operation also may be utilized in other rotary equipment to transmit torque through a stationary fluid barrier, such as in mixers, compressors, or the like.

[00016] ~~In a first aspect, the disclosure provides~~ Herein disclosed is a rotary device having a magnet coupling comprising a casing having a front portion and a rear portion, a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion, a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly, and the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis. The rotary device further includes a stationary canister comprising a substantially cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly and includes a radial bearing surface that engages the rotor assembly, an axial bearing surface that engages the rotor assembly in one axial direction, and separates an internal fluid chamber within the casing from the inner driven portion.

[00016a] In a first aspect, there is provided a rotary device having a magnet coupling comprising: a casing having a front portion and a rear portion; a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion; a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly; the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis; a stationary canister comprising a cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, said cylindrical portion including a radial bearing surface axially located between the inner and outer magnets and the radial bearing surface of the cylindrical portion engages and serves as a radial bearing

for the rotor assembly, the stationary canister further comprising an axial bearing surface that is engaged by the rotor assembly in an axial direction, and the stationary canister separates an internal fluid chamber within the casing from the inner drive portion.

[00016b] In a second aspect, there is provided a rotary device having a magnet coupling comprising: a casing having a front portion and a rear portion; a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion; a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly; the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis; and a stationary canister comprising a cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, a canister end cap portion that sealingly closes a front end of the stationary canister and is supported by or integrally formed with the front portion of the casing, and a rear end of the stationary canister that contacts or is integral with the rear portion of the casing, wherein the stationary canister separates an internal fluid chamber within the casing from the inner drive portion.

[00016c] In a third aspect, there is provided a rotary device having a magnet coupling comprising: a casing having a front portion and a rear portion; a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion; a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly; the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis; and a stationary canister comprising a cylindrical portion disposed between the magnets of the inner

drive portion and the magnets of the rotor assembly, wherein the stationary canister is held in place radially and axially by compression applied axially through the cylindrical portion by the front and rear casing portions and the stationary canister separates an internal fluid chamber within the casing from the inner drive portion.

[00016d] In a fourth aspect, there is provided a rotary device having a magnet coupling comprising: a casing having a front portion and a rear portion; a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion; a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly; the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis; and a multi-piece stationary canister having a cylindrical portion and including a front end portion having an opening sized to receive the inner drive therethrough and being constructed of a material that is non-conductive or semi-conductive and a rear portion that contacts or is integral with the rear portion of the casing, with the cylindrical portion being disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, and a separate end cap that closes the opening in the front end portion and is constructed of a material that is non-conductive, semi-conductive or conductive, and wherein the multi-piece stationary canister separates an internal fluid chamber within the casing from the inner drive portion, and the canister end cap is removable to access the inner drive portion while the rotor assembly remains within the rear portion of the casing.

[00016e] In a fifth aspect, there is provided a rotary device having a magnet coupling comprising: a casing having a front portion and a rear portion; a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion; a rotor assembly that includes a driven

portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly; the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis; a stationary canister comprising a cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly and including a front opening sized to receive the inner drive therethrough, a separate canister end cap that sealingly closes the front opening of the stationary canister and is supported by or integrally formed with the front portion of the casing, and a rear end of the stationary canister that contacts or is integral with the rear portion of the casing; a bushing disposed between the inner periphery of the magnets of the rotor assembly and the cylindrical portion of the stationary canister; and wherein the stationary canister separates an internal fluid chamber within the casing from the inner driven portion and the canister end cap is removable to access the inner drive portion while the rotor assembly remains within the rear portion of the casing.

[00017] ~~In a second aspect, the disclosure provides~~Herein disclosed is a rotary device having a magnet coupling comprising a casing having a front portion and a rear portion, a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion, a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly, and the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis. The rotary device further includes a stationary canister comprising a substantially cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, a canister end cap portion that seallingly closes a front end of the stationary canister and is supported by or integrally formed with the front portion of

the casing, and a rear end of the stationary canister that contacts or is integral with the rear portion of the casing, wherein the stationary canister separates an internal fluid chamber within the casing from the inner driven portion, and wherein the rotor assembly further comprises a bushing disposed between the inner periphery of the magnets of the rotor assembly and the stationary canister wherein the bushing includes a radial bearing surface that engages the stationary canister, an axial bearing surface that engages the stationary canister in one axial direction, and separates the magnets of the rotor assembly from contact with fluid within the casing.

[00018] ~~In a third aspect, the disclosure provides~~Herein disclosed is a rotary device having a magnet coupling comprising a casing having a front portion and a rear portion, a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion, a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly, the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis, and a stationary canister comprising a substantially cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, wherein the stationary canister is held in place radially and axially in compression through the substantially cylindrical portion between the front and rear casing portions and separates an internal fluid chamber within the casing from the inner driven portion.

[00019] ~~In a fourth aspect, the disclosure provides~~Herein disclosed is a rotary device having a magnet coupling comprising a casing having a front portion and a rear portion, a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion, a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets

proximate an inner periphery of the rotor assembly, the inner drive portion and rotor assembly being

disposed within the casing and being rotatable about a rotational axis, and a multi-piece canister having a substantially cylindrical portion constructed of a material that is non-conductive or semi-conductive and being disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, and an end cap portion that closes the substantially cylindrical portion and is constructed of a material that is non-conductive, semi-conductive or conductive, and wherein the multi-piece stationary canister separates an internal fluid chamber within the casing from the inner driven portion.

[00020] ~~In a fifth aspect, the disclosure provides~~Herein disclosed is a rotary device having a magnet coupling comprising a casing having a front portion and a rear portion, a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion, a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly, and the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis. The rotary device further includes a stationary canister comprising a substantially cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, a canister end cap portion that seallingly closes a front end of the stationary canister and is supported by or integrally formed with the front portion of the casing, and a rear end of the stationary canister that contacts or is integral with the rear portion of the casing. The rotary device also includes a bushing disposed between the inner periphery of the magnets of the rotor assembly and the substantially cylindrical portion of the stationary canister, and wherein the stationary canister separates an internal fluid chamber within the casing from the inner driven portion and the canister end cap portion is removable to access

the inner drive portion while the rotor assembly remains within the rear portion of the casing.

Claims:

1. A rotary device having a magnet coupling comprising:

a casing having a front portion and a rear portion;

a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion;

a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly;

the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis;

a stationary canister comprising a ~~substantially~~ cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, said ~~substantially~~ cylindrical portion including a radial bearing surface axially located between the inner and outer magnets and ~~that~~the radial bearing surface of the cylindrical portion engages and serves as a radial bearing for the rotor assembly, ~~a front~~ the stationary canister further comprising an axial bearing surface that ~~engages~~is engaged by the rotor assembly in ~~a forward~~an axial direction, and the stationary canister separates an internal fluid chamber within the casing from the inner ~~driven~~drive portion.

2. The rotary device of claim 1 wherein the rotor assembly further comprises a bushing disposed between the inner periphery of the magnets of the rotor assembly and the ~~substantially~~ cylindrical portion of the stationary canister.

3. The rotary device of claim 2 wherein the bushing disposed between the inner periphery of the magnets of the rotor assembly and the ~~substantially~~ cylindrical portion of the stationary canister includes a radial bearing surface that engages the stationary canister, an axial bearing surface that engages the stationary canister in one axial

direction, and separates the magnets of the rotor assembly from contact with fluid within the casing.

4. The rotary device of claim 1 wherein the rotary device further comprises a pump and the casing further comprises an inlet port and an outlet port in communication with a pumping cavity, with the rotor assembly being disposed in the pumping cavity.

5. A rotary device having a magnet coupling comprising:

a casing having a front portion and a rear portion;

a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion;

a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly;

the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis; and

a stationary canister comprising a ~~substantially~~ cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, a canister end cap portion that ~~sealinglyscalingly~~ closes a front end of the stationary canister and is supported by or integrally formed with the front portion of the casing, and a rear end of the stationary canister that contacts or is integral with the rear portion of the casing, wherein the stationary canister separates an internal fluid chamber within the casing from the inner ~~drivendrive~~ portion.

6. The rotary device of claim 5 wherein the rotary device further comprises a pump and the casing further comprises an inlet port and an outlet port in communication with a pumping cavity that houses the rotor assembly.

7. The rotary device of claim 6 wherein the rotor assembly further comprises an impeller.

8. The rotary device of claim 5 wherein the magnets of the inner drive portion and the rotor assembly are permanent magnets.

9. A rotary device having a magnet coupling comprising:

a casing having a front portion and a rear portion;

a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion;

a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly;

the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis; and

a stationary canister comprising a ~~substantially~~ cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, wherein the stationary canister is held in place radially and axially ~~in~~by compression applied axially through the ~~substantially~~ cylindrical portion ~~between~~by the front and rear casing portions and the stationary canister separates an internal fluid chamber within the casing from the inner ~~driven~~drive portion.

10. The rotary device of claim 9 wherein the stationary canister further comprises a canister end cap portion that ~~sealingly~~sealingly closes a front end of the stationary canister and is supported by or integrally formed with the front portion of the casing.

11. The rotary device of claim 10 wherein the front end of the stationary canister includes a peripheral flange that is sealed to the canister end cap portion by a static seal.

12. The rotary device of claim 9 wherein athe stationary canister further comprises a rear end that contacts or is integral with the rear portion of the casing.

13. A rotary device having a magnet coupling comprising:

a casing having a front portion and a rear portion;

a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion;

a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly;

the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis; and

a multi-piece stationary canister having a substantially cylindrical portion and including a front end portion having an opening sized to receive the inner drive therethrough and being constructed of a material that is non-conductive or semi-conductive and a rear portion that contacts or is integral with the rear portion of the casing, with the cylindrical portion being disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, and a separate end cap that closes the substantially cylindricalopening in the front end portion and is constructed of a material that is non-conductive, semi-conductive or conductive, and wherein the multi-piece stationary canister separates an internal fluid chamber within the casing from the inner driven portiondrive portion, and the canister end cap is removable to access the inner drive portion while the rotor assembly remains within the rear portion of the casing.

14. The rotary device of claim 13 wherein a bushing is disposed between the inner periphery of the magnets of the rotor assembly and the substantially cylindrical portion of the stationary canister wherein the bushing provides a radial bearing surface that engages

the stationary canister and extends along the entire length of the magnets of the rotor assembly, an axial bearing surface that engages the stationary canister in one axial direction, and separates the magnets of the rotor assembly from contact with fluid within the casing.

15. The rotary device of claim 13 wherein the stationary canister is held in place radially and axially ~~in~~by compression applied axially through the ~~substantially~~ cylindrical portion ~~between~~by the front and rear casing portions.

16. The rotary device of claim 13 wherein ~~a~~the front end portion of the stationary canister includes a peripheral flange that is sealed to the ~~canister~~ end cap ~~portion~~ by a static seal.

17. A rotary device having a magnet coupling comprising:

a casing having a front portion and a rear portion;

a rotatable inner drive portion of a magnetic coupling having multiple magnets proximate an outer periphery of the inner drive portion;

a rotor assembly that includes a driven portion of the magnetic coupling having multiple magnets proximate an inner periphery of the rotor assembly;

the inner drive portion and rotor assembly being disposed within the casing and being rotatable about a rotational axis;

a stationary canister comprising a ~~substantially~~ cylindrical portion disposed between the magnets of the inner drive portion and the magnets of the rotor assembly and including a front opening sized to receive the inner drive therethrough, a separate canister end cap that ~~sealinglysealingly~~ closes the front opening of the stationary canister and is supported by or integrally formed with the front portion of the casing, and a rear end of the stationary canister that contacts or is integral with the rear portion of the casing;

a bushing disposed between the inner periphery of the magnets of the rotor assembly and the ~~substantially~~ cylindrical portion of the stationary canister; and

wherein the stationary canister separates an internal fluid chamber within the casing from the inner driven portion and the canister end cap ~~portion~~ is removable to access the inner drive portion while the rotor assembly remains within the rear portion of the casing.

18. The rotary device of claim 17 wherein the bushing disposed between the inner periphery of the magnets of the rotor assembly and the ~~substantially~~ cylindrical portion of the stationary canister includes a radial bearing surface that engages the stationary canister, an axial bearing surface that engages the stationary canister in one axial direction, and separates the magnets of the rotor assembly from contact with fluid within the casing.

19. The rotary device of claim 17 wherein the rotary device further comprises a pump and the casing further comprises an inlet port and an outlet port in communication with a pumping cavity, with the rotor assembly being disposed in the pumping cavity.

20. The rotary device of claim 17 wherein the stationary canister is of multi-piece construction having a ~~substantially~~ cylindrical portion constructed of a material that is non-conductive or semi-conductive and being disposed between the magnets of the inner drive portion and the magnets of the rotor assembly, and an end cap portion that closes the ~~substantially~~ cylindrical portion and is constructed of a material that is non-conductive, semi-conductive or conductive.