communicate with supply lines 65 and 66 through valves 67 and 68, whereby the catalyst and liquid resin may be continuously recirculated through the system.

The supply lines 65 and 66 have restricted orifices 65a and 66a therein to sense pressure to be indicated on the pressure gauges 28 and 29 through the connections 65b and 66b provided in the supply lines 65 and 66.

A preheat, run and off switch 111 is provided exteriorly of the upper portion of the housing for the purpose of allowing preheating of the components 9 and prior to turning the switch to the run position which would start the motors 2 and 20 to cause circulation of fluids through the system. The switch 111 is controlled by a suitable control lever 112.

An air pressure gauge 113 is provided on the outer surface of the upper portion of the housing and a warning light 114 is provided for visual indication on the outer surface of the housing when the pressure becomes excessive.

This is also provided a catalyst pressure gauge 115 on the outer face of the upper portion of the housing to indicate pressure of the catalyst as it is circulated through the system. An alarm bell 116 is also positioned on the outer wall of the upper portion of the housing which audibly indicates when a predetermined delay has occurred between ejections thus warning that the system should be purged if ejections are further appreciably delayed.

An exhaust port 117 is connected through the valve 107 with the purge tank 103 so that air pressure may be exhausted therefrom when the device is in run condition.

A foot pedal switch 118 is provided for actuation of the air cylinder 79 to thereby laterally move the rack 85 to operate the four-way valves 67 and 68 in the manner hereinafter described.

When the foot pedal switch 118 is closed by pressure thereon the solenoid valve 119 is energized to move the shaft 120 outwardly to move the piston 121, 122 and 121a to a position as shown in FIG. 12 wherein the air supply line 131 is in communication with the line 80 communicating with the air cylinder 79 to thereby push the piston 82 inwardly of the cylinder 79 and move the rack gear 85 inwardly of the slot 86 to thereby rotate the gears 87 and 88 to rotate the four-way valves 67 and 68 to cause communication between the catalyst and resin supply lines 65 and 66 and the nipples 97 leading into the mixing head 24 to thereby cause mixing and dispensing of catalyst and liquid resin. Upon upward movement of the shaft 120, the spring 124 is depressed. The solenoid valve is maintained in energized position by a timer 137 (FIG. 13) which may be set to allow dispensing of a predetermined quantity of mixed catalyst and resin. When the timer switch releases, the spring 124 will relax to move the shaft 120 and pistons 121, 121a and 122 outwardly of the solenoid valve housing 119 to a position where the air supply line 131 no longer communicates with the line 80 to thereby move the piston 82 outwardly of the air cylinder 79 to move the rack 85 outwardly of the slot 86 and thereby counter-rotate the gears 87 and 88 to thereby rotate the valves 67 and 68 to a position where the passages therethrough cause communication between the inlet lines 65 and 66 and return lines 109 and 110 to resume the recirculation of catalyst and resin through the system. Thereby a measured quantity of catalyst and liquid resin material is mixed and ejected through the mixing head 24, and after such measured quantity has been ejected the catalyst and resin material is continued to be recirculated through the system and heated.

Exhaust ports 125 and 126 are provided through the wall of the solvent valve body 119 so that air is exhausted from the areas behind the piston 121 and 122, said exhaust ports being alternately brought into communication with the lines 80 and 81 as the air cylinder 79 is operated in the manner hereinafter described.

A compressed air supply line 127 is provided for supplying compressed air for the operation of the air cylinder 79 through the solenoid valve 119. A filter 128 is provided in the air supply line 127 and said supply line has a pressure regulator 129 therein to regulate the pressure supplied to the air cylinder 79.

The four-way air supply valve 107 (FIG. 12) is shown in dispensing position and compressed air being supplied to the passage 130 through said valve and through line 131 and solenoid valve 119 to the air cylinder 79.

When the device is in dispensing position an exhaust passage 132 through the valve 107 is in communication with an outlet line 133 from the solvent tank 103 and said line 133 is in communication through the valve passage 132 with the air exhaust outlet 117. Therefore, it will be seen when the device is in run position, i.e., when catalyst and resin are being circulated through the system and periodically ejected in mixed quantities, the air is exhausted from the solvent tank 103 so that no solvent is dispensed therefrom.

However, if the valve 107 is rotated to a position where the passage 132 therethrough connects the air pressure supply line 127, and the line 133 and passage 130 connects line 131 with exhaust line 117, the air pressure will be supplied to the solvent tank 103, forcing solvent through the outlet line 105 and through solvent supply lines 106 to the valves 41 and 42.
When the system is to be turned off or if for any reason the mixing head 24 is to be cleaned and flushed, the valve 107 is rotated through the control 108 to a position where the air supply line 127 is in communication with the solvent tank 103 and the air supply line 127 is out of communication with the solenoid valve 119. Thereby solvents may be ejected from the tank 103 through the outlet line 105 and through branches lines 106 to the air solvent control valves 41 and 42. Upon opening the valves 41 and 42 solvent is passed through the nippels 97 into the bore 96a, and as the mixer bit 25 is rotated said solvent is agitated in a swirling motion and ejected through the nozzle 27a to thereby clean and purge the mixer and dispensing head 24. During this time the catalyst and resin material is continuously circulated through the system and maintained in heated condition. After sufficient purge solvent has been passed through the head the valves 41 and 42 may be closed and valve 107 may be rotated to a position where the air supply line 127 is in communication with the line 131 and the solenoid valve 119 so that measured quantities of mixed catalyst and resin can be dispensed through the head 24 by pressing upon the foot operated switch 118.

If it is desired to determine whether the resin-catalyst mixture is in proper proportion and the temperatures thereof are properly regulated so that same will properly set and harden after being dispensed, a sample thereof may be taken through the mixing and dispensing head 24 in one of the cups 34. The cup may be suspended in one of the holes 35, the timer switch 37 for the sample oven 30 may be pressed to energize the heater bulbs 32 to thereby heat the material in the cup 34 for sufficient length of time to determine whether same will set at the temperature determined on the thermometer 31 and within the time set on the timer 37. It is important that each batch of resin-catalyst mixture be tested since it may be of different consistency and that the times and temperatures be adjusted accordingly.

It will be noted that while the device is in operation the air produced by the circulating fan in the motor housing 20 is directed downwardly through the scoop 21 to cool the resin-catalyst mixture dispensed in the battery case or other device to cause same to more quickly set and to provide fresh air for the operator.

It will thus be seen that I have provided a resin-catalyst mixing and dispensing device wherein the resin and catalyst may be continuously circulated while it is heated and maintained in such state to maintain the desired viscosity for optimum dispensing, wherein the resin-catalyst mixture may be dispensed in measured quantities and thoroughly agitated and mixed before dispensing, and wherein the mixing and dispensing head may be quickly cleaned and purged while the catalyst and resin material are continued to be circulated through the system and the temperatures thereof are maintained. Safety alarms, both visual and audible, are provided for indicating when the system is in operation when the pressure increases therein to a dangerous extent, and when dispensing has been discontinued for a dangerous length of time to thereby require purging.

I have provided a portable device which is relatively inexpensive to manufacture, easy to use, disassemble and repair and which is economical in its operation and provides for maximum production.

It will be understood that other and further embodiments of my invention may be devised without departing from the spirit and scope of the appended claims.

I claim:
1. In a device of the class described, a container for liquid resin; a container for catalyst; separate circulation conduits for the catalyst and resin; means to circulate fluid through each of the conduits; a heater device arranged in heat exchange relation with each conduit; heat sensor means in heat exchange relation with each of said circulation conduits; means to operably connect the heat sensor means to the heater device to control the temperature of the fluid as it flows through each conduit; a mixing and dispensing head arranged to be simultaneously placed in communication with the con-
duits; and separate valve means between the head and the conduits arranged to operate in unison to simultaneously bring the conduits into communication with the interior of the head.

2. In a device of the class described, a container for liquid resin; a container for catalyst; separate circulation conduits for the catalyst and resin; means to circulate fluid through each of the conduits; a heater device arranged in heat exchange relation with each conduit; a mixing and dispensing head arranged to be simultaneously placed in communication with the conduits; separate valve means between the head and the conduits arranged to operate in unison to simultaneously bring the conduits into communication with the interior of the head; a solvent container; conduit means between the solvent container and the head; valve means in the conduit means to selectively place the solvent container in communication with the interior of the head; means to eject solvent from said container through the conduit means; and means to prevent simultaneous opening of the valve means in the circulation conduits and the valve means in the conduit between the solvent container and the head.

3. The combination called for in claim 2 wherein the means for ejecting solvent from the solvent container includes pressure fluid; and valve means to selectively connect the pressure fluid to the solvent container to thereby force solvent from the container through the conduit means, wherein the separate valve means between the head and conduit is pressure actuated, and wherein the means to prevent simultaneous opening of the respective valve means comprises a valve in fluid communication with the solvent container and the valve means between the head and the container means.

4. The combination called for in claim 2 with the addition of pressure actuated alarm means to indicate predetermined intervals between ejections of fluid.

5. The combination called for in claim 1 wherein the mixing and dispensing head includes a central passage therethrough into which the resin and catalyst are injected; a rotatable member having spiral convolutions on the outer surface thereof; and motor means for rotating said convoluted member.

6. The combination called for in claim 5 wherein the convoluted member is a drill bit, adapted to form a hole in solid material when rotated in a counterclockwise direction, which is then exposed to solvent.

7. The combination called for in claim 5 wherein the motor means include a circulating fan therein; and a downwardly directed scoop extending outwardly of the motor means to direct air from the circulating fan downwardly about the head.

8. In a device of the class described, a container for liquid resins; a container for catalyst; separate circulation conduits for the catalyst and resin; means to circulate fluid through each of the conduits; a heater device arranged about each conduit; a rod extending through the portion of each circulation conduit about which the heater device is positioned; said rod having convolutions on the outer surface thereof to cause spiral movement of fluid as it passes thereabout in the conduit; a mixing and dispensing head arranged to be simultaneously placed in communication with the conduits; and separate valve means between the head and the conduits arranged to operate in unison to simultaneously bring the conduits into communication with the interior of the head.

9. The combination called for in claim 8 wherein the rod has a central bore therethrough; and a thermocouple extending into said bore connected to a thermostat to control the temperature of the heater element about said conduit.

10. The combination called for in claim 1 wherein the means to circulate fluid through the conduits comprises separate pumps and common drive means to rotate said pumps.

11. The combination called for in claim 1 wherein the means to operate the valve means between the head and the conduit comprises a gear attached to the shaft of each valve; and a rack gear movable laterally to rotate said gears in unison to thereby operate said valves in unison; and means to move said rack gear laterally in two directions.

12. The combination called for in claim 11 wherein the means to move the rack gear laterally includes a compressed air supply; an air cylinder having a piston and rod therein movable inwardly and outwardly thereof; said rod being operably connected to said rack gear to move the rack gear back and forth in response to air pressure in said cylinder on opposite sides of the piston; and valve means to selectively admit air pressure to opposite sides of the piston to selectively move the rack in opposite directions.

13. The combination called for in claim 12 with the addition of a solenoid valve between the compressed air supply and the air cylinder; switch means to energize said solenoid valve, said solenoid valve being arranged to alternately connect opposite sides of the piston in communication with the air supply to open and close said valves.

14. The combination called for in claim 13 with the addition of a timer switch between the switch means and the solenoid to maintain same in energized position for a selected length of time.

15. In a device of the class described, a container for liquid resin; a container for catalyst; separate circulation conduits for the catalyst and resin; means to circulate fluid through each of the conduits; a heater device arranged about each conduit; a mixing and dispensing head arranged to be simultaneously placed in communication with the conduit; separate valve means between the head and the conduits arranged to operate in unison to simultaneously bring the conduits into communication with the interior of the head; and a control switch having an off position, a second position arranged to supply power to the heater device prior to supplying power to the means to circulate fluid through the conduits to preheat the heater device, and a run position arranged to supply power to the means to circulate fluid through the conduits.

16. In a device of the class described, a container for liquid resins; a container for catalyst; separate circulation conduits for the catalyst and resin; means to circulate fluid through each of the conduits; a rod extending through a portion of each circulation conduit arranged to form an annular space between the outer surface of the rod and the inner surface of the conduit; heater means in heat exchange relation with the annular space to maintain the fluid at a preselected temperature as it flows through the annular space; and a motor means for rotating said convoluted member.

17. In a device of the class described, a container for liquid resin; a container for catalyst; separate circulation conduits for the catalyst and resin; means to circulate fluid through each of the conduits arranged to have an off position, a first position arranged to activate the heater means, and a second position arranged to activate the means to circulate fluid through the conduits.
separate valves in unison to simultaneously bring the circulation conduits into communication with the interior of the head, and a second position arranged to supply pressurized fluid to the solvent container to inject pressure fluid thereinto to force solvent from the container through the solvent conduit means and to close off the supply of pressurized fluid to the pressure actuated means.