ground, causing an obstruction and are not compliant with ICAO guidelines. Improvements are desirable.

SUMMARY

[0010] According to certain embodiments of this disclosure, there may be provided a retractable sheave system for positioning a cable across an aircraft runway surface, comprising: a foundation along a side of the aircraft runway surface, the foundation comprising a cavity therein, a beam configured to be positioned within the cavity, wherein the beam comprises at least one roller sheave in order to orient tape moving through the beam; a hinge associated with the beam, a lifting/lowering mechanism associated with the beam, wherein when the lifting/lowering mechanism configures the beam in a lowered position, the beam rests within the cavity and is flush with the aircraft runway surface, and wherein when the lifting/lowering mechanism configures the beam in a raised position, the beam hinges with respect to the hinge such that at least the forward portion of the elongated beam raises above the runway surface, wherein the retractable sheave system is mounted at a runway edge. The hinge associated with the beam may be a rear hinge, and when the lifting/lowering mechanism configures the beam in a raised position, the beam hinges with respect to the rear hinge such that the forward portion of the elongated beam raises above the runway surface. In other examples, wherein the hinge associated with the beam may be a side hinge.

[0011] The beam may comprise a lifting plate. The foundation may comprise one or more restraint plates for securing the beam in position.

[0012] In some examples, there are also provided side ramp portions operatively secured to the beam. Raising of the beam also results is raising of the side ramp portions, and lowering of the beam results is lowering of the side ramp portions. For example, side ramp portions are hinged to sides of the beam, such that raising of the beam results in corresponding raising of the ramp portions. The side ramp portions may be hinged to the beam and are slidable with respect to the foundation. There may be provided guards to cover open spaces between the foundation and ramp portion edges when the beam is raised.

[0013] Other examples include the beam as an elongated beam that functions as a runway edge sheave. The beam may have at least one horizontal roller sheave and at least one vertical sheave in order to orient tape moving through the beam.

[0014] The lifting/lowering mechanism comprises a pneumatic system, hydraulic system, electrical actuation, or mechanical actuation, or actuation via an airbag system.

[0015] There may be a tape connection positioned at a forward portion of the beam.

[0016] In other examples, there is provided a retractable sheave system for positioning a cable across an aircraft runway surface, comprising: a foundation along a side of the aircraft runway surface, the foundation comprising a cavity therein,

a beam configured to be positioned within the cavity, a lifting/ lowering mechanism associated with the beam; wherein when the raising system configures the beam in a lowered position, the beam rests within the cavity and is flush with the aircraft runway surface, and wherein when the lifting/ lowering mechanism configures the beam in a raised position, at least a forward portion of the beam raises above the runway surface, wherein the retractable sheave system is mounted at a runway edge. The raising system may comprise a rear hinge and a lifting/lowering mechanism that allows the beam to raise or lower when the lifting/lowering mechanism is activated. The raising system may comprise a hydraulic system, electrical actuation, mechanical actuation, or actuation via an airbag system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Figure 1 is a schematic view illustrating an aircraft with a tailhook catching a cross-runway cable.

[0018] Figure 2 is a side perspective view of a fairlead beam sheave.

[0019] Figure 3 is a front perspective view of one embodiment of a retractable runway edge sheave in a raised position, as described herein.

[0020] Figure 4 is a side plan view of Figure 3.

[0021] Figure 5 is a front plan view of Figure 3.

[0022] Figure 6 is a front perspective view of one embodiment of a retractable runway edge sheave in a lowered position, as described herein.

[0023] Figure 7 is a side plan view of Figure 6.

[0024] Figure 8 is a front plan view of Figure 6.

[0025] Figure 9 illustrates one embodiment of an elongated beam in the lowered position, with ramp portions removed for ease of illustration.

[0026] Figure 10 illustrates the elongated beam of Figure 9 in the raised position.

[0027] Figure 11A illustrates a front perspective view of the elongated beam of Figure 9.

[0028] Figure 11B illustrates a front perspective view of the elongated beam of Figure 10.

[0029] Figures 12 illustrates a top perspective view of an alternate embodiment for securing the elongated beam into the foundation cavity.

[0030] Figure 13 illustrates an alternate perspective view of an alternate embodiment for securing the elongated beam into the foundation cavity.

[0031] Figure 14 illustrates a front plan view of the embodiment of Figure 13.

CLAIMS

That which is claimed is:

1. A retractable sheave system for positioning a cable across an aircraft runway surface, comprising:

a foundation (12) along a side of the aircraft runway surface, the foundation comprising a cavity therein,

a beam (14) configured to be positioned within the cavity, wherein the beam comprises at least one roller sheave in order to orient tape moving through the beam;

a hinge (20) associated with the beam;

a lifting/lowering mechanism (16) associated with the beam,

wherein when the lifting/lowering mechanism configures the beam in a lowered position, the beam rests within the cavity and is flush with the aircraft runway surface, and wherein when the lifting/lowering mechanism configures the beam in a raised position, the beam hinges with respect to the hinge such that at least the forward portion of an elongated beam raises above the runway surface,

wherein the retractable sheave system is mounted at a runway edge.

2. The system of claim 1, wherein the hinge associated with the beam comprises a rear hinge, and wherein when the lifting/lowering mechanism configures the beam in a raised position, the beam hinges with respect to the rear hinge such that the forward portion of the elongated beam raises above the runway surface.

3. The system of any of the preceding claims, wherein the beam comprises a lifting plate.

4. The system of any of the preceding claims, wherein the foundation comprises one or more restraint plates (34) for securing the beam in position.

5. The system of any of the preceding claims, further comprising side ramp portions (32) operatively secured to the beam.

6. The system of claim 5, wherein raising of the beam comprises raising of the side ramp portions and wherein lowering of the beam comprises lowering of the side ramp portions.

7. The system of claims 5 or 6, wherein the side ramp portions are hinged to the beam and are slidable with respect to the foundation.

8. The system of any of claims 5-7, wherein the side ramp portions are hinged to sides of the beam, such that raising of the beam results in corresponding raising of the ramp portions.

9. The system of any of claims 5-8, further comprising guards to cover open spaces between the foundation and ramp portion edges when the beam is raised.

10. The system of any of the preceding claims, wherein the beam comprises an elongated beam that functions as a runway edge sheave.

11. The system of any of the preceding claims, wherein the beam comprises at least one horizontal roller sheave and at least one vertical sheave in order to orient tape moving through the beam.

12. The system of any of the preceding claims, wherein the lifting/lowering mechanism comprises a pneumatic system, hydraulic system, electrical actuation, or mechanical actuation, or actuation via an airbag system.

13. The system of any of the preceding claims, further comprising a tape connection positioned at a forward portion of the beam.

14. The system of any of the preceding claims, wherein the hinge associated with the beam comprises a side hinge.

15. A retractable sheave system for positioning a cable across an aircraft runway surface, comprising:

a foundation (12) along a side of the aircraft runway surface, the foundation comprising a cavity therein,

a beam (14) configured to be positioned within the cavity,

a lifting/ lowering mechanism associated with the beam;

wherein when the lifting/ lowering mechanism configures the beam in a lowered position, the beam rests within the cavity and is flush with the aircraft runway surface, and wherein when the lifting/lowering mechanism configures the beam in a raised position, at least a forward portion of the beam raises above the runway surface, wherein the retractable sheave system is mounted at a runway edge.

16. The system of claim 15, wherein the raising system comprises a rear hinge (20) and a lifting/lowering mechanism (16) that allows the beam to raise or lower when the lifting/lowering mechanism is activated.17. The system of claim 15, wherein the raising system comprises a hydraulic system, electrical actuation, mechanical actuation, or actuation via an airbag system.