[0005] In addition, the existing fall protection systems usually protect the crane operator by securing the harness to the crane platform. However, this type of fall protection does not properly protect the operator from injury during the fall. It has been noted that securing the harness above the shoulder of the operator may be a better way of preventing any injury during the fall. This type of fall protection system requires a rigid and stable structure that has a height which is much higher than the overall crane height.

[0006] Further, most of the existing fall protection systems require a flat ground or a fixed and rigid structure to be mounted on for stability. These systems are thus not suitable for use in some operations because most crane operations are invariably carried out on rough terrain such as slope or soft soil environments. Moreover, the existing fall protection system may have other shortcomings, e.g. sagging of wire, unacceptable falling clearance, short working range.

[0007] A need therefore exists to provide a fall protection device that seeks to address at least some of the problems above or to provide a useful alternative.

SUMMARY

[0008] According to a first aspect of the present invention, there is provided a fall protection device comprising:

a base; ~~and~~

a frame member connected to the base and operable between a contracted first position and an extended second position relative to the base; and

a drive mechanism mounted to the frame member for moving the frame member between the contracted first position and the extended second position,

wherein the base is adaptable based on a datum supporting the fall protection device.

[0009] The base may be adapted to be mounted to a structure of a crane.

[0010] The base may be adapted to be mounted to a boom of the crane.

[0011] The base may be adapted to be mounted to an outrigger of the crane.

[0012] The base may be adapted to be mounted to a ground.

[0013] The base may comprise at least one adjustment member for adapting to a profile of the ground.

[0014] The frame member may be slidably connected to the base.

[0015] The frame member may be pivotably connected to the base.

[0016] The frame member may comprise a plurality of elongated arms, the plurality of elongated arms being in sliding engagement with each other.

[0017] The frame member may be telescopically extendable.

[0018] ~~The fall protection device may further comprise a drive mechanism for moving the frame member between the first and second positions.~~

[0019] The fall protection device may further comprise a locking mechanism for fastening the frame member to the base in the second position.

[0020] According to a second aspect of the present invention, there is provided a fall protection system comprising:

at least two devices as claimed in any one of the preceding claims; and

an elongated beam connecting the frame members of the at least two devices.

[0021] The elongated beam may be an I-beam.

[0022] The elongated beam may comprise a stopper at a first end and a second end of the elongated beam.

[0023] According to a third aspect of the present invention, there is provided a method for protecting a person against a fall, the method comprising suspending the person using the device as provided in the first aspect or the system as provided in the second aspect.

[0024] According to a fourth aspect of the present invention, there is provided a method of installing a fall protection device, the method comprising the steps of:

adapting a base of the fall protection device to a datum supporting the fall protection device;

mounting the base to the datum; and

extending a frame member connected to the base from a contracted first position to an extended second position relative to the base by actuating a drive mechanism mounted to the frame member.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] Embodiments of the invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

[0026] Figure 1A shows a schematic diagram illustrating a fall protection device according to an example embodiment.

[0027] Figure 1B shows a schematic diagram illustrating the fall protection device of Figure 1A in which the post member is at a lowered (i.e. contracted) position.

[0028] Figure 2A shows a schematic diagram illustrating a fall protection device according to an alternate embodiment.

[0029] Figure 2B shows a schematic diagram illustrating a fall protection device of Figure 2A in which the retractable frame is at a lowered (i.e. contracted) position.

[0030] Figure 3A shows a schematic diagram illustrating a perspective view of a fall protection system according to an example embodiment.

[0031] Figure 3B shows a schematic diagram illustrating a front view of a fall protection system of Figure 3A.

[0032] Figure 4 shows a schematic diagram illustrating a perspective view of a fall protection system according to a further example embodiment.

CLAIMS

1. A fall protection device comprising:

a base; ~~and~~

a frame member connected to the base and operable between a contracted first position and an extended second position relative to the base; and

a drive mechanism mounted to the frame member for moving the frame member between the contracted first position and the extended second position,

wherein the base is adaptable based on a datum supporting the fall protection device.

2. The fall protection device as claimed in claim 1, wherein the base is adapted to be mounted to a structure of a crane.

3. The fall protection device as claimed in claim 2, wherein the base is adapted to be mounted to a boom of the crane.

4. The fall protection device as claimed in claim 2, wherein the base is adapted to be mounted to an outrigger of the crane.

5. The fall protection device as claimed in claim 1, wherein the base is adapted to be mounted to a ground.

6. The fall protection device as claimed in claim 5, wherein the base comprises at least one adjustment member for adapting to a profile of the ground.

7. The fall protection device as claimed in any one of the preceding claims, wherein the frame member is slidably connected to the base.

8. The fall protection device as claimed in any one of claims 1 to 6, wherein the frame member is pivotably connected to the base.

9. The fall protection device as claimed in any one of the preceding claims, wherein the frame member comprises a plurality of elongated arms, the plurality of elongated arms being in sliding engagement with each other.

10. The fall protection device as claimed in claim 9, wherein the frame member is telescopically extendable.

~~11. The fall protection device as claimed in any one of the preceding claims, further comprises a drive mechanism for moving the frame member between the first and second positions.~~

~~12~~11. The fall protection device as claimed in any one of claims 8 to ~~11~~10, further comprises a locking mechanism for fastening the frame member to the base in the second position.

~~13~~12. A fall protection system comprising:

at least two devices as claimed in any one of the preceding claims; and

an elongated beam connecting the frame members of the at least two devices.

~~14~~13. The fall protection system as claimed in claim ~~13~~12, wherein the elongated beam is an I-beam.

~~15~~14. The fall protection system as claimed in any one of claim ~~13~~12 or ~~14~~13, wherein the elongated beam comprises a stopper at a first end and a second end of the elongated beam.

~~16~~15. A method for protecting a person against a fall, the method comprising suspending the person using the device as claimed in any one of claims 1 to ~~12~~11 or the system as claimed in any one of claims ~~13~~12 to ~~15~~14.

~~17~~16. A method of installing a fall protection device, the method comprising the steps of:

adapting a base of the fall protection device to a datum supporting the fall protection device;

mounting the base to the datum; and

extending a frame member connected to the base from a contracted first position to an extended second position relative to the base by actuating a drive mechanism mounted to the frame member.