CLAIMS

(1) A device for the treatment of liquids comprising a first sheet of rigid plastic material and a second sheet of rigid plastic material, each sheet has a first major surface and a second major surface and a thickness between the first and second major surfaces, each of the first and second sheets has one or more flow channels formed therein, the one or more flow channels are formed in each sheet in manner such that the area of the sheet where the one or more flow channels are formed extend away from the first major surface of the sheet and beyond the normal plane of the second major surface of the sheet, the first and second sheets are liquid tightly sealed to each other at their adjoining first major surfaces and one or more pieces of tubing for movement of the liquids are inserted in the one or more flow channels formed between the two sheets, wherein the one or more pieces of tubing substantially conform to the dimension of the flow channels and one or more fittings are secured to the one or more pieces of tubing in the one or more flow channels at an edge of the two liquid tightly sealed sheets.

(2) The device of claim 1 further comprising one or more holes formed through at least one of the first or second sheets at a location over the one or more flow channels and a device selected from the group consisting of a sensor, filter and a fitting is liquid tightly attached to each of the one or more holes.

(3) The device of claim 1 further comprising one or more holes through one of the first or second sheets at a location over the one or more flow channels, a device selected from the group consisting of a sensor, filter and a fitting being liquid tightly attached to the opening, the device is a sensor and the sensor is selected from the group consisting of temperature, pressure, conductivity, flow and pH sensors.

(4) A device for the treatment of liquids comprising a first sheet of rigid plastic material and a second sheet of plastic material, each sheet has a first major surface and a second major surface and a thickness between the first and second major surfaces, each of the first and second sheets has one or

more flow channels formed in it, the one or more flow channels are formed in each of the sheets in a manner such that the area of the sheet where the flow channels are formed extends away from the first major surface of the sheet and beyond the normal plane of the second major surface of the sheet, the first and second sheets are liquid tightly sealed to each other at their adjoining first major surfaces, one or more pieces of tubing inserted within the one or more flow channels, wherein the one or more pieces of tubing substantially conform to the dimension of the one or more flow channels, one or more fittings are secured to the one or more pieces of tubing at an edge of the two liquid tightly sealed sheets so as to function as a port for the system and one or more holes formed through at least one of the first or second sheets at a location over the one or more flow channels and a device selected from the group consisting of a sensor, filter and a fitting is liquid tightly attached to the one or more holes.

(5) The device of claim 1 further comprising one or more holes formed through at least one of the first or second sheets at a location over the one or more channels and a filter being liquid tightly attached to the one or more holes.

(6) The device of claim 1 further comprising one or more holes formed through at least one of the first or second sheets at a location over the one or more flow channels and a fitting being liquid tightly attached to the one holes or more.

(7) The device of claim 3 wherein the device attached to the one or more holes is a filter.

(8) The device of claim 3 wherein the device attached to the one or more holes is a fitting.

(9) The device of claim 3 wherein the device attached to the one or more holes is a sensor is selected from the group consisting of temperature, pressure, conductivity, flow and pH sensors.

(10) A system for the processing of a liquid comprising a device comprising a first sheet of rigid plastic material and a second sheet of plastic material wherein each sheet is formed of a polycarbonate material, each sheet has a first major surface and a second major surface and a thickness between

the first and second major surfaces, each of the first and second sheets has one or more flow channels formed in it, the one or more flow channels are formed in each of the sheets in a manner such that the area of the sheet where the flow channels are formed extends away from the first major surface of the sheet and beyond the normal plane of the second major surface of the sheet, the first and second sheets are liquid tightly sealed to each other at their adjoining first major surfaces, one or more pieces of silicone tubing inserted within the one or more flow channels wherein the one or more pieces of silicone tubing substantially conform to the dimension of the flow channels and a first fitting secured at a first location in the silicone tubing in the one or more flow channels at a first edge of the two liquid tightly sealed sheets and a second fitting secured at a second location in the silicone tubing in the one or more flow channels at a second edge of the two liquid tightly sealed sheets, the first fitting being connected to a supply of liquid for processing and the second fitting being connected to a means to hold the liquid after passing through the tubing contained within the one or more flow channels.

(11) The system of claim 10 further comprising one or more holes formed through at least one of the first or second sheets at a location over the one or more flow channels and a device selected from the group consisting of a sensor, filter and a fitting is liquid tightly attached to the one or more holes.

CLAIMS

(1) A device comprising a first sheet of rigid plastic material and a second sheet of rigid plastic material, each sheet has a first major surface and a second major surface and a thickness between the first and second major surfaces, at least one of the first and second sheets has one or more flow channels formed therein, the one or more flow channels are formed in the at least one sheet in manner such that the area of the sheet where the flow channels are formed extend away from the first major surface of the sheet and beyond the normal plane of the second major surface of the sheet, the first and second sheets are liquid tightly sealed to each other at their adjoining first major surfaces and one or more pieces of tubing are contained in the one or more flow channels formed between the two sheets.

(2) The device of claim 1 wherein the first and second sheets have one or more flow channels in them.

(3) The device of claim 1 wherein the first and second sheets have one or more flow channels in them and the flow channels of the two sheets are aligned and in register with each other.

(4) The device of claim 1 further comprising one or more fittings are secured in the flow channel at an edge of the two liquid tightly sealed sheets.

(5) The device of claim 1 wherein the first sheet has one more flow channels and the one or more flow channels have a cross-sectional profile selected from the group consisting of semi-circles, semi-ovals, squares, triangles, rectangangles and semi-polygonals where p equals the number of sides of the polygon and p>4.

(6) The device of claim 1 wherein the first and second sheets have one or more flow channels in them and the one Or mote flow channels have a cross-sectional profile selected from the group consisting of semi-circles, semi-ovals, squares, triangles, rectangangles, semi-hexagonals and semi-polygonals where p equals the number of sides of the polygon and p>4.

(7) The device of claim 1 wherein the sheets are made from a plastic selected from the group consisting of polyolefins, polycarbonates, epoxies,

~~fiberglass reinforced thermosets, carbon reinforced thermosets, carbon~~ composites, polysulphones and polyetherimides.

(8) The device of claim 1 wherein the sheets are liquid tightly sealed together by a means selected from the group consisting of heat bonds, ultrasonic welding, vibration welding, heat-staking, solvent welding, adhesives, clamps and nuts and bolts.

(9) The device of claim 1 further comprising one or more fittings are secured to the one or more pieces of tubing in the one or more flow channels at an edge of the two liquid tightly sealed sheets.

(10) The device of claim 1 further comprising one or more holes through one of the first or second sheets at a location over the one or more flow channels and a sensor being liquid tightly attached to the opening.

(11) The device of claim 1 further comprising one or more holes through one of the first or second sheets at a location over the one or more flow channels, each opening having a elastomeric seal formed therein and a sensor being liquid tightly attached to the opening.

(12) The device of claim 1 further comprising one or more holes through one of the first or second sheets at a location over the one or more flow channels, a sensor being liquid tightly attached to the opening and the sensor being selected from the group consisting of temperature, pressure, conductivity, flow and pH sensors.

(13) A device comprising a first sheet of rigid plastic material and a second sheet of plastic material, each sheet has a first major surface and a second major surface and a thickness between the first and second major surfaces, at least one of the first and second sheets has one or more flow channels formed in it, the one or more flow channels are formed in at least one of the sheets in a manner such that the area of the sheet where the flow channels are formed extends away from the first major surface of the sheet and beyond the normal plane of the second major surface of the sheet, the first and second sheets are liquid tightly sealed to each other at their adjoining first major surfaces, one or more pieces of tubing contained within the one or more flow ~~channels and one or more fittings are secured to the one or more pieces of~~

~~tubing at an edge of the two liquid tightly sealed sheets so as to function as a~~ port for the system.

