CLAIMS

1. A vane inlet device for use in a vessel to receive and redistribute a fluid stream entering the vessel, said vane inlet device comprising:

a passageway bounded by a top plate and a bottom plate spaced from the top plate, said passageway having an inlet end for receiving the fluid stream when it enters the vessel, an opposite end, and first and second sides;

a first array of vanes positioned in spaced apart relationship to each other along said first side of the passageway for receiving a first portion of said fluid stream when flowing from the inlet end of the passageway toward the opposite end and redirecting it out said first side of the passageway;

a second array of vanes positioned in spaced apart relationship to each other along said second side of the passageway for receiving a second portion of said fluid stream when flowing from the inlet end of the passageway toward the opposite end and redirecting it out said second side of the passageway,

wherein a spacing between the first array of vanes and the second array of vanes progressively decreases in a direction from the inlet end of the passageway toward the opposite end; and

a beam extending from the top plate to the bottom plate between said first and second arrays of vanes to reduce flexure of the top and bottom plates and separating said first portion of the fluid stream from the second portion.

2. The vane inlet device of claim 1, wherein said beam has at least one opening to allow

some of said fluid stream to pass through the beam to equalize pressure on opposite sides of the beam.

3. The vane inlet device of claim 2, wherein each of said first and second arrays of vanes extend from the top plate to the bottom plate and is connected thereto.

4. The vane inlet device of claim 3, wherein each of said vanes in said first and second arrays are curved to present a concave surface on a front side of the vane facing in the direction of the inlet end of the passageway.

5. The vane inlet device of claim 4, wherein each of said vanes in said first and second arrays has a leading edge positioned nearest the beam and an opposite trailing edge, wherein the leading edges of the vanes in the first array are positioned in a first common vertical plane and the leading edges of the vanes in the second array are positioned in second common vertical plane, wherein the first and second common vertical planes converge toward each other in the direction from the inlet end of the passageway toward the opposite end.

6. The vane inlet device of claim 5, wherein the trailing edge of each vane in said first and second arrays is formed into a liquid collection channel positioned on a back side of the vane and including an aperture in the vane extending from the front side to the back side of the vane and positioned to allow liquid on the front side of the vane to pass through the aperture and enter the liquid collection channel on the back side of the vane.

7. The vane inlet device of claim 4, including braces extending from said first and second arrays of vanes to the beam.

8. The vane inlet device of claim 4, including straightening vanes positioned at said inlet end of the passageway and extending in a direction away from said opposite end of the passageway for reducing turbulent flow of said fluid stream.

9. The vane inlet device of claim 8, including a vertically-extending drain passage formed at said opposite end of the passageway beyond a final pair of vanes in said first and second arrays of vanes and extending downwardly from said top plate.

10. The vane inlet device of claim 9, including a drain channel extending along said top plate to direct liquid when on an upper surface of said top plate to the drain passage.

11. The vane inlet device of claim 1, wherein said beam comprises wall segments joined together along edges extending in said direction from the inlet end of the passageway toward the opposite end.

12. A vessel comprising:

an external shell defining an interior volume;

an opening in said external shell for delivering a fluid stream into said interior volume;

an inlet flange surrounding said opening and extending outwardly from said external shell; and

a vane inlet device according to any one of claims 1 to 6 positioned primarily in said interior volume of the external shell of the vessel in alignment with said opening and connected to an interior surface of the external shell,

a passageway bounded by a top plate and a bottom plate spaced from the top plate, said passageway having an inlet end for receiving the fluid stream when it enters the vessel, an opposite end, and first and second sides; and

straightening vanes positioned at said inlet end of the passageway and extending into said inlet flange for reducing turbulent flow of said fluid stream.

13. The vane inlet device comprised in the vessel according to claim 12, wherein said vanes in said first and second arrays are curved to present a concave surface on a front side of the vane facing in the direction of the inlet end of the passageway. said vane inlet device including a vertically-extending drain passage formed at said opposite end of the passageway beyond a final pair of vanes in said first and second arrays of vanes and extending downwardly from said top plate.

14. The vane inlet device of claim 13, including a drain channel extending along said top plate to direct liquid when on an upper surface of said top plate to the drain passage.

15. The vessel of claim 12, wherein said beam comprises wall segments joined together along edges extending in said direction from the inlet end of the passageway toward the opposite end.