CLAIMS

WE CLAIM:

1. An actuator assembly, comprising:

a power drive unit adapted to receive drive power and configured, upon receipt of the drive power, to rotate;

an actuator coupled to the power drive unit and configured, in response to power drive unit rotation, to move to a position;

a latch rotor coupled to the power drive unit to rotate therewith;

one or more permanent magnets spaced apart from and at least partially surrounding the latch rotor, the permanent magnets supplying a permanent magnetic field that opposes rotation of the latch rotor; and

an electromagnet adapted to receive a flow of electrical current and, upon receipt thereof, to generate a magnetic field that selectively opposes or aids the permanent magnetic field supplied from the permanent magnets.

2. The actuator assembly of Claim 1, wherein the latch electromagnet comprises:

a latch stator non-rotationally mounted adjacent to, and at least partially surrounding, the latch rotor; and

a plurality of latch windings wound around at least a portion of the latch stator, the latch windings adapted to receive the flow of electrical current and, upon receipt thereof, to generate the magnetic field,

wherein the permanent magnets are mounted on the latch stator and are disposed adjacent each of the latch windings.

3. The actuator assembly of Claim 2, wherein:

each of the one or more permanent magnets has one or more pole pairs; and

the coils are wound on the latch stator such that, upon receipt of the flow of electrical current, the coils generate the same number of magnetic pole pairs as there are permanent magnets.

4. The actuator assembly of Claim 2, wherein:

the latch rotor comprises a main body having a plurality of lobes extending radially therefrom.

5. The actuator assembly of Claim 3, wherein at least a portion of each of the plurality of lobes comprises a magnetically permeable material.

6. The actuator assembly of Claim 1, wherein the actuator comprises:

an actuation member coupled to the power drive unit and configured, in response to rotation of the power drive unit, to rotate.

7. The actuator assembly of Claim 6, wherein the actuator further comprises:

a translation member disposed adjacent the actuation member and configured, upon rotation of the actuation member, to translate to a position;

8. The actuator assembly of Claim 7, wherein:

the actuation member comprises a ballscrew; and

the translation member comprises a ballnut mounted against rotation on the ballscrew and configured, upon rotation of the ballscrew, to translate to the position.

9. An actuator drive unit assembly, comprising:

a power drive unit adapted to receive drive power and configured, upon receipt of the drive power, to rotate;

a latch rotor coupled to the power drive unit to rotate therewith;

one or more permanent magnets spaced apart from and at least partially surrounding the latch rotor, the permanent magnets supplying a permanent magnetic field that opposes rotation of the latch rotor; and

a latch electromagnet adapted to receive a flow of electrical current and, upon receipt thereof, to generate a magnetic field that selectively opposes or aids the permanent magnetic field supplied from the permanent magnets.

10. The assembly of Claim 9, wherein the latch electromagnet comprises:

a latch stator non-rotationally mounted adjacent to, and at least partially surrounding, the latch rotor; and

a plurality of latch windings wound around at least a portion of the latch stator, the latch windings adapted to receive the flow of electrical current and, upon receipt thereof, to generate the magnetic field,

wherein the permanent magnets are mounted on the latch stator and are disposed adjacent each of the latch windings.

11. The assembly of Claim 10, wherein:

each of the one or more permanent magnets has one or more pole pairs; and

the coils are wound on the latch stator such that, upon receipt of the flow of electrical current, the coils generate the same number of magnetic pole pairs as there are permanent magnets.

12. The assembly of Claim 10, wherein:

the latch rotor comprises a main body having a plurality of lobes extending radially therefrom.

13. The assembly of Claim 12, wherein at least a portion of each of the plurality of lobes comprises a magnetically permeable material.

14. An actuation control system, comprising:

a control circuit adapted to receive input signals and operable, in response thereto, to selectively supply drive control signals and latch control signals;

a power drive unit coupled to receive the drive control signals and operable, in response to the drive control signals, to rotate;

a latch rotor coupled to the power drive unit to rotate therewith;

one or more permanent magnets spaced apart from and at least partially surrounding the latch rotor, the permanent magnets supplying a permanent magnetic field that opposes rotation of the latch rotor; and

a latch electromagnet adapted to receive a flow of electrical current and, upon receipt thereof, to generate a magnetic field that selectively opposes or aids the permanent magnetic field supplied from the permanent magnets.

15. The system of Claim 14, wherein the latch electromagnet comprises:

a latch stator non-rotationally mounted adjacent to, and at least partially surrounding, the latch rotor; and

a plurality of latch windings wound around at least a portion of the latch stator, the latch windings adapted to receive the flow of electrical current and, upon receipt thereof, to generate the magnetic field,

wherein the permanent magnets are mounted on the latch stator and are disposed adjacent each of the latch windings.

16. The system of Claim 15, wherein:

each of the one or more permanent magnets has one or more pole pairs; and

the coils are wound on the latch stator such that, upon receipt of the flow of electrical current, the coils generate the same number of magnetic pole pairs as there are permanent magnets.

17. The system of Claim 15, wherein:

the latch rotor comprises a main body having a plurality of lobes extending radially therefrom.

18. The assembly of Claim 17, wherein at least a portion of each of the plurality of lobes comprises a magnetically permeable material.

19. The system of Claim 14, further comprising:

a power source coupled to receive the latch control signals and operable, upon receipt thereof, to supply the flow of electrical current to the electromagnet.

20. An actuation control system, comprising:

a control circuit adapted to receive input signals and operable, in response thereto, to selectively supply drive control signals and latch control signals;

a power drive unit coupled to receive the drive control signals and operable, upon receipt of the drive control signals, to rotate;

a latch rotor coupled to the power drive unit to rotate therewith;

an electromagnet coupled to receive a flow of current and, upon receipt thereof, to generate a magnetic field force that opposes rotation of the latch rotor, the generated magnetic field force having a magnitude sufficient to prevent rotation of the power drive unit.