CLAIMS

~~What is claimed is:~~

1. A theater seating assembly (2), comprising:
    a. a seat support seat support base (210a, 210b,210c,201d);
    b. a first seat support (200a), comprising:
        i. a first lift arm (220a) pivotally connected to the seat support seat support base (210a,210b), the first lift arm (220a) comprising:
            1. a lower portion; and
            2. an upper portion disposed at an angular offset from the lower portion;
        ii. a first lift arm actuator (221a) operatively connected to the first lift arm (220a);
        iii. a first passenger seat beam rotator (240a) operatively connected to the first lift arm (220a) distally from the seat support base (210a,210b,210c,210d); and
        iv. a first passenger seat beam rotator actuator (241a) operatively connected to the first passenger seat beam rotator (240a), the first passenger seat beam rotator actuator (241a) operative to effect a change in passenger seat row pitch independently of rotation of the first lift arm (220a);
    c. a second seat support (200b) disposed distally from the first seat support (200a) in a mirror configuration with respect to a seat axis defined by a longitudinal distance between the first seat support (200a) and the second seat support (200b), comprising:
        i. a second lift arm (220b) pivotally connected to the seat support seat support base (210a,210b,210c,210d), the second lift arm (220a) comprising:
            1. a lower portion; and

2. an upper portion disposed at an angular offset from the lower portion;

ii. a second lift arm actuator (221b) operatively connected to the second lift arm (220b) and configured to coordinate movement of the second lift arm with the first lift arm;

iii. a second passenger seat beam rotator (240b) operatively connected to the second lift arm (220b); and

iv. a second passenger seat beam rotator actuator (241b) operatively connected to the second passenger seat beam rotator (240b) distally from the seat support base (210a,210b,210c,210d), the second passenger seat beam rotator actuator (241b) operative to effect a change in passenger seat row pitch independently of rotation of the second lift arm (220b) cooperatively with the first passenger seat beam rotator actuator (241a);

d. a passenger seat assembly (260) operatively connected to the first passenger seat beam rotator (240a) and to the second passenger seat beam rotator (240b), the passenger seat assembly (260) disposed substantially parallel to the seat axis, the passenger seat assembly comprising a passenger seating area (162); and

e. a system controller (201,202) operatively in communication with the first lift arm actuator (221a), the second lift arm actuator (221b), the first passenger seat beam rotator actuator (241a), and the second passenger seat beam rotator actuator (241b), the system controller operative to coordinate movement of the first lift arm with the second lift arm in their respective X-Y planes while simultaneously effecting a change to ~~the~~ a pitch angle of the passenger seat assembly and to coordinate movement of the first

passenger seat beam rotator actuator (241a) with the second passenger seat beam rotator actuator (241b).

2. The theater seating assembly of Claim 1, wherein the seat support base (210a,201b,210c,210d) comprises a first seat support base (210a,210b) connected to the first lift arm (220a) and a second seat support base (210c,210d) connected to the second lift arm (220b).

3. The theater seating assembly of Claim 1, further comprising a safety encoder (280) operatively in communication with the system controller (201,202), the safety encoder operative to provide a measurement of an offset of the first passenger seat beam rotator (240a) or the second passenger seat beam rotator (240a) from the seat axis.

4. The theater seating assembly of Claim 1, further comprising a sensor (281,282) operatively in communication with the system controller (201,202), the sensor operative to provide a measurement of a predetermined physical characteristic of the first lift arm (220a) or the second lift arm (220b).

5. The theater seating assembly of Claim 4, wherein the sensor (281,282) comprises a pressure transducer (281) or a linear transducer (282).

6. The theater seating assembly of Claim 1, wherein each lift arm actuator (221a,221b) further comprises a motion damper (221c,221d) operatively connected to the seat support base (210a,210b,210c,210d) and the first lift arm (220a) or the second lift arm (220b).

7. The theater seating assembly of Claim 6, wherein the motion damper (221c,221d) comprises:

a. a first motion damper (221c) operatively connected to the first lift arm (220a); and

b. a second motion damper (221d) operatively connected to the second lift arm (220b).

8. The theater seating assembly of Claim 7, wherein the seat support base (210a,201b,210c,210d) comprises:

a. a first seat support base (210a) operatively connected to the first motion damper (221c);

b. a second seat support base (210b) connected to the first lift arm (220d);

c. a third seat support base (210c) connected to the second motion damper (221b); and

d. a fourth seat support base (210d) connected to the second lift arm (220b).

9. The theater seating assembly of Claim 1, further comprising a brake operatively connected to the first lift arm (220a) or the second lift arm (220b), the brake operative to impede motion of the first lift arm (220a) or the second lift arm (220b).

10. The theater seating assembly of Claim 1, wherein:

a. the first passenger seat beam rotator (240a) is pivotally connected to the first lift arm (220a) at a pivot substantially located at a center of the first passenger seat beam rotator (240a); and

b. the second passenger seat beam rotator (240b) is pivotally connected to the second lift arm (220b) at a pivot substantially located at a center of the second passenger seat beam rotator (240b).

11. The theater seating assembly of Claim 1, wherein the passenger seat assembly (260) comprises:

a. a first seat beam (260a) operatively connected to the first passenger seat beam rotator (240a) at a first end of the first passenger seat beam rotator (240a) and the second passenger seat beam rotator (240b) at a corresponding first end of the second passenger seat beam rotator (240b) substantially parallel to the seat axis; and

b. a second seat beam (260b) operatively connected to the first passenger seat beam rotator (240a) at a second end of the first passenger seat beam rotator (240a) distally from the first end and the second passenger seat beam rotator (240b) at a corresponding second end of the second passenger seat beam rotator (240b) substantially parallel to the first seat beam (260a).

12. The theater seating assembly of Claim 1, wherein the passenger seat assembly (260) further comprises:

a. a seat beam (260a,260b); and

b. a passenger seating area (162) connected to the seat beam.

13. The theater system of Claim 1, wherein each of the rotator actuators (241a,241b) comprises:

a. a rotary motor; and

b. a chain or sprocket set operatively in communication with the rotary motor.

14. The theater system of Claim 1, wherein the passenger seat assembly (160) further comprises a canopy.

15. The theater system of Claim 1, wherein the passenger seat assembly (160) further comprises a shield.

16. A method of providing a theater experience using a theater seating assembly comprising a seat support seat support base (210a, 210b,210c,201d); a first seat support (200a) comprising a first lift arm (220a) pivotally connected to the seat support seat support base (210a,210b) where the first lift arm (220a) comprises a lower portion and an upper portion disposed at an angular offset from the lower portion, a first lift arm actuator (221a) operatively connected to the first lift arm (220a), a first passenger seat beam rotator (240a), comprising a first rotator arm (32),

operatively connected to the first lift arm (220a) distally from the seat support base (210a,210b,210c,210d), and a first passenger seat beam rotator actuator (241a) operatively connected to the first passenger seat beam rotator (240a) where the first passenger seat beam rotator actuator (241a) is operative to effect a change in passenger seat row pitch independently of rotation of the first lift arm (220a); a second seat support (200b) disposed distally from the first seat support (200a) in a mirror configuration with respect to a seat axis defined by a longitudinal distance between the first seat support (200a) and the second seat support (200b), comprising a second lift arm (220b) pivotally connected to the seat support seat support base (210a,210b,210c,210d) where the second lift arm (220a) comprises a lower portion and an upper portion disposed at an angular offset from the lower portion; and a second lift arm actuator (221b) operatively connected to the second lift arm (220b) and configured to coordinate movement of the second lift arm with the first lift arm; a second passenger seat beam rotator (240b), comprising a second rotator arm (32), operatively connected to the second lift arm (220b), and a second passenger seat beam rotator actuator (241b) operatively connected to the second passenger seat beam rotator (240b) distally from the seat support base (210a,210b,210c,210d) where the second passenger seat beam rotator actuator (241b) is operative to effect a change in passenger seat row pitch independently of rotation of the second lift arm (220b) cooperatively with the first passenger seat beam rotator actuator (241a); a passenger seat assembly (260) operatively connected to the first passenger seat beam rotator (240a) and to the second passenger seat beam rotator (240b), the passenger seat assembly (260) disposed substantially parallel to the seat axis, the passenger seat assembly comprising a passenger seating area; and a system controller (201,202) operatively in communication with the first lift arm actuator (221a), the second lift arm actuator (221b), the first passenger seat beam rotator actuator (241a), and the second passenger seat beam rotator actuator

(241b), the system controller operative to coordinate movement of the first lift arm with the second lift arm in their respective X-Y planes while simultaneously effecting a change to ~~the~~ a pitch angle of the passenger seat assembly and to coordinate movement of the first passenger seat beam rotator actuator (241a) with the second passenger seat beam rotator actuator (241b), the method comprising:

a. positioning the first lift arm and the second lift arm and rotating the passenger seat assembly to a passenger boarding position sufficient to allow a passenger to sit in the passenger seat assembly;

b. using the system controller to substantially synchronously control the left and right lift arms and the first and the second rotator arms via their associated actuators to effect a motion between each lift arm and its associated rotator to adjust an angular relationship between the two by adjusting an angular relationship between a first lift arm lowered position to a second lift arm raised position at a first predetermined set of times; and

c. rather than pivoting the passenger seat assembly with a rotating floor, altering positions of the passenger seat assembly while a raising and lowering function is taking place.