**TETHERED DEVICE HOLDER**

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**ABSTRACT**
A shell or case for holding a cell phone, with a releasable tether attached to the case, for quickly locating and retrieving the cell phone from the depths of a handbag or tote bag. A catch device with a push-button release mechanism is attached to an external surface of the shell. The tether has a post and anchor head that is catchable within the catch device. Pushing the release mechanism opens the catch. A biasing spring ejects the anchor head from the device. The tether may be attached at its other end to a handbag or tote bag strap, so that it is easily and quickly located. Pulling on the tether retrieves the shell with phone or other electronic device from the bag. Pushing the release button automatically releases and ejects the anchor head end of the tether from the shell, so that the user may use the cell phone or device freely, without any restraint on freedom of movement.
TETHERED DEVICE HOLDER
BACKGROUND INFORMATION

[0001] 1. Field of the Invention

[0002] The invention relates to the field of article carriers and, particularly, to cases or carriers for handheld electronic devices. More particularly, the invention relates to tethered holders, which facilitate retrieval of such devices from a larger storage area.

[0003] 2. Description of the Prior Art

[0004] Handheld electronic devices are ubiquitous in today's world. People routinely carry PDAs, cell phones, pagers, and other devices. For the sake of simplicity, reference shall be made to a cell phone hereinafter, although it is understood that this term is also representative of PDAs, pagers, and other handheld electronic devices. Men typically carry such devices, when not in use, in their pants pocket or clipped to their pants belt, so they are generally readily accessible. Women, on the other hand, generally carry such devices in a handbag. When the phone rings, the user then has to quickly locate the cell phone in the handbag and retrieve it before the caller has given up and terminated the call. The problem with storing a cell phone in a handbag is that the phone, being small and denser than other objects in the handbag, sinks to the bottom of the bag. Depending on the size and contents of the bag, it may take some time to locate and retrieve the device. The same problem applies when carrying the cell phone in a backpack, tote bag, book bag, or other large carrier.

[0005] One solution to the problem above is to attach a tether to the device. Many embodiments of a spooled tether are known. Typically, a case for the handheld electronic device is attached to a belt. Also attached to the belt is a spooled tether case. The end of the tether is attached to the electronic device. The tether is generally spring-biased to retract automatically into its case. This allows the tether to remain on the device during use, yet allow sufficient freedom of movement so that the device can be used comfortably for its intended function. That is, the device can comfortably be raised to the ear or held in the hand. This system also works well for key rings, which are attached to the end of the tether and are carried close to the spooled tether case.

[0006] This type of tether system is not particularly suitable for use with cell phones that are stored in a handbag or other type of bag. If the spooled tether case is attached to some strap or loop in the bag, the user is forced to use or at least respond to a call on the cell phone in close proximity to the bag, and this is not always convenient.

[0007] What is needed, therefore, is a device for tethering a handheld electronic device to a handbag or tote bag for quick retrieval, that will instantly allow untethered use of the device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present invention is described with reference to the accompanying drawings. In the drawings, like reference numbers indicate identical or functionally similar elements. The drawings are not drawn to scale.

[0011] FIG. 1 is a perspective view of the holder according to the invention, holding an electronic device.

[0012] FIG. 2 is a plane view of the holding area of the holster.

[0013] FIG. 3 is a plane view of the tether post.

[0014] FIG. 4 is perspective view of the tether catch device, with tether post engaged.

[0015] FIG. 4A is a top plane view of the tether catch device.

[0016] FIG. 4B is a first cross-sectional view of the tether catch device, a lengthwise cut through the catch device.

[0017] FIG. 4C is a second cross-sectional view of the tether catch device, a transverse cut through release button of catch device.

[0018] FIG. 4D is a third cross-sectional view of the tether catch device, a transverse cut through tether catch end of the device, showing the tether post in the catch.

[0019] FIG. 5 is a perspective view of the catch-device housing, showing the outer and the inner surfaces.

[0020] FIG. 5A is a top plane view of the inside of the housing.

[0021] FIG. 6 is a perspective view of the underside of the button.

[0022] FIG. 6A is an plane elevational view of the button.

[0023] FIG. 6B is a cross-sectional view of the button, showing the contour of the slider push block.
FIG. 6C is a cross-sectional view of the button, showing the slider push block and the button spring post.

FIG. 7 is a perspective view of the button.

FIG. 7A is a top plane view of the button.

FIG. 8 is a perspective view of the slider.

FIG. 8A is a top plane view of the slider.

FIG. 8B is a side elevational view of the slider.

FIG. 8C is a side view of the leaf spring.

FIG. 9 is a perspective view of the catch prong.

FIG. 9A is a top plane view of the catch prong.

FIG. 9B is a plane side view, showing a spring-retaining groove.

FIG. 9C is a cross-sectional view of the catch prong.

FIG. 10 is a partial assembly drawing, showing the slider assembled on the backplate, with the slider pushed to the release position and the prongs superimposed and shown held in their release position by the slider.

FIG. 11 is perspective view from below of the second embodiment of the holster.

FIG. 12 is an exploded view from below of the second embodiment of the tether catch device.

FIG. 13 is an exploded view from above of the second embodiment of the tether catch device.

FIG. 14 is a cross-sectional view of the tether catch device, with the cut along the central longitudinal line of the device.

DETAILED DESCRIPTION OF THE INVENTION

The present invention will now be described more fully in detail with reference to the accompanying drawings, in which the preferred embodiments of the invention are shown. This invention should not, however, be construed as limited to the embodiments set forth herein; rather, they are provided so that this disclosure will be complete and will fully convey the scope of the invention to those skilled in the art.

FIGS. 1 and 2 show a first embodiment of a holster 1000 according to the invention, for holding a small handheld electronic device ED. The holster 1000 is constructed to allow ready access to the operational features of the electronic device ED while it is held in the holster. The holster 1000 has a case 100 formed of side walls 102, a bottom wall 104, a back wall 112, and a catch device 200 mounted on the back wall. A continuous lip 106 on the edge of the back wall 112 and side walls 102 defines a storage area 108 on the case 100.

FIG. 3 shows a tether 400, which has a tether line 420, the ends of which are captured in a tether post 410. A post end 412 has an anchor head 414. FIG. 4 is a perspective view of the catch device 200, shown without the case 100. The catch device 200 comprises a catch 260 for releasably holding the anchor head 414 and a catch release 220. The anchor head 414 is shown captured in the catch 260. The catch release 220 in the embodiment shown is a button 230, which, when actuated, opens the catch 260, allowing the tether 400 to be quickly and easily released from the case 100.

FIGS. 4A-9C illustrate the construction and various features of the catch device 200 and FIG. 10 is a partial assembly drawing, showing the internal catch components in their assembled position. FIGS. 4A-4D show the catch device, with the tether post 410 engaged in the catch 260. FIG. 4A is a top plane view, FIG. 4B a cross-sectional side view, FIG. 4C a cross-sectional view showing the catch release 220, and FIG. 4D a cross-sectional view showing the anchor head 414 of the tether post 410 held in the catch 260. The catch 260 and the catch release 220 are enclosed in a housing 300 that comprises an upper housing 310 and a backplate 330. The catch release 220 includes the button 230 that is spring biased by a first spring 232 to hold the catch 260 in a restraining position. A more detailed discussion of the cooperation among the various components to actuate the catch 260 and the catch release 220 continues below, after the individual components have been explained.

FIGS. 5-5B show the inside of the upper housing 310, which has a button aperture 332 that provides access to the button 230 and a post aperture 336 into which the tether post 410 is inserted into the catch 260. Mounting holes 302 are provided for mounting the catch device 200 to the case 100.

FIG. 6 shows the underside of the button 230, which has a first push block 234 and a post 232A on which the first spring 232 is assembled. FIGS. 6A-6C illustrate the contours of the button 230 and push block 234.

FIG. 7 is a perspective view 330 and FIG. 7A a top plane view of the backplate 330. The backplate 330 has various features that are constructed to hold a slider assembly 270, which will be described in connection with FIGS. 8-83 below. Mounting holes 332 are provided, for attached the catch device 200 to the case 100.

FIG. 8A is a top plane view of the slider assembly 270, which is assembled on and slides along the backplate 330 to open or close the catch 260. The slider assembly 270 comprises a slider body 278, a leaf spring 274 that extends across a slider aperture 271, cam surfaces 276, a second push block 275, and a second biasing spring 272. FIG. 8C shows the contour of the leaf spring 274. FIG. 8 is a perspective view of the slider body 278, shown from its underside, without the leaf spring 274 and the second biasing spring 272 assembled.

FIGS. 9-9C illustrate a post prong 240 which has a recess 240A, a spring receiving groove 240B for retaining a third biasing spring 242, and a push surface 246. A pair of prongs 240 is assembled within the upper housing 310. During assembly, the prongs 240 are held in place by a lubrication substance that is applied to a surface of the prong, which is then pressed against the inner surface of the housing 310. Once the housing 310 is assembled on the backplate 330, the confines of the housing 310 and backplate 330 serve to hold the prongs 240 in their operative positions. The lubrication serves as a glue adhesive: it initially holds the prongs in position, yet allows the prongs to slide between a catch position and a release position, to be discussed with reference to FIG. 10.

FIG. 10 is a partial assembly drawing of the catch device 200, with the upper housing 310 removed, and which illustrates the catch and catch-release operations of the catch device 200. The slider 278 is assembled on the backplate 330, such that it is movable in the longitudinal direction, indicated by a first directional arrow A1. The catch release elements that are assembled in the upper housing 310 are shown with dashed lines, superimposed over the slider assembly 270. The button 230 with its first push block 234 is positioned above the second push block 275 on the slider 278. The pair of prongs 240 are movably retained within the upper housing 310. A third biasing spring 242 on each prong 240 biases the prongs toward the center of the catch device 200. The recesses 240A are dimensioned such that they encompass the diameter of the tether post 410, yet are narrower than the diameter of the anchor head 414. Pressing on the button 230 forces the first push block 234 against the second push block 275 on the slider 278. This pushes the slider assembly 270 upward, that
is, in the direction against the second biasing spring 272. In so doing, the cam edges 276 of the slider body 278 push against the push surfaces 246 on the prongs 240, which forces them to move in a lateral direction indicated by directional arrow A2, that is, away from the center and toward the sides of the catch device 200. This effectivly widens the area between the prong recesses 240, so that the anchor head 414 on the tether post 410 can escape the catch 260. The leaf spring 274 has an upward bias, so when the throw housing 210 is assembled, it serves as an ejection spring. When the prongs 240 are opened, so as to release the anchor head 414, the ejection spring 274 pushes the anchor head 414 upward and out of the catch 260. [0050] To capture the tether 400 in the catch device 200, the user need only insert the anchor head 414 in the post aperture 336 and push slightly. The anchor head 414 and the edges of the recess 240 on the prongs 240 are contoured such that, the downward force on the prongs 240 forces them apart. The anchor head pushes past the opening formed by the recesses. The prongs 240, being spring biased toward the center of the device, snap to their catch position, in which the anchor head 414 is held in the catch device 200 by the prongs 240. [0051] FIGS. 11-14 illustrate a second embodiment of a holster 2000 according to the invention. This embodiment is a mechanically simplified version of the first embodiment of the holster 1000, having fewer separate components, but which provides essentially the same function. The holster 2000 comprises a catch device 2200 that is mounted on the case 100. The case is essentially the same case 100 as in the first embodiment. In FIGS. 12 and 13, one of the side walls 102 extends further upward and the catch 2200 is mounted on that side wall, as shown in FIG. 11. The tether 400 is identical to the tether previously described. [0052] FIGS. 12 and 13 are exploded views of the holster 2000, illustrating the various components and FIG. 14 a cross-sectional view of the assembled catch device 2200, the cut for the cross-sectional view being a lengthwise cut through the center of the catch device 2200. A slider assembly 2270, which includes a slider body 2278 and a biasing spring 2232, is assembled inside a housing 2300, which includes a backplate 2330 and an upper housing 2310. The backplate 2330 attaches to the side wall 102 of the case 100 by means of some type of suitable fastener. The slider body 2278 is assembled on the floor of the backplate 2330 and the biasing spring 2232 is assembled between the rearward or non-operative end of the slider body 2278 and a wall of the upper housing 2310. A pair of prongs 2240 are provided on the forward or operative end of the slider body 2278. A button aperture 2332 and a post aperture 2356 are formed in the upper housing 2310. The biasing spring 2232 biases the slider body 2278 to a forward or operative position that engages the anchor head 414 of the tether 400. The pair of post prongs 2240 captures the anchor head 414 of the tether when the slider body 2278 is biased forward and holds the anchor head 414 within the upper housing 2310. [0053] A button 2230 has protrusions 2234 that are pivotally held in a button support 2236 provided on the back plate 2330. The button 2230 extends through a button aperture 2332 on the upper housing 2310. The slider body 2278 has a cam surface 2279 at its rearward end. Depressing the button 2230 forces the slider body 2278 in a rearward direction away from the post aperture 2356. This downward action on the button 2230 releases the anchor head 414 from the pair of prongs 2240. An ejection spring 2272 is assembled on the back plate 2230 and applies an upward force against the anchor head 414. When the anchor head 414 is released from the prongs 2240, the ejection spring 2272 automatically ejects the anchor head 414 through the post aperture 2336, thereby releasing it from the catch device 2210. [0054] It is understood that the embodiments described herein are merely illustrative of the present invention. Variations in the construction of the catch device and phone holster may be contemplated by one skilled in the art without limiting the intended scope of the invention herein disclosed and as defined by the following claims.

What is claimed is:

1. A catch device for capturing a tether post that has an anchor head, said catch device comprising:
   - a catch-device housing comprising an upper housing and a backplate;
   - a catch release assembly comprising a slider assembly slidably mounted on said backplate and a release button assembled in an aperture on said upper housing;
   - a catch assembly comprising a pair of prongs that are positionable between a catch position and a release position;
   - and an ejection spring;
   wherein said prongs, when in said catch position, capture said anchor head within said catch-device housing;
   wherein, when an operating force is exerted on said release button, said button forces said slider assembly to move said prongs from said catch position to said release position; and
   wherein, when said prongs are in said release position, said ejection spring exerts a force on said anchor head to facilitate ejection of said anchor head from said catch-device housing.

2. The catch device of claim 1, wherein said release button has a first push block, said slider assembly includes a slider body having a second push block and push edges, and said prongs have a push surface; and
   wherein, when said actuating force is exerted on said release button, said first push block pushes against said second push block on said slider body, forcing said slider body to slide in a longitudinal direction along said backplate and to move from said catch position to said release position, with said push edges of said slider body thereby pushing against said push surface of said prongs, forcing said prongs to slide in a transverse direction relative to said longitudinal direction of said slider body, so as to move said prongs to said open position.

3. The catch device of claim 2, wherein said release button has a first biasing spring that biases said button upward.

4. The catch device of claim 2, wherein said slider assembly has a second biasing spring that biases said slider body to a catch position.

5. The catch device of claim 2, wherein said prongs have a third biasing spring that biases each prong inward in a transverse direction relative the longitudinal direction of said slider assembly, to a catch position.

6. The catch device of claim 1, wherein said release button is pivotally mounted in said slider body; and
   wherein depressing said release button forces said slider body to move to said release position and simultaneously pushes a forward end of said slider body upward, thereby ejecting said anchor head from said catch-device housing.

7. The catch device of claim 1, wherein said slider body has a forward end that includes said pair of prongs for engaging
said anchor head, wherein said catch-release button is pivotably mounted on said slider body, with and wherein actuating said catch-release button simultaneously forces said slider body rearward away from said capture position to said release position and forces said forward end of said slider body upward, which in turn applies an upward pressure on said forward end of said slider body, thereby ejecting said anchor head from said catch-device housing.

8. The catch device of claim 7, said catch assembly further comprising a biasing spring that is assembled between said rearward end of said slider body and a wall of said upper housing, wherein said biasing spring biases said slider body to a forward position.

9. The catch device of claim 1, wherein said slider assembly has a rearward end that includes a slider body with a cam surface and a biasing spring, and a forward end into which said prongs are incorporated, wherein said biasing spring holds said prongs in said catch position, and wherein applying said operating force to said button causes said button to move against said cam surface, forcing said slider assembly in a rearward direction, thereby also moving said prongs to said release position.

10. The catch device of claim 9, said upper housing having an aperture adapted to allow said anchor head pass through and said catch-release assembly further including an ejection spring that has a mounting end that is assembled on said backplate and a spring end that applies a force upward toward said aperture, so as to automatically eject said anchor head from said catch-device housing when said prongs are moved to said release position.

11. A holster for releasably securing an object, said holster comprising:
   a shell adapted to hold an object;
   a tether having a distal end with a post and an anchor head and a proximal end for attaching to an external object;
   a catch device for releasably capturing said anchor head of said tether, said catch device comprising a housing that includes an upper housing and a backplate and a pair of prongs that are slidably captured between said upper housing and said backplate and that form a releasable catch aperture for retaining an anchor head of said tether within said housing;
   a catch release assembly comprising a slider body slidably mounted on said backplate and a release button assembled in an aperture on said upper housing, so as to be actutable from outside said catch-device housing;
   wherein said catch device is attached to an outer surface of said shell, so as to be accessible external to said shell;
   wherein said prongs in a catch position capture said anchor head within said catch-device housing;
   wherein, when an actuating force is exerted on said release button, said button forces said slider body to move from a catch position to a release position and to eject said anchor head from said catch-device housing.

12. The holster of claim 11, wherein said release button has a first push block, said slider assembly includes a slider body having a second push block and push edges, and said prongs have a push surface; and
   wherein, when said actuating force is exerted on said release button, said first push block pushes against said second push block on said slider body, forcing said slider body to slide in a longitudinal direction along said backplate and to move from said catch position to said release position, with said push edges of said slider body thereby pushing against said push surface of said prongs, forcing said prongs to slide in a transverse direction relative to said longitudinal direction of said slider body, so as to move said prongs to said open position.

13. The holster of claim 12, wherein said release button has a first biasing spring that biases said button upward.

14. The holster of claim 12, wherein said slider assembly has a second biasing spring that biases said slider body to a catch position.

15. The holster of claim 12, wherein said prongs have a third biasing spring that biases each prong inward in a transverse direction relative to the longitudinal direction of said slider assembly, to a catch position.

16. The holster of claim 11, wherein said catch release assembly includes a biasing spring that biases said slider body toward said catch position.

17. The holster of claim 11, wherein said slider body has a forward end with said pair of prongs and a rearward end with a cam surface, and a downward force applied to said release button forces said release button to contact said cam surface, which forces said slider body to move against said biasing spring.

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