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[54]	Title:	FIRE ESCAPE BY THREE PULLEYS	
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[57]	Abstract:	This invention disclosed a fire escape safety device which can be used by a person in lowering himself from a building along a cable in a controllable descent path. The device includes a pair of spaced-slide plates having guide pulleys in permanent position and a brake pulley in movable position. The cable is held about the guide pulleys and brake pulley in a serpentine path wherein the slippage of the slide plates relative to the cable can be regulated closely by controlling the relative freedom of the brake pulley and guide pulleys thus the rate of descent path is controllable by the user when descending himself towards the ground.	

SPECIFICATION

FIRE ESCAPE SAFETY DEVICE

TECHNICAL FIELD OF THE INVENTION:

This invention relates in general to the field of safety devices, and more particularly to a safety device which slides relative to a cable being attached to a building to permit a person to descend by himself/herself.

BACKGROUND OF THE INVENTION:

All multi-story buildings are provided with stairs or elevators to both gain access to the upper floors and permit a person to leave the upper floors when it is desired. Due to dangers inherent in buildings of multi-story construction, building codes and fire codes have been developed by governmental, insurance and safety officials to regulate construction and to design safe means of egress from such buildings.

The building and safety codes generally require the construction of suitable fire stairs and/or exits, fire towers or similar types of fire-resistant means of egress. However, despite the previous attempts to render buildings safe for egress in times of emergency, fire reports abound with statistics of persons injured or killed when trapped within the buildings wherein they are unable to reach the

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stairs, fire stairs and/or exits installed in the building.

5 In smaller buildings, prior building workers in
the art have developed emergency means of egress such
as fire ropes, fire ladders, folding ladders and
other types of portable escape means which could
10 permit a person to escape through a window or roof
top to thereby reach the ground without the need to
use the building stairways. Others have attempted to
solve the problem of emergency egress from tall
buildings by providing cables which position
exteriorly of the building and which have reels or
slides for descent purposes. The prior art cable and
15 reel types of construction have proved cumbersome in
construction and quite difficult in operation when
attempting to regulate the rate of descent relative
to the cable.

20 **SUMMARY OF THE INVENTION:**

It is therefore the object of this invention to
provide a fire escape safety device which functions
25 along a cable being secured to the building to permit
a person to lower himself to the ground at a
controlled rate of speed.

Another object of this invention is to provide
a safety device incorporating a slide pulleys having
30 guide pulleys and brake pulley rotatively supported
therein with the guide pulleys and brake pulley being
arranged to form a serpentine path of travel of a
cable therewithin for descent control purposes.

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Other objects and advantages of this utility model will be fully understood upon reading the following detailed description taken in conjunction with the appended drawings, wherein:

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BRIEF DESCRIPTION OF THE DRAWINGS:

Figure 1 is a perspective view of the fire escape safety device in accordance with the present invention;

10

Figure 2 is another perspective view of the fire escape safety device with a partially cut-out portion showing a transversely provided elongated slot thereon;

15

Figure 3 is a side elevational view of one slide plate showing the device in normally non-operative position;

Figure 4 is another side elevational view of one slide plate showing the device in operative position;

20

Figure 5 is an example of body securing means used with the device which secured the body of a person when lowering himself to the ground; and

Figure 6 is an example of a reel wherein the cable is wound when the safety device is not in used.

25

DETAILED DESCRIPTION OF THE INVENTION:

Referring now to the drawings, there is shown the fire escape safety device 1 of the present invention for lowering a person from a building. Safety device 1 comprises a pair of spaced-slide plates 2a,2b to define therein a gap therebetween within which encloses a plurality of pulleys in the manner hereinafter more fully set forth. Slide plates

30

2a,2b have aligned elongated slots 3 transversely provided on the left side of the longitudinal axis of slide plates 2a,2b.

5 Referring now to Figures 3 and 4, it will be seen that a pair of upper and lower guide pulleys 4a, 4b with respect to elongated slots 3 are rotatively supported within spaced-slide plates 2a,2b. Upper and lower guide pulleys 4a,4b are permanently positioned
10 on the right side of the longitudinal axis of slide plates 2a,2b. Also, it will be seen that a brake pulley 5 is rotatively supported within spaced-slide plates 2a,2b by a pin 6. Pin 6 is extendedly received in aligned elongated slots 3 causing brake pulley 5
15 to move through elongated slot 3 in lateral direction.

It will be noted that cable 7 which is received within spaced-slide plates 2a,2b passes through top
20 opening of spaced-slide plates 2a,2b, travels around and holds about the upper and lower pulleys 4a,4b and brake pulley 5, in serpentine path and exits through bottom opening of spaced-slide plates 2a,2b. Upper end of cable 7 is adapted to be attached to building
25 when the safety device 1 is in used while the lower end of cable 7 extends downwardly to the ground.

A descent control means 8 is connected to brake pulley 5 for movement between an operative and non-
30 operative position along cable 7. As seen in Figure 3, the safety device 1 is in normally non-operative position wherein cable 7 is gripped in-between brake pulley 5 and pair of upper and lower guide pulleys 4a,4b. As seen in Figure 4, the safety device 1 is in

operative position wherein cable 7 is loosen from its gripping position by the brake pulley 5 and pair of upper and lower guide pulleys 4a,4b. Descent control means 8 comprises a connecting lever 9 having its upper end pivotally connected to slide plate 2a by pivoting pin 9a, a link arm 10 having its forward end fixedly attached to pin 6 of brake pulley 5 while its rearward end fixedly attached to connecting lever 9, and a control handle 11 fixedly attached to the lower end of connecting lever 9. A spring means 12 is mounted within slide plates 2a,2b. Spring means 12 urges brake pulley 5 towards to normally non-operative position through connecting lever 9 and link arm 10. Spring means 12 includes a pair of extended opposed arms 12a and 12b. One of opposed arm 12a is secured to slide plate 2a,2b by holding pin 13 while other opposed arm 12b is connected to control handle 11 to provide the actuating operation of slide plates 2a,2b in its operative and non-operative position.

When activated in operative position, control handle 11 is pulled towards slide plates 2a,2b causing brake pulley 5 to move away from pair of upper and lower guide pulleys 4a,4b through elongated slots 3, thus cable 7 is loosen in-between brake pulley 5 and pair of upper and lower guide pulleys 4a,4b causing pair of slide plates 2,2a to travel freely along cable 7. In reducing the rate of speed of slide plates 2a,2b along cable 7 or wants to stop slide plates 2a,2b, control handle 11 is released from its operative position wherein spring means 12 normally goes back rearwardly urging control handle 11 to its non-operative position urging brake pulley

5 to move rearwardly towards pair of upper and lower guide pulleys 4a,4b in gripping cable 7 therebetween.

5 Safety device 1 includes a triangularly formed metal bar 14 being securely held at the lower end portion of slide plates 2a,2b by a lower pin 15 fixedly held therein. A pair of opposed bar 16a,16b having one opposed bar 16a being connected to one of slide plate 2b while other opposed bar 16b is connected to link arm 10. Opposed bar 16a,16b serves as carrying handle of the safety device 1. Safety device 1 also includes a pair of lower tubular bar 17a,17b, each being pivotally supported therein by corresponding brackets 18a,18b. Lower tubular bars 17a,17b can be folded upwardly when safety device 1 is not in used and is supported by brackets 18a,18b in its perpendicular position with respect to slide-plates 2a,2b when unfolded which serves as arm rest by the user in holding the control handle 11.

20 Safety device 1 includes a body securing means 19 removably connected to slide plates 2a,2b for securing a user's body when descending himself towards the ground. Body securing means 19 comprises a harness 20 having a conventional releasable hook fastener 20a adapted to be connected or hooked to triangularly formed metal bar 14 of slide plates 2a,2b.

30 As shown in Figure 6, cable 7 can be wound on a reel 21 when the safety device 1 is not in used. In case of emergency, cable 7 is unwind from reel 7 in order to be used with slide plates 2a,2b.

5 In order to use the safety device 1, one end of
cable 7 is securely attached to a building part such
as window frame while the other end of cable 7
extends downwardly to the ground. Pair of slide
plates 2a,2b is positioned exteriorly of the
building. The user (not illustrated) then secure the
securing means 19 about him, such as by employing the
harness 20. Once the harness 20 is secured around the
body of the user, it can be now fastened to the slide
10 plates 2a,2b.

15 After the harness is secured to the slide plates
2a,2b, the user can exit through a window of the
building and allow his weight to be fully supported
exteriorly of the building by the slide plates 2a,2b
as it is locked upon the cable 7 in non-operative
position. Control handle 11 is then pulled slowly
towards the user to decrease the gripping engagement
of the cable 7 in between brake pulley 5 and pair of
20 upper and lower guide pulleys 4a,4b. The slide plates
2a,2b can now be freely slide along cable 7 due to
the weight of the user. The rate of descent speed of
the slide plates 2a,2b relative to the cable 7 can be
controlled either faster or slower by the user by
25 means of the control handle 11.

30

CLAIM:

1. A fire escape safety device for lowering
5 person from a building, said safety device comprising:

a pair of spaced-slide plates having aligned
elongated slots transversely provided on the left side
of the longitudinal axis thereof;

a pair of upper and lower guide pulleys with
10 respect to said elongated slots rotatively supported
within said spaced-slide plates, said upper and lower
guide pulleys being permanently positioned on the
right side of the longitudinal axis of said slide
plate;

15 a brake pulley rotatively supported within said
spaced-slide plates by a pin which is extendedly
received in said elongated slot causing said brake
pulley to move in lateral direction;

a cable received within said spaced-slide
20 plates and being held about by said upper and lower
guide pulleys and brake pulley in serpentine path,
said cable having one end adapted for attaching to
said building and the other end extending downwardly
to the ground;

25 a descent control means connected to said brake
pulley for movement between an operative and non-
operative position along said cable;

a spring means mounted within said slide plates
urging said brake pulley towards said non-operative
30 position; and

a body securing means removably connected to
said slide plate for securing the user's body when
descending himself towards the ground.

2. A fire escape safety device in accordance with claim 1, wherein said descent control means comprising a connecting lever having its upper end pivotally connected to said slide plate, a link arm having its forward end fixedly attached to said pin of said brake pulley while its rearward end fixedly attached to said connecting lever, and a control handle fixedly attached to the lower end of said connecting lever.

3. A fire escape safety device in accordance with claim 1, wherein said spring means including a pair of extended opposed arms, one of said opposed arm being fixedly secured to said slide plates by holding pin while the other opposed arm being connected to said control handle.

4. A fire escape safety device in accordance with claim 1, wherein said body securing means is a harness.

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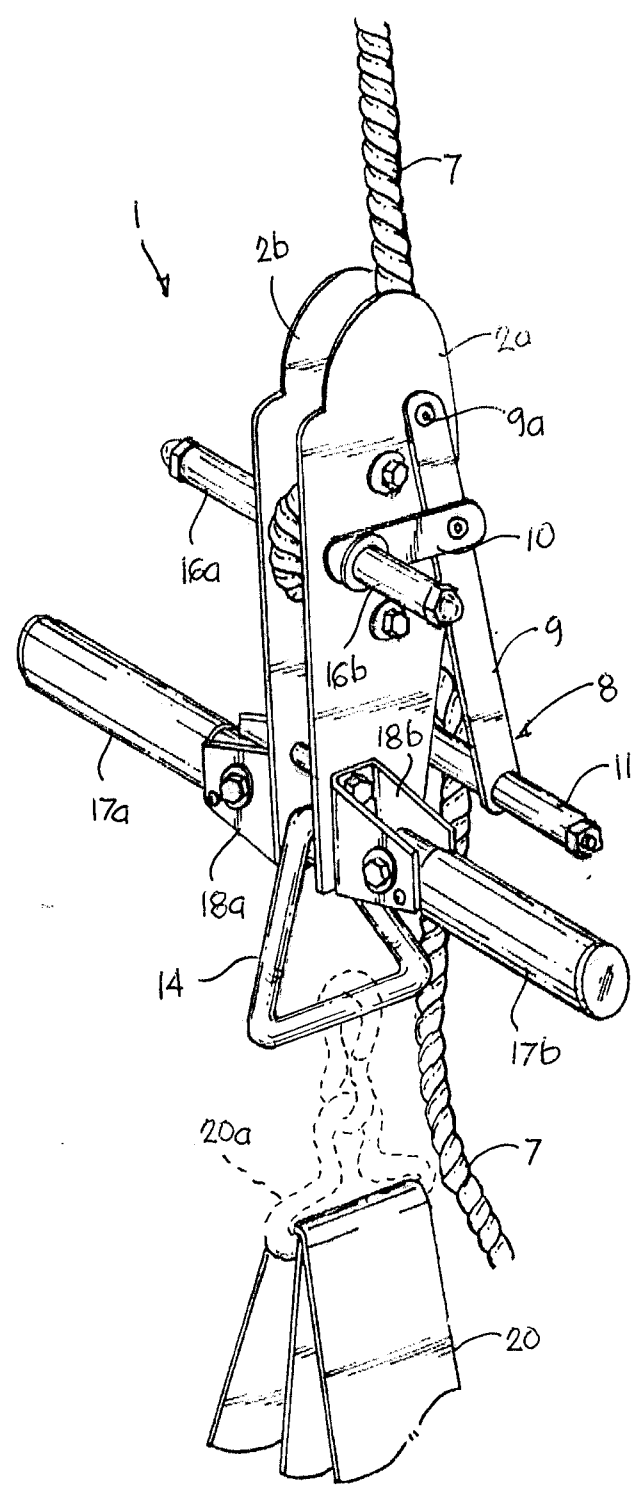
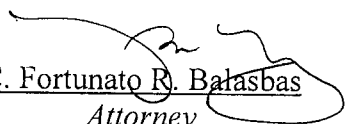


Figure 1

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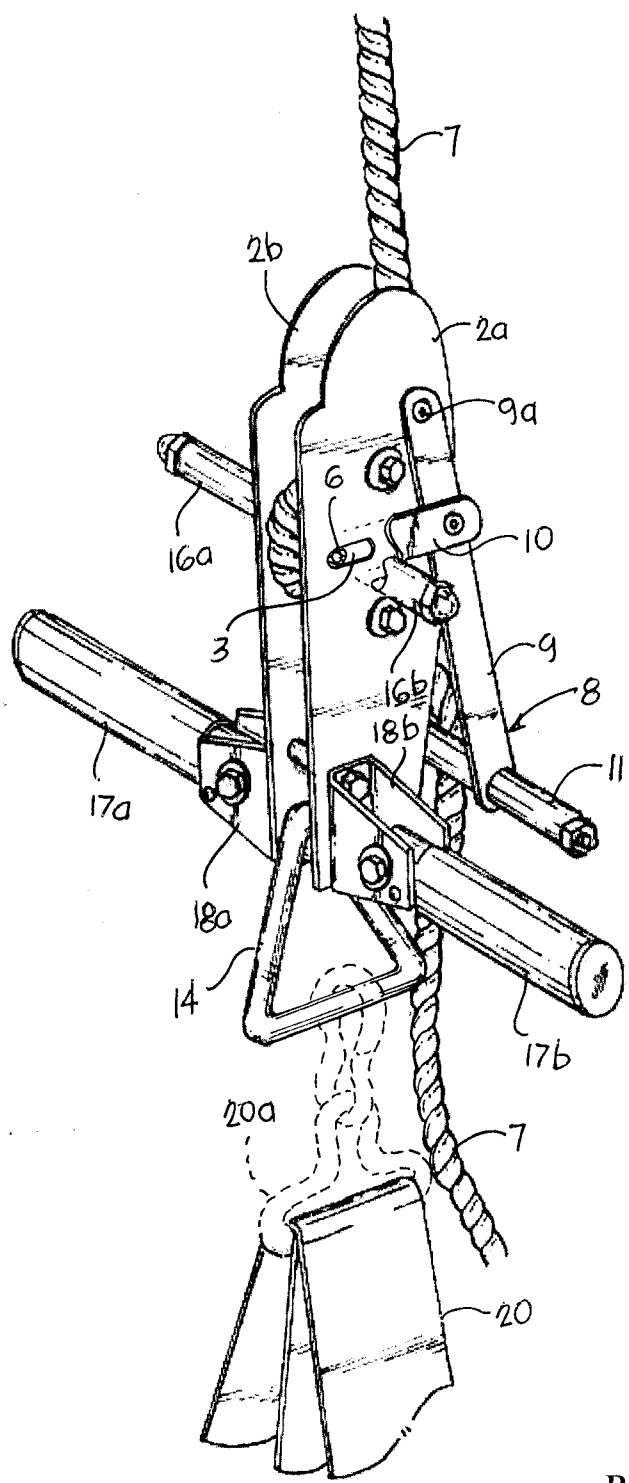


Figure 2

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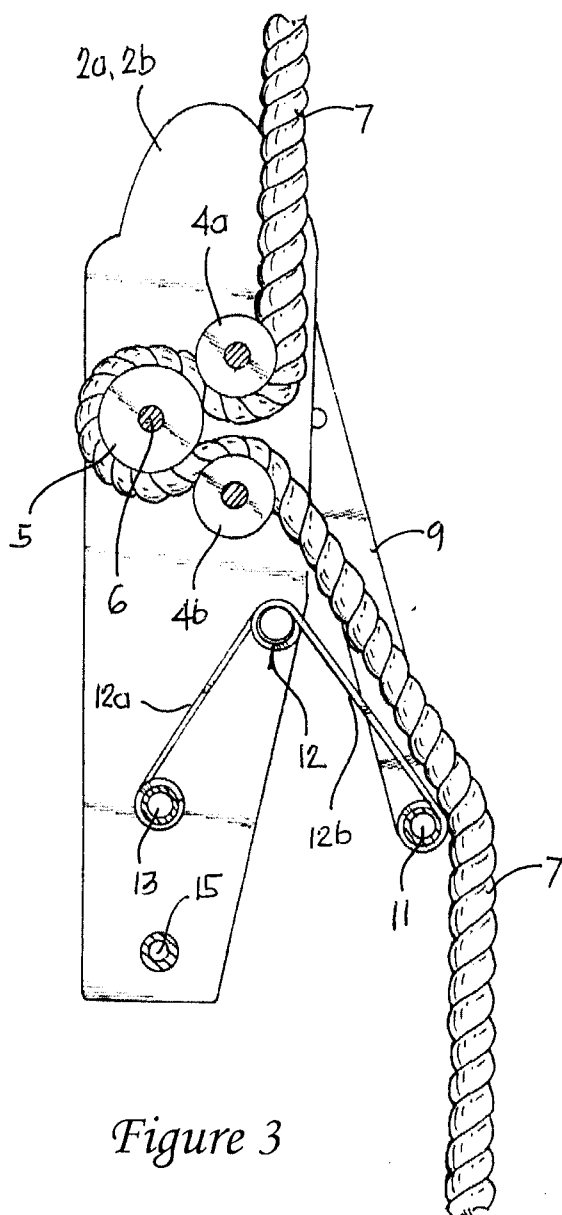


Figure 3

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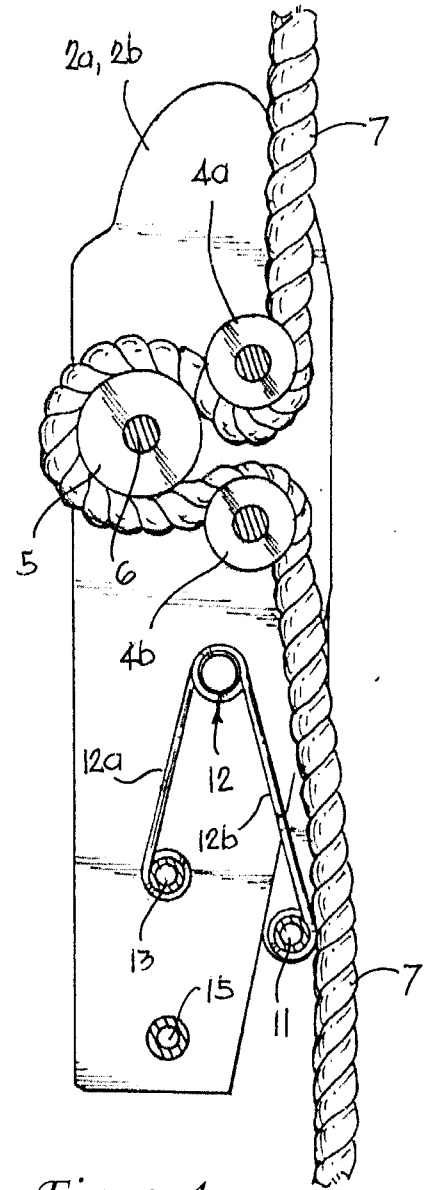


Figure 4

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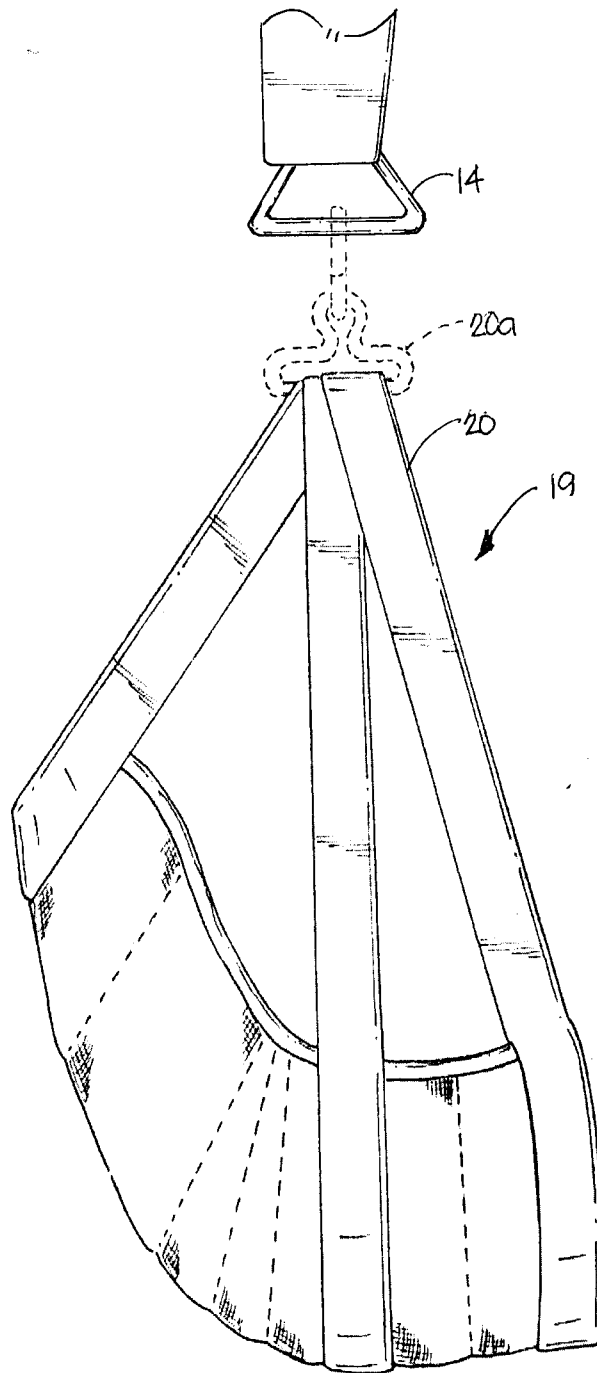


Figure 5

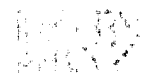
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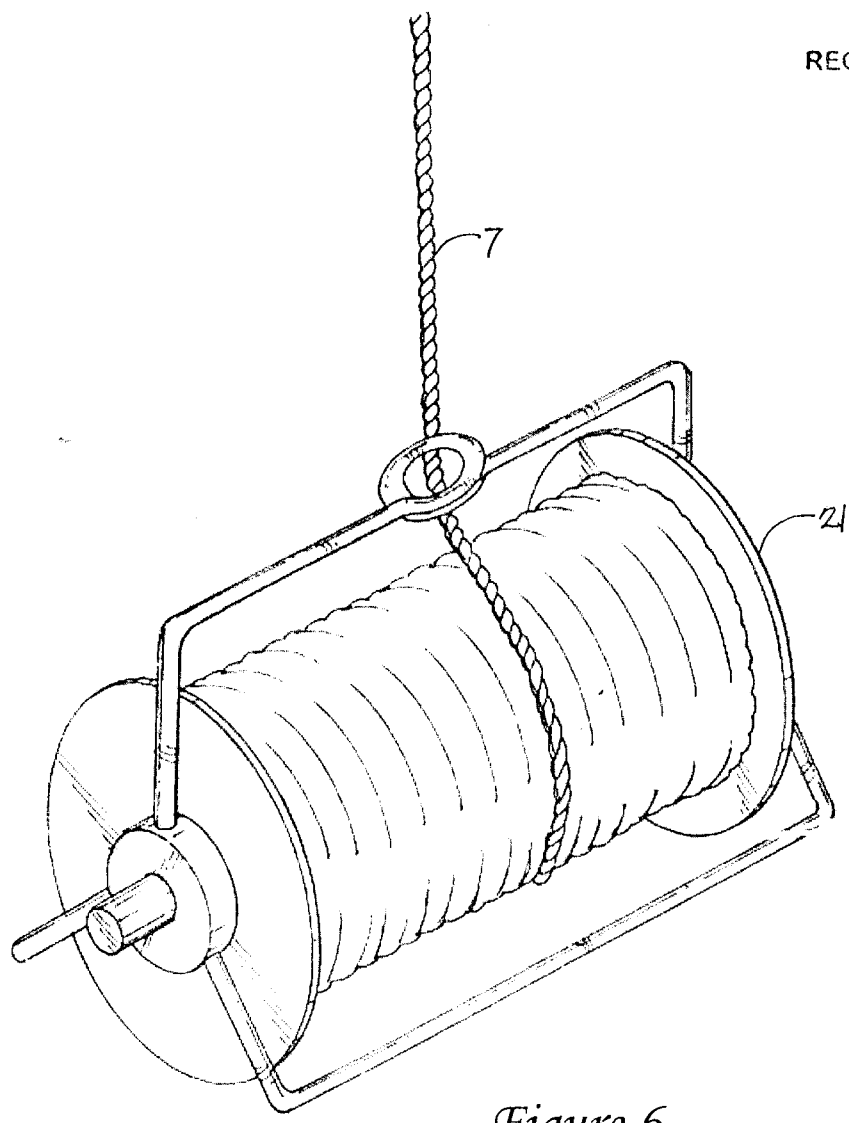
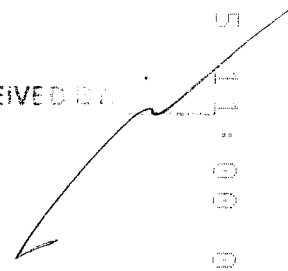


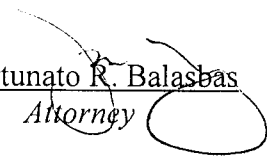
Figure 6

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