Claims

1. A heat sink assembly comprising:

a heat sink including a plurality of parallel fins, said fins defining a plurality of channels, and a capping over said fins, said capping shaped to create a void in a space provided by the capping;

said heat sink divided into two stages;

a first stage of the two stages positioned in an upstream portion of said heat sink and arranged such that liquid entering the heat sink is under closed channel flow conditions within said capping enclosing said plurality of channels and;

a second stage of the two stages positioned in a downstream portion and arranged to receive the liquid from the first stage, said second stage including said void above said channels, said void arranged to provide room for vapor expansion so as to have open channel flow in said channels for liquid exiting said heat sink to escape from said channels, wherein the channels are arranged such that the fluid flows in a longitudinal direction of the channels from the first stage to the second stage and exiting the heat sink, and wherein the void increases from the first stage to the second stage based at least on a decreasing thickness of the capping.

2. The heat sink assembly according to claim 1, further including an entry stage positioned upstream from the first stage said entry stage arranged to receive an inflow of fluid for distribution to the first stage said entry stage having open channel flow conditions.

3. The heat sink assembly according to claim 1, wherein the void progressively increases in size along the flow path of the fluid.

4. The heat sink assembly according to claim 1, wherein the fins are shaped so as to decrease in height along the flow path of the fluid.

5. The heat sink assembly according to claim 1, wherein the fins are shaped as a step function such that the void progressively increases in size along the flow path of the fluid in steps.

6. The heat sink assembly according to claim 4, wherein the fins are shaped to be inclined.

7. The heat sink assembly according to claim 1, wherein the fins are shaped to be a uniform height.

8. The heat sink assembly according to claim 1, wherein the fins are shaped to decrease in height along the flow path of the fluid such that the void is formed by both the capping and the fins.

9. The heat sink assembly according to claim 1, wherein the void above the channels in the second stage is arranged to allow fluid to flow in a transverse direction of the channels.