fall occur, the brake assembly within the device is automatically engaged by a centrifugal clutch assembly, which gradually and quickly stops the worker's fall by gradually and quickly stopping the rotation of the drum. As the rotation of the drum is stopped, additional cable is prevented from being paid out of the housing to stop the fall of the worker. Some self-retracting lifelines are sealed to prevent contaminants from interfering with the braking or locking mechanism.

Another type of safety device commonly used is a descender or a controlled descent device, which generally include a braking mechanism to allow the worker to slowly descend to a safe location.

For the reasons stated above and for other reasons stated below, which will become apparent to those skilled in the art upon reading and understanding the present specification, there is a need in the art for a shuttle for use with a fall protection assembly that is less prone to contaminants interfering with its operation.

Summary

The above-mentioned problems associated with prior devices are addressed by embodiments of the present invention and will be understood by reading and understanding the present specification. The following summary is made by way of example and not by way of limitation. It is merely provided to aid the reader in understanding some of the aspects of the invention.

~~In one embodiment, a fall protection safety device including a braking mechanism comprises a first component, a second component configured and arranged to move relative to the first component, and at least one magnet operatively connected to one of the components and another of the components being at least partially made of a non-ferromagnetic and electrically conductive material. The at least one magnet and the non-ferromagnetic and electrically conductive material creating an electromagnetic field force when the second component moves at a rate greater than a predetermined rate relative to the first component.~~

~~In one embodiment, a fall protection safety device including a braking mechanism comprises a housing, a pawl, and a magnet. The housing is configured and arranged to move along a support structure being from the group consisting of a rail, a track, and a cable and being made of a non-ferromagnetic and electrically conductive material. The pawl is pivotally connected to the housing and is configured and arranged to move from a disengaged position into an engaged position when the housing moves along the support structure at a rate greater than a predetermined rate to lock the housing onto the support structure. The magnet is~~

According to a first aspect of the present invention, there is provided a fall protection safety device including a braking mechanism, comprising: a first component from the group consisting of a rail, a track, and a cable being at least partially made of a non-ferromagnetic and electrically conductive material; and a second component configured and arranged to move relative to the first component, the second component including a pawl configured and arranged to pivot from a disengaged position into an engaged position when the second component moves along the first component at a rate greater than a predetermined rate to lock the second component onto the first component, at least one magnet being operatively connected to the pawl, the at least one magnet and the non-ferromagnetic and electrically conductive material of the first component creating an electromagnetic field force when the second component moves at a rate greater than a predetermined rate relative to the first component thereby creating repulsive forces between the at least one magnet and the first component to assist in moving the pawl from the disengaged position into the engaged position.

According to a second aspect of the present invention, there is provided a fall protection safety device including a braking mechanism, comprising: a housing configured and arranged to move along a support structure, the support structure being from the group consisting of a rail, a track, and a cable and being made of a non-ferromagnetic and electrically conductive material; a pawl pivotally connected to the housing and configured and arranged to move from a disengaged position into an engaged position when the housing moves along the support structure at a rate greater than a predetermined rate to lock the housing onto the support structure; and a magnet operatively connected to the pawl such that when the housing moves at an increased rate repulsive forces between the magnet and the support structure assist in moving the pawl from the disengaged position into the engaged position.

~~operatively connected to the pawl such that when the housing moves at an increased rate repulsive forces between the magnet and the support structure assist in moving the pawl from the disengaged position into the engaged position.~~

As disclosed herein~~In one embodiment~~, a fall protection safety device comprises a housing, a drum, at least one magnet, and a lifeline. The drum is rotatably operatively connected to the housing and rotates in a first direction and a second direction. The at least one magnet is operatively connected to one of the housing and the drum, and another of the housing and the drum is at least partially made of a non-ferromagnetic and electrically conductive material. The lifeline is operatively connected to the drum. The intermediate portion of the lifeline is at least partially wound about the drum and the second end extends outward from the housing. The lifeline is paid out from the housing when sufficient tension is placed on the lifeline thereby rotating the drum. A repulsion force between the at least one magnet and the non-ferromagnetic and electrically conductive material reduces a rate at which the drum rotates in at least one of the first direction and the second direction.

Brief Description of the Drawings

The present invention can be more easily understood, and further advantages and uses thereof can be more readily apparent, when considered in view of the detailed description and the following Figures in which:

Figure 1 is a side perspective view of a pawl of a shuttle constructed according to the principles of the present invention;

Figure 2 is a bottom perspective view of a shuttle constructed according to the principles of the present invention including the pawl shown in Figure 1;

Figure 3 is a top perspective view of the shuttle shown in Figure 2;

Figure 4 is a side view of the shuttle shown in Figure 2 operatively connected to a rail in a locked position;

Figure 5 is a side perspective view of a first shuttle and a second shuttle operatively connected to a rail;

Figure 6 is a front view of the first and second shuttles shown in Figure 5 operatively connected to a rail;

Figure 7 is a side cross-section view of the first and second shuttles taken along the lines 7-7 in Figure 6, the first shuttle being in an unlocked position and the second shuttle being in a locked position;