CLAIMS:

1. A rotational orientation control apparatus for controlling rotational orientation of a load suspended from the apparatus, the apparatus including:

a rotator having a single flywheel, the flywheel including:

one rotatable mass; and

at least one fan having vanes,

a motor;

a drive means, wherein the motor is configured to drive the flywheel via the drive means; and

a control means,

wherein:

control of rotation of the flywheel provides a respective proportion of reaction torque, and

in use, the vanes act to augment or replace a change of speed of rotation of the flywheel for controlling rotational orientation of the suspended load.

2. The apparatus according to claim 1, further including a controller connected by a data cable or wirelessly to communicate with the control means.

3. The apparatus according to any one of the preceding claims, including at least one camera for monitoring the suspended load and/or a physical space around the load or location below the load and/or for collecting one or more images and/or data relating to the apparatus or the load.

4. The apparatus according to any one of any one of the preceding claims, including a remotely actuated load release mechanism including at least one hook or retractable pin.

5. The apparatus according to claim 2, wherein at least one of said vanes is moveable to modify/control airflow from the respective fan(s).

6. The apparatus according to any one of the preceding claims, further including at least one thruster, and wherein operation of the at least one thruster is controlled by a remote controller.

7. The apparatus according to claim 6, the at least one thruster mounted external of a housing of the rotator or mounted independently on a lifting device attached to the rotator or attached to the suspended load.

8. The apparatus according to claim 6 or claim 7, wherein the at least one thruster includes one or more of a propeller, a turbo fan, a shrouded fan or compressed gas jet thruster, or combinations of two or more thereof.

9. The apparatus according to any one of the preceding claims, including a control system, the control system including one or more of a) a microcomputer; b) a 9 axis inertial sensor containing accelerometers, gyros and magnetometers for each of the 3 principal axes x,y,z; c) an encoder input that senses the flywheel speed; d) interface to a motor variable speed controller; e) wireless interface; f) interface to load cell; g) interface to remote release; h) interface to thrusters; i) interface to centrifugal fan air guide vanes, and j) one or more GPS receivers.

10. The apparatus according to any one of the preceding claims, including the control means controlling the suspended load to be rotated to an

orientation, optionally a yaw orientation, defined by the operator and to maintain the load in that orientation.

11. The apparatus of claim 1, wherein a rotational speed of the apparatus, or an applied torque according to the inertia of the load, or a desired speed or rate of rotation, or combination of two or more thereof, is controlled by the control means.

12. The apparatus according to any one of the preceding claims, wherein the flywheel includes an annular or ring type flywheel driven directly or indirectly by a motor.

13. The apparatus according to claim 12, wherein the annular or ring type flywheel is driven through an internal or external ring gear of the flywheel.

14. The apparatus according to claim 12 or 13, including bearings supporting the annular or ring type flywheel at a periphery or adjacent the periphery of the annular or ring type flywheel.

15. The apparatus according to claim 12, wherein the annular or ring type flywheel is driven by a motor with a hollow centre, and wherein the annular or ring type flywheel allows the main load carrying element connecting the load and the lift line to pass through the hollow centre, and including at least one bearing supporting the annular or ring type flywheel on an inside of an annulus or adjacent to the inside of the annulus by attaching to the main load carrying element that supports the load and transmits torsional forces to the load.

16. The apparatus according to any one of the preceding claims, further including a rotational swivel and a single point attachment that connects

multiple lifting points, wherein a projection of an axis of the rotational swivel passes through the single point attachment.

17. The apparatus according to any one of the preceding claims, including a swivel supporting the apparatus, and the swivel is tiltable such that the axis of the swivel passes through a centre of gravity of a mass supported by the swivel.

18. The apparatus according to any one of the preceding claims, including at least one pivot, each said pivot having a respective pivot axis.

19. The apparatus according to claim 18, including at least one said pivot connected between the rotator and a suspension line from which the rotator is suspended and/or at least one said pivot connected between the rotator and a load suspended from the rotator.

20. The apparatus of claim 18 or 19, wherein the at least one pivot allows the rotator to tilt about the respective pivot axis relative to the load suspended from the rotator and there is no moment on the rotator about at least one axis perpendicular to a rotation axis of the rotator.

21. The apparatus according to claim 18, wherein the pivot axis of at least one said pivot connected between the rotator of the apparatus and a suspension line from which the rotator is suspended and a pivot axis of the at least one said pivot connected between the rotator and a load suspended from the rotator are parallel to one another.

22. The apparatus according to any one of the preceding claims, including a drive motor which converts rotational energy of the flywheel into electrical energy that is used to charge batteries of the apparatus.

23. The apparatus according to any one of the preceding claims, including a control system that utilises measured load to adapt parameters for determining torque to be applied to the load and/or the control system uses or is in communication with a load cell wherein the control system uses at least one signal from the load cell to determine whether to prevent the load from being disconnected if a load greater than a preset load is being supported by the apparatus.

24. The apparatus according to any one of the preceding claims, further including at least one replaceable or rechargeable battery, at least one plug in or slide in cassette for supporting connection of at least one component of the apparatus, the at least on said plug in cassette or slide in cassette optionally mounting at least one battery, or a combination of a plug in or slide in cassette contained in a removable container.

25. The apparatus according to any one of the preceding claims, including image and/or data capture means, wherein the captured image(s) and/or data relate to a lifted load, wherein the captured image(s) and/or data is/are stored on-board the apparatus or on a remote computer.

26. The apparatus according to any one of the preceding claims, including at least one hook including a groove or recess to receive and restrict rotation of a shackle or link connected to a suspended load that is supported, in use, by the respective hook.

27. The apparatus according to claim 26, wherein the groove or recess of the at least one hook is provided at a widened/thickened portion of the bend of the respective hook, and the bend of the respective hook has a portion that widens/flares outwards such that a base of the recess or groove is wider than portions of the respective hook immediately prior to and/or after the flared portion.