LOAD SECUREMENT DEVICE

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ABSTRACT

A load securement device for securing a load to a load support structure.
LOAD SECUREMENT DEVICE

RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 61/154,089 filed on Feb. 20, 2009.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] This application discloses and claims embodiments generally related to cargo control devices, and more particularly, to a load securement device.

[0004] 2. Description of the Related Art

[0005] Traditionally, various tie-down devices such as rope, straps, hooks, and winches have been utilized to secure cargo and various other types of loads. Employing the use of these conventional devices unnecessarily requires the use of at least two persons. Typically, one person is required to hold one end of the securing means, e.g., rope, while another is required to simultaneously pull an opposite end thereof in order to tighten the securing means around the load. Subsequently, both ends must be securely fastened or anchored to a load support apparatus in such a manner to ensure the securing means is suitably tensioned around the load, and to ensure the load is stabilized and secured to the load support apparatus.

[0006] The prior art does not disclose a load securement device comprising a flexible linking device having opposed magnetic attachment means.

[0007] Accordingly, a need has arisen for a load securement device adapted to allow a single individual to secure a load to a load support structure via a flexible linking device in a quick, easy, and efficient manner. The development of the load securement device fulfills this need.

[0008] This application presents claims and embodiments that fulfill a need or needs not yet satisfied by the products, inventions and methods previously or presently available. In particular, the claims and embodiments disclosed herein describe a load securement device for securing a load to a load support structure, the load securement device comprising a flexible linking device, the flexible linking device comprising an adjustable elongated strap, the elongated strap having opposing ends to which an attachment means is attached, the attachment means is magnetic or magnetized, and an adjustment mechanism for tensioning and removing tension from the elongated strap wherein the load securement device providing an anticipated and nonobvious combination of features distinguished from the products, inventions and methods pre-existing in the art. The applicant is unaware of any product, method, disclosure or reference that discloses the features of the claims and embodiments disclosed herein.

SUMMARY OF THE INVENTION

[0009] Therefore, it is an object of the present invention to provide a load securement device for securing a load to a support structure.

[0010] It is another object of the present invention to provide a load securement device which includes a flexible linking device comprising an elongated flexible linking means.

[0011] It is another object of the present invention to provide an adjustment mechanism for tensioning and removing tension from the elongated strap.

[0012] It is another object of the present invention to provide a load securing device having opposed ends to each of which an attachment means is attached.

[0013] It is another object of the present invention to provide an attachment means that is magnetic or magnetized.

[0014] It is still another object of the present invention to provide an elongated strap being adjustable in length to suit a size of a load.

[0015] It is yet another object of the present invention to provide an attachment means which includes a body to which a magnet is suitably mounted thereto.

[0016] In accordance with one embodiment of the present invention, a load securing device is disclosed. The load securing device comprises a flexible linking device capable of securing a load to a load support structure, such as the cargo bay of truck or another motor vehicle. The flexible linking device comprises an elongated flexible linking means tensioned or tightened via an adjustment mechanism so as to ensure the load is secured to the load support structure. The elongated flexible linking means includes opposed ends to each of which an attachment means is attached. The attachment means are each defined as being magnetic or magnetized, thereby being attracted to any magnetically attractive or magnetically conductive surface.

[0017] An alternate embodiment is disclosed wherein the attachment means each comprises a body to which a magnet is suitably mounted thereto.

[0018] The use of the present invention allows a single individual to secure a load to a load support structure via the flexible linking device in a quick, easy, and efficient manner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The advantages and features of the present invention will become better understood with reference to the following more detailed description and claims taken in conjunction with the accompanying drawings, in which like elements are identified with like symbols, and in which:

[0020] FIG. 1 is a perspective view of a load securing device, according to the preferred embodiment of the present invention;

[0021] FIG. 2 is a partial perspective view of the flexible linking means illustrating an attachment means attached to opposing ends thereof, according to the preferred embodiment of the present invention;

[0022] FIG. 3 is a perspective view of the load securing device shown in use, according to the preferred embodiment of the present invention;

[0023] FIG. 4 is a perspective view of the load securing device utilized to secure a load to the cargo bay of a truck, according to one embodiment of the present invention;

[0024] FIG. 5 is a partial side elevational view of one end of the strap, according to one embodiment of the present invention;

[0025] FIG. 6 is a partial perspective view of the strap illustrating an attachment means attached to opposing ends thereof, according to an alternate embodiment of the present invention;

[0026] FIG. 7 is a partial side elevational view of one end of the strap, according to an alternate embodiment of the present invention; and
FIG. 8 is a perspective view of the load securement device shown in use, according to an alternate embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Detailed Description of the Figures

With reference to FIGS. 1-3, and 5, a load securement device 10 is disclosed, according to one embodiment of the present invention. The load securement device 10 comprises a flexible linking device 20 capable of securing a load 12 to a load support structure 100, such as the cargo bay 130 of a truck 120 or other motor vehicle, a metal pallet supported upon a plurality of casters (not shown) or the like. The flexible linking device 20 comprises a flexible linking means 21, the flexible linking means 21 preferably comprising an elongated strap 22 tensioned or tightened via an adjustment mechanism 30, shown herein as a ratchet mechanism 31, so as to ensure the load 12 is secured to the load support structure 100. It is envisioned flexible linking means 21 may alternatively include but is not limited to, e.g., rope, chain tie-down devices, bungee cord, winch hooks, cargo straps utilized with truck semi-trailers, crane hooks, and shipping container hooks. The strap 22 may be constructed of any suitable material that provides the required strength such as high quality polyester or polypropylene. The suitable material provides adequate strength for the webbing of the strap 22 and aids to eliminate stretching of the webbing while the strap 22 is being tightened.

Any conventional ratchet mechanism 31 may be utilized to tighten the strap 22. Thus, the ratchet mechanism 31 allows the length of the strap 22 to be adjusted in order to suit a size of the load 12. Generally ratchet mechanisms comprise a toothed wheel on which a pawl rests, and an actuating lever 32 for operating the ratchet. The lever 32 operates between a locked closed position wherein the strap tension is maintained and a locked open position which releases the tension load on the strap 22 and allows the strap 22 to be freely pulled in the non-tensioning direction. The operation of the lever 32 between these two positions results in tightening of the strap 22. The pawl is positioned so that it can move over the teeth of the ratchet, however, once the actuating lever 32 is in the locked closed position, the pawl engages the teeth of the ratchet thereby preventing movement of the strap 22 in the non-tensioning direction.

The strap 22 includes a loop 24 formed at each end 25, 26 thereof to which an attachment means 40, 42, respectively, is attached. The attachment means 40, 42 are each defined as being magnetic or magnetized, thereby being attracted to any magnetically attractive or magnetically conductive surface. Thus, positioning attachment means 40, 42 onto a magnetically attractive or a magnetically conductive surface ensures fixed engagement by attachment means 40, 42 with the magnetically attractive or magnetically conductive surface. According to an exemplary embodiment, strap 22 is positioned over the load 12 in an overlapping manner, and the attachment means 40, 42 are each fixedly engaged to a respective attachment means receiving surface 101, wherein each the respective attachment means receiving surface 101 is magnetically attractive or magnetically conductive.

The attachment means 40, 42 each further comprises an elongated planar body 44, the body 44 being magnetic or magnetized, and wherein the body 44 having an upper end 45 attached to its respective loop 24, and a lower curved end 46. The body 44 further includes an upper surface 44a and a lower surface 44b. The lower curved end 46 of each attachment means 40, 42 provides a hook portion for fixedly engaging a respective attachment means receiving surface 101 or hook receiving surface 102 of the load support structure 100, wherein the hook receiving surface 102 is magnetically attractive or magnetically conductive. More specifically, and as illustrated in FIG. 3, the body 44 of each attachment means 40, 42 is engaged against a respective upper edge 113, 137 of the sidewalk 112, 136 of the load support structure 100, or more specifically, cargo bay 130, whereby attraction between each body 44 with each respective upper edge 113, 137 ensures the engagement of the body 44 with each respective upper edge 113, 137.

Referring now more specifically to FIG. 4, in accordance with one embodiment of the present invention, the lower curved end 46 of first attachment means 40 is fixedly engaged against a front surface 132a of the forward sidewalk 132, proximal the upper edge 133 thereof, of the cargo bay 130 of the truck 120, and lower surface 44b of the body 44 of first attachment means 40 is engaged against the upper edge 133 of the forward sidewalk 132. Attraction between the body 44 of first attachment means 40 and the upper edge 133 ensures the engagement of the body 44 of first attachment means 40 with the upper edge 133, and attraction between the lower curved end 46 of first attachment means 40 with the front surface 132a of the forward sidewalk 132 ensures the engagement of the lower curved end 46 of first attachment means 40 with the front surface 132a of the forward sidewalk 132.

The lower curved end 46 of second attachment means 42 is fixedly engaged against a rear surface 136a of the rear sidewalk 136, proximal the upper edge 137 thereof, of the cargo bay 130 of the truck 120, and lower surface 44b of the body 44 of the second attachment means 42 is engaged against the upper edge 137 of the rear sidewalk 136. Attraction between the body 44 of the second attachment means 42 and the upper edge 137 ensures the engagement of the body 44 of the second attachment means 42 with the upper edge 137, and attraction between the lower curved end 46 of second attachment means 42 with the rear surface 136a of the rear sidewalk 136 ensures the engagement of the lower curved end 46 of second attachment means 42 with the rear surface 136a of the rear sidewalk 136.

In order to ensure the load 12 is secured to the load support structure 100, the lever 32 of ratchet mechanism 31 is actuated to tighten tension in strap 22. Once strap 22 is sufficiently taut to secure the load 12 to the load support structure 100, the lever 32 is operated to a locked closed position, thereby maintaining strap 22 tension. To release the strap 22 tension, the lever 32 is operated to a locked open position, thereby releasing the tension load on the strap 22 and allowing the strap 22 to be freely pulled in the non-tensioning direction. The attachment means 40, 42 are disengaged and the flexible linking device 20 is removed from atop the load 12.

Referring now to FIGS. 6-8, an alternate embodiment of the present invention is disclosed wherein the attachment means 40, 42 each comprises a body 44 having an upper surface 44a and a lower surface 44b. The body 44 further includes a magnet 140 suitably mounted thereto. The magnet 140 is preferably a planar plate 142 suitably mounted to the lower surface 44b of the body 44 of each attachment
The body 44' has an upper end 45' attached to a respective loop 24 of the strap 22, and a lower curved end 46'. The lower curved end 46' of each attachment means 40', 42' provides a hook portion for fixedly engaging a respective attachment means receiving surface 101.

Referring now more specifically to FIG. 8, similar to the preferred embodiment described hereinabove, the body 44' of each attachment means 40', 42' of the alternate embodiment is engaged against a respective upper edge 113, 137 of the sidewall 112, 136 of the load support structure 100, whereby attraction between each magnet 140 of each body 44' with each respective upper edge 113, 137 ensures the engagement of each magnet 140, and hence each body 44', with each respective upper edge 113, 137. The lever 32 of the ratchet mechanism 31 is actuated to tighten tension in strap 22, thereby ensuring load 12 is secured to the load support structure 100.

The magnetic or magnetized attachment means 40, 42 and magnet 140 may comprise a wide variety of permanent magnets including rare earth magnets, alnico magnets, ceramic magnets, and flexible magnets. Other suitable magnets for use as described hereinabove may include rare earth magnets such as Samarium Cobalt and neodymium iron classes.

Ceramic or Ferrite magnets are made of a composite of iron oxide and barium or strontium carbonate. These materials are readily available and at a lower cost than other types of materials used in permanent magnets making it desirable due to the lower cost. Ceramic magnets are produced using pressing and sintering, but are brittle and require diamond wheels if grinding is necessary. These magnets are made in different grades. Ceramic grade 1 is an isotropic grade having equal magnetic properties in all directions. Ceramic grades 5 and 8 are anisotropic grades. Anisotropic magnets are magnetized in the direction of pressing. The anisotropic method delivers the highest energy product among ceramic magnets at values up to 3.5 MGOe (Mega Gauss Oersted). Ceramic magnets possess a good balance of magnetic strength, resistance to demagnetization and low cost.

Flexible magnets are magnets made of flexible materials that are bonded with a magnetic material. Flexible magnets are advantageous in that they may be bent, coiled, twisted, or otherwise machined into almost any desired shape without depleting their magnetic field. Flexible magnets are corrosion resistant, do not need a coating, are easily machined, and may be bonded with a high magnetic energy material.

Rare earth metal magnets are composed of more expensive magnetic material. Rare earth magnets may be coated onto a flexible material, e.g., plastic or nylon, and will provide excellent magnetic strength and flexibility. These magnets can also be manufactured so as to be very thin.

Alnico magnets are made primarily from a composite of aluminum, nickel, and cobalt with small amounts of other elements added to enhance the properties of the magnet. Alnico magnets possess excellent temperature stability, good resistance to demagnetization due to shock, but are easily demagnetized. Alnico magnets are produced by two typical methods, namely, casting or sintering. Sintering offers superior mechanical characteristics, whereas casting delivers higher energy products (up to 5.5 MGOe) and allows for the design of intricate shapes. Alnico magnets are made in different grades. Grades 5 and 8, which are anisotropic grades, are two very common grades. Anisotropic grades provide for a preferred direction of magnetic orientation. Alnico magnets have been replaced in many applications by ceramic and rare earth magnets.

The use of the present invention allows a single individual to secure a load 12 to the load support structure 100 via the flexible linking device 20 in a quick, easy, and efficient manner.

It is envisioned that the various embodiments, as separately disclosed, are interchangeable in various aspects, so that elements of one embodiment may be incorporated into one or more of the other embodiments, and that specific positioning of individual elements may necessitate other arrangements not specifically disclosed to accommodate performance requirements or spatial considerations.

It is to be understood that the embodiments and claims are not limited in its application to the details of construction and arrangement of the components set forth in the description and illustrated in the drawings. Rather, the description and the drawings provide examples of the embodiments envisioned, but the claims are limited to the specific embodiments. The embodiments and claims disclosed herein are further capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purposes of description and should not be regarded as limiting the claims.

Accordingly, those skilled in the art will appreciate that the conception upon which the application and claims are based may be readily utilized as a basis for the design of other structures, methods, and systems for carrying out the several purposes of the embodiments and claims presented in this application. It important, therefore, that the claims be regarded as including such equivalent constructions.

Furthermore, the purpose of the foregoing Abstract is to enable the U.S. Patent and Trademark Office and the public generally, and especially including the practitioners in the art who are not familiar with patent and legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The Abstract is neither intended to define the claims of the application, nor is it intended to be limiting to the scope of the claims in any way. It is intended that the application is defined by the claims appended hereto.

Therefore, the foregoing description is included to illustrate the operation of the preferred embodiment and is not meant to limit the scope of the invention. As one can envision, an individual skilled in the relevant art, in conjunction with the present teachings, would be capable of incorporating many minor modifications that are anticipated within this disclosure. The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the Claims appended hereto and their equivalents. Therefore, the scope of the invention is to be broadly limited only by the following Claims.
What is claimed is:

1. A load securement device for securing a load to a load support structure, the load securement device comprising:
   a flexible linking device, the flexible linking device comprises:
   an elongated flexible linking means, the elongated flexible linking means having opposing ends;
   an attachment means, the attachment means is attached to each of the opposing ends of the elongated flexible linking means; and
   an adjustment mechanism for tensioning and removing tension from the elongated flexible linking means.
2. The load securement device of claim 1, wherein the elongated flexible linking means is adjustable in length to suit a size of the load.
3. The load securement device of claim 1, wherein the adjustment means is magnetic or magnetized.
4. The load securement device of claim 1, wherein the adjustment mechanism is a ratchet mechanism.
5. The load securement device of claim 3, wherein the attachment means each further comprises an elongated planar body being magnetic or magnetized, the body comprising:
   an upper surface;
   a lower surface, the lower surface engages a respective attachment means receiving surface of the load support structure;
   an upper end, the upper end is attached to a respective opposed end of the elongated flexible linking means; and
   a lower curved end, the lower curved end of each the attachment means provides a hook portion for fixedly engaging the respective attachment means receiving surface or a hook receiving surface of the load support structure, wherein the receiving surface or the hook receiving surface is magnetically attractive or magnetically conductive, and whereby attraction between each the lower curved end and the body with the respective receiving surface ensures the engagement of each the lower curved end and the body with the respective receiving surface.
6. The load securement device of claim 1, wherein the elongated flexible linking means is a strap.
7. A load securement device for securing a load to a load support structure, the load securement device comprising:
   a flexible linking device, the flexible linking device comprises:
   an elongated flexible linking means, the elongated flexible linking means having a first end opposing a second end;
   a first attachment means, the first attachment means is suitably attached to the first end of the elongated flexible linking means;
   a second attachment means, the second attachment means is suitably attached to the second end of the elongated flexible linking means; and
   an adjustment mechanism for tensioning and removing tension from the elongated flexible linking means.
8. The load securement device of claim 7, wherein the elongated flexible linking means is adjustable in length to suit a size of the load.
9. The load securement device of claim 7, wherein the adjustment mechanism is a ratchet mechanism.
10. The load securement device of claim 7, wherein the first attachment means and the second attachment means are magnetic or magnetized.
11. The load securement device of claim 7, wherein the first end of the elongated flexible linking means includes a loop formed thereat to which the first attachment means is attached, and wherein the second end of the elongated flexible linking means includes a loop formed thereat to which the second attachment means is attached.
12. The load securement device of claim 11, wherein the first attachment means and the second attachment means each further comprises an elongated planar body, the body comprising:
   an upper surface;
   a lower surface;
   an upper end, the upper end is attached to a respective loop of the elongated flexible linking means; and
   a lower curved end, the lower curved end of each the first attachment means and the second attachment means provides a hook portion for fixedly engaging the respective attachment means receiving surface or a hook receiving surface of the load support structure, wherein the receiving surface or the hook receiving surface is magnetically attractive or magnetically conductive.
13. The load securement device of claim 7, wherein the elongated flexible linking means is a strap.
14. A load securement device for securing a load to a load support structure, the load securement device comprising:
   a flexible linking device, the flexible linking device comprises:
   an elongated adjustable flexible linking means, the elongated adjustable flexible linking means having a first end opposing a second end;
   a first attachment means, the first attachment means is suitably attached to the first end of the elongated adjustable flexible linking means;
   a second attachment means, the second attachment means is suitably attached to the second end of the elongated adjustable flexible linking means; and
   an adjustment mechanism for tensioning and removing tension from the elongated adjustable flexible linking means.
15. The load securement device of claim 14, wherein the adjustment mechanism is a ratchet mechanism.
16. The load securement device of claim 14, wherein the first end of the elongated adjustable flexible linking means includes a loop formed thereat to which the first attachment means is attached, and wherein the second end of the elongated adjustable flexible linking means includes a loop formed thereat to which the second attachment means is attached.
17. The load securement device of claim 16, wherein the first attachment means and the second attachment means each further comprises an elongated planar body, the body comprising:
   an upper surface;
   a lower surface;
   an upper end, the upper end is attached to a respective loop of the elongated adjustable flexible linking means; and
   a lower curved end, the lower curved end of each the first attachment means and the second attachment means provides a hook portion for fixedly engaging the respective attachment means receiving surface or a hook receiving surface of the load support structure, wherein
the receiving surface or the hook receiving surface is magnetically attractive or magnetically conductive.

18. The load securement device of claim 17, wherein the body includes a magnet suitably mounted thereto.

19. The load securement device of claim 14, wherein the elongated adjustable flexible linking means is a strap.

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