CLAIMS

1. A transport carrier (10), comprising:

a support frame (100) mountable along a stairway (60);

a carriage (200) movably coupled to the support frame (100), the carriage (200) being movable relative to the support frame (100) between a first position and a second position elevated and horizontally shifted relative to the first position;

a cable coupled between the support frame (100) and the carriage (200),

wherein pulling of the cable causes the carriage to move towards the second position, and releasing of the cable allows the carriage to move towards the first position; and

a drum (406) disposed in and rotatably coupled to the support frame (100), the drum being rotatable relative to the support frame along a first rotational direction to wind the cable around the drum, and along a second rotational direction countering to the first rotational direction to unwind the cable off the drum,

wherein rotation of the drum along the first rotational direction tensions the cable to move the carriage towards the second position, and rotation of the drum along the second rotational direction releases the cable (500) to allow the carriage to move towards the first position,

wherein winding of the cable around the drum moves an unwind segment of the cable along a first linear direction parallel to a center axis of the drum, and unwinding of the cable off the drum moves the unwind segment along a second linear direction opposite to the first linear direction,

wherein the drum is rotatable about a drum axis, the transport carrier further comprise a pulley shaft slidably coupled to the support frame and a pulley rotatably coupled to the pulley shaft and engaged to the cable, wherein the pully shaft is oriented orthogonal to the drum axis, wherein winding of the cable around the drum causes the pulley shaft and the pulley to move along the first linear direction, and wherein unwinding of the cable off the drum causes pulley shaft and the pulley to move along the second linear direction.

2. The transport carrier as recited in claim 1, further comprising a guide rod to which the pulley shaft is coupled, the guide rod being oriented parallel to the drum axis and fixed to the support frame, wherein the pulley shaft is slidable relative to the guide rod (4086) in a direction (4420/4421) parallel to the first linear direction (4418) to vary the position of the pulley relative to the drum.

3. The transport carrier as recited in claim 2, further comprising a support rod coupled to the pulley shaft and a biasing member disposed between the guide rod and the support frame, wherein the biasing member exerts a force against the support rod to urge the pulley moving towards a balance position.

4. The transport carrier as recited in claim 1, further comprising a rack coupled to the support frame and a pawl coupled to the carriage, wherein release of the cable causes the pawl to engage the rack to prevent the carrier from moving towards the first position.

5. The transport carrier as recited in claim 4, wherein tensioning the cable disengages the pawl from the rack, and when the tension in the cable is removed, the pawl engages the rack preventing the carriage to move towards the first position.

6. The transport carrier as recited in claim 5, further comprising a biasing member (249, 247) to bias the pawl to engage the rack.

7. The transport carrier as recited in claim 6, wherein the biasing member (247) comprises a compression spring (247) abutting against the carriage.

8. The transport carrier as recited in claim 1, further comprises a pedal (232) pivotally coupled to the carriage, the pedal being pivotable relative to the carriage between a close position (232a) and an open position (232c).

9. The transport carrier as recited in claim 8, further comprises a biasing member (236) to urge the pedal toward the close position.

10. The transport carrier as recited in claim 9, further comprising a pedal actuator (262) to move the pedal towards the open position.

11. The transport carrier as recited in claim 10, further comprising a connector (268, 269) coupled to the pedal, the pedal actuator drives the connector to move the pedal between the close and open position.

12. The transport carrier as recited in claim 11, further comprises a pedal sensor (2668, 2669) to detect a position of the connector relative to the carriage.

13. The transport carrier as recited in claim 11, further comprises a proximity sensor (238) coupled to the pedal to detect an obstacle during a movement of the carriage relative to the support frame.

14. The transport carrier as recited in claim 1, further comprises a guide member (300, 302, 114, 116) coupled to the support frame and engaged with the carriage.

15. The transport carrier as recited in claim 14, further comprising a sleeve (220) coupled to the carriage, wherein the guide member is a rod (300) received in the sleeve.

16. The transport carrier as recited in claim 15, further comprising a bushing (224) coupled to the sleeve, and engaged with the rod.

17. The transport carrier as recited in claim 15, further comprising a nipple (226) coupled to the sleeve for providing a lubricant between the rod and the sleeve.

18. The transport carrier as recited in claim 14, wherein the guide member is a rail (302) and the transport carrier further comprises grooved wheels coupled to the carriage and engaged with the rail to guide the movement of the carriage.

19. The transport carrier as recited in claim 14, wherein the guide member is a channel (114,116) formed on the support frame and the transport carrier further comprises guide wheels (222) coupled to the carriage and engaged with the channel to guide the movement of the carriage.

20. A transport carrier (10), comprising:

a support frame (100) mountable to a stairway;

a carriage (200) movable along a line of movement (800) relative to the support frame between a first position and a second position elevated relative to the first position;

a pedal (232) pivotally coupled to the carriage, the pedal configured to pivot between a close position (232a) substantially parallel to a side surface (102a) of the support frame and an open position (232c) substantially perpendicular to the side surface of the support frame;

an actuating assembly (400), wherein the actuation assembly comprises a rotatable drum (406) configured to pull on or release the cable (500); and

a cable (500) coupled between the actuating assembly and the carriage, the actuating assembly holds the carriage in position through a tension in the cable,

wherein the actuating assembly is configured to pull on the cable to move the carriage towards the second position, and to release on the cable to move the carriage towards the first position,

wherein the drum is configured to wind the cable forming a plurality of adjacent windings in a traverse winding direction (4418) parallel to a rotational axis of the drum, and the drum is configured to unwind the adjacent windings in a traverse unwinding direction (4419) opposite to the traverse winding direction,

wherein the actuation assembly further comprising a pulley (4408) coupled between the drum and the carriage to maintain tension to the cable,

wherein the pulley (4408) is moveable along a guide rod (4086) in a direction (4420/4421) substantially parallel to the traverse winding direction (4418), the movement of the pulley reduces a fleet angle formed between the cable and a neutral axis (4417) of the drum.

21. The transport carrier as recited in claim 20, wherein the pulley is urged by the cable to move (4420) in the traverse winding direction (4418) in tandem with the winding of the cable.

22. The transport carrier as recited in claim 21, wherein the pulley is biased (4082) towards the traverse unwinding direction (4419) such that the pulley moves (4421) in the traverse unwinding direction (4419) in tandem with the unwinding of the cable.

23. The transport carrier as recited in claim 20, wherein the pulley is biased (5082) towards the traverse winding direction (5418) such that the pulley moves (5422) in the traverse winding direction (5418) in tandem with the winding of the cable.

24. The transport carrier as recited in claim 23, wherein the pulley is urged by the cable to move (5423) in the traverse unwinding direction (5419) in tandem with the unwinding of the cable.