The Claims

1. A revolving vane compressor comprising: a cylinder having a cylinder longitudinal axis of rotation, a rotor mounted within the cylinder and having a rotor longitudinal axis of rotation, the rotor longitudinal axis and the cylinder longitudinal axis being spaced from each other for relative movement between the rotor and the cylinder; a vane operatively engaged in a slot for causing the cylinder and the rotor to rotate together, the vane being mounted in the slot with a two degree-of-freedom motion relative to the slot for enabling the rotor and the cylinder to rotate with each other, the slot comprising an intermediate portion forming a narrow neck, such that during the two degree-of-freedom motion of the vane relative to the slot, the vane is configured to selectively contact either side of the narrow neck depending on interaction of rotary inertia of the cylinder and gas pressure forces in the slot so as to form a fluid-tight seal, the two degree-of-freedom motion of the vane being relative to the intermediate portion of the slot forming the narrow neck.

2. A revolving vane compressor comprising a vane operatively engaged in a slot for movement relative thereto, the slot being shaped to enable the movement to be a sliding movement and a pivoting movement at the same time, the slot comprising an intermediate portion forming a narrow neck, such that during the sliding and pivoting movement of the vane relative to the slot, the vane contacts either side of the narrow neck depending on interaction of rotary inertia of the cylinder and gas pressure forces in the slot so as to form a fluid-tight seal, wherein the sliding movement and the pivoting movement at the same time comprise sliding movement and pivoting movement relative to the intermediate portion of the slot forming the narrow neck.

3. A revolving vane compressor comprising: a cylinder, a rotor mounted within the cylinder, a vane operatively engaged in a slot for movement relative thereto for enabling the cylinder and the rotor to rotate together; the vane comprising: a portion of one of the rotor and the cylinder, and being one of: rigidly attached to or integral with, the one of the rotor and the cylinder; the slot being in the other of the rotor and the cylinder, the slot comprising an intermediate portion forming a narrow neck, such that during a two degree-of-freedom motion of the vane

relative to the slot, the vane is configured to selectively contact either side of the narrow neck depending on interaction of rotary inertia of the cylinder and gas pressure forces in the slot so as to form a fluid-tight seal.

4. A revolving vane compressor comprising a vane operatively engaged in a slot for movement relative thereto, the slot comprising an inner portion, an intermediate portion forming a narrow neck, and an enlarged outer end portion, the narrow neck have a clearance fit with the vane; the narrow neck comprising a pivot for a sliding and a non-sliding movement of the vane relative to the slot such that during the sliding and non-sliding movement of the vane relative to the slot, the vane contacts a first side of the narrow neck or an opposing, second side of the narrow neck depending on interaction of rotary inertia of the cylinder and gas pressure forces in the slot so as to form a fluid-tight seal.

5. A revolving vane compressor as claimed in claim 2, further comprising a cylinder having a cylinder longitudinal axis of rotation, a rotor mounted within the cylinder and having a rotor longitudinal axis of rotation, the rotor longitudinal axis and the cylinder longitudinal axis being spaced from each other for relative movement between the rotor and the cylinder; a vane operatively engaged in a slot for causing the cylinder and the rotor to rotate together, the motion comprising a two degree-of-freedom motion for causing the rotor and the cylinder to rotate with each other.

6. A revolving vane compressor as claimed in claim 3, wherein the cylinder has a cylinder longitudinal axis of rotation, and the rotor has a rotor longitudinal axis of rotation, the rotor longitudinal axis and the cylinder longitudinal axis being spaced from each other for relative movement between the rotor and the cylinder; the vane and the slot being capable of movement relative to each other.

7. A revolving vane compressor as claimed in claim 4 further comprising: a cylinder having a cylinder longitudinal axis of rotation, a rotor mounted within the cylinder and having a rotor longitudinal axis of rotation, the rotor longitudinal axis and the cylinder longitudinal axis being spaced from each other for relative movement between the rotor and the cylinder; the vane being operatively engaged in a slot for causing the cylinder and the rotor to rotate

together, the sliding and non-sliding movement comprising a two degree-of-freedom motion.

8. A revolving vane compressor as claimed in claim 1, wherein the slot is in the cylinder and the vane comprises a part of the rotor.

9. A revolving vane compressor as claimed in claim 1, wherein the slot is in the rotor and the vane comprises a part of the cylinder.

10. A revolving vane compressor as claimed in claim 8, wherein the vane is one of: rigidly attached to and integral with, the rotor.

11. A revolving vane compressor as claimed in claim 9, wherein the vane is one of: rigidly attached to and integral with, the cylinder.

12. A revolving vane compressor as claimed in claim 1, wherein the two degree-of-freedom movement comprises a sliding movement and a pivoting movement.

13. A revolving vane compressor as claimed in claim 1, wherein the slot comprises an inner portion, an intermediate portion forming a narrow neck, and an enlarged outer end portion, the narrow neck having a clearance fit with the vane; the narrow neck comprising a pivot for non-sliding movement of the vane relative to the slot.

14. A revolving vane compressor as claimed in claim 1, wherein the narrow neck has a clearance fit with the vane.

15. A revolving vane compressor as claimed in claim 4, wherein the inner portion is chamfered.

16. A revolving vane compressor as claimed in claim 4, wherein the inner portion and the intermediate portion form a smooth curve.

17. A revolving vane compressor as claimed in claim 4, wherein the enlarged outer end portion is bulbous.

18. A revolving vane compressor as claimed in claim 4, wherein the pivoting contact between the vane and the neck forms a seal.

19. A revolving vane compressor as claimed in claim 1, wherein one of the rotor and the cylinder is operatively connected to a drive shaft, the operative connection being one of: rigidly connected to and integral with, the drive shaft.

20. A revolving vane compressor as claimed in claim 1, wherein the slot and the vane are configured such that during the two-degree-of-freedom motion, the vane is in contact with either side of the neck of the slot.

21. A revolving vane compressor comprising: a vane operatively engaged in a slot for movement relative thereto, the slot being shaped to enable the movement of the vane within the slot to be a sliding movement along a radial path and a pivoting movement relative to the radial path at the same time, wherein the radial path is a trajectory of the vane in the slot only in the sliding direction, wherein the slot is formed on one of an interior surface of a cylinder or an interior surface of the cylinder on an interior surface of a rotor, wherein the vane is operatively engaged in a slot for causing the cylinder and the rotor to rotate together, and wherein the slot comprises an intermediate portion forming a narrow neck, such that during the sliding and pivoting movement of the vane relative to the radial path, the vane is configured to selectively contact either side of the narrow neck depending on interaction of rotary inertia of the cylinder and gas pressure forces in the slot so as to form a fluid-tight seal.

22. The revolving vane compressor of claim 21, wherein the radial path is curved relative to a radial axis.

23. A revolving vane compressor comprising: a cylinder; a rotor at least partially housed within the cylinder and being eccentrically mounted relative to the cylinder, the rotor having a longitudinal axis of rotation; and a vane operatively engaged in a radially extending slot for causing the cylinder and the rotor to rotate together, wherein the slot is formed on one of an interior surface of the cylinder or an interior surface of the rotor, and wherein the slot comprises an intermediate portion forming a narrow neck, such that during a two degree-of-freedom motion of the vane relative to the slot, the vane is configured to selectively contact either side of the narrow neck depending on interaction of rotary inertia of the cylinder and gas pressure forces in the slot so as to form a fluid-tight seal.

24. A revolving vane compressor comprising: a cylinder having a cylinder longitudinal axis of rotation; a rotor mounted within the cylinder and having a rotor longitudinal axis of rotation, the rotor longitudinal axis and the cylinder

longitudinal axis being spaced from each other for relative movement between the rotor and the cylinder; and a vane operatively engaged in a slot for causing the cylinder and the rotor to rotate together, the vane being mounted in the slot with a two degrees-of-freedom motion relative to the slot for enabling the rotor and the cylinder to rotate with each other, wherein the slot is formed on one of an interior surface of the cylinder or an interior surface of the rotor, and wherein the slot comprises an intermediate portion forming a narrow neck, such that during the two degree-of-freedom motion of the vane relative to the slot, the vane is configured to selectively contact either side of the narrow neck depending on interaction of rotary inertia of the cylinder and gas pressure forces in the slot so as to form a fluid-tight seal.