RETRACTOR HAVING ROTARY DAMPER AND PRODUCT DISPLAY UTILIZING SAME

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ABSTRACT

A retractor has a housing with a rotatable reel captured therein and a cable wound on the reel. A terminal end of the cable extends exteriorly of the housing and is extendable from the housing. The cable is retractable onto the reel by the force of a spring located in the housing. A rotary damper is connected to the reel for restricting the speed of rotation of the reel as the cable is retracted via the force of the spring. A product display utilizing the retractor and a method of tethering lightweight objects to displays are also disclosed.
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BACKGROUND OF THE INVENTION

[0001] The present invention relates to a retractor device having a retractable tether and a spring biased reel providing a retracting force on the tether to take up any slack in the tether and to automatically return the tether a wound storage position on the reel, and more particularly, the present invention relates to a constant pull retractor that can be utilized in product displays for tethering relatively-lightweight articles to displays.

[0002] It is common for otherwise loose objects to be secured to a display, shelf or like surface. For example, hair swatch samples may be secured with staples or the like to shelves in connection with the sale of hair dye products, electronic goods such as phones and cameras may be tethered to a display shelf, pens may be tethered to table tops, and security badges, keys, identification cards, lift tickets or the like may be tethered to a person or other object.

[0003] Examples of constant pull cable retractors that can be utilized for at least some of the above referenced purposes are disclosed by U.S. Pat. Nos. 5,124,685 and 6,419,175 B1 which are assigned to the assignee of the present application.

[0004] While the above referenced retractors function in a superior manner for their intended purposes, there remains a need for a retractor which can be utilized to tether relatively lightweight objects to displays and the like. For example, the tethered objects may include swatches of hair or the like that themselves provide very little resistance to the retracting force of the spring in the retractor.

SUMMARY OF THE INVENTION

[0005] The present invention provides a retractor having a housing with a retractable reel captured therein. A cable is wound on the reel and has a terminal end extending exteriorly of the housing such that the cable is extendable from the housing and is retractable onto the reel by the force of a spring located in the housing. A rotary damper is connected to the reel for restricting the speed of rotation of the reel as the cable is retracted via the force of the spring.

[0006] According to another aspect of the present invention, a product display having a sample object, or article, tethered to the display is provided. The display includes the use of the above referenced retractor with rotary damper.

[0007] According to a further aspect of the present invention, a method of tethering a relatively lightweight article to a product display is provided. A retractor is mounted to a surface of the product display, and an article is connected to an end fitting on a terminal end of the cable of the retractor. The speed of rotation of the reel of the retractor is limited by a rotary damper that is operatively connected to the reel. Thus, when the cable is automatically retracted into the housing by a spring, the rotary damper limits the speed of retraction to a desirable and safe rate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The foregoing and other objects, features and advantages of the present invention should become apparent from the following description when taken in conjunction with the accompanying drawings, in which:

[0009] FIG. 1 is a perspective view of a retractor according to the present invention;

[0010] FIG. 2 is a cross-sectional view of the retractor taken along line 2-2 of FIG. 1;

[0011] FIG. 3 is a cross-sectional view of the retractor taken along line 3-3 of FIG. 2; and

[0012] FIG. 4 is a cross-sectional view of the retractor taken along line 4-4 of FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Referring now to the drawings, FIG. 1 illustrates a retractor 10 that can be secured to a surface of a display, shelf or the like (not shown). Typically, the retractor 10 is connected to a mounting surface with double-sided adhesive tape, brackets, clips, screws, or like fasteners. The retractor 10 has a housing 12 with an exit port 14 through which a cable 16 can be extended and retracted. Alternate exit ports, such as port 18, can also be provided in the walls of the housing 12 to provide alternate retractor/cable configurations.

[0014] The cable 16 has a terminal end 20 with an end fitting 22. Preferably, the end fitting 22 prevents the terminal end 20 from being completely retracted into the housing 12 and provides a means of connecting the cable 16 to an object, article, product or the like (not shown) which is to be tethered to the housing 12. As illustrated, the end fitting 22 is a plate on which a piece of double-sided adhesive tape 24 is attached. Thus, an article, object, product or the like can readily be adhesively secured to the terminal end 20 of the cable 16. Of course, other end fittings can be utilized, such as, loops, rings, clips, fasteners or the like which permit mechanical connection of objects to the cable 16.

[0015] The opposite end 26 of the cable 16 is wound on a reel 28 mounted within the housing 12. In the illustrated embodiment, the reel 28 has a circular periphery (see FIG. 3) and rotates about an axis “A” (see FIG. 2) thereby permitting the cable 16 to be retracted into a compact coil configuration within the housing 12. Preferably, the reel 28 has a hollow central portion 30 that is concentric with axis “A” and that enables the reel 28 to be mounted for rotation about a cylindrical flange 32 extending inwardly from a wall of the housing 12.

[0016] A spring 34, preferably a constant force spring that has a memorized wound shape, is located within the housing 12 and provides a retracting force that automatically retracts the cable 16 onto the reel 28 to a fully retracted condition, for instance, as shown in FIGS. 1-3. Preferably, the reel 28 has a pair of hubs, 36 and 38, that each extend about axis “A”. The cable 16 is wound on hub 36, and a leading end 40 of the spring 34 is secured to hub 38. A remaining portion 42 of the spring 34 is captured within the housing 12 adjacent the reel 28. Preferably, the remaining portion 42 of the spring 34 is not attached about a hub; rather, it is freely positioned in a defined location within the housing 12.

[0017] One of the novel aspects of the retractor 10 according to the present invention is that a damper 44 is mounted to the housing 12 and is operatively connected to the reel 28.
to damp the rotary motion of the reel 28 when the cable 16 is retracted by the force of the spring 34. Preferably, the damper 44 is an oil-type rotary damper in which the viscosity of oil (not shown) contained within the body 46 of the damper 44 provides resistance to the rotation of the fins (not shown) of a rotor submerged in the oil. The rotor has a shaft 48 that connects to the reel 28 for rotation therewith. In the illustrated embodiment, the shaft 48 has an end tip that is oval in transverse cross-section and that engages the reel 28 via a complementary oval-shaped slot 50 formed in a wall 52 of the reel 28 extending transversely within the otherwise hollow central portion 30 of the reel 28. Thus, the shaft 48 is connected to the reel 28 along the axis of rotation “A” of the reel 28, and the reel 28 is only permitted to rotate at a speed determined by the damper 44. Of course, other types of dampers and rotary dampers can be utilized, for instance, dampers that utilize gears or frictionally engaging parts to provide a damping function.

[0018] In use, a tethered object is grasped by a person and pulled a distance from the housing 12. This causes a length of the cable 16 to be unwound from reel 28 and extend from the housing 16. Simultaneously, the spring 34 is caused to be wound onto the reel 28. Thus, as the cable 16 is unwound from hub 36, the spring 34 is wound in an opposite direction onto the hub 38. When the tethered object is released by the person, the spring 34 winds into its normal, memorized wound position as shown, for instance, in FIG. 4. This causes the cable 16 to be simultaneously wound onto the reel 28 to a final fully retracted position, for instance, as shown in FIG. 3.

[0019] If the tethered object is a relatively lightweight object, such as a swatch of hair or like article, a cable may be retracted at undesirable fast speeds. For instance, since the tethered object may provide little, if any, resistance to retraction, the retraction may occur at a rate that may result in damage or undesired wear to the tethered object, adjacent display, or retractor, or may cause the object to be disengaged from the cable. However, the retractor 10 according to the present invention prevents such undesirable retraction since the rotary damper 44 restricts the speed of retraction to an acceptable rate. Thus, a lightweight product, such as a swatch of hair, can be tethered to a shelf or display and can be retracted at a slow, safe, controlled pace. In addition, the retractor 10 according to the present invention can be constructed with a spring 34 that provides sufficient amounts of force for retracting relatively heavy objects, yet can also be used with lightweight objects due to the rotary damper 44.

[0020] If desired, the retractor 10 can include a swivel (not shown). For example, the swivel can be identical to that disclosed in U.S. Pat. No. 6,419,175 B1, the disclosure of which is herein incorporated by reference. Thus, the swivel can be secured in a stationary manner relative to a mounting surface of a shelf, display panel, or the like, and the housing 12 is permitted to pivot or rotate relative to the mounting surface. For example, when the cable 16 is pulled in different directions, the housing 12 rotates about the swivel such that the exit port through which the cable 16 extends through the housing 12 always points toward the direction of pull.

[0021] Thus, the above-described retractor 10 according to the present invention provides a unique manner of tethering relatively lightweight objects to a mounting surface. The unique construction of the retractor permits the efficient manufacture and assembly of relatively small sized retractors which can have relatively strong springs and a long service life.

[0022] According to other aspects of the present invention, a product display (not shown) and method for safely tethering lightweight articles to product displays are provided. The product display can include a display panel or shelf on which products, such as containers of hair dye, are supported or displayed. The retractor 10, as discussed above, is mounted with double sided adhesive tape or other fasteners such as clips, screws or the like to the shelf or panel. A sample article is connected to the end fitting 22 of the cable 16. Thus, the article is tethered to the display and can be retracted in a controlled, safe manner due to the rotary damper 44 of the retractor 10.

[0023] By way of example, and not limitation, the products can be containers of hair dye and the sample article can be swatches of hair. Thus, a consumer can readily handle and position a swatch of hair in a desired location to be viewed, for instance, in a mirror or the like, and thereafter, can release the swatch of hair for safe retraction by the retractor 10. A retractor 10 and different shade swatch of hair can be provided adjacent each corresponding shade of hair dye. Of course, this provides just one example of a product display, and the retractors 10 can be used with other products and for other purposes.

[0024] While a preferred retractor, product display and method have been described in detail, various modifications, alterations, and changes may be made without departing from the spirit and scope of the retractor according to the present invention as defined in the appended claims.

1. A retractor, comprising:
   a housing having a rotatable reel mounted therein;
   a cable wound on said reel and having a terminal end extending exteriorly of said housing, said cable being extendable from said housing and being retractable onto said reel;
   a spring located in said housing for retracting said cable onto said reel; and
   a rotary damper connected to said reel for damping rotary motion of said reel when said cable is retracted under force exerted by said spring.

2. A retractor according to claim 1, wherein said rotary damper includes a rotor having a shaft, and wherein said shaft is connected to said reel such that said reel can only rotate at a speed permitted by said rotor.

3. A retractor according to claim 2, wherein shaft has an end tip connected to said reel along an axis of rotation of said reel.

4. A retractor according to claim 3, wherein said rotary damper is an oil type rotary damper in which viscosity of oil contained within said damper provides resistance to rotation of said rotor.

5. A retractor according to claim 4, wherein said reel has a cable hub and a spring hub, and wherein said spring is a constant force spring with a first wound portion located in said housing remote from said reel and a second wound portion wound on said spring hub of said reel in an opposite direction relative to said first wound portion such that, as
said spring unwinds from said first wound portion, it winds onto said spring hub, and as said spring unwinds from said spring hub, it winds into said first wound portion.

6. A retractor according to claim 5, wherein said terminal end of said cable has an end fitting connectable to a sample product so that said sample product is tethered to said retractor.

7. A retractor according to claim 6, further comprising a swivel connected to said housing, said housing being rotatable relative to said swivel, whereby, when said swivel is secured to a surface, said retractor is pivotable relative to the surface.

8. A product display having a sample article tethered to the display, comprising a retractor connected to the display, said retractor having a housing with a reel mounted for rotation therein and a cable wound on said reel and having a terminal end extending exteriorly of said housing and connected to the article, said cable being extendable from said housing and automatically retractable onto said reel via the force of a spring located in said housing, and a rotary damper being connected to said reel within said housing for damping the rotation of said reel when said cable is retracted into said housing by said spring.

9. A product display according to claim 8, wherein said rotary damper includes a rotor having a shaft, and wherein said shaft is connected to said reel such that said reel can only rotate at a speed permitted by said rotor.

10. A product display according to claim 9, wherein shaft has an end tip connected to said reel along an axis of rotation of said reel.

11. A product display according to claim 10, wherein said rotary damper is an oil type rotary damper in which viscosity of oil contained within said damper provides resistance to rotation of said rotor.

12. A product display according to claim 8, wherein the display includes a shelf to which said retractor is connected.

13. A product display according to claim 8, wherein said retractor has a swivel, and wherein said housing is rotatable relative to said swivel, whereby, when said swivel is connected to a surface of the product display, said retractor is pivotable relative to said surface.

14. A product display according to claim 8, wherein said reel has a cable hub and a spring hub, and wherein said spring is a constant force spring with a first wound portion located in said housing remote from said reel and a second wound portion wound on said spring hub of said reel in an opposite direction relative to said first wound portion such that, as said spring unwinds from said first wound portion, it winds onto said spring hub, and as said spring unwinds from said spring hub, it winds into said first wound portion.

15. A method of tethering a lightweight article to a product display, comprising the steps of:

mounting a retractor to a surface of the product display, said retractor having a housing with a reel mounted for rotation therein and a cable wound on said reel and having a terminal end extending exteriorly of said housing, said cable being extendable from said housing and automatically retractable onto said reel via the force of a spring located in said housing;

connecting the article to an end fitting located on said terminal end of said cable; and

restricting the speed of rotation of said reel when said cable is automatically retracted into said housing by said spring by utilizing a rotary damper connected to said reel;

whereby lightweight articles can be safely retracted by said retractor.

16. A method according to claim 15, wherein said restricting step is accomplished by the use of a rotary damper having a rotor with a shaft that is connected to said reel along the rotational axis of said reel.

17. A method according to claim 16, wherein said rotary damper is an oil type rotary damper in which the viscosity of oil contained within said damper provides resistance to rotation of said rotor.

18. A method according to claim 16, wherein said spring is a constant force spring so that the retraction force exerted on said cable is constant regardless of how far the article is extended from said housing.

19. A method according to claim 18, wherein said retractor is mounted to the surface of the product display via a swivel that enables the retractor to pivot relative to the surface.

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