CLAIMS

What is claimed is:

1. An earth-boring drill bit, comprising:

a bit body having a plurality of radially extending blades and a plurality of cutting elements attached to the plurality of radially extending blades;

wherein only gouging cutting elements are attached to at least one blade of the plurality of radially extending blades;

only shearing cutting elements are attached to at least another blade of the plurality of radially extending blades; and

only shearing cutting elements are attached to a number of blades of the plurality of radially extending blades that is different from a number of blades of the plurality of radially extending blades to which only gouging cutting elements are attached.

2. The earth-boring drill bit of claim 1, wherein the number of blades of the plurality of radially extending blades to which only shearing cutting elements are attached is greater than the number of blades of the plurality of radially extending blades to which only gouging cutting elements are attached.

3. The earth-boring drill bit of claim 2, wherein at least one blade to which only gouging cutting elements is attached is located at an angular position rotationally closer to an immediately rotationally leading blade to which only shearing cutting elements are attached than if all the blades were spaced exactly equally apart.

4. The earth-boring drill bit of claim 2, wherein only gouging cutting elements are attached to only one blade of the plurality of radially extending blades.

5. The earth-boring drill bit of claim 2, wherein only gouging cutting elements are attached to at least two blades of the plurality of radially extending blades.

6. The earth-boring drill bit of claim 5, wherein the at least two blades of the plurality of radially extending blades are located at angular positions that are spaced at least substantially equally from one another.

7. The earth-boring drill bit of claim 1, wherein the number of blades of the plurality of radially extending blades to which only gouging cutting elements are attached is greater than the number of blades of the plurality of radially extending blades to which only shearing cutting elements are attached.

8. The earth-boring drill bit of claim 7, wherein only shearing cutting elements are attached to only one blade of the plurality of radially extending blades.

9. The earth-boring drill bit of claim 7, wherein only shearing cutting elements are attached to at least two blades of the plurality of radially extending blades.

10. The earth-boring drill bit of claim 9, wherein the at least two blades of the plurality of radially extending blades are located at angular positions that are spaced at least substantially equally from one another.

11. The earth-boring drill bit of claim 7, wherein at least one blade of the plurality of blades to which only gouging cutting elements are attached extends from the bit body in a direction that forms an oblique angle with a line tangent at a point of intersection of a central axis of the at least one blade with a radially outer surface the bit body from which the at least one blade protrudes.

12. The earth-boring drill bit of claim 1, wherein the gouging cutting elements comprise a polycrystalline superabrasive material that is at least one of dome-shaped, chisel-shaped, and cone-shaped.

13. The earth-boring drill bit of claim 1, wherein the shearing cutting elements comprise a polycrystalline superabrasive material that is disc-shaped.

14. The earth-boring drill bit of claim 1, wherein the plurality of cutting elements comprise a cutting structure comprising polycrystalline superabrasive material attached to an end of a substrate comprising a hard material.

15. The earth-boring drill bit of claim 1, wherein only one of gouging cutting elements and shearing cutting elements is attached to each blade of the plurality of radially extending blades.

16. A method of forming an earth-boring drill bit, comprising:
forming a bit body including a plurality of radially extending blades;
attaching only gouging cutting elements to at least one blade of the plurality of radially extending blades;
attaching only shearing cutting elements to at least another blade of the plurality of radially extending blades; and
attaching only shearing cutting elements to a number of blades different from a number of blades to which only gouging cutting elements are attached.

17. The method of claim 16, wherein attaching only gouging cutting elements to at least one blade of the plurality of radially extending blades comprises attaching only gouging cutting elements to at least two blades of the plurality of radially extending blades.

18. The method of claim 17, further comprising:
positioning the at least two blades of the plurality of radially extending blades at angular positions that are spaced at least substantially equally from one another.

19. The method of claim 17, further comprising:
attaching only one of gouging cutting elements and shearing cutting elements to each blade of the plurality of radially extending blades.

20. The method of claim 16, further comprising:

forming at least one of the gouging cutting elements or the shearing cutting elements using an HTHP process comprising subjecting a plurality of particles comprising a superabrasive material to a pressure of at least 7.0 GPa and a temperatures of at least 1,400 °C for between 30 sec and 20 min.

CLAIMS

What is claimed is:

1. An earth-boring drill bit, comprising:

a bit body having a plurality of radially extending blades and a plurality of cutting elements attached to the plurality of radially extending blades;

wherein only gouging cutting elements are attached to at least one blade of the plurality of radially extending blades;

only shearing cutting elements are attached to at least another blade of the plurality of radially extending blades;

only gouging cutting elements or only shearing cutting elements are attached to each blade of the plurality of radially extending blades; and

only shearing cutting elements are attached to a number of blades of the plurality of radially extending blades that is different from a number of blades of the plurality of radially extending blades to which only gouging cutting elements are attached.

2. The earth-boring drill bit of claim 1, wherein the number of blades of the plurality of radially extending blades to which only shearing cutting elements are attached is greater than the number of blades of the plurality of radially extending blades to which only gouging cutting elements are attached.

3. The earth-boring drill bit of claim 2, wherein at least one blade to which only gouging cutting elements is attached is located at an angular position rotationally closer to an immediately rotationally leading blade to which only shearing cutting elements are attached than if all the blades were spaced exactly equally apart.

4. The earth-boring drill bit of claim 2, wherein only gouging cutting elements are attached to only one blade of the plurality of radially extending blades.

5. The earth-boring drill bit of claim 2, wherein only gouging cutting elements are attached to at least two blades of the plurality of radially extending blades.

6. The earth-boring drill bit of claim 5, wherein the at least two blades of the plurality of radially extending blades are located at angular positions that are spaced at least substantially equally from one another.

7. The earth-boring drill bit of claim 1, wherein the number of blades of the plurality of radially extending blades to which only gouging cutting elements are attached is greater than the number of blades of the plurality of radially extending blades to which only shearing cutting elements are attached.

8. The earth-boring drill bit of claim 7, wherein only shearing cutting elements are attached to only one blade of the plurality of radially extending blades.

9. The earth-boring drill bit of claim 7, wherein only shearing cutting elements are attached to at least two blades of the plurality of radially extending blades.

10. The earth-boring drill bit of claim 9, wherein the at least two blades of the plurality of radially extending blades are located at angular positions that are spaced at least substantially equally from one another.

11. The earth-boring drill bit of claim 7, wherein at least one blade of the plurality of blades to which only gouging cutting elements are attached extends from the bit body in a direction that forms an oblique angle with a line tangent at a point of intersection of a central axis of the at least one blade with a radially outer surface the bit body from which the at least one blade protrudes.

12. The earth-boring drill bit of claim 1, wherein the gouging cutting elements comprise a polycrystalline superabrasive material that is at least one of dome-shaped, chisel-shaped, and cone-shaped.

13. The earth-boring drill bit of claim 1, wherein the shearing cutting elements comprise a polycrystalline superabrasive material that is disc-shaped.

14. The earth-boring drill bit of claim 1, wherein the plurality of cutting elements comprise a cutting structure comprising polycrystalline superabrasive material attached to an end of a substrate comprising a hard material.

15. The earth-boring drill bit of claim 1, wherein a rotationally leading gouging cutting element of the at least one blade is positioned to travel in a helical path at least partially overlapping with a helical path in which a rotationally trailing shearing cutting element of the at least another blade is positioned to travel.

16. A method of forming an earth-boring drill bit, comprising:

forming a bit body including a plurality of radially extending blades;

attaching only gouging cutting elements to at least one blade of the plurality of radially extending blades;

attaching only shearing cutting elements to at least another blade of the plurality of radially extending blades;

attaching only gouging cutting elements or only shearing cutting elements to each blade of the plurality of radially extending blades; and

attaching only shearing cutting elements to a number of blades different from a number of blades to which only gouging cutting elements are attached.

17. The method of claim 16, wherein attaching only gouging cutting elements to at least one blade of the plurality of radially extending blades comprises attaching only gouging cutting elements to at least two blades of the plurality of radially extending blades.

18. The method of claim 17, further comprising:

positioning the at least two blades of the plurality of radially extending blades at angular positions that are spaced at least substantially equally from one another.

19. The method of claim 17, further comprising:

positioning a rotationally leading gouging cutting element of the at least one blade to travel in a helical path at least partially overlapping with a helical path in which a rotationally trailing shearing cutting element of the at least another blade is positioned to travel.

20. The method of claim 16, further comprising:

forming at least one of the gouging cutting elements or the shearing cutting elements using an HTHP process comprising subjecting a plurality of particles comprising a superabrasive material to a pressure of at least 7.0 GPa and a temperatures of at least 1,400 °C for between 30 sec. and 20 min.