MULTI-LAYERED POLISHING PADS

FIELD

The present disclosure relates to polishing pads useful for the polishing of substrates, and systems for and methods of using such polishing pads.

BACKGROUND

Various articles, systems, and methods have been introduced for the polishing of ltrahard substrates. Such articles, systems, and methods are described, for example, in E. Kasman, M. Irvin, CS Mantech Conference, May 17-20th 2010, Portland Oregon; and K.Y. Ng, T. Dumm, CS Mantech Conference, April 23rd-26th, Boston , MA.

SUMMARY

According to an aspect of the present invention, there is provided a system for polishing a substrate, the system comprising:

a carrier assembly configured to receive and hold the substrate;

a polishing pad comprising:

a base layer having a first major surface and a second major surface opposite the first major surface, wherein the first major surface includes a plurality of cavities that extend into the base layer from the first major surface and wherein the second major surface is the working surface, and

a platen, wherein the polishing pad is coupled to the platen; and

a polishing solution disposed between the polishing pad and the substrate, wherein the polishing solution comprises:

a fluid component, and

ceramic abrasive composites, wherein the ceramic abrasive composites comprise individual abrasive particles dispersed in a porous ceramic matrix, and wherein the ceramic abrasive composites are dispersed in the fluid component; and

wherein the system is configured such that the polishing pad is movable relative to the substrate to carry out a polishing operation.

A system for polishing a substrate is also disclosed. The system includes a carrier assembly configured to receive and hold the substrate and a multi-layered polishing pad arrangement. The multi-layered polishing pad arrangement includes a first polishing pad layer having a first top and a first bottom major surface, a second polishing pad layer having a second top and a second bottom major surface, and a coupling arrangement disposed between the first bottom surface and the second top surface. The coupling layer is configured such that the first polishing pad layer is removable from the pad arrangement to expose the second top surface. The system further includes a platen. The multi-layered polishing pad is coupled to the platen such that the first top surface is adjacent a major surface of the substrate. The system is configured such that the multi-layered polishing pad arrangement is movable relative to the substrate to carry out a polishing operation.

A method for polishing the surface of a substrate is also disclosed. The method includes providing a substrate having a major surface to be polished and providing a system for polishing a substrate. The method further includes providing a polishing solution. The polishing solution includes a fluid component, and ceramic abrasive composites. The ceramic abrasive composites include individual abrasive particles dispersed in a porous ceramic matrix. The ceramic abrasive composites are dispersed in the fluid component. The method further includes contacting said major

WHAT IS CLAIMED IS:

1. A system for polishing a substrate, the system comprising:

a carrier assembly configured to receive and hold the substrate;

a polishing pad comprising:

a base layer having a first major surface and a second major surface opposite the first major surface, wherein the first major surface includes a plurality of cavities that extend into the base layer from the first major surface and wherein the second major surface is the working surface, and

a platen, wherein the polishing pad is coupled to the platen; and

a polishing solution disposed between the polishing pad and the substrate, wherein the polishing solution comprises:

a fluid component, and

ceramic abrasive composites, wherein the ceramic abrasive composites comprise individual abrasive particles dispersed in a porous ceramic matrix, and wherein the ceramic abrasive composites are dispersed in the fluid component; and

wherein the system is configured such that the polishing pad is movable relative to the substrate to carry out a polishing operation.

2. The system for polishing a substrate of claim 1, the polishing pad further comprising a plurality of cavities extending into the base layer from the second major surface.

3. The system for polishing a substrate of claim 1, wherein the base layer comprises polypropylene.

4. The system for polishing a substrate of claim 3, wherein the base layer has a thickness of between 0.125 mm and 10 mm.

5. The system for polishing a substrate of claim 1, wherein the individual abrasive particles are uniformly distributed throughout the porous ceramic matrix