WHAT IS CLAIMED IS:

1. A wellhead assembly with an axis, comprising:

an outer wellhead member (10) having a bore (12);

an inner wellhead member (18) located in the bore (12);

a seal ring (25) between and in sealing engagement with the inner and outer wellhead members (18, 12), and

a bellows (40) on a lower end of the seal ring (25), , the bellows (40) being axially contractible, having outer surfaces (46) that expand outward radially and inner surfaces (42) that contract radially inward to engage the outer and inner wellhead members (18, 10), respectively.

2. The assembly according to claim 1, wherein the seal ring (25) has an inner annular member (22) and an outer annular member (26) circumscribing a portion of the inner annular member (22).

3. The assembly according to claim 2, further comprising:

an annular energizing ring (60) having a lower end insertable between the inner and outer annular members (22, 26) of the seal ring (25), so that when the lower end of the energizing ring (60) is inserted between the inner and outer annular members (22, 26) of the seal ring (25), outer walls (24, 28) of the inner and outer annular members (22, 26) of the seal ring (25) are urged radially outward into sealing engagement with the inner and outer wellhead members (18,10).

4. The assembly according to claim 3, further comprising:

an annular extension (32) extending downwards and located below the seal ring 25), the annular extension (32) having a downward facing lower surface (36);

an annular nose ring (37) connected to the annular extension (32), the nose ring (37) having an upward facing shoulder (38) in contact with the lower surface (36) of the annular extension (32) and having a lower surface (39) for landing on a portion of the inner wellhead member (18).

5. The assembly according to claim 4, wherein the bellows (40) are formed on the nose ring (37) in a helical shape.

6. The assembly according to claim 4, wherein the nose ring (37) is connected to the annular extension (32) via a threaded connection (34) formed between the annular extension (32) and an upward extension of the nose ring (37).

7. The assembly according to claim 1, wherein the bellows (40) comprise undulations (44) that meet at a point and form gaps (48, 50) at an opposite end of the undulations (44), the gaps in the bellows (40) exist prior to setting, the gaps (48, 50) diminishing when the bellows (40) collapses during setting.

8. The assembly according to claim 1, wherein slots (30) are formed on the bellows (40) and extend from a lower end to an upper end of the bellow (40) to facilitate collapse of bellows (40) during setting operations.

9. The assembly according to claim 1, wherein the inner wellhead member (18) comprises a shoulder (19) projecting radially outward to allow the lower surface (39) of the annular nose ring (37) to land, the shoulder providing a reaction point during setting operations.

10. The assembly according to claim 1, wherein a set of teeth (80) is formed on at least one of the bellow (82) inner and outer diameter surfaces.

11. A method for sealing an inner wellhead member (18) to an outer wellhead member (10), comprising:

providing a seal assembly having a bellows (40) carried on a lower end;

landing and setting the seal assembly between the inner and outer wellhead members (18, 10);

in response to setting the seal assembly, expanding outer surface (46) of the bellows (40) outward into engagement with the outer wellhead member (10);

contracting inner surfaces (42)of the bellows (40) inward into engagement with the inner wellhead member (10).

12. The method according to claim 11, further comprising providing teeth (80) on one of the surface (42, 46) of the bellows (40) and driving the teeth into engagement with one of the inner and outer wellhead members (18, 10).

WHAT IS CLAIMED IS:

1. A wellhead assembly with an axis, comprising:

an outer wellhead member having a bore;

an inner wellhead member located in the bore;

a seal ring between and in sealing engagement with the inner and outer wellhead members, wherein the seal ring has an inner annular member and an outer annular member circumscribing a portion of the inner annular member,

a bellows on a lower end of the seal ring, the bellows having undulations that meet at a point and form gaps at an opposite end of the undulations and being axially contractible, having outer surfaces that expand outward radially into the outer wellhead member and inner surfaces that contract radially inward into the inner wellhead member; and

an annular energizing ring having a lower end insertable between the inner and outer annular members of the seal ring, so that when the lower end of the energizing ring is inserted between the inner and outer annular members of the seal ring, outer walls of the inner and outer annular members of the seal ring are urged radially apart into sealing engagement with the inner and outer wellhead members.

2. The assembly according to claim 1, further comprising:

an annular extension extending downwards and located below the seal ring, the annular extension having a downward facing lower surface;

an annular nose ring connected to the annular extension, the nose ring having an upward facing shoulder in contact with the lower surface of the annular extension and having a lower surface for landing on a portion of the inner wellhead member.

3. The assembly according to claim 2, wherein the bellows are formed on the nose ring in a helical shape.

4. The assembly according to claim 2, wherein the nose ring is connected to the annular extension via a threaded connection formed between the annular extension and an upward extension of the nose ring.

5. The assembly according to claim 1, wherein the bellows comprise undulations that meet at a point and form gaps at an opposite end of the undulations, the gaps in the bellows exist prior to setting, the gaps diminishing when the bellows collapses during setting.

6. The assembly according to claim 1, wherein slots are formed on the bellows and extend from a lower end to an upper end of the bellow to facilitate collapse of bellows during setting operations.

7. The assembly according to claim 4, wherein the inner wellhead member comprises a shoulder projecting radially outward to allow the lower surface of the annular nose ring to land, the shoulder providing a reaction point during setting operations.

8. The assembly according to claim 1, wherein a set of teeth is formed on at least one of the bellow inner and outer diameter surfaces.

9. A wellhead seal assembly, comprising:

a seal ring for location and sealing between inner and outer wellhead members, wherein the seal ring has an inner member and an outer annular member circumscribing a portion of the inner annular member;

a bellows on a lower end of the seal ring, the bellows being axially contractible, having outer surfaces and inner surfaces; wherein

the bellows comprise undulations that meet at a point and form gaps at an opposite end of undulations, the gaps in the bellows exist prior to setting, and the gaps diminish when the bellows axially contract during setting; and

a lower end of the bellows is adapted to land on a shoulder of the inner wellhead member and when seal ring is energized, the bellows axially contract and expand outward into the outer wellhead member and inward into the inner wellhead member; and

an annular energizing ring having a lower end insertable between the inner and outer annular members of the seal ring, so that when the lower end of the energizing ring is inserted between the inner and outer annular members of the seal ring, outer

walls of the inner and outer annular members of the seal ring are urged radially apart into sealing engagement with the inner and outer wellhead members.

10. The assembly according to claim 9, further comprising:

an annular extension extending downwards and located below the seal ring, the annular extension having a downward facing lower surface;

an annular nose ring connected to the annular extension, the nose ring having an upward facing shoulder in contact with the lower surface of the annular extension and having a lower surface for landing on a portion of the inner wellhead member.

11. The assembly according to claim 9, wherein the bellows are in a helical shape.

12. The assembly according to claim 10, wherein the nose ring is connected to the annular extension via a threaded connection formed between the annular extension and an upward extension of the nose ring.

13. The assembly according to claim 9, wherein slots are formed on the bellows and extend from a lower end to an upper end of the bellow to facilitate collapse of bellows during setting operations.

14. The assembly according to claim 9, wherein a set of teeth is formed on at least one of the bellows inner and outer diameter surfaces.

15. A method for sealing an inner wellhead member to an outer wellhead member, comprising:

providing a seal assembly having a bellows carried on a lower end, the bellows having undulations that meet at a point and form gaps at an opposite end of the undulations;

providing teeth on one of the surface of the bellows and driving the teeth into engagement with one of the inner and outer wellhead members;

landing and setting the seal assembly between the inner and outer wellhead members;

in response to setting the seal assembly, expanding the outer surface of the bellows outward into the outer wellhead member;

contracting inner surfaces of the bellows inward into the inner wellhead member.

16. The assembly according to claim 9, wherein in an axially contracted condition, a radial distance from an inner diameter to an outer diameter of the bellows in greater than a radial distance between the inner annular member and the outer annual member.

17. The assembly according to claim 9, wherein in an axially contracted condition, a radial distance from an inner diameter to an outer diameter of the bellows is greater than a radial distance between the inner annular member and the outer annular member.