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# A SECURITY BARRIER

## Field of Invention

The invention relates to security barriers, particularly those adopting flexible cord materials such as webbing, tape, rope, cable etc. In particular, the invention relates to movable barriers having said cordon members attached thereto for deployment of the cord to strain off a specific zone.

## Background

In many industries, it is necessary to use demarcation barriers such as to prevent the public venturing into such zones for security, safety or logistical purposes. Further, in many obvious instances, it is not necessary to have physical barriers preventing access but merely to indicate that the zone has been demarcated from general traffic. Further still, said zones may vary in position or shape or may be temporary, and so leading to the need to conveniently establish such demarcated zones and then remove said barriers as necessary.

What is lacking in conventional security barriers, however, is ease of deployment due to the weight of the barrier, the ability to move it conveniently and quickly, and the number of said barrier units that is required given the necessity to cordon a variety of zones within the demarcated area.

It would therefore be advantageous to make such security barriers more convenient to manoeuvre and more flexible in which to demarcate several areas or extended areas within a shorter space of time.

## Summary of Invention

In a first aspect, the invention provides a security barrier unit comprising a housing having wheels mounted adjacent a base of said housing; a stabilising portion

mounted adjacent to said base; a plurality of cassettes, said cassettes having selectively extendable cord, wherein; said cassettes are mounted to substantially vertical surfaces of said housing.

In a second aspect, the invention provides a cassette for storing and retracting cord comprising a casing; a spool of cord engaged with and wound around a mandrel within said casing; said mandrel rotationally biased to retract the cord; a first directional member for engaging the cord so as to change direction from tangential with the spool to a second directional member; the second directional member for engaging the cord so as to change direction from the first directional member to a direction out of a plane defined by the spool.

In a preferred embodiment, the cassette provides a profiled inner mandrel about which the spring is coiled, said mandrel having a large diameter ratio and dual purpose profile. This may have the advantage of reducing the rotational spring tension necessary to coil the spring about it's outer circumference and also provides a slide in engagement for the inner springs 'D' shaped location point which is difficult under normal circumstances to ensure it stays engaged.

In a preferred embodiment, said housing comprises at least one surface inclined to the vertical plane. In a more preferred embodiment, said at least one inclined surface progressively projects away from a central vertical axis of said housing as said surface approaches said base.

In a preferred embodiment, on application of a horizontal wind load from a pre-determined direction said housing is subjected to a net downward force.

In a preferred embodiment, said housing includes an upper surface inclined to the horizontal plane. Similar to the embodiment incorporating vertically inclined surfaces, a horizontal surface inclined to the horizontal plane, such as about 5 degrees, may also provide a downward force component on application of a wind load.

In a preferred embodiment, said stabilising portion including a weight located adjacent to a base of said housing. In a more preferred embodiment, said stabilising portion including a selectively engage-able weight, such as the addition of water or sand. Such a stabilising portion may permit the addition of 5, 10 or 20 kilogram subject to the desired application and available volume of said portion to receive sand and/or water.

To provide for greater flexibility and mobility, said unit may include a tow bar for attachment to a vehicle. In a more preferred embodiment, said wheels may be adapted for vehicular speeds and so making said unit more applicable to vehicular deployment.

As will be apparent to the skilled addressee, the cord may be equally be applicable to the use of webbing, rope, cable or other flexible elongate materials that permit repeated cycles of winding and unwinding from a relatively small diameter spool.

Brief Description of Drawings

It will be convenient to further describe the present invention with respect to the accompanying drawings that illustrate the possible arrangements of the inventions. Other arrangements of the inventions are possible, and consequently, the particularity of the accompanying drawings is not to be understood as superseding the generality of the preceding description of the invention.

Figure 1A is an asymmetric view of the security barrier housing according to one embodiment of the present invention;

Figure 1B is a reversed asymmetric view of a security barrier housing of Figure 1A;

Figure 2 is an exploded asymmetric view of the cassette according to a further embodiment of the present invention;

Figure 3 is an asymmetric view of the cassette of figure 1 with the casing removed;

Figure 4 is a detailed view of the directional members according to a further embodiment of the present invention;

Figure 5 is a detailed view of the rotationally bias mandrel according to one embodiment of the present invention;

Figure 6 is a detailed view of the second directional member according to a further embodiment of the present invention;

Figure 7 is the cassette according to a further embodiment of the present invention;

Figures 8A to 8D is various views of a wall bracket according to a further embodiment of the present invention;

Figure 9 is a schematic plan view of the cassette according to a further embodiment of the present invention, and;

Figures 10A and B are detail plan views of the speed limiter according a further embodiment of the present invention.

Description of Preferred Embodiment

Figures 1A to 1E show one embodiment of the security barrier housing 1, according to the present invention. The security barrier housing 1 is a selectively mobile device having handles 20 which may be used to tip the housing 1 above the wheel 10 so that the housing 1 may be transported to the desired location

The housing 1 includes cassettes 5 which are supported within the vertical sides 75A, B, C of the housing. In this embodiment, there are up to six cassettes mounted within the vertical faces of the housing. Further, in this embodiment, the cassettes 5 are removable so that they can be used either separately from the housing or whilst mounted within the housing. Each cassette has an orifice 55 from which a cordon material may be extended. Said cordon material may be mounted to a fixed support (not shown) or for use with multiple housings 1 may be engaged with purposed built engagement portions 50 so that the housings 1 can be used in a free standing form.

The housings may be manufactured from a polymer material such as polypropylene, MDPE, HDPE or other plastic material suitable for use both inside or outside. To this end, the housing may be manufactured from materials dedicated to the purpose for indoor use or external use or as previously mentioned, from material that is equally applicable both indoors and outdoors.

For outdoor use and in this embodiment, the housing has an upper surface 80 having drain hole 15 so that accumulated rain will drain easily and so further applicability to outside use. Similarly, the base includes drain hole 25 for any rain that accumulates within the housing 1. Further in this embodiment, the housing 1 includes useful spaces within the housing 27, 28. Further in this embodiment, 1 27 is open with a enclosed space 28 having a door 40 pivotably open through hinges 45. The door 40 may be opened using a handle and further may include an undercut lock 70 for securing the door 40 in placed. Thus, the housing 1 may also be useful for securely storing fire extinguishers, tools, flash lights or other safety equipment, for outdoor use, or brochures, stationery or personal effects for inside use.

Further included in this embodiment, is a stabilizing portion 30 which is used to secure the housing 40 in place, particularly for use outside where wind loads may topple the housing, which is a notable flaw of systems of the prior art. In this embodiment, a stabilizing portion 30 is conveniently put into a storage area whereby water sand or other particular matter may be poured within the unit 30 through office 35. The stabilizing portion 30 may also be pivotably mounted within the housing 1 for ease of removal of the material. Thus whether for internal or external use, the housing may be moved to the desired area and only then be weighted down by the addition of material into the stabilizing portion 30 and so avoid the problems of prior systems that must be manhandled with stabilizing weights already and fixably mounted to the device.

The housing 1 is further adapted in this embodiment to resist wind blots when used outside. By having inclined faces 75A, B, C shaped in a frusto-conical shape when viewed inclined wind bearing on the housing 1 will forcibly be directed around the housing 1 due to the frusto-conical shape of the housing. Further, the inclined faces

75A, B, C direct a component of the wind load downwards assisting in the stability of the housing. Further, the upper surface 80 is inclined 60 to the horizontal plane. In this embodiment, the inclination is about 3 degrees which may be sufficient to further add to the stabilizing effect by directing a component of the wind blot downwards and further provides a surface which may be sufficiently flat to retain objects placed on top of the housing 1. A ridge around the top surface 80 is also provided such that should an object be placed on the surface 80, it will be retained by the ridge without falling from the inclined surface.

As mentioned, the upper surface 80 may be used for retaining objects. Said surface may also be used as a writing surface which may be valuable for outside use, such as for personnel on an airport tarmac where a writing surface may be lacking or alternatively, in an indoor use, for instance, during an exhibition whereby exhibitors may used the housing 1 to secure areas within the exhibition hall, and further be able to use the top surface for writing of orders, etc.

A further aspect of the housing 1 is the addition of a tow bar (not shown) which may be mounted adjacent to the handles 20. In this embodiment, the tow bar may be attached to the back of a vehicle for transportation by the vehicle. In this case, the wheel pin will be selected for vehicular use and in any event, further increases the flexibility of the housing 1 for easy deployment such as around an airport tarmac or transportation outside between distant locations.

According to this embodiment, the invention may provide a highly visible and rapidly deployed, aerodynamically designed queue management barrier system. The housing of said security barrier unit may be shaped to take advantage of high or low pressure air flowing over the sculptured outer elevations, which may lead to a venturi suction effect.

Devices of the prior art, when subjected to strong gusts of winds exceeding 25 knots on an airport apron, for example, may require considerable amounts of weight added to the base to achieve the accumulative pillar weight required, which may be as

high as 110kgs. It follows that the lifting of such weight may be in breach of certain occupational health and safety policies. Accordingly, the benefit provided by this embodiment of the present invention, whereby the selective adding of weight, and the benefit of applied wind loads making use of a downward component may have distinct advantage of such prior art devices.

Figure 2 shows an exploded view of one cassette 5 which is adapted to be mounted to the housing 1.

The cassette is assembled within a casing 85, which comprises an outer casing 90, to which is internally mounted a two part inner casing 87, 95. In this embodiment, the casing 85 is tear drop shaped, having an enlarged area, into which a spool of webbing (not shown) is wound about a mandrel 100, and a smaller area into which is mounted the feeder assembly.

The mandrel is assembled from a core 105 which is fixed to a pin 107, with the pin 107 mounted to one part of the casing 95. The core 105 is located within a two part mandrel drum 110, 115. Intermediate the drum 110, 115 and the core is located a rotational spring (not shown) which provides a retracting force to the webbing such that on release of the extended webbing, the spring applies a force to retract the webbing back within the cassette 5.

To direct the webbing from the mandrel through the casing 85, so it may be extended outwards, is the feeder assembly. Here a first roller 120, rotating about an axle 125, receives the webbing from the spool and directs from a tangential direction to a second roller 130, rotating about a second axle 135. The second roller 130 then directs it to an exit member 140. The exit member 140 includes a rod 145 which is inclined to the plane defined by the casing 95. The rod receives the webbing from the second roller 130 turning the webbing and directing it out of plane from the spool and subsequently through an orifice 150 in the outer casing 90. Thus, whilst the webbing is stored compactly within the plane of the spool, the feeder assembly comprising the first and second rollers and the exit member cumulatively change the direction of the webbing so

as to direct it out of plane from the spool. This has a range of advantages, not the least of which are:

i) Compactness within the casing 85 which, *inter alia*, aids in the mounting of the cassette 5 onto the housing 1;

ii) Increases the capacity of the cassette 5 so that greater lengths of webbing can be included for instance up to 25 metres;

iii) Avoidance of jamming of the webbing on retraction, which in turn allows greater spring load to accommodate the increased length of webbing.

Mounted to the webbing may also be the return bracket 155 which prevents the webbing from fully retracting into the casing 85, and a mounting clip 160 to facilitate the mounting of the webbing to a stationary device or other housing 1.

Figure 3 shows the cassette 5 with the outer casing removed. Here, the webbing 165 is shown mounted to the mandrel (not shown), and placed within the inner casing members. In this view, the leading end 166 of the webbing is yet to have the mounting clip attached. Figure 4 shows the cassette with a part of the inner casing 87 removed, so that the feeder assembly can be seen. As discussed, the feeder assembly comprises a first roller 120 which receives the webbing directly of the spool 165, and directs it to a second roller 130. In this embodiment, the rollers may be straight rollers. Alternatively, tapered rollers may be used to further assist in preventing jamming of the webbing on retraction. The webbing is then directed to the exit member which has been removed for clarity.

Further removing components, Figure 5 shows the mandrel 100 with the cover removed showing the rotational spring 175 mounted between the core 105 at mounting point 180 and the drum 115. In this orientation, rotation of the drum through retraction of the webbing primes the spring against the non-rotating core 105 sufficiently to retract the webbing back within the cassette. In one embodiment, nylon bearings may be used to facilitate wear resistant rotation of the mandrel.

As shown in Figure 6, the exit member 140 comprises an inclined rod 145 mounted to the inner casing 95. The rod 145 is arranged so as to receive the webbing and gradually "turn" it so as to direct the webbing out of the plane of the spool. In this embodiment, the exit member incorporates a fixed rod of a material selected to withstand the significant wear associated with repeated use extension and retraction of the webbing, without adding significantly to frictionally resistance. In a further embodiment, the surface of the rod may be hardened steel surface. Alternatively, the surface may include a low friction wear resistance surface such as Teflon or a ceramic material. In a further embodiment, the rod may be replaced by a roller.

Figure 7 shows a further overview of the spool 165 mounted to the mandrel 100. The webbing is then directed through the feeder assembly, and eventual exiting of the cassette (not shown).

Figures 8A to D show a wall mounted bracket 195 for mounting a leading end of the webbing to a fixed object. The wall mounted bracket 195 comprises two parts 200, 220, one part 200 arranged to be affixed to a wall (not shown) which provides a pivotal point for the slotted fascia panel 220. The fascia panel 220 is held in its pivotal position by a spring loaded pin 205, 210, 215. The fascia panel 220 is intended to flap up and down such that, when not in use, gravity and a magnet (not shown) hold the two components 200, 220 together to ensure as close an engagement as possible against the wall. By engaging a buckle (not shown) in the fascia panel slot 225, said engagement automatically causes the panel 220 to tilt outward from the bottom to enable a correctly angle engagement of the buckle.

Figures 9, 10A and 10B show an alternative arrangement to the use of a first roller. Here a speed limiter 230 is placed in line with the webbing 187 leading from the spool 165. The speed limiter 230 comprises a pair of conventional rollers 235, 250. Intermediate the two rollers 235, 250 is located a rotational member 240 having an offset axle 245 about which the rotational member is free to rotate within the range limited by contact with the two rollers 235, 250. Accordingly, the rotational member

oscillates between the limits of the two rollers 235, 250 subject to whether the webbing is being extended or retracted.

By way of example, Figure 10A shows the position of the rotational member 240 when the webbing is extended 257. If the speed of extension of the webbing exceeds the desired amount, friction will rotate 258 the rotational member about the offset axle, jamming 260 the webbing 255 against the respective roller 235 and so preventing further extension until released. Similarly, as shown in Figure 10B, on retraction the rotational member 240 is rotated 267 until it jams 270 the webbing 265 against the opposing roller 250.

In alternative arrangement, the degree of speed limitation may be controlled by biasing the axle 245 of the rotational member with a spring (not shown), such that the member 240 is only rotated once a pre-determined speed is reached; the stiffer the spring the higher the speed of the webbing before the speed limiter is engaged.

Claims :

1. A security barrier unit comprising:

a housing having wheels mounted adjacent a base of said housing;
a stabilising portion mounted adjacent to said base;
a plurality of cassettes, said cassettes having selectively extendable cord, wherein;
said cassettes are mounted to substantially vertical surfaces of said housing.

2. The security barrier unit according to claim 1, wherein said housing comprises at least one surface inclined to the vertical plane.

3. The security barrier unit according to claim 2, wherein said at least one inclined surface progressively projects away from a central vertical axis of said housing as said surface approaches said base.

4. The security barrier unit according to any one of the preceding claims, wherein on application of a horizontal wind load from a pre-determined direction said housing is subjected to a net downward force.

5. The security barrier unit according to any one of the preceding claims , wherein said housing includes an upper surface inclined to the horizontal plane.

6. The security barrier unit according to any one of the preceding claims, wherein said stabilising portion including a weight located adjacent to a base of said housing.

7. The security barrier unit according to claim 6, wherein said stabilising portion includes a selectively engagable weight.

8. The security barrier unit according to claim 7, wherein said selectively engageable weight includes a receptacle for receiving a volume of water.

9. The security barrier unit according to claim 7, wherein said selectively engageable weight includes a receptacle for receiving a volume of particulate matter such as sand.

10. The security barrier unit according to any one of the preceding claims, wherein said plurality cassettes are selectively detachable and re-attachable from said housing.

11. The security barrier unit according to any one of the preceding claims, wherein there are at least three cassettes.

12. The security barrier unit according to claim 11, wherein there are at least six cassettes.

13. The security barrier unit according to any one of the preceding claims, wherein said unit includes a tow bar mounted adjacent to an upper surface of said housing.

14. The security barrier unit according to any one of the preceding claims, wherein each cassette is according to any one of claims 16 to 24.

15. The security barrier unit according to any one of the preceding claims, wherein said housing is frusto-conical in plan shape.

16. A cassette for storing and retracting cord comprising

a casing;

a spool of cord engaged with and wound around a mandrel within said casing said mandrel rotationally biased to retract the cord;

a first directional member for engaging the cord so as to change direction from tangential with the spool to a second directional member;
the second directional member for engaging the cord so as to change direction from the first directional member to a direction out of a plane defined by the spool.

17. The cassette according to claim 16, wherein said out of plane direction is perpendicular to said plane.

18. The cassette according to claim 16, wherein said cord includes any one of : rope, chain, tape, webbing, strip.

19. The cassette according to any one of the preceding claims, further including a third directional member intermediate the first and second directional member.

20. The cassette according to claim 19, wherein at least one of said first, second and third directional member includes a roller.

21. The cassette according to any one of the preceding claims, wherein said rotational bias on said mandrel is provided by a rotational spring mounted between a core and a drum of said mandrel such that rotation of said drum varies the force applied by said rotational spring.

22. The cassette according to any one of the preceding claims, wherein said at least one roller is a tapered roller.

23. The cassette according to any one of the preceding claims, wherein said casing includes an orifice through which the cord projects.

24. The cassette according to any one of the preceding claims, wherein said cassette is mountable to a security barrier unit according to any one claims 1 to 15.