

CLAIMS

1. A retaining ring comprising:
an annular body including
 - a top surface configured to be secured to a carrier head;
 - a bottom surface configured to contact a polishing surface;
 - an outer surface extending from the top surface at an outer top perimeter to the bottom surface at an outer bottom perimeter; and
 - an inner surface extending from the top surface at an inner top perimeter to the bottom surface at an inner bottom perimeter, the inner surface comprising a first portion adjacent the bottom surface and a second portion adjoining the first portion along a boundary, wherein the first portion of the inner surface comprises seven or more planar facets, adjacent planar facets of the first portion of the inner surface being connected at a straight side edge, and the inner bottom perimeter defined by straight bottom edges of the planar facets, and wherein the second portion comprises a frustoconical surface that is sloped downwardly from outside in.
2. The retaining ring of claim 1, wherein, the boundary comprises a plurality of curved edges, and each curved edge for a facet has a lowest point at a horizontal center of the facet.
3. The retaining ring of claim 2, wherein the annular body includes an upper section and a lower section of a different material than the upper section.
4. The retaining ring of claim 3, wherein a lowest point on each curved edge is aligned to a boundary between the upper section and the lower section.
5. The retaining ring of claim 1, wherein the bottom surface comprises channels extending from the outer surface to the inner surface.
6. The retaining ring of claim 5, wherein each channel comprises an end open to the inner surface of the body at a straight side edge.

7. The retaining ring of claim 6, wherein the first portion of the inner surface comprises a first number of facets and the bottom surface comprises a second number of channels, and wherein the first number is a whole number times the second number.
8. The retaining ring of claim 7, wherein the whole number is three, four or five.
9. The retaining ring of claim 1, wherein the first portion of the inner surface comprises between 10 and 150 facets.
10. The retaining ring of claim 9, wherein the first portion of the inner surface comprises between 60 and 80 facets.
11. The retaining ring of claim 10, wherein the first portion of the inner surface comprises a total of 72 facets.
12. The retaining ring of claim 1, wherein the inner bottom perimeter is a regular polygon.
13. The retaining ring of claim 1, each planar facet intersects the frustoconical surface along an edge that forms a hyperbolic curve.
14. The retaining ring of claim 1, wherein each planar facet is substantially perpendicular to the bottom surface.