CLAIMS

What is claimed is:

1. A cutting element comprising:

a substrate base; and

a volume of polycrystalline diamond material on an end of the substrate base, the volume of polycrystalline diamond material comprising:

a generally conical surface;

an apex; and

a flat cutting surface extending from a first point at least substantially proximate the apex to a second point on the cutting element more proximate a lateral side surface of the substrate base.

2. The cutting element of claim 1, wherein the apex is centered about a longitudinal axis extending through a center of the substrate base.

3. The cutting element of claim 1, wherein the apex is offset from a longitudinal axis extending through a center of the substrate base.

4. The cutting element from one of claims 2 and 3, wherein the second point comprises a location on the volume of polycrystalline diamond material.

5. The cutting element from one of claims 2 and 3, wherein the second point comprises a location on the lateral side surface substrate base.

6. The cutting element from one of claims 2 and 3, wherein an angle within a range of from about thirty degrees (30°) to about sixty degrees (60°) exists between the generally conical surface and a phantom line extending from the lateral side surface of the substrate base.

7. The cutting element from one of claims 2 and 3, wherein an angle

within a range of from about fifteen degrees (15°) to about ninety degrees (90°) exists between the flat cutting surface and the longitudinal axis.

8. The cutting element from one of claims 2 and 3, wherein a first angle within a range of from about thirty degrees (30°) to about sixty degrees (60°) exists between the generally conical surface and a phantom line extending from the lateral side surface of the substrate base, and wherein a second angle within a range of from about fifteen degrees (15°) to about ninety degrees (90°) exists between the flat cutting surface and the longitudinal axis.

9. A method of manufacturing a cutting element, comprising:

forming a base substrate; and

providing a volume of polycrystalline diamond material on an end of a substrate base, the volume of polycrystalline diamond material comprising a generally conical surface, an apex, and a flat cutting surface extending from the apex.

10. The method of claim 9, wherein providing the volume of polycrystalline diamond material on an end of a substrate base comprises centering the apex of the volume of polycrystalline diamond material about a longitudinal axis extending through a center of the substrate base.

11. The method of claim 9, wherein providing the volume of polycrystalline diamond material on an end of a substrate base comprises offsetting the apex of the volume of polycrystalline diamond material from a longitudinal axis extending through a center of the substrate base.

12. The method of one of claims 10 and 11, wherein providing the volume of polycrystalline diamond material on an end of a substrate base further comprises forming the generally conical surface of the volume of polycrystalline diamond material at an angle within a range of from about thirty degrees (30°) to about sixty degrees (60°) relative a phantom line extending from a lateral side surface of the substrate base.

13. The method of one of claims 10 and 11, wherein providing the volume of polycrystalline diamond material on an end of a substrate base further comprises forming the flat cutting surface of the volume of polycrystalline diamond material at an angle within a range of from about fifteen degrees (15°) to about ninety degrees (90°) relative the longitudinal axis.

14. The method of one of claims 10 and 11, wherein providing the volume of polycrystalline diamond material further comprises:

forming the generally conical surface of the volume of polycrystalline diamond material at an angle within a range of from about thirty degrees (30°) to about sixty degrees (60°) relative a phantom line extending from a lateral side surface of the substrate base; and

forming the flat cutting surface of the volume of polycrystalline diamond material at an angle within a range of from about fifteen degrees (15°) to about ninety degrees (90°) relative the longitudinal axis.

15. The method of claim 9, wherein providing the volume of polycrystalline diamond material on the substrate base comprises attaching the volume of polycrystalline diamond material to the substrate base after forming at least one of the generally conical surface, the apex, and the flat cutting surface of the volume of polycrystalline diamond material.

16. The method of claim 9, wherein providing the volume of polycrystalline diamond material on the substrate base comprises forming at least one of the generally conical surface, the apex, and the flat cutting surface of the volume of polycrystalline diamond material while the volume of polycrystalline diamond material is attached to the substrate base.

CLAIMS

What is claimed is:

1. A cutting element comprising:

a substrate base; and

a volume of polycrystalline diamond material on an end of the substrate base, the volume of polycrystalline diamond material comprising:

an apex centered about a longitudinal axis extending through a center of the substrate base; and

a generally conical surface extending at a first angle from the substrate base to the apex;

a flat cutting surface opposing the generally conical surface and extending at a second, different angle from a first point at least substantially proximate a center of the apex to a second point on the cutting element more proximate a lateral side surface of the substrate base.

2. The cutting element of claim 1, wherein the second point comprises a location on the volume of polycrystalline diamond material.

3. The cutting element of claim 1, wherein the second point comprises a location on the lateral side surface of the substrate base offset from an interface of the substrate base and the volume of polycrystalline diamond material.

4. The cutting element of claim 1, wherein the first angle comprises an angle within a range of from about thirty degrees (30°) to about sixty degrees (60°) between the generally conical surface and a phantom line extending from the lateral side surface of the substrate base.

5. The cutting element of claim 1, wherein the second, different angle comprises an angle within a range of from about fifteen degrees (15°) to about ninety degrees (90°) between the flat cutting surface and the longitudinal axis.

6. The cutting element of claim 1, wherein the first angle is within a range of from about thirty degrees (30°) to about sixty degrees (60°) between the generally conical surface and a phantom line extending from the lateral side surface of the substrate base, and wherein the second, different angle is within a range of from about fifteen degrees (15°) to about ninety degrees (90°) between the flat cutting surface and the longitudinal axis.

7. A cutting element comprising:

a substrate base; and

a volume of polycrystalline diamond material on an end of the substrate base, the volume of polycrystalline diamond material comprising:

a generally conical surface;

an apex offset from a longitudinal axis extending through a center of the substrate base; and

a flat cutting surface extending from a first point at least substantially proximate a center of the apex to a second point on the cutting element more proximate a lateral side surface of the substrate base, a distance between the first point and the second point greater than a distance between the second point and the lateral side surface of the substrate base.

8. The cutting element of claim 7, wherein the second point comprises a location on the volume of polycrystalline diamond material.

9. The cutting element of claim 7, wherein the second point comprises a location on the lateral side surface substrate base.

10. The cutting element of claim 7, wherein an angle within a range of from about thirty degrees (30°) to about sixty degrees (60°) exists between the generally conical surface and a phantom line extending from the lateral side surface of the substrate base.

11. The cutting element of claim 7, wherein an angle within a range of from about fifteen degrees (15°) to about ninety degrees (90°) exists between the flat cutting surface and the longitudinal axis.

12. The cutting element of claim 7, wherein a first angle within a range of from about thirty degrees (30°) to about sixty degrees (60°) exists between the generally conical surface and a phantom line extending from the lateral side surface of the substrate base, and wherein a second angle within a range of from about fifteen degrees (15°) to about ninety degrees (90°) exists between the flat cutting surface and the longitudinal axis.

13. A method of manufacturing a cutting element, comprising:

forming a substrate base; and

providing a volume of polycrystalline diamond material on an end of the substrate base, the volume of polycrystalline diamond material comprising:

an apex centered about a longitudinal axis extending through a center of the substrate base; and

a generally conical surface extending at a first angle from the substrate base to the apex;

a flat cutting surface opposing the generally conical surface and extending at a second, different angle from a first point at least substantially proximate a center of the apex to a second point on the cutting element more proximate a lateral side surface of the substrate base.

14. The method of claim 13, wherein providing the volume of polycrystalline diamond material on an end of a substrate base comprises forming the first angle to be within a range of from about thirty degrees (30°) to about sixty degrees (60°) relative a phantom line extending from a lateral side surface of the substrate base.

15. The method of claim 13, wherein providing the volume of polycrystalline diamond material on an end of a substrate base comprises forming the second angle to be within a range of from about fifteen degrees (15°) to about ninety degrees (90°) relative the longitudinal axis.

16. The method of claim 13, wherein providing the volume of polycrystalline diamond material comprises:

forming the first angle to be within a range of from about thirty degrees (30°) to about sixty degrees (60°) relative a phantom line extending from a lateral side surface of the substrate base; and

forming the second angle to be within a range of from about fifteen degrees (15°) to about ninety degrees (90°) relative the longitudinal axis.

17. A method of using a cutting element, comprising:

attaching a cutting element to an earth-boring tool, the cutting element comprising an apex, a generally conical surface extending at a first angle from a substrate base to the apex, and a flat cutting surface opposing the generally conical surface and extending at a second, different angle from a first point substantially proximate a center of the apex to a second point more proximate a lateral sidewall of the substrate base, the cutting element attached to the earth-boring tool such that at least a portion of the flat cutting surface contacts a surface of a subterranean formation during at least one of a drilling process and a reaming process to form a wellbore;

wherein an angle between the flat cutting surface of the cutting element and the surface of the subterranean formation is within a range of from about forty-five degrees (45°) to about one-hundred and twenty degrees (120°).

18. The method of claim 17, wherein attaching the cutting element comprises orienting the cutting element such that the cutting element has a negative physical back rake angle and a negative effective back rake angle.

19. The method of claim 17, wherein attaching the cutting element comprises orienting the cutting element such that the cutting element has a positive physical back rake angle and a positive effective back rake angle.

20. The method of claim 17, wherein attaching the cutting element comprises orienting the cutting element such that the cutting element has a neutral physical back rake angle and a positive effective back rake angle.

21. The method of claim 17, wherein attaching the cutting element comprises orienting the cutting element such that the cutting element has a negative physical back rake angle and a positive effective back rake angle.

22. The method of claim 17, wherein attaching the cutting element comprises orienting the cutting element such that the cutting element has a negative physical back rake angle and a neutral effective back rake angle.