Summary

[0006] In one embodiment, the present invention ~~is~~ provides an abrasive element including a first major surface and a second major surface. At least the first major surface includes a plurality of precisely shaped features. The abrasive element includes at least about 99% of carbide ceramic by weight and has a porosity of less than about 5%.

[0007] In another embodiment, the present invention ~~is~~ provides an abrasive article including a first abrasive element comprising first and second major surfaces. At least the first major surface includes a plurality of precisely shaped features. The first abrasive element includes at least about 99% of carbide ceramic by weight and has a porosity of less than about 5%.

[0008] In yet another embodiment, the present invention ~~is~~ provides a method of making an abrasive article. The method includes providing a first abrasive element and a second abrasive element~~;~~, each abrasive element including first and second major surfaces, wherein at least the first major surfaces comprise a plurality of precisely shaped features and wherein the abrasive elements comprise at least about 99% of carbide ceramic by weight and have a porosity of less than about 5%; placing the first major surfaces of the abrasive elements in contact with an alignment plate; providing a resilient element having first and second major surfaces; affixing the first major surface of the resilient element to the second major surfaces of the abrasive elements; providing a fastening element; and affixing the second major surface of the resilient element to a carrier through the fastening element. ~~Each abrasive element includes first and second major surfaces, wherein at least the first major surfaces comprise a plurality of precisely shaped features and wherein the abrasive elements comprise at least about 99% of carbide ceramic by weight and have a porosity of less than about 5%.~~

[0008a] In yet another embodiment, the present invention ~~is~~ provides an abrasive article including a first abrasive element comprising first and second major surfaces. At least the first major surface includes a plurality of precisely shaped features having a diamond coating. The first abrasive element includes at least about 99% of carbide ceramic by weight and has a porosity of less than about 5%.

Brief Description of Drawings

[0009] FIG. 1a is a top view of a positive master having pyramid precisely shaped features arranged in a grid pattern used in some of the Examples.

[0010] FIG. lb is a cross-sectional view of the positive master of FIG. la having pyramid precisely shaped features arranged in a grid pattern.

[0011] FIG. 2 is a top view of an abrasive article including abrasive elements of the present invention arranged in a star pattern.

[0012] FIGS. 3a and 3b show the global coplanarity of Example 12 and Comparative Example 13.

[0013] FIG. 4a is a top view of a positive master having pyramid precisely shaped features arranged in a grid pattern used in Example 15.

[0014] FIG. 4b is a cross-sectional view of the positive master of FIG. 4a having pyramid precisely shaped features arranged in a grid pattern