CLAIMS

1. A dynamic seal assembly (10, 40, 60, 70, 210, 260, 270) characterized by:

a seal subassembly (14) configured to hold pressure;

a first load member (18) having a first side disposed adjacent a first side of the seal subassembly (14), the first load member (18) configured to engage a recess (22) in one of a central member (12) radially inwardly of the seal subassembly (14) or a housing (215) radially outwardly of the seal subassembly (14) such that the first load member (18) independently has a limited axial movement capability in both longitudinal directions along the seal assembly (10, 40, 60, 70, 210, 260, 270), while the seal assembly is in a sealed condition as a dynamic seal; and

a first energizer (16) adjacent a second side of the first load member (18), the first load member (18) isolating the first energizer (16) from mechanical loading in a direction opposite a direction of bias of the first energizer (16).

2. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 further characterized by:

a second load member (18) having a first side adjacent a second side of the seal subassembly (14), the second load member (18) configured to engage the central member (12) or housing (215) such that the second load member (18) independently has a limited axial movement capability in both longitudinal directions along the seal assembly (10, 40, 60, 70, 210, 260, 270); and

a second energizer (16) adjacent a second side of the second load member (18), the second load member (18) isolating the second energizer (16) from mechanical loading in a direction opposite a direction of bias of the second energizer (16).

3. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 wherein the subassembly (14) is mechanically energized by the first energizer (16) in a direction of bias of the first energizer (16).

4. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 wherein the subassembly (14) is mechanically energized by the second energizer (16) in a direction of bias of the second energizer (16).

5. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 wherein at least a portion of the seal subassembly (14) is axially fixed to the central member (12) or housing (215).

6. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 wherein the first energizer (16) comprises a unidirectional seal.

7. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 wherein the magnet arrangement is a plurality of magnets arranged to produce a collective stroke length using a magnetic field induced stroke of each magnet.

8. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1, further characterized by a sub (50) that is attached to a mandrel (12) to create a gland (44) receptive of the first load member (18) and the first load member (18) is a circumferentially complete ring.

9. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 wherein the central member (12) or housing (215) includes a recess (22) receptive to a portion of the first load member (18).

10. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 further characterized by a second seal subassembly (72) disposed on the central member (12) or housing (215), wherein the first energizer (16) energizes the seal subassembly (10) and the second seal subassembly (72) in opposing directions.

11. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 wherein the central member (12) or housing (215) contains an internal passage extending into fluid communication with the first energizer (16).

12. The seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1 wherein the seal subassembly (14) is energized by the first energizer (16) and a retainer after installation of the subassembly (14) into the housing (215).

13. A downhole tool (80) characterized by;

a housing (215); and

an actuator (82) disposed in the housing (215), the actuator (82) including a seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1.

14. The tool (80) as claimed in claim 13 further including a sleeve (84) disposed in operable contact with the housing (215) and actuatable by the actuator (82).

15. A wellbore system (100) characterized by:

a borehole (102) in a subsurface formation (104);

a string (106) disposed in the borehole (102); and

a downhole tool disposed within or as a part of the string (106) and including the seal assembly (10, 40, 60, 70, 210, 260, 270) as claimed in claim 1.