

CLAIMS

What is claimed is:

1. A contact tray for use in a mass transfer column, said contact tray comprising:
a tray deck for receiving a liquid stream; and
a plurality of valves distributed across the tray deck, each of said valves comprising:
an opening in the tray deck to allow for passage of fluid through the tray deck for interaction with the liquid stream when it is received on the tray deck, said opening having a central segment and extensions that extend outwardly from opposite ends of the central segment;
wall segments that extend upwardly along opposite sides of the central segment of the opening; and
a valve body comprising a valve cover positioned in covering relationship above said opening and legs that are attached to the valve cover at recesses located at opposite ends of the valve cover and extend downwardly through said extensions in the opening,
wherein said valve cover has sides that extend outwardly beyond the sides of the opening.
2. The contact tray as set forth in claim 1, wherein said legs and the extensions of the opening are constructed so that the legs are vertically moveable within said extensions of the opening to allow the valve cover to move up and down.
3. The contact tray as set forth in claim 2, wherein each of said legs has a lower portion that extends below said tray deck.

4. The contact tray as set forth in claim 3, wherein the lower portion of each of said legs includes a stop for contact against said tray deck to limit said vertical movement of the legs within said extensions of the opening.
5. The contact tray as set forth in claim 4, wherein the lower portion of at least one of said legs includes a pair of said stops positioned in laterally spaced-apart relationship to each other.
6. The contact tray as set forth in claim 4, wherein the sides of the valve cover extend downwardly.
7. The contact tray as set forth in claim 6, including deflectors that are positioned adjacent opposite sides of the legs and that extend downwardly below the sides of the valve cover.
8. The contact tray as set forth in claim 7, wherein the deflectors are positioned outwardly of the legs.
9. The contact tray as set forth in claim 6, wherein each of the legs has a width less than that of the valve cover and the width of one of the legs is greater than the other leg.
10. The contact tray of claim 9, wherein the central segment of the opening is circular and said extensions are rectangular.
11. A contact tray for use in a mass transfer column, said contact tray comprising:
 - a tray deck for receiving a liquid stream; and
 - a plurality of valves distributed across the tray deck, each of said valves comprising:
 - an opening in the tray deck to allow for passage of fluid through the tray deck for interaction with the liquid stream when it is received on the tray deck, said opening having a central segment and rectangular extensions that extend outwardly from opposite ends of the central segment;

wall segments that extend upwardly along opposite sides of the central segment of the opening; and

a valve body comprising a valve cover positioned in covering relationship above said opening and legs that are attached to the valve cover at recesses located at opposite ends of the valve cover and extend downwardly through said extensions in the opening,

wherein each of said legs has a lower portion that extends below said tray deck, the legs and the extensions of the opening are constructed so that the legs are vertically moveable within said extensions of the opening to allow the valve cover to move up and down, each of the legs has a width less than that of the valve cover, and the width of one of the legs is greater than the other leg, and

wherein said valve cover has sides that extend outwardly beyond the sides of the opening.

12. The contact tray as set forth in claim 11, wherein the lower portion of each of said legs includes a stop for contact against said tray deck to limit said vertical movement of the legs within said extensions of the opening.

13. The contact tray as set forth in claim 12, wherein the lower portion of at least one of said legs includes a pair of said stops positioned in laterally spaced-apart relationship to each other.

14. The contact tray as set forth in claim 13, wherein the lower portion of each of said legs includes the pair of said stops positioned in laterally spaced-apart relationship to each other.

15. The contact tray as set forth in claim 14, wherein the sides of the valve cover extend downwardly.

16. The contact tray as set forth in claim 15, including deflectors that are positioned adjacent opposite sides of the legs and that extend downwardly below the sides of the valve cover to restrict vapor passage around the legs.
17. A contact tray for use in a mass transfer column, said contact tray comprising:
- a tray deck for receiving a liquid stream; and
 - a plurality of valves distributed across the tray deck, each of said valves comprising:
 - an opening in the tray deck to allow for passage of fluid through the tray deck for interaction with the liquid stream when it is received on the tray deck, said opening having a circular central segment and rectangular extensions that extend outwardly from opposite ends of the central segment; and
 - a valve body comprising a valve cover positioned in covering relationship above said opening, legs that are attached to the valve cover at recesses located at opposite ends of the valve cover and extend downwardly through said extensions in the opening, and deflectors positioned adjacent opposite sides of the legs and extending downwardly below the sides of the valve cover to restrict vapor passage around the legs,
- wherein each of the legs has a lower portion that extends below said tray deck, the legs and the extensions of the opening are constructed so that the legs are vertically moveable within said extensions of the opening to allow the valve cover to move up and down, and the lower portion of each of the legs includes a stop for contact against said tray deck to limit said vertical movement of the legs within said extensions of the opening,
- wherein said valve cover has curved sides that extend outwardly beyond the sides of the opening and each of the legs has a width less than that of the valve cover.

18. The contact tray as set forth in claim 17, wherein the lower portion of each of said legs includes a pair of said stops positioned in laterally spaced-apart relationship to each other and the width of one of the legs is greater than the other leg.
19. The contact tray as set forth in claim 17, wherein the sides of the valve cover extend downwardly.
20. The contact tray as set forth in claim 19, including wall segments that extend upwardly along opposite sides of the central segment of the opening.
21. The contact tray as set forth in claim 20, wherein said valve cover is round.
22. A contact tray for use in a mass transfer column, said contact tray comprising:
a tray deck for receiving a liquid stream; and
a plurality of valves distributed across the tray deck, each of said valves comprising:
an opening in the tray deck to allow for passage of vapor through the tray deck for interaction with the liquid stream when it is received on the tray deck, said opening having a central segment and extensions that extend outwardly from opposite ends of the central segment and include transversely-extending slots;
wall segments that extend upwardly along opposite sides of the central segment of the opening; and
a valve body comprising a trapezoidal valve cover positioned in covering relationship above said opening and extensions and having legs that are attached to the valve cover at opposite ends of the valve cover and extend downwardly through said slots in the extensions of the opening,
wherein said valve cover has sides that extend outwardly beyond the sides of the central segment and the extensions of the opening.

23. The contact tray as set forth in claim 22, wherein each of said legs has a lower portion that extends below said tray deck and includes a stop for contact against said tray deck to limit said vertical movement of the legs within said slots in the extensions of the opening.
24. The contact tray as set forth in claim 23, wherein the lower portion of at least one of said legs includes a pair of said stops positioned in laterally spaced-apart relationship to each other.
25. The contact tray as set forth in claim 23, wherein the sides of the valve cover extend downwardly.
26. The contact tray as set forth in claim 25, including a vent positioned in one of said legs to allow passage of vapor through said one leg after the vapor passes through the opening.