CLAIMS

What is claimed is:

1. An electric submersible pump comprising:

a plurality of impellers;

a plurality of diffusers including a first diffuser and a second diffuser, the second diffuser being lower than the first diffuser in an axial direction;

a sealing ring positioned axially between the first diffuser and the second diffuser, the sealing ring including:

a first surface disposed on an upper side of the sealing ring, wherein the first surface contacts a lower side of the first diffuser;

a second surface disposed on a lower side of the sealing ring, wherein the second surface contacts an upper side of the second diffuser; and

a third surface disposed on the lower side of the sealing ring, wherein the third surface is angled with respect to the second surface; and

an O-ring positioned axially between the third surface of the sealing ring and the upper side of the second diffuser.

2. The electric submersible pump of Claim 1, wherein the plurality of impellers, the first and second diffusers, the sealing ring, and the O-ring are disposed in a housing of the electric submersible pump.

3. The electric submersible pump of Claim 2 wherein the O-ring is compressed against an inner surface of the housing, and the O-ring seals against the inner surface of the housing to reduce stress on the second diffuser.

4. The electric submersible pump of Claim 1, comprising a second sealing ring positioned axially between a third diffuser and a fourth diffuser, the fourth diffuser being lower than the third diffuser in the axial direction, and a second O-ring positioned axially between the second sealing ring and the fourth diffuser.

5. The electric submersible pump of claim 1, wherein the sealing ring comprises a radially inner portion and a radially outer portion.

6. The electric submersible pump of claim 5, the radially outer portion includes the third surface.

7. A method of assembling an electric submersible pump, the method comprising:

positioning a sealing ring axially between a first diffuser and a second diffuser such that a first surface disposed on an upper side of the sealing ring contacts a lower

side of the first diffuser, and a gap is formed axially between a second surface disposed on a lower side of the sealing ring and an upper side of the second diffuser;

positioning an uncompressed O-ring axially between a third surface of the sealing ring and the second diffuser, wherein the third surface is disposed on the lower side of the sealing ring and is angled with respect to the second surface;

sliding the first and second diffusers, the sealing ring, and the uncompressed O-ring into a housing to a desired position; and

applying stage compression to close the gap, thereby compressing the uncompressed O-ring to create a seal that prevents or inhibits leakage of fluid.

8. The method of Claim 7, comprising:

positioning a second sealing ring axially between a third diffuser and a fourth diffuser, wherein the fourth diffuser is lower than the third diffuser;

positioning a second uncompressed O-ring axially between the second sealing ring and the fourth diffuser; and

sliding the third and fourth diffusers, the second sealing ring, and the second uncompressed O-ring into the housing to the desired position.

9. An electric submersible pump system comprising:

an electric submersible pump comprising:

a housing;

a plurality of impellers;

a plurality of diffusers including a first diffuser and a second diffuser, the second diffuser being lower than the first diffuser in an axial direction;

a sealing ring positioned axially between the first diffuser and the second diffuser, the sealing ring including:

a first surface disposed on an upper side of the sealing ring, wherein the first surface contacts a lower side of the first diffuser;

a second surface disposed on a lower side of the sealing ring, wherein the second surface contacts an upper side of the second diffuser; and

a third surface disposed on the lower side of the sealing ring, wherein the third surface is angled with respect to the second surface;

an O-ring positioned axially between the third surface of the sealing ring and the upper side of the second diffuser;

a shaft extending axially through the electric submersible pump;

a protector; and

a motor.

10. The system of claim 9, wherein the O-ring is in an uncompressed state as the plurality of impellers, the first and second diffusers, the sealing ring, and the O-ring are slid into the housing during assembly.

11. The system of claim 10, wherein the O-ring is compressed against an inner surface of the housing.

12. The system of claim 9, wherein the sealing ring comprises a radially inner portion and a radially outer portion.