both sides of the first unit dispensing unit and are connected to the first unit dispensing unit in such a way to enable the liquid to flow between the second unit dispensing units and the first unit dispensing unit.

[15] The connection ~~tube~~ is configured to connect the first unit dispensing unit to the lower sides of the first and second unit chambers.

Advantageous effects

[16] The liquid dispensing device according to the present invention has advantageous effects in the way that the whole installation space may be saved because the construction for a liquid dispensing device configured to dispense liquid may be arranged inside of the distillation column.

Brief Description of Drawings

[17] Figure 1 is a perspective view illustrating a construction of a liquid dispensing device according to an exemplary embodiment of the present invention.

[18] Figure 2 is a perspective view illustrating a detailed construction of a porous plate illustrated in Figure 1.

[19] Figure 3 is a perspective view illustrating a construction of a dispensing box illustrated in Figure 1.

arranged in the above manner, the liquid in the space between the first unit partition 162a and the second unit partition 162b among the liquid which has descended into the dispensing box 160 is discharged through the outlet tube 164 to the outside.

[66] It is preferred that a predetermined value (not shown) is installed at the outlet tube 164 so as to intermittently control the discharge of the liquid. When the valve is closed, the liquid overflows through top of the first unit partition 162a toward both sides of the inner side of the dispensing box 160, namely, toward the first and second units chambers 164a and 164b.

[67] The outlet tube 164 is connected to an inlet tube 166, so it is preferred that the liquid may be dispensed in the interior of the housing 110 without any loss of the discharged liquid.

[68] To the both lower sides of the dispensing box 160, namely to the lower sides of the first and second unit chambers 164a and 164b, a connection ~~tube~~ 168 is connected so as to enable the liquid to move toward a liquid dispenser 170. In the present exemplary embodiment of the present invention, two connection ~~tubes~~ 168 are connected to an end of the dispensing box 160, respectively. The number of connections may be changed based on the necessity of the user.

[69] The separation wall 190 divides the space of the inner lower side of

separation wall 190.

[76] The second unit dispensing unit 174 is disposed at either side of the first unit dispensing unit 172. Here, the second unit dispensing unit 174 communicates with the first unit dispensing unit 172 in such a way that liquid can move between them. It is preferred that the second unit dispensing units 174 are disposed in a symmetrical shape.

[77] It is preferred that the second unit dispensing unit 174 is disposed at a portion higher than the lower grid 120b.

[78] The operations of the thusly constituted present invention will be described.

[79] The liquid (circulating) discharged from the distillation column is inputted through the packing bed of the upper side and the upper grid 120a into the interior of the housing 110.

[80] The inputted liquid spreads over the whole portions of the upper surface of the collector tray 130.

[81] Thereafter, the liquid on the collector tray 130 descends through the holes 152 of the porous plate 150 into the dispensing box 160.

[82] The liquid which has descended into the dispensing box 160 moves through the connection ~~tube~~ 168 from the first and second unit chambers 164a and 164b into the liquid dispenser 170.

[83] Namely, the liquid which has descended into the dispensing box 160 is inputted trough the top of the second unit partition 162b into the space formed between the first unit partition 162a and the second unit partition 162b and is discharged through the outlet tube 164 to the outside. The discharge of the liquid may be intermittently controlled by adjusting the opening and closing of the valve installed at the outlet tube 164.

[84] Meanwhile, the liquid which has been discharged through the outlet tube 164 to the outside may input through the inlet tube 166. The liquid inputted through the inlet tube 166 and the liquid inputted through the connection ~~tube~~ 168 gather on the first unit dispensing unit 172 and the second unit dispensing unit 174.

[85] The liquid gathering on the first unit dispensing unit 172 and the second unit dispensing unit 174 descends through the lower grid 120b into the packing bed of the lower side.

[86] The above-described exemplary embodiments of the present invention are provided for illustrative purposes and should understood in such a way that the above-described examples are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and

Claims:

1. A liquid dispensing device, comprising:

a housing disposed inside of a distillation column;

lattice -shaped upper and lower grids which are disposed at the inner sides of top and bottom of the housing;

a collector tray disposed at top of the inner side of the housing for thereby guiding the liquid inputted through the upper grid;

a porous plate which is disposed at ~~top~~ of the collector tray and includes a plurality of through holes through which the guided liquid descends;

a dispensing box which is disposed at a lower side of the porous plate and is configured to dispense the liquid which descends through the porous plate, through an outlet tube connected to both sides thereof to the outside of the housing;

a liquid dispenser which is disposed at a lower side of the dispensing box and is configured to uniformly dispense and discharge the liquid dispensed by the dispensing box toward the lower side;

a connection pipe connected to enable a fluid flow between the dispensing box and the liquid dispenser;

an inlet pipe configured to enable a liquid input from the outside of the housing to the liquid dispenser; and

9. The device of claim 1, wherein the liquid dispenser comprises:

a first unit dispensing unit which is formed in a hexahedron shape and whose top and bottom are open, and which is symmetrically disposed with respect to the first and second chambers; and

a plurality of second unit dispensing units which are symmetrically disposed at both sides of the first unit dispensing unit and are connected to the first unit dispensing unit in such a way to enable the liquid to flow between the second unit dispensing units and the first unit dispensing unit.

10. The device of either ~~claim4 or claim 9~~, wherein the connection ~~tube~~ is configured to connect the first unit dispensing unit to the lower sides of the first and second unit chambers.

both sides of the first unit dispensing unit and are connected to the first unit dispensing unit in such a way to enable the liquid to flow between the second unit dispensing units and the first unit dispensing unit.

[15] The connection pipe is configured to connect the first unit dispensing unit to the lower sides of the first and second unit chambers.

Advantageous effects

[16] The liquid dispensing device according to the present invention has advantageous effects in the way that the whole installation space may be saved because the construction for a liquid dispensing device configured to dispense liquid may be arranged inside of the distillation column.

Brief Description of Drawings

[17] Figure 1 is a perspective view illustrating a construction of a liquid dispensing device according to an exemplary embodiment of the present invention.

[18] Figure 2 is a perspective view illustrating a detailed construction of a porous plate illustrated in Figure 1.

[19] Figure 3 is a perspective view illustrating a construction of a dispensing box illustrated in Figure 1.

arranged in the above manner, the liquid in the space between the first unit partition 162a and the second unit partition 162b among the liquid which has descended into the dispensing box 160 is discharged through the outlet tube 164 to the outside.

[66] It is preferred that a predetermined value (not shown) is installed at the outlet tube 164 so as to intermittently control the discharge of the liquid. When the valve is closed, the liquid overflows through top of the first unit partition 162a toward both sides of the inner side of the dispensing box 160, namely, toward the first and second units chambers 164a and 164b.

[67] The outlet tube 164 is connected to an inlet tube 166, so it is preferred that the liquid may be dispensed in the interior of the housing 110 without any loss of the discharged liquid.

[68] To the both lower sides of the dispensing box 160, namely to the lower sides of the first and second unit chambers 164a and 164b, a connection pipe 168 is connected so as to enable the liquid to move toward a liquid dispenser 170. In the present exemplary embodiment of the present invention, two connection pipes 168 are connected to an end of the dispensing box 160, respectively. The number of connections may be changed based on the necessity of the user.

[69] The separation wall 190 divides the space of the inner lower side of

separation wall 190.

[76] The second unit dispensing unit 174 is disposed at either side of the first unit dispensing unit 172. Here, the second unit dispensing unit 174 communicates with the first unit dispensing unit 172 in such a way that liquid can move between them. It is preferred that the second unit dispensing units 174 are disposed in a symmetrical shape.

[77] It is preferred that the second unit dispensing unit 174 is disposed at a portion higher than the lower grid 120b.

[78] The operations of the thusly constituted present invention will be described.

[79] The liquid (circulating) discharged from the distillation column is inputted through the packing bed of the upper side and the upper grid 120a into the interior of the housing 110.

[80] The inputted liquid spreads over the whole portions of the upper surface of the collector tray 130.

[81] Thereafter, the liquid on the collector tray 130 descends through the holes 152 of the porous plate 150 into the dispensing box 160.

[82] The liquid which has descended into the dispensing box 160 moves through the connection pipe 168 from the first and second unit chambers 164a and 164b into the liquid dispenser 170.

[83] Namely, the liquid which has descended into the dispensing box 160 is inputted trough the top of the second unit partition 162b into the space formed between the first unit partition 162a and the second unit partition 162b and is discharged through the outlet tube 164 to the outside. The discharge of the liquid may be intermittently controlled by adjusting the opening and closing of the valve installed at the outlet tube 164.

[84] Meanwhile, the liquid which has been discharged through the outlet tube 164 to the outside may input through the inlet tube 166. The liquid inputted through the inlet tube 166 and the liquid inputted through the connection pipe 168 gather on the first unit dispensing unit 172 and the second unit dispensing unit 174.

[85] The liquid gathering on the first unit dispensing unit 172 and the second unit dispensing unit 174 descends through the lower grid 120b into the packing bed of the lower side.

[86] The above-described exemplary embodiments of the present invention are provided for illustrative purposes and should understood in such a way that the above-described examples are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and

Claims:

1. A liquid dispensing device, comprising:

a housing disposed inside of a distillation column;

lattice -shaped upper and lower grids which are disposed at the inner sides of top and bottom of the housing;

a collector tray disposed at top of the inner side of the housing for thereby guiding the liquid inputted through the upper grid;

a porous plate which is disposed at the same level or at the bottom of the collector tray and includes a plurality of through holes through which the guided liquid descends;

a dispensing box which is disposed at a lower side of the porous plate and is configured to dispense the liquid which descends through the porous plate, through an outlet tube connected to both sides thereof to the outside of the housing;

a liquid dispenser which is disposed at a lower side of the dispensing box and is configured to uniformly dispense and discharge the liquid dispensed by the dispensing box toward the lower side;

a connection pipe connected to enable a fluid flow between the dispensing box and the liquid dispenser;

an inlet pipe configured to enable a liquid input from the outside of the housing to the liquid dispenser; and

9. The device of claim 1, wherein the liquid dispenser comprises:

a first unit dispensing unit which is formed in a hexahedron shape and whose top and bottom are open, and which is symmetrically disposed with respect to the first and second chambers; and

a plurality of second unit dispensing units which are symmetrically disposed at both sides of the first unit dispensing unit and are connected to the first unit dispensing unit in such a way to enable the liquid to flow between the second unit dispensing units and the first unit dispensing unit.

10. The device of either claim 1,

wherein the dispensing box comprises:

a box body which is formed in a rectangular parallelepiped shape and whose top is open;

a first unit partition which is disposed inside of the box body and is configured to divide the inner side of the box body into a first unit chamber and a second unit chamber; and

a second unit partition which is configured to interconnect the first unit partition and the inner wall of the box body for thereby forming a unit separation space,

wherein the liquid dispenser comprises:

a first unit dispensing unit which is formed in a hexahedron shape and

whose top and bottom are open, and which is symmetrically disposed with respect to the first and second chambers; and

a plurality of second unit dispensing units which are symmetrically disposed at both sides of the first unit dispensing unit and are connected to the first unit dispensing unit in such a way to enable the liquid to flow between the second unit dispensing units and the first unit dispensing unit, and

wherein the connection pipe is configured to connect the first unit dispensing unit to the lower sides of the first and second unit chambers.