WHAT IS CLAIMED IS:

1. A sealing system for a bearing of a rock bit, comprising:

a gland;

a shaft; and

a seal positioned in the gland and compressed by the gland against the shaft at a sealing surface on the shaft,

wherein the sealing surface includes a surface texturing comprised of a plurality of non-overlapping surface texture features arranged in a repeating pattern.

2. The sealing system of claim 1, wherein the repeating pattern is an array pattern.

3. The sealing system of claim 1, wherein the repeating pattern is an offset array pattern.

4. The sealing system of claim 1, wherein the surface texture features have a uniform size and shape.

5. The sealing system of claim 1, wherein surface texture features comprise dimples.

6. The sealing system of claim 5, wherein the dimples have a circular plan shape.

7. The sealing system of claim 5, wherein the dimples have an elliptical plan shape.

8. The sealing system of claim 1, wherein the surface texture features have a uniform size and shape, and a depth of between 3 and 3000 microns.

9. The sealing system of claim 8, wherein the depth is 20-30 microns.

10. The sealing system of claim 1, wherein the surface texture features have a uniform size and shape, and a width or diameter of 15-1000 microns.

11. The sealing system of claim 10, wherein the width or diameter is 100-200 microns.

12. The sealing system of claim 1, wherein a density of textured surface area for the surface texture features is between 3-60%.

13. The sealing system of claim 12, wherein the density of textured surface area is 15-20%.

14. The sealing system of claim 1, wherein a percentage of the sealing surface covered with surface texture features is 3-100%.

15. The sealing system of claim 14, wherein the percentage is greater than 60%.

16. The sealing system of claim 15, wherein the percentage is about 100%.

17. The sealing system of claim 1, wherein the sealing surface is a cylindrical surface of the shaft.

18. The sealing system of claim 1, wherein the sealing surface is a conical surface of the shaft.

19. Apparatus, comprising:

a shaft including a first seal surface;

a roller cone having an annular gland including a second seal surface;

wherein the roller cone is rotatably mounted to the shaft such that the gland aligns with the first seal surface;

a seal ring compressed between the first and second seal surfaces within the seal gland; and

wherein at least one of the first and second seal surfaces includes a surface texturing comprised of a plurality of non-overlapping surface texture features arranged in a pattern which repeats along a circumference of the at least one of the first and second seal surfaces.

20. The apparatus of claim 19, wherein the first seal surface includes the surface texturing and the first seal surface is a cylindrical surface.

21. The apparatus of claim 19, wherein the first seal surface includes the surface texturing and the first seal surface is a conical surface.

22. The apparatus of claim 19, wherein the second seal surface includes the surface texturing and the second seal surface is a cylindrical surface.

23. The apparatus of claim 19, wherein the first seal surface includes the surface texturing and the second seal surface is a conical surface.

24. The apparatus of claim 19, wherein the repeating pattern is an array pattern.

25. The apparatus of claim 19, wherein the repeating pattern is an offset array pattern.

26. The apparatus of claim 19, wherein the surface texture features have a uniform size and shape.

27. Apparatus, comprising:

a shaft including a first seal surface;

a roller cone having an annular gland including a second seal surface;

wherein the roller cone is rotatably mounted to the shaft such that the gland aligns with the first seal surface;

a seal ring compressed between the first and second seal surfaces within the seal gland; and

wherein at least one of the first and second seal surfaces includes a surface texturing comprised of a plurality of non-overlapping surface texture features arranged in a non-random pattern extending about a circumference of the at least one of the first and second seal surfaces.

28. The apparatus of claim 27, wherein the at least one of the first and second seal surfaces is in sliding contact with the seal ring.

CLAIMS

1. A sealing system for a bearing of a rock bit, comprising:

a gland;

a shaft; and

a seal positioned in the gland and compressed by the gland against the shaft at a sealing surface on the shaft,

wherein the sealing surface includes a surface texturing comprised of a plurality of non-overlapping surface texture features arranged in a repeating pattern, wherein the surface texture features are reservoir-like structure.

2. The sealing system of claim 1, wherein the repeating pattern is an array pattern.

3. The sealing system of claim 1, wherein the repeating pattern is an offset array pattern.

4. The sealing system of claim 1, wherein the surface texture features have a uniform size and shape.

5. The sealing system of claim 1, wherein surface texture features comprise dimples.

6. The sealing system of claim 5, wherein the dimples have a circular plan shape.

7. The sealing system of claim 5, wherein the dimples have an elliptical plan shape.

8. The sealing system of claim 1, wherein the surface texture features have a uniform size and shape, and a depth of between 3 and 3000 microns.

9. The sealing system of claim 8, wherein the depth is 20-30 microns.

10. The sealing system of claim 1, wherein the surface texture features have a uniform size and shape, and a width or diameter of 15-1000 microns.

11. The sealing system of claim 10, wherein the width or diameter is 100-200 microns.

12. The sealing system of claim 1, wherein a density of textured surface area for the surface texture features is between 3-60%.

13. The sealing system of claim 12, wherein the density of textured surface area is 15-20%.

14. The sealing system of claim 1, wherein a percentage of the sealing surface covered with surface texture features is 3-100%.

15. The sealing system of claim 14, wherein the percentage is greater than 60%.

16. The sealing system of claim 15, wherein the percentage is about 100%.

17. The sealing system of claim 1, wherein the sealing surface is a cylindrical surface of the shaft.

18. The sealing system of claim 1, wherein the sealing surface is a conical surface of the shaft.

19. An apparatus, comprising:

a shaft including a first seal surface;

a roller cone having an annular gland including a second seal surface;

wherein the roller cone is rotatably mounted to the shaft such that the annular gland aligns with the first seal surface;

a seal ring compressed between the first and second seal surfaces within the annular gland; and

wherein at least one of the first and second seal surfaces includes a surface texturing comprised of a plurality of non-overlapping surface texture features arranged in a pattern which repeats along a circumference of the at least one of the first and second seal surfaces, the surface texture features being reservoir-like structure.

20. The apparatus of claim 19, wherein the first seal surface includes the surface texturing and the first seal surface is a cylindrical surface.

21. The apparatus of claim 19, wherein the first seal surface includes the surface texturing and the first seal surface is a conical surface.

22. The apparatus of claim 19, wherein the second seal surface includes the surface texturing and the second seal surface is a cylindrical surface.

23. The apparatus of claim 19, wherein the first seal surface includes the surface texturing and the second seal surface is a conical surface.

24. The apparatus of claim 19, wherein the repeating pattern is an array pattern.

25. The apparatus of claim 19, wherein the repeating pattern is an offset array pattern.

26. The apparatus of claim 19, wherein the surface texture features have a uniform size and shape.

27. An apparatus, comprising:

a shaft including a first seal surface;

a roller cone having an annular gland including a second seal surface;

wherein the roller cone is rotatably mounted to the shaft such that the annular gland aligns with the first seal surface;

a seal ring compressed between the first and second seal surfaces within the annular gland; and

wherein at least one of the first and second seal surfaces includes a surface texturing comprised of a plurality of non-overlapping surface texture features arranged in a non-random pattern extending about a circumference of the at least one of the first and second seal surfaces, the surface texture features being reservoir-like structure.

28. The apparatus of claim 27, wherein the at least one of the first and second seal surfaces is in sliding contact with the seal ring.