What is claimed is:

1. A cathodically-protected pad conditioner for chemical mechanical planarization comprising:

an abrasive member comprising a metallic substrate having an abrasive surface and a back surface opposite the abrasive surface, wherein the abrasive surface comprises abrasive particles affixed to the metallic substrate;

a support carrier having a receiving surface and a peripheral edge adjacent the receiving surface, wherein the receiving surface is affixed and adjacent to the back surface of the abrasive member;

an anode affixed to the peripheral edge; and

a cathodic protection circuit configured to provide a cathodic protection current from the anode to the metallic substrate if contacted with an electrolyte solution.

2. The cathodically-protected pad conditioner of claim 1, wherein the cathodic protection circuit comprises an electric cell having a positive terminal and a negative terminal, wherein the positive terminal is electrically coupled to the anode, and wherein the negative terminal is electrically coupled to the metallic substrate.

3. The cathodically-protected pad conditioner of claim 2, wherein the electric cell is at least partially disposed within a cavity in the support carrier.

4. The cathodically-protected pad conditioner of claim 2, wherein the negative terminal is at least partially affixed to the metallic substrate by conductive adhesive.

5. The cathodically-protected pad conditioner of claim 1, wherein the peripheral edge has a beveled portion adjacent the abrasive member, and wherein the anode is disposed on the beveled portion.

6. A method of conditioning a pad, the method comprising using the cathodically-protected pad conditioner of any one of claims 1 to 5 during chemical mechanical planarization of a semiconductor wafer.

7. The method of claim 6, wherein the cathodically-protected pad conditioner contacts the pad during chemical mechanical planarization of a semiconductor wafer.

CLAIMS

1. A cathodically-protected pad conditioner for chemical mechanical planarization comprising:
   an abrasive member comprising a metallic substrate having an abrasive surface and a back surface opposite the abrasive surface, wherein the abrasive surface comprises abrasive particles affixed to the metallic substrate;
   a support carrier having a receiving surface and a peripheral edge adjacent the receiving surface, wherein the receiving surface is affixed and adjacent to the back surface of the abrasive member; an anode affixed to the peripheral edge;
   and a cathodic protection circuit configured to provide a cathodic protection current from the anode to the metallic substrate if contacted with an electrolyte solution that bridges the metallic substrate and the anode.

2. The cathodically-protected pad conditioner of claim 1, wherein the cathodic protection circuit comprises an electric cell having a positive terminal and a negative terminal, wherein the positive terminal is electrically coupled to the anode, and wherein the negative terminal is electrically coupled to the metallic substrate.

3. The cathodically-protected pad conditioner of claim 2, wherein the electric cell is at least partially disposed within a cavity in the support carrier.

4. The cathodically-protected pad conditioner of claim 2, wherein the negative terminal is at least partially affixed to the metallic substrate by conductive adhesive.

5. The cathodically-protected pad conditioner of claim 1, wherein the peripheral edge has a beveled portion adjacent the abrasive member, and wherein the anode is disposed on the beveled portion.

6. A method of conditioning a pad, the method comprising using the cathodically-protected pad conditioner of any one of claims 1 to 5 to condition the pad during chemical mechanical planarization of a semiconductor wafer.

7. The method of claim 6, wherein the cathodically-protected pad conditioner contacts and conditions the pad during chemical mechanical planarization of a semiconductor wafer.