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(54) **ALL PLASTIC BELT OR STRAP CLIP WITH
LEVERED RELEASE ARM OPERATIVE
WITH BUTTON MOUNT FOR CELL PHONE
OR PERSONAL ELECTRONIC DEVICE AND
METHOD**

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(76) **Inventor: Fernando Tages, Coral Springs,
FL (US)**

(57) **ABSTRACT**

Correspondence Address:
ROBERT C. KAIN, JR.
750 SOUTHEAST THIRD AVENUE, SUITE 100
FT LAUDERDALE, FL 333161153

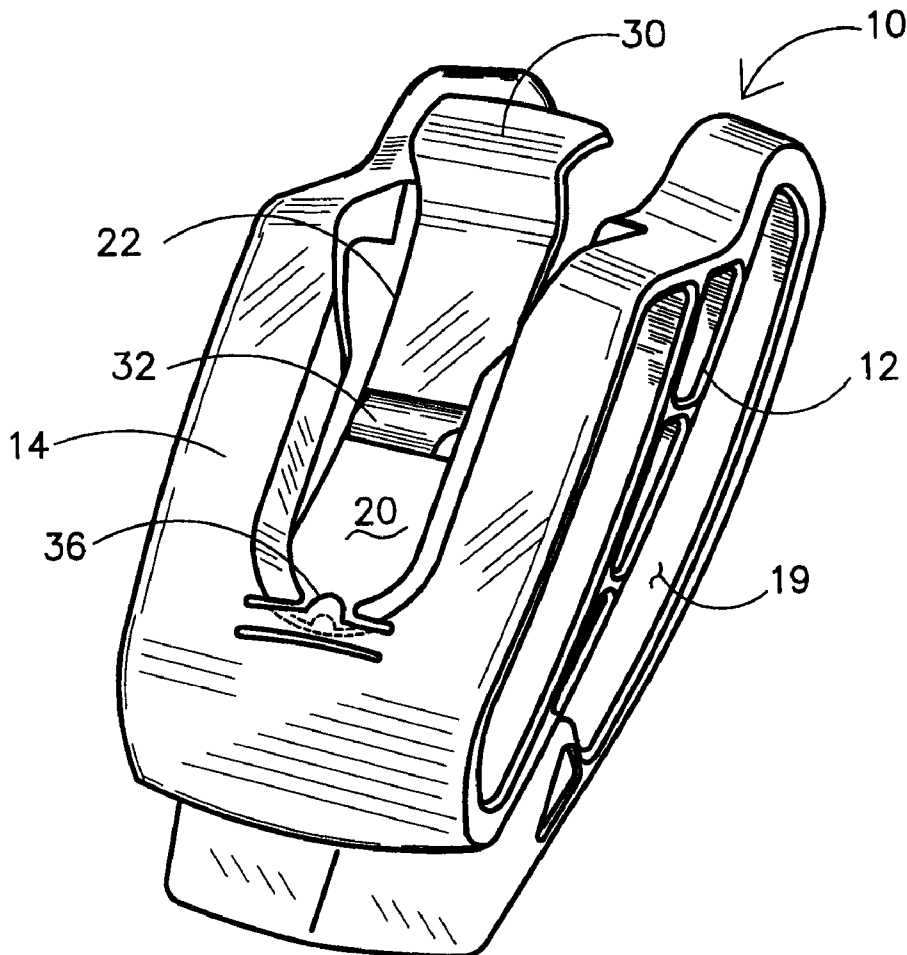
A main clip body mounts a cell phone or PED to a belt or strap. The phone carries a plastic button mount and stem. The plastic clip body has a capture cavity which captures the button stem in a locked mode with a lock face on a cantilevered release arm and complementary locking element on the clip body. The release arm has a distal end mounted to the clip body extends through the capture cavity and has a proximal, free end with a user actuation surface thereon. The lock face on the release arm coacts with one side of the button stem and complementary locking elements of the clip body on the other side of the button. To release, the release arm is moved backwards away from the clip's front face, the lock face moves backward and the stem can be moved by the user upwards out of the capture cavity.

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Related U.S. Application Data

(60) **Provisional application No. 60/827,434, filed on Sep. 29, 2006.**



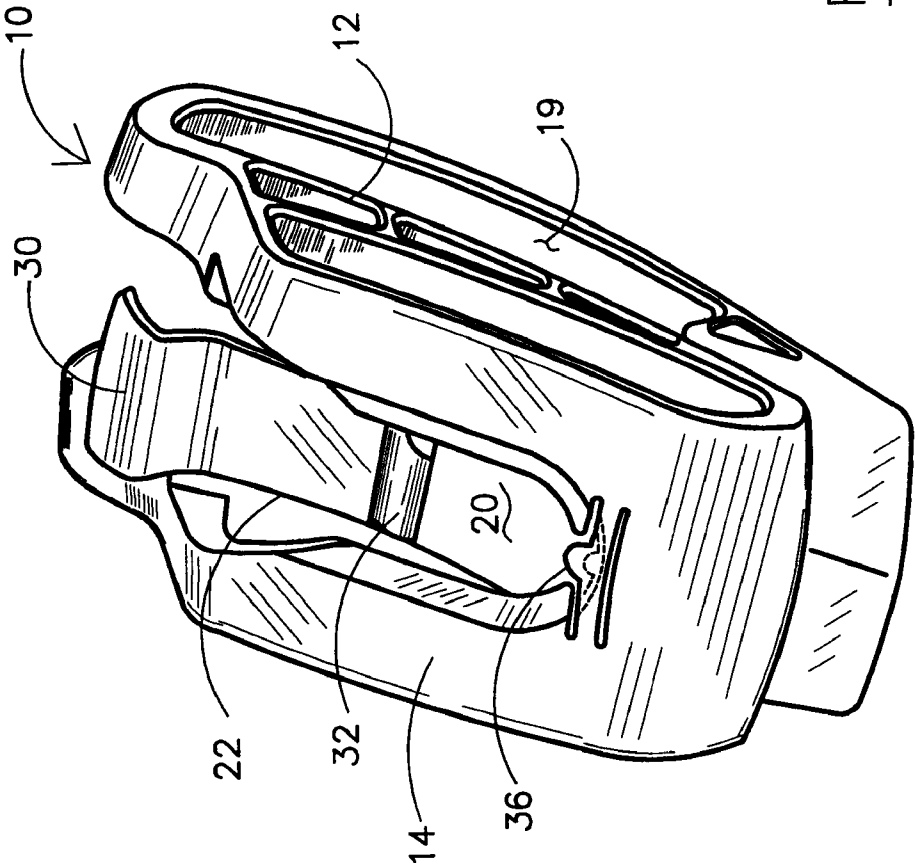


FIG.1A

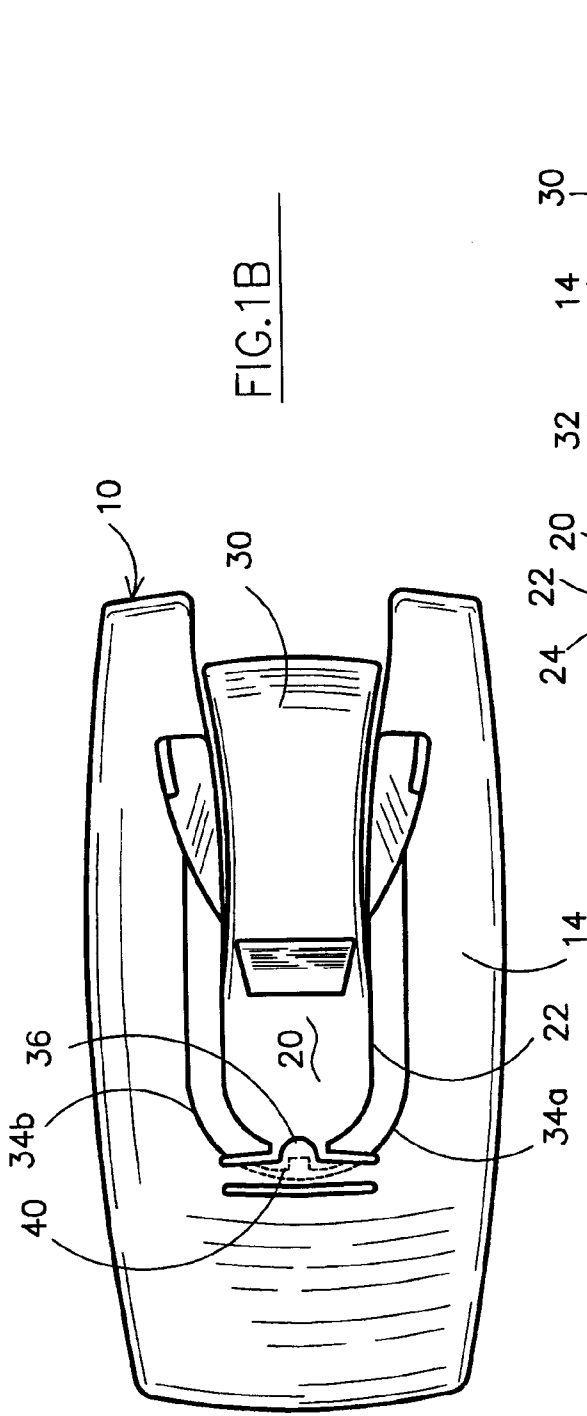


FIG. 1B

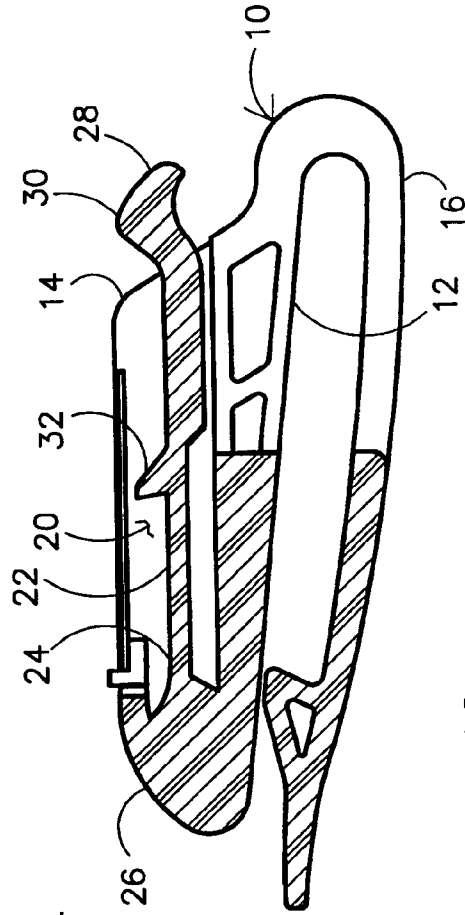


FIG. 1C

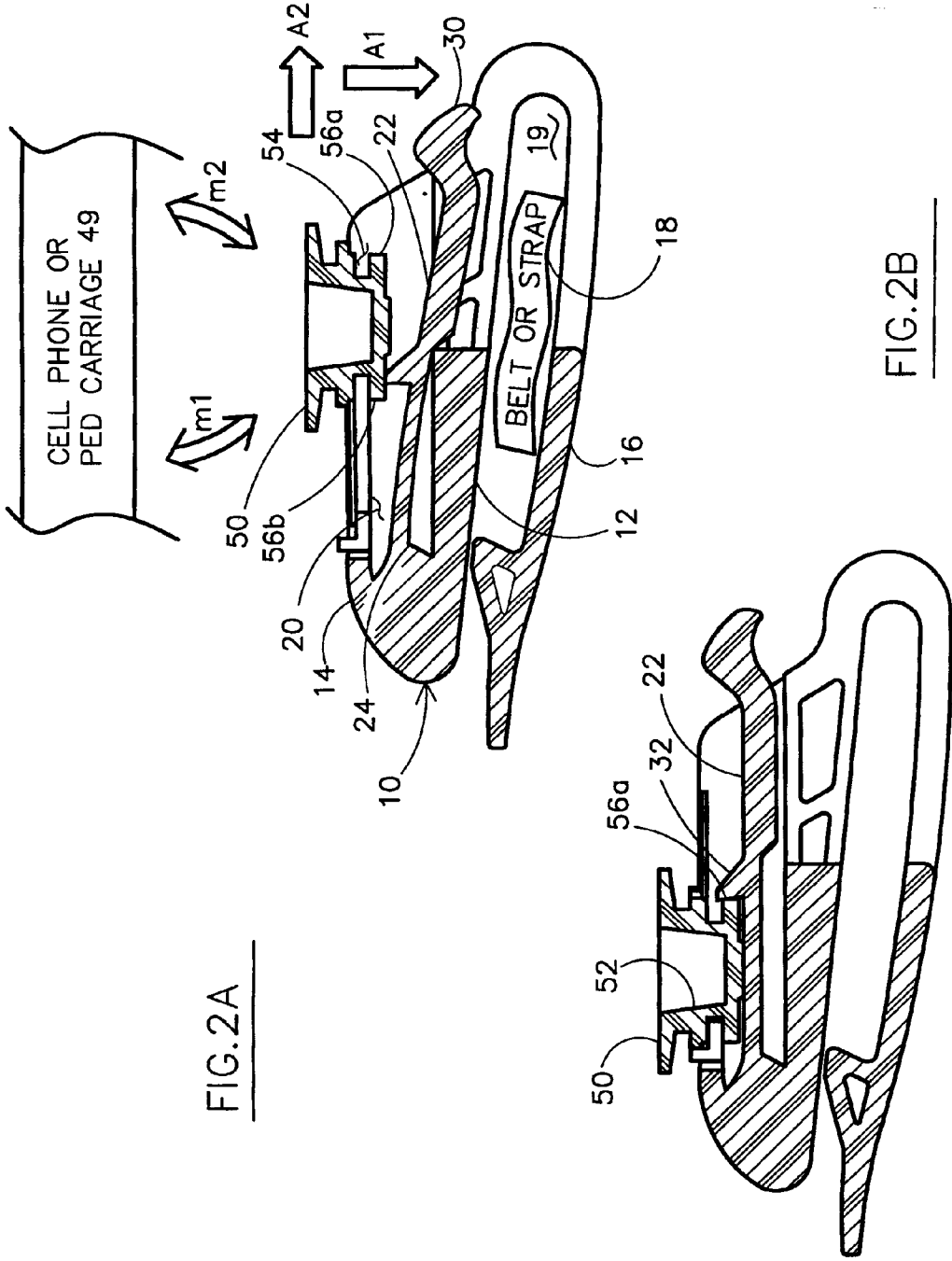


FIG. 2A

FIG. 2B

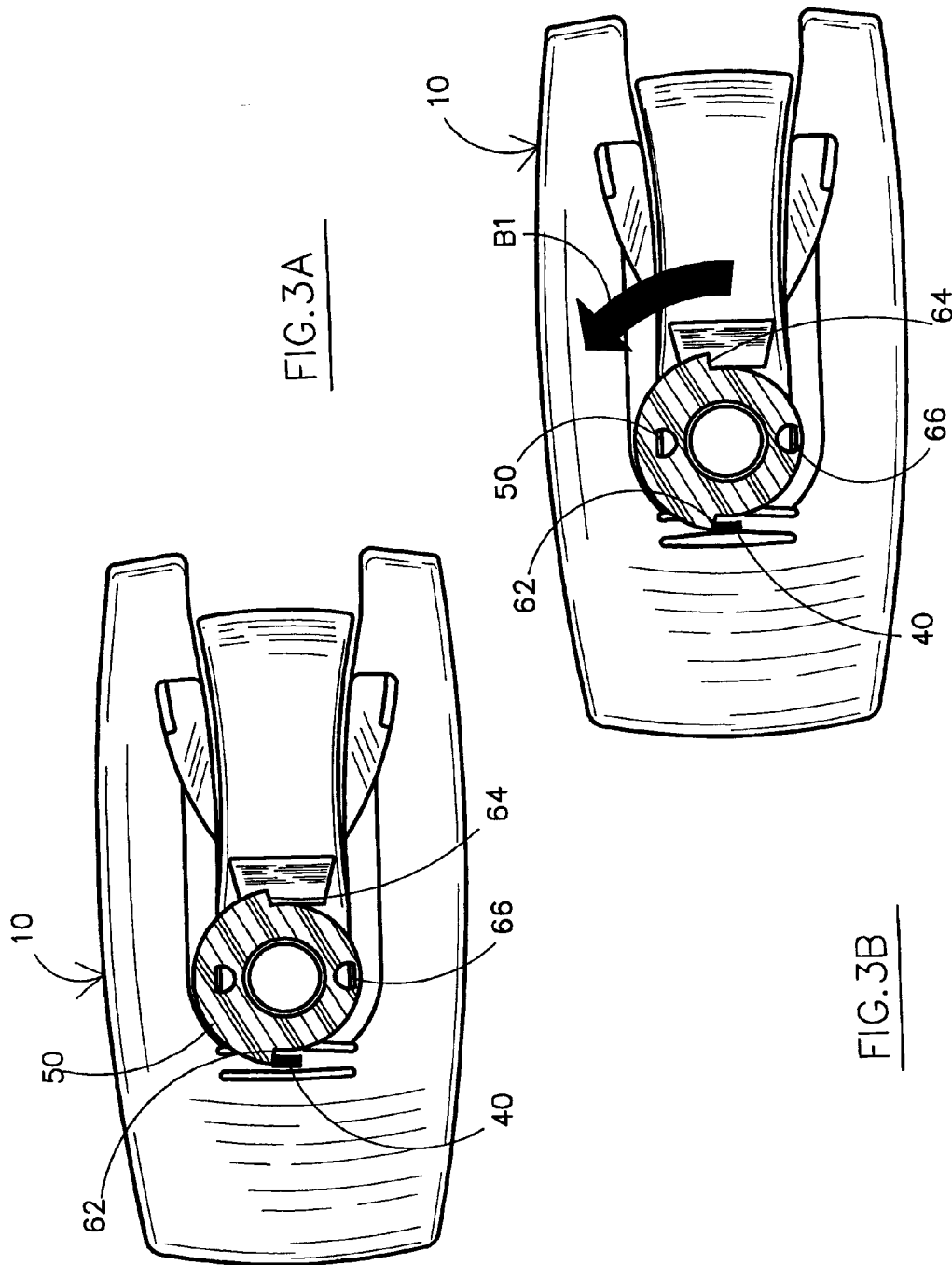


FIG. 3A

FIG. 3B

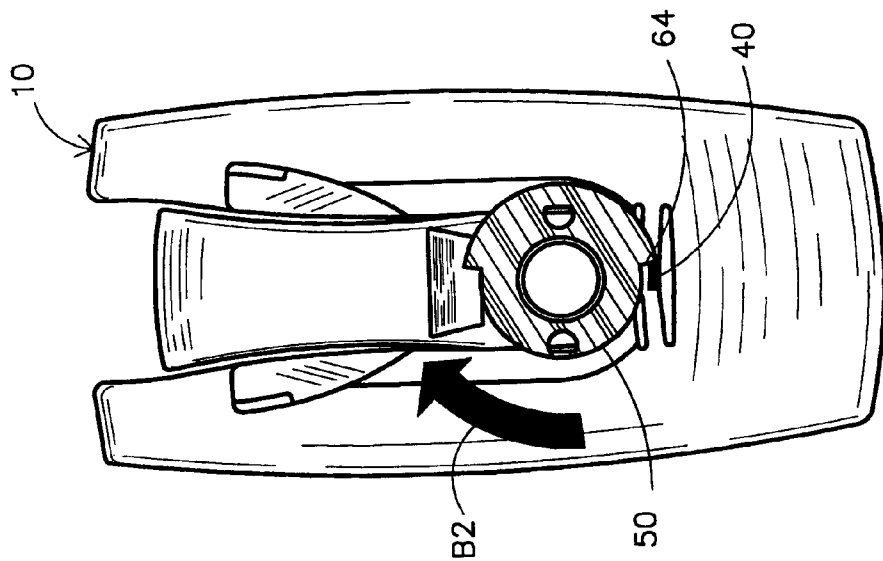


FIG. 3D

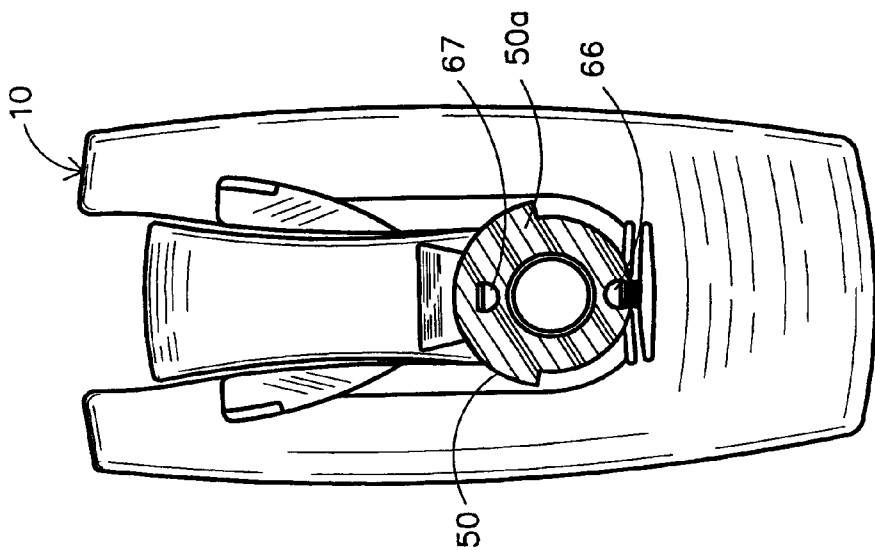


FIG. 3C

**ALL PLASTIC BELT OR STRAP CLIP WITH
LEVERED RELEASE ARM OPERATIVE
WITH BUTTON MOUNT FOR CELL PHONE
OR PERSONAL ELECTRONIC DEVICE AND
METHOD**

[0001] This is a regular patent application claiming the benefit of provisional patent application Ser. No. 60/827,434, filed Sep. 29, 2006.

[0002] The present invention relates to a clip for removably mounting a cellular telephone or a personal electronic device (PED), such as an MP3 player, Ipod, personal data assistant (PDA) or other small, highly transportable electronic device, which cell phone or PED is adapted to be mounted via the clip on a strap or a belt. A method for mounting is also provided.

BACKGROUND OF THE INVENTION

[0003] It is convenient for a user to carry his or her cell phone or PED on his or her pants belt or purse strap. In order to accomplish this, sometimes the cell phone or personal electronic device (PED) has mounted thereto or attached thereto a carriage having a button. Clip systems which coast with buttons have been described in certain prior art references. See U.S. Pat. Nos. 6,364,184 and 6,098,858 and design Pat. D504,768.

OBJECTS OF THE INVENTION

[0004] It is an object of the present invention to provide a clip body to capture a button mount employing a cantilevered release arm.

[0005] It is a further object of the present invention to provide clip body with a detent interlock which operates with complementary detents on the button mount to permit temporary latching of the cell phone or PED in a rotational plane parallel to the front face of the clip body.

[0006] It is a further object of the present invention to provide an all plastic clip which does not interfere with radio frequency RF signals from the cell phone or PED.

SUMMARY OF THE INVENTION

[0007] The main clip body removably mounts a cell phone or PED on a belt or strap. A carriage, mounted to the cell phone or PED, has a button mount and a button mount stem. A main clip body has a capture cavity which captures the button stem in a locked mode. A cantilevered release arm has a distal end mounted to the clip body on one side of the capture cavity and a proximal, free standing end opposite the distal end. A locking face element on the release arm coacts with the button stem such that, in a locked mode, the release arm locking face interacts with the button stem on one side of the button stem and a complementary locking element, formed by the main clip body on the other side of the button stem, locks the stem, and hence the carriage and the cell phone or PED, in the capture cavity. To release, the release arm is moved backwards away from the front face of the clip main body thereby releasing the stem via the locking face

element and permitting the button stem to be moved vertically away from the capture cavity.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Further objects and advantages of the present invention can be found in the detailed description of the preferred embodiments when taken in conjunction with the accompanying drawings in which:

[0009] FIGS. 1A, 1B and 1C diagrammatically illustrate the clip body in a perspective view, a front elevational view, and a partial, cross-sectional view;

[0010] FIGS. 2A and 2B diagrammatically illustrate cross-sectional views of the clip body and the button mount (the cell phone and PED and/or associated carriage and the belt or strap being shown in FIG. 2A); and

[0011] FIGS. 3A, 3B, 3C and 3D diagrammatically show temporary latching of the button mount and hence the cell phone or PED with respect to the main clip body due to detent-detent lock elements described herein.

**DETAILED DESCRIPTION OF THE
PREFERRED EMBODIMENTS**

[0012] The present invention relates to a clip removably mounting a cell phone or personal electronic device (PED) on a belt or strap (see FIG. 2A diagrammatically showing the belt or strap). Typically a button is formed on a cell phone or PED or on a carriage therefor (see FIG. 2A) and the button mounts in a capture cavity of the main clip body as discussed below. A method is also featured as part of the invention herein.

[0013] FIGS. 1A, 1B and 1C are discussed concurrently herein. Main clip body 10 includes a backside 12 and a front side 14. An inverted, generally U-shaped clip element 16 is formed on the backside 12 of main clip body 10. This inverted U-shaped clip element 16 is adapted to be removably mounted on a belt or strap 18 as shown in FIG. 2A. The inverted U-shaped clip element 16 has a belt or strap interspace 19 within which is retained belt or strap 18.

[0014] Main clip body 10 also defines a capture cavity 20 within which is disposed a cantilevered release arm 22. As best shown in FIG. 1C, release arm 22 has a distal end 24 which is mounted to lower body section 26 of the main clip body 10. The balance of release arm 22 extends from distal end 24 and is effectively free standing throughout capture channel 20 and with respect to main clip body 10. Arm 22 is levered to distal end 24. Proximal end 28 of release arm 22 includes a user actuation surface 30.

[0015] In general, capture channel 20 is generally U-shaped and is formed on the front side 14 of main clip body 10. End 28 of release arm 22 is proximal to the user as compared with lower end 26 of clip body 10. Release arm 22 also includes a locking face element 32 discussed later in conjunction with the button mount shown in FIG. 2A.

[0016] Capture cavity 20 and in particular the distal or lower arcuate portion of capture cavity 20 forms complementary locking elements 34a, 34b which coact with the button as described later. A plastic spring biased tab or detent lock element 36 is positioned in the lower distal region of capture cavity 20. A stop 40 is formed in the clip body 10 beneath the detent lock element 36 which, as described later, limits rotational or arcuate movement of the button and hence the cell phone or PED attached thereto. The phone or PED button may rotate in the capture cavity. Biased detent

lock 36 can take various forms one of which is the flexible detent system illustrated in FIGS. 1A-1C. The detent tip flexes due to the flex bar mounted in the cut-outs of the main clip body.

[0017] FIG. 2A shows a button mount 50 which, in general, is attached or mounted to cell phone or PED carriage. The mounting is shown by the double headed arrows M1 and M2. Button mount 50 includes a stem 52 which is captured within capture channel 20 as shown in FIG. 2B. In a preferred embodiment, button stem 52 forms a female lock channel 54 at its distal end away from cell phone or PED carriage 49. Lock channel 54 includes vertical proximal end 56a and vertical distal end 56b. The term "vertical" is related to the normal position of the main clip body on a user's belt. However, as discussed later in conjunction with FIGS. 3A-3D, the angular or rotational position of the button mount and the cell phone or PED can be changed by the user. To insert button mount 50 into capture channel 20, the user vertically moves the button mount 50 downward or opposite single headed arrow A2 thereby forcing release arm 22 backwards away from front face 14 and towards back face 12 of main clip body 10. Arm 22 rotates at the distal end 24. Locking face element 32 rides along the exposed button face of button mount 50.

[0018] FIG. 2B shows that button mount 50 has been disposed in capture cavity 20 and that locking face element 32, which is generally at a mid-section of release arm 22, interacts with edge 56a of lock channel 54 of the button mount 50. The distal end 56b of the lock channel coacts with capture channel edge portions 34a, 34b shown in FIG. 1B. Further, locking edge portions 34a and 34b form male complementary locking elements which are captured and inserted into the female locking channel 54 of button mount 50.

[0019] Throughout the embodiments, locking channels and locking elements (tabs or plates and channels) may be reversibly configured as male and female elements on either body dependent upon the designer's choice. The claims appended hereto are meant to cover these modifications.

[0020] To release button mount 50 (and the attached cell phone or PED retained by carriage 49) from the locked position shown in FIG. 2B, the user or operator moves release arm 22 backwards as shown by arrow A1 (FIG. 2A) (typically by actuating user actuator surface 30) and then vertically moves button mount 50 vertically upward as shown by arrow A2 in FIG. 2A. In this manner, button mount 50 is moved vertically upward, away from capture cavity 20.

[0021] FIGS. 3A, 3B, 3C and 3D are discussed concurrently herein. These figures show a partial, cross-sectional view of button stem 50 and particularly the angular positions of the button stem relative to main clip body 10. Button stem 50 includes a pair of stop surfaces 62, 64 in a preferred embodiment which limit rotational movement (angular position) from the position shown in FIG. 3B and FIG. 3A (+90 degree position) due to button stop 62 and clip body stop 40, and the other extreme rotational position shown in FIG. 3D (-90 degree position) due to the interaction between button stop 64 and clip body stop 40. In the illustrated embodiment, detent depression 66 on the button stop ledge surface 50a cooperates with detent lock element 36 best shown in FIG. 1B. In other words, the detent lock 36 has a knob or ball which falls within the depression 66 on button surface 50a. FIG. 3C shows this midpoint, vertical, zero degree position

of the button and hence the PED relative to the clip body. Of course, the depression may be formed on locking element 36 and a ball or knob formed as element 66 on the button surface. In FIG. 3B and FIG. 3A when button mount stop 62 is adjacent clip body stop 40, rotational movement in a direction of B1 is prohibited. In FIG. 3D, rotational movement in a direction of arrow B2 is prohibited due to the interaction of stops 64, 40. Further, multiple angular positions can be provided by the temporary latching of one or more detents 66 and 67 compared with detent latch or lock 36 (FIG. 1B).

[0022] The claims appended hereto are meant to cover modifications and changes within the scope and spirit of the present invention.

What is claimed is:

1. A clip for removably mounting a cellular telephone or a personal electronic device to a belt or strap, the clip adapted to capture a button mount on said cellular telephone or personal electronic device, said button mount having a stem, the clip comprising:

a main body having a front side and a back side, said back side forming an inverted, generally U-shaped clip element which clip element is adapted to be removably mounted on said belt or strap;

a capture cavity on said front side of said main body, said capture cavity adapted to removably retain therein said stem of said button mount;

a cantilevered release arm having a distal end mounted to said main body on one side of said capture cavity and a proximal, free standing end opposite said distal end, said release arm having a locking face element which coacts with said stem of said button mount such that, in a locking mode, said locking face element coacts with said stem and capture cavity to capture said stem and button mount thereat, and in an unlocked mode, said release arm moves rearwardly with respect to said front side thereby releasing said stem and button mount from said capture cavity.

2. A clip as claimed in claim 1 including a further locking element formed about a portion of said capture cavity on said main body, said further locking element adapted to coact with said stem of said button mount such that, in said locking mode, said locking face element and said further locking element coact with said stem to capture said stem and button mount in said capture cavity, and in said unlocked mode, said release arm moves rearwardly with respect to said front side permitting proximal movement of said stem with respect to said main body thereby releasing said stem and button mount from said capture cavity.

3. A clip as claimed in claim 2 wherein said stem defines a female lock channel and said further locking element is a complementary male locking element which, in said locking mode, is inserted into said female locking channel.

4. A clip as claimed in claim 3 wherein said female locking channel on said stem includes an edge and said locking face element on said release arm includes an interface which interface coacts with said edge of said female locking channel on said stem in said locking mode.

5. A clip as claimed in claim 3 wherein said stem includes a detent and said main body defines a detent lock element about said capture cavity, said detent lock element coacts with the button stem detent to enable at least temporary angular locking of said button stem with respect to said main body.

6. A clip as claimed in claim 3 wherein said stem includes a plurality of detents thereon and said main body defines a detent lock element about said capture cavity, said detent lock element coacting with respective ones of said plurality of button detents to enable said button to be at least temporarily locked at corresponding angular positions with respect to said main body.

7. A clip as claimed in claim 6 wherein said angular positions being defined in a plane parallel to said front side of said main body.

8. A clip as claimed in claim 7 including a stop on said main body and a complementary stop on said button which limits rotational movement of said button with respect to said main body.

9. A clip as claimed in claim 8 wherein said button includes a first and a second complementary stop which limits rotational movement of said button with respect to said main body between two angular positions.

10. A clip as claimed in claim 8 wherein said main body includes a first and a second stop which, in combination with said complementary button stop, limits rotational movement of said button with respect to said main body between two angular positions.

11. A clip as claimed in claim 3 wherein said complementary male locking element on said main body is distal to said locking face element on said release arm and is on the opposite side of said capture cavity with respect to said locking face element.

12. A clip as claimed in claim 11 wherein said complementary male locking element has an arcuate span to lock onto said female lock channel on said stem.

13. A clip as claimed in claim 2 wherein said capture cavity defines a U-shaped cavity on said front side of said main body and said release arm is free standing thereat.

14. A clip as claimed in claim 13 wherein said distal end of said release arm is mounted to said main body beneath said front side of said main body.

15. A clip as claimed in claim 14 wherein said release arm forms a user actuation surface at a proximal end thereof.

16. A clip as claimed in claim 2 wherein said release arm forms a user actuation surface at a proximal end thereof.

17. A clip for removably mounting a cellular telephone or a personal electronic device to a belt or strap comprising:

a carriage adapted to be mounted onto or formed on said cellular telephone or personal electronic device, said carriage having a button mount and a button mount stem;

a main clip body having a front side and a back side, said back side forming an inverted, generally U-shaped clip element which clip element is adapted to be removably mounted on said belt or strap;

a capture cavity on said front side of said main clip body, said capture cavity adapted to removably retain therein said stem of said button mount;

a cantilevered release arm having a distal end mounted to said main clip body on one side of said capture cavity and a proximal, free standing end opposite said distal end, said release arm having a locking face element which coacts with said stem of said button mount such that, in a locking mode, said locking face element coacts with said stem and capture cavity to capture said stem and button mount thereat, and in an unlocked mode, said release arm moves rearwardly with respect

to said front side thereby releasing said stem and button mount from said capture cavity.

18. A clip as claimed in claim 17 including a further locking element formed about a portion of said capture cavity on said main clip body, said further locking element adapted to coact with said stem of said button mount such that, in said locking mode, said locking face element and said further locking element coact with said stem to capture said stem and button mount in said capture cavity, and in said unlocked mode, said release arm moves rearwardly with respect to said front side permitting proximal movement of said stem with respect to said main clip body thereby releasing said stem and button mount from said capture cavity.

19. A clip as claimed in claim 18 wherein said stem defines a female lock channel and said further locking element is a complementary male locking element which, in said locking mode, is inserted into said female locking channel.

20. A clip as claimed in claim 19 wherein said female locking channel on said stem includes an edge and said locking face element on said release arm includes an interface which interface coacts with said edge of said female locking channel on said stem in said locking mode.

21. A clip as claimed in claim 19 wherein said stem includes a detent and said main clip body defines a detent lock element about said capture cavity, said detent lock element coacts with the button stem detent to enable at least temporary angular locking of said button stem with respect to said main clip body.

22. A clip as claimed in claim 19 wherein said stem includes a plurality of detents thereon and said main clip body defines a detent lock element about said capture cavity, said detent lock element coacting with respective ones of said plurality of button detents to enable said button to be at least temporarily locked at corresponding angular positions with respect to said main clip body.

23. A clip as claimed in claim 22 wherein said angular positions being defined in a plane parallel to said front side of said main clip body.

24. A clip as claimed in claim 23 including a stop on said main clip body and a complementary stop on said button which limits rotational movement of said button with respect to said main clip body.

25. A clip as claimed in claim 24 wherein said button includes a first and a second complementary stop which limits rotational movement of said button with respect to said main clip body between two angular positions.

26. A clip as claimed in claim 24 wherein said main clip body includes a first and a second stop which, in combination with said complementary button stop, limits rotational movement of said button with respect to said main clip body between two angular positions.

27. A clip as claimed in claim 19 wherein said complementary male locking element on said main clip body is distal to said locking face element on said release arm and is on the opposite side of said capture cavity with respect to said locking face element.

28. A clip as claimed in claim 27 wherein said complementary male locking element has an arcuate span to lock onto said female lock channel on said stem.

29. A clip as claimed in claim 18 wherein said capture cavity defines a U-shaped cavity on said front side of said main clip body and said release arm is free standing thereat.

30. A clip as claimed in claim 29 wherein said distal end of said release arm is mounted to said main clip body beneath said front side of said main clip body.

31. A clip as claimed in claim 30 wherein said release arm forms a user actuation surface at a proximal end thereof.

32. A clip as claimed in claim 18 wherein said release arm forms a user actuation surface at a proximal end thereof.

33. A method of capturing a button mount in a clip body, said button mounted on a cellular telephone or a personal electronic device, said button mount having a stem thereon, comprising:

inserting said button vertically into a capture cavity formed in said clip body;

clipping a distal end region of said button stem in said capture cavity and clipping an opposing proximal end of said button stem at a mid-section of a cantilevered release arm;

releasing said button mount by moving said cantilevered release arm backwards away from a front side of said clip body and then moving said button mount vertically upward away from said capture cavity.

34. A method of capturing a button mount as claimed in claim 33 wherein said release is permitted by backward depression of a proximal end of said release arm thereby causing said release arm to flex at a distal clip body attachment locus.

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