

Claims

1. A self-piercing fastener, comprising:
 - a planar baseplate having a top, a bottom, and a peripheral edge; and
 - a plurality of prongs fixed to said peripheral edge and extending downward past the bottom of said baseplate, each of said prongs having a central axis and an arrowhead-shaped barb fixed to a distal end, each barb having opposed front edges extending from the tip of the barb, and opposed back edges oriented at a reverse acute angle relative to the central axis of said prong;

wherein each barb is adapted to fixedly embed in the interior of a panel to which the fastener is affixed.
2. The fastener of claim 1 wherein said baseplate is substantially circular.
3. The fastener of claim 1 wherein the front edges of each of said barbs have a compound tapered configuration.
4. The fastener of claim 1 wherein a second fastener is fixed to and extends upward from the top of the base plate.
5. The fastener of claim 4 wherein the second fastener is an externally threaded stud.
6. The fastener of claim 4 wherein the second fastener is an internally threaded nut.
7. The fastener of claim 1 wherein the barbs are substantially identical and equally spaced around the perimeter of said base plate.
8. The fastener of claim 7 wherein opposed pairs of barbs are parallel to one another.
9. The fastener of claim 3 wherein the front edges of the barbs have first and second tapered regions, wherein said first regions are oriented at an included angle of approximately 90 degrees relative to one another, and said second regions are oriented at a included angle of approximately 60 degrees relative to one another.
10. The fastener of claim 1 wherein the base plate is composed of metal.
11. The fastener of claim 10 wherein the second fastener is affixed to the base plate by clinch attachment in a mounting hole in the base plate, whereby undercuts of the fastener receive the cold flow of metal from the base plate.
12. An assembly of a fastener and a honeycomb panel, comprising:
 - a) a honeycomb panel having a top panel, a bottom panel, and a plurality of internal cells in between said panels and defined by spaced vertical columns with side walls; and
 - b) a self-piercing fastener, comprising:
 - i) a planar base plate having a top, a bottom, and a peripheral edge; and

ii) a plurality of prongs fixed to said peripheral edge and extending downward past the bottom of said baseplate, each of said prongs having a central axis and an arrowhead-shaped barb fixed to a distal end, each barb having opposed front edges extending from the tip of the barb, and opposed back edges oriented at a reverse acute angle relative to the central axis of said prong;

wherein said fastener prongs penetrate through said top panel and said barbs engage the columns of said internal cells to rigidly affix the fastener to the top panel of the honeycomb panel.

13. The assembly of claim 12 wherein said barbs are adapted to randomly deflect during installation of the fastener into the top panel such that at one pair of opposed barbs are not parallel after assembly.

14. The assembly of claim 13 wherein the barbs do not pierce the bottom surface of the panel.

15. The assembly of claim 14 wherein internal column walls of the panel are deflected by the barbs during installation of the fastener into the honeycomb panel such that corners of the back edges of the barbs resist pull-out forces by direct engagement with the deflected column walls.