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(54) **ATTACHMENT FOR PORTABLE ELECTRONIC DEVICES AND METHODS FOR USING THE SAME**

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(76) Inventors: **Christopher J. Knapp**, Murray, UT (US); **Jon McBride**, Kaysville, UT (US)

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Correspondence Address:

**KENNETH E. HORTON
KIRTON & MCCONKLE
60 EAST SOUTH TEMPLE
SUITE 1800
SALT LAKE CITY, UT 84111 (US)**

(57) **ABSTRACT**

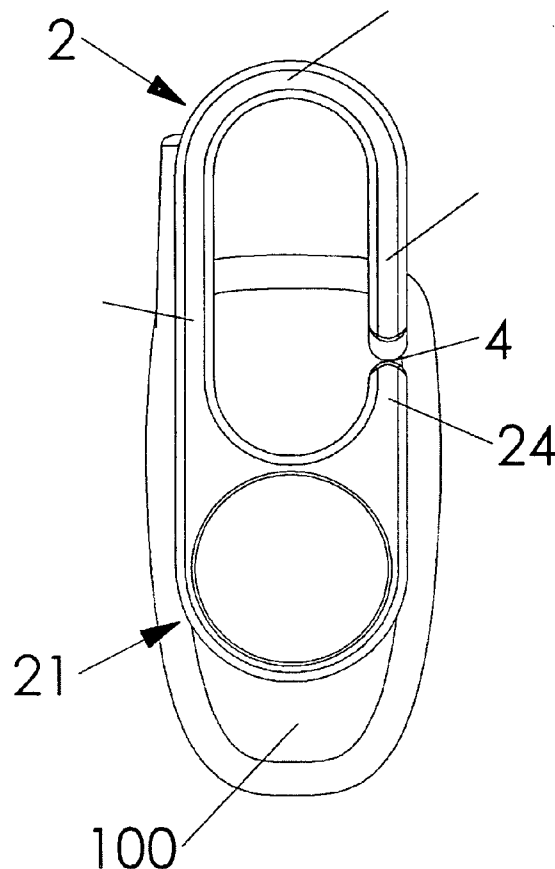
An apparatus for portable devices—especially portable electronic devices—and methods for using such apparatus are described. The apparatus is connected to the portable device and is used to attach the portable device (i.e., a cellular phone) to an object (i.e., a belt loop). The apparatus comprises a base mechanism that is connected to the portable device and a hooking mechanism with one part that is connected to the base means and another part that can be attached to the object by a hooking action. The apparatus permits easy and quick attachment (and removal) of the portable device to an object (i.e., the belt) while providing secure retention when not in use. The apparatus can also be used to carry and hold the portable device when it is being used.

(21) Appl. No.: **11/103,275**

(22) Filed: **Apr. 11, 2005**

Related U.S. Application Data

(63) Continuation-in-part of application No. 10/941,662, filed on Sep. 15, 2004.



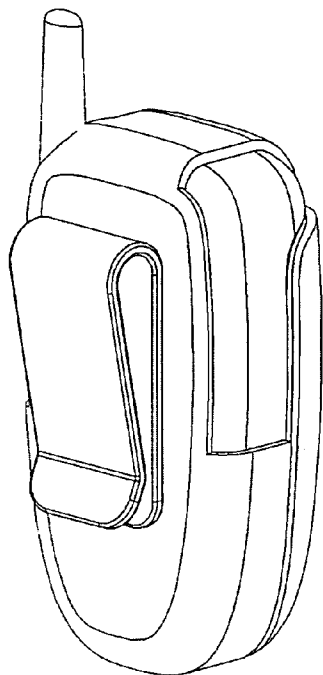


FIGURE 1A

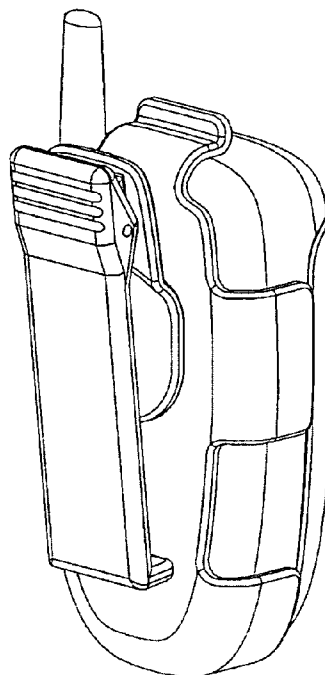


FIGURE 1B

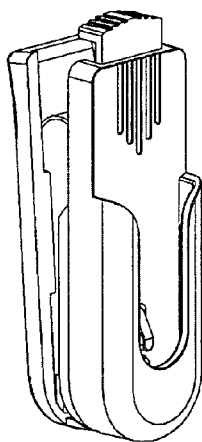
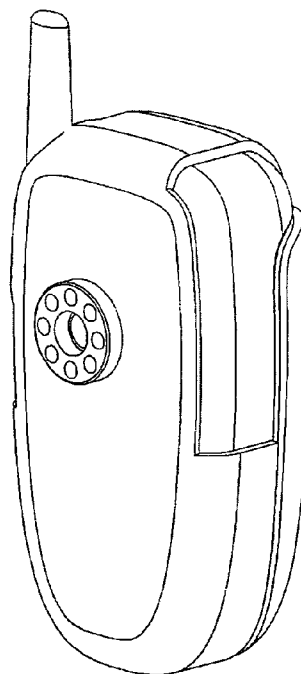


FIGURE 1C



PRIOR ART

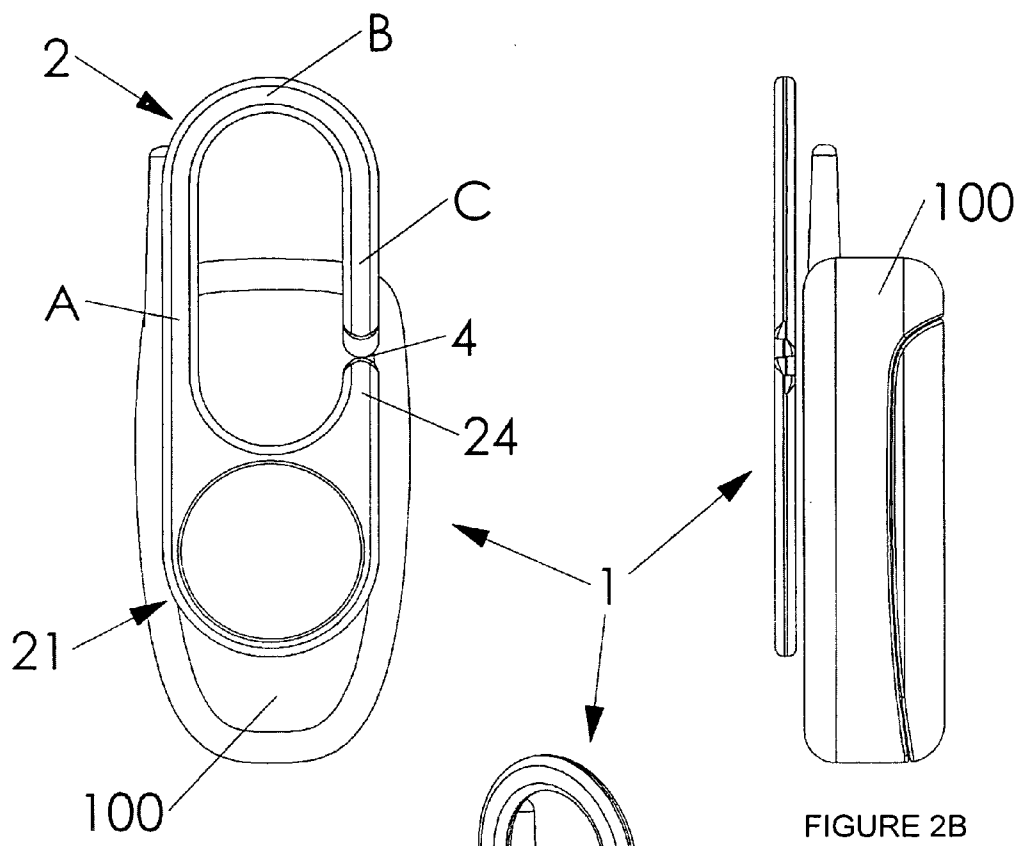


FIGURE 2A

FIGURE 2B

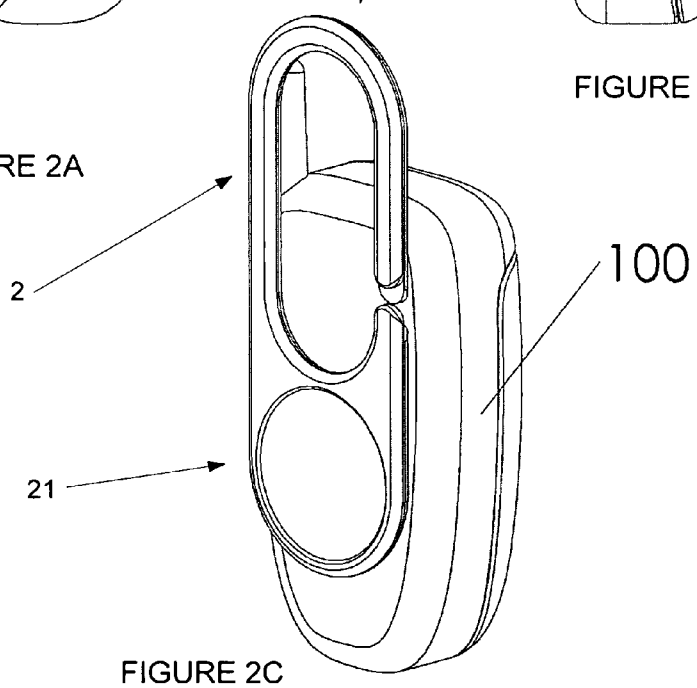


FIGURE 2C

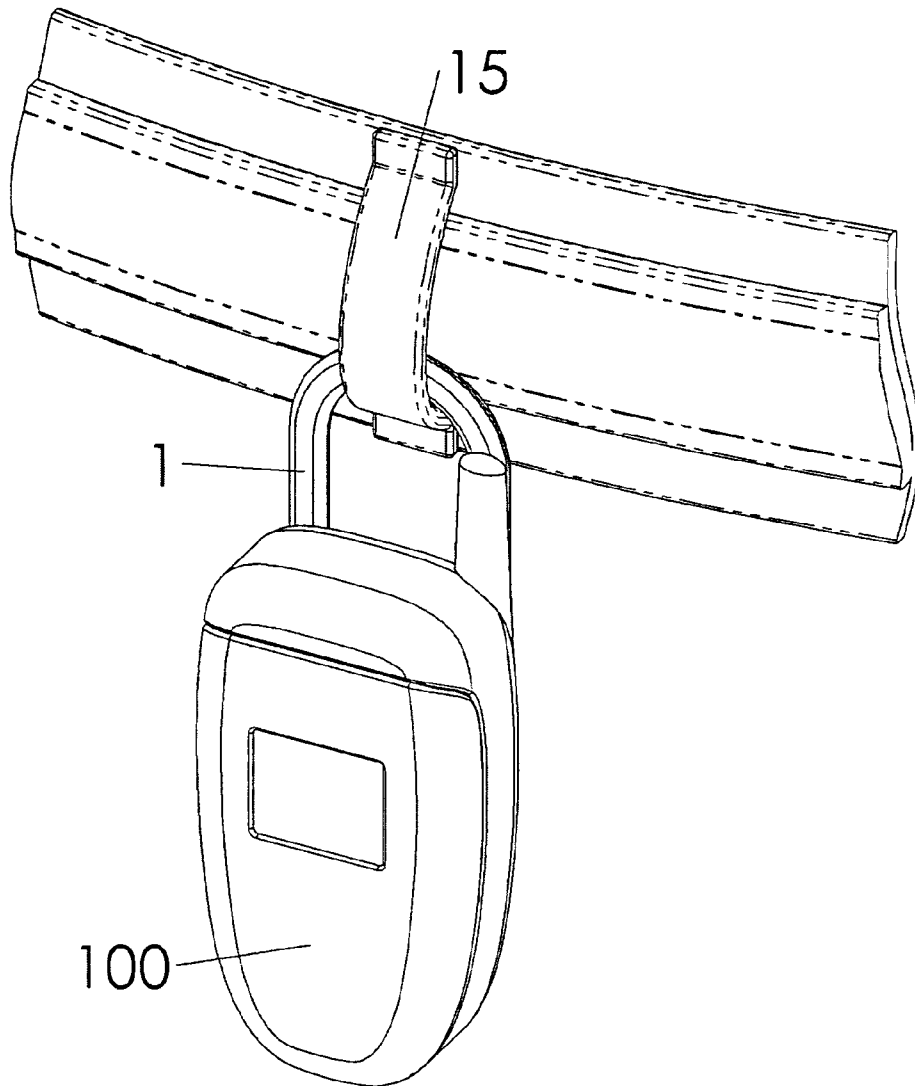


Figure 3

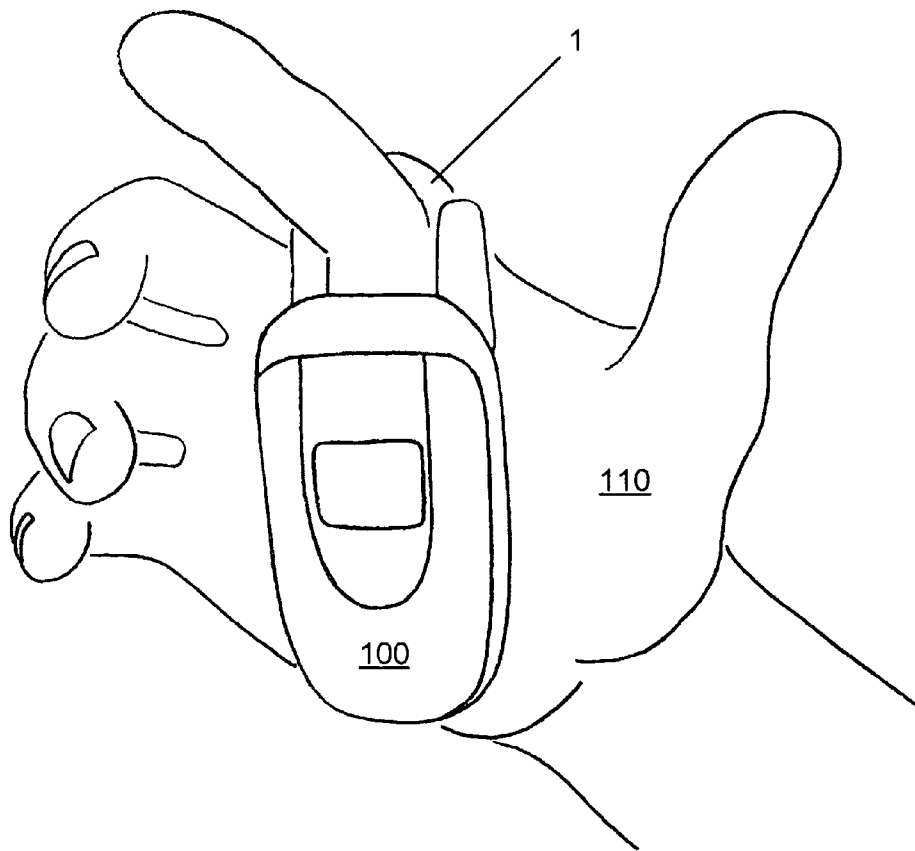


Figure 4

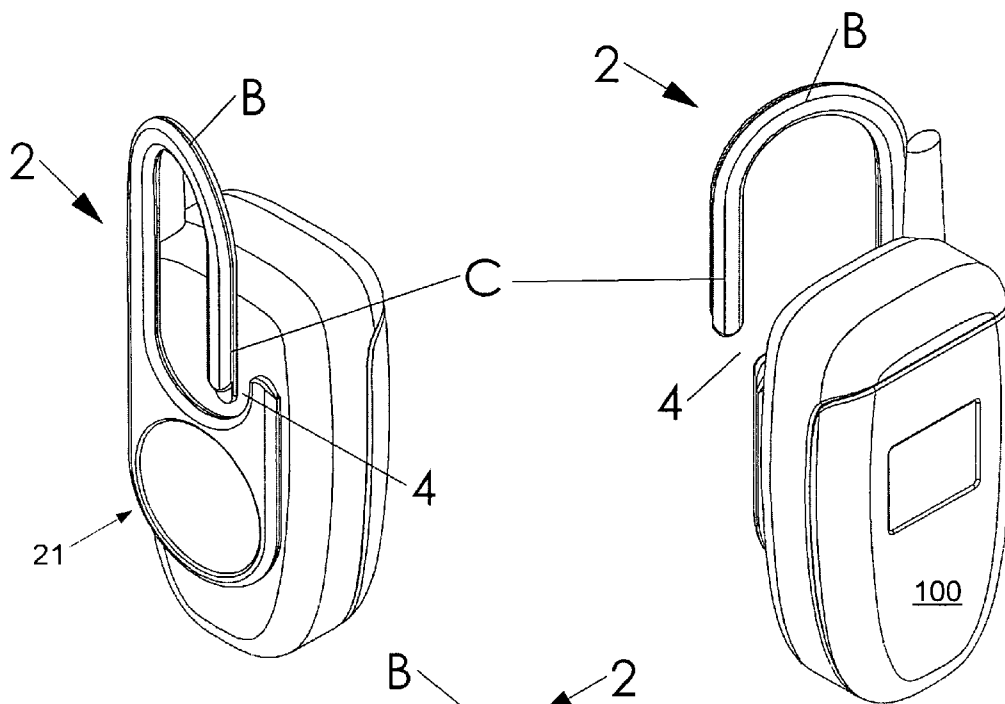


FIGURE 5A

FIGURE 5B

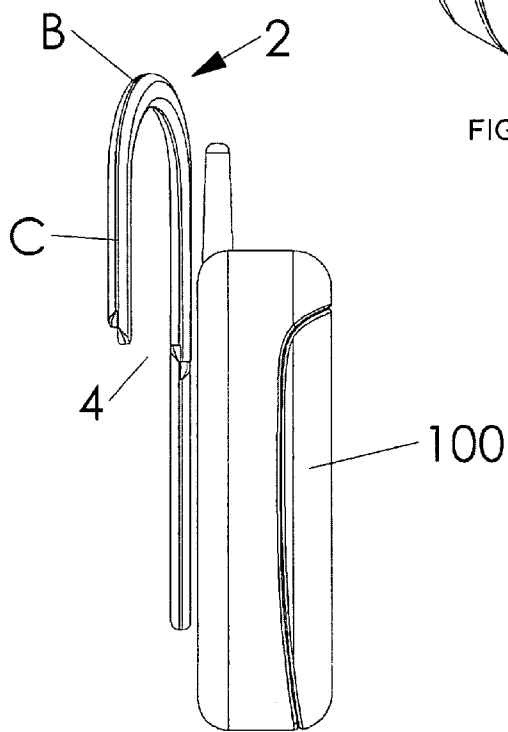


FIGURE 5C

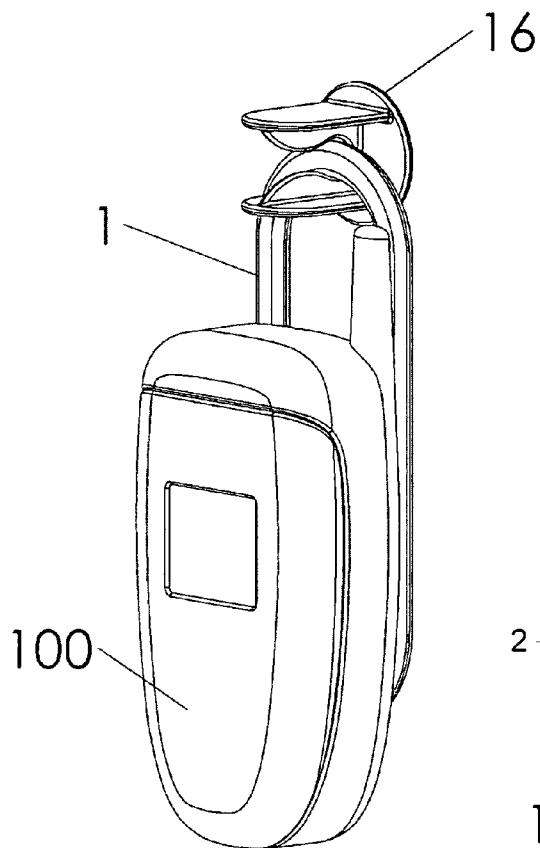


FIGURE 6A

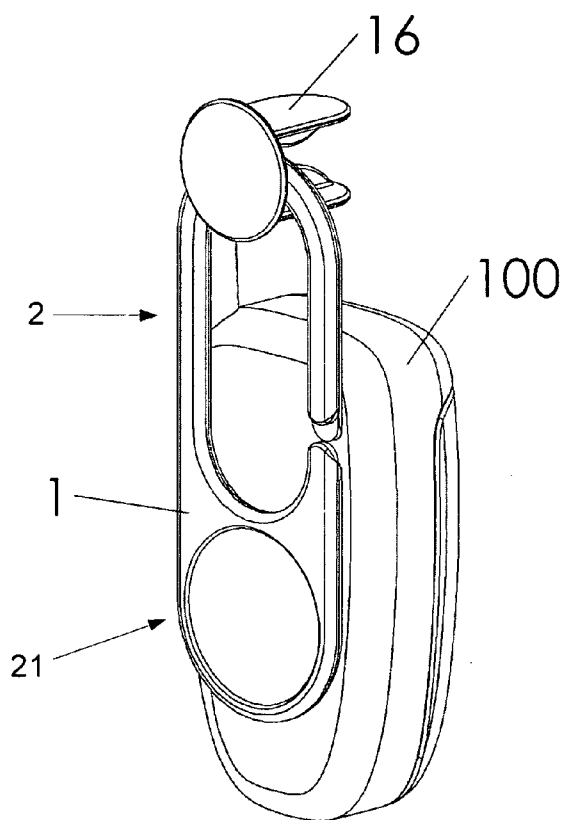


FIGURE 6B

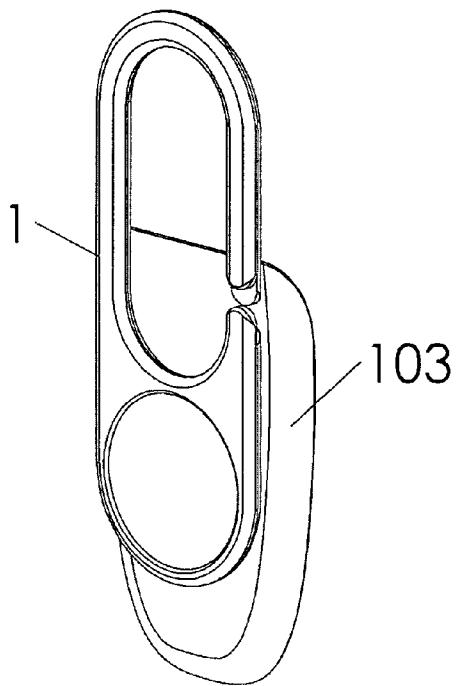


FIGURE 7A

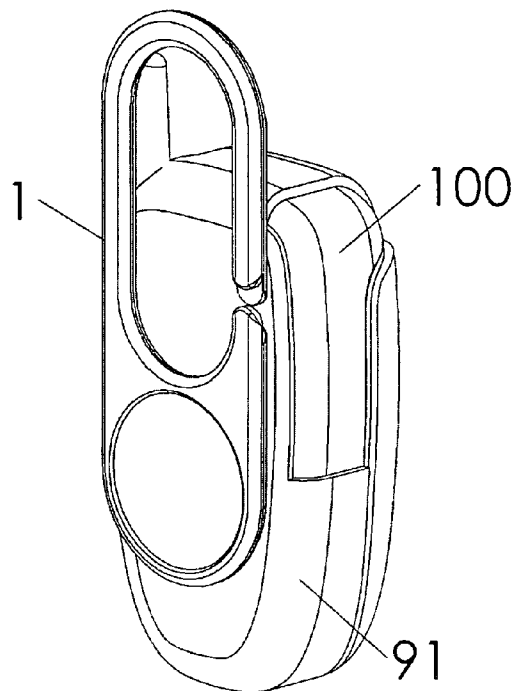


FIGURE 7B

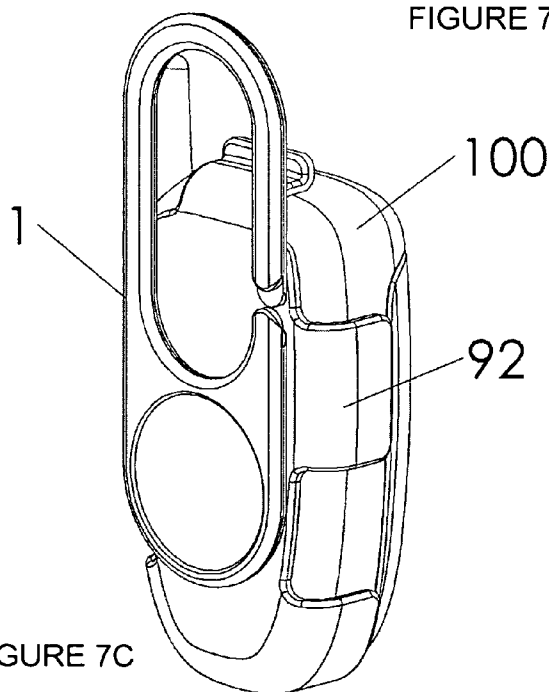


FIGURE 7C

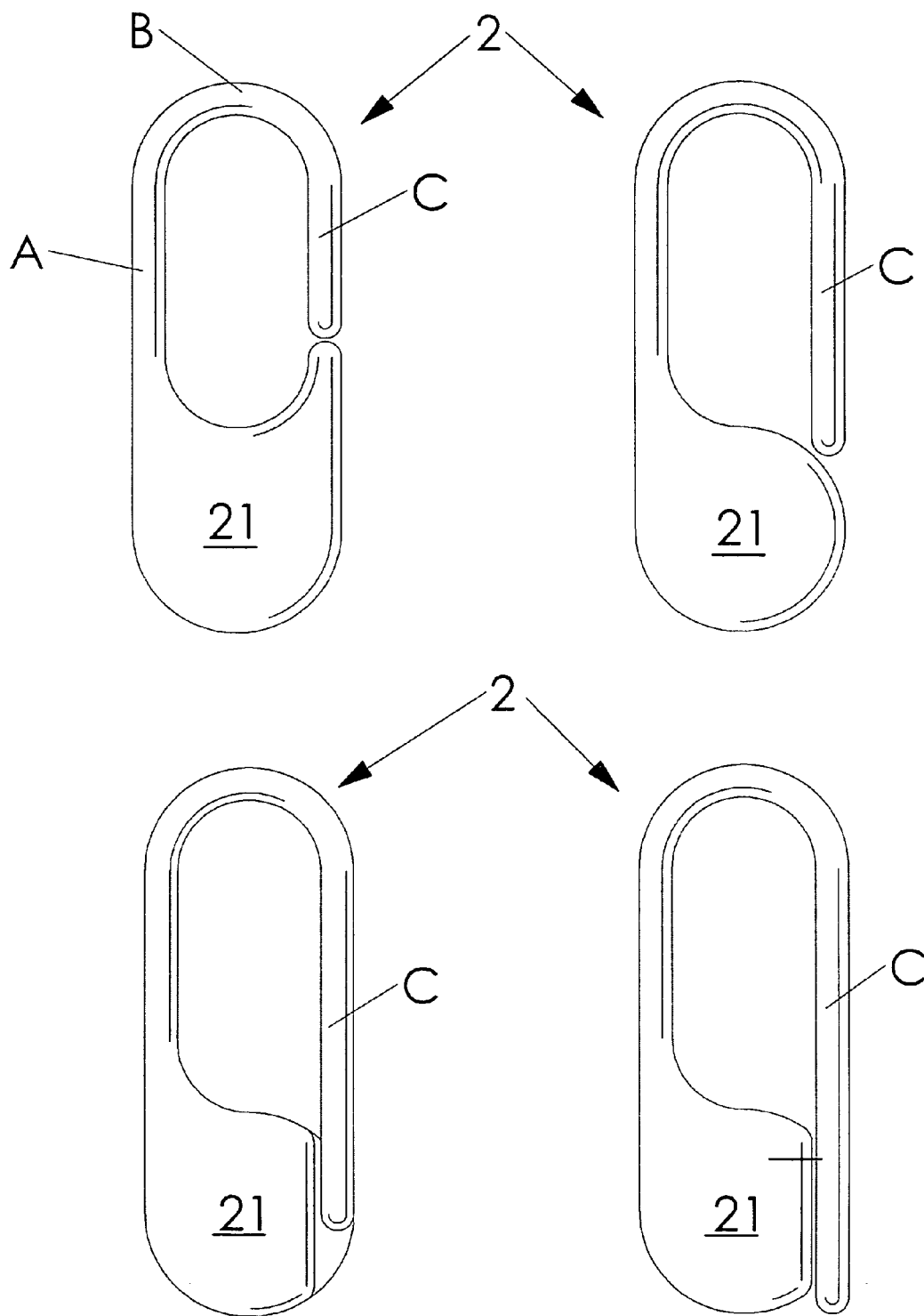


Figure 8

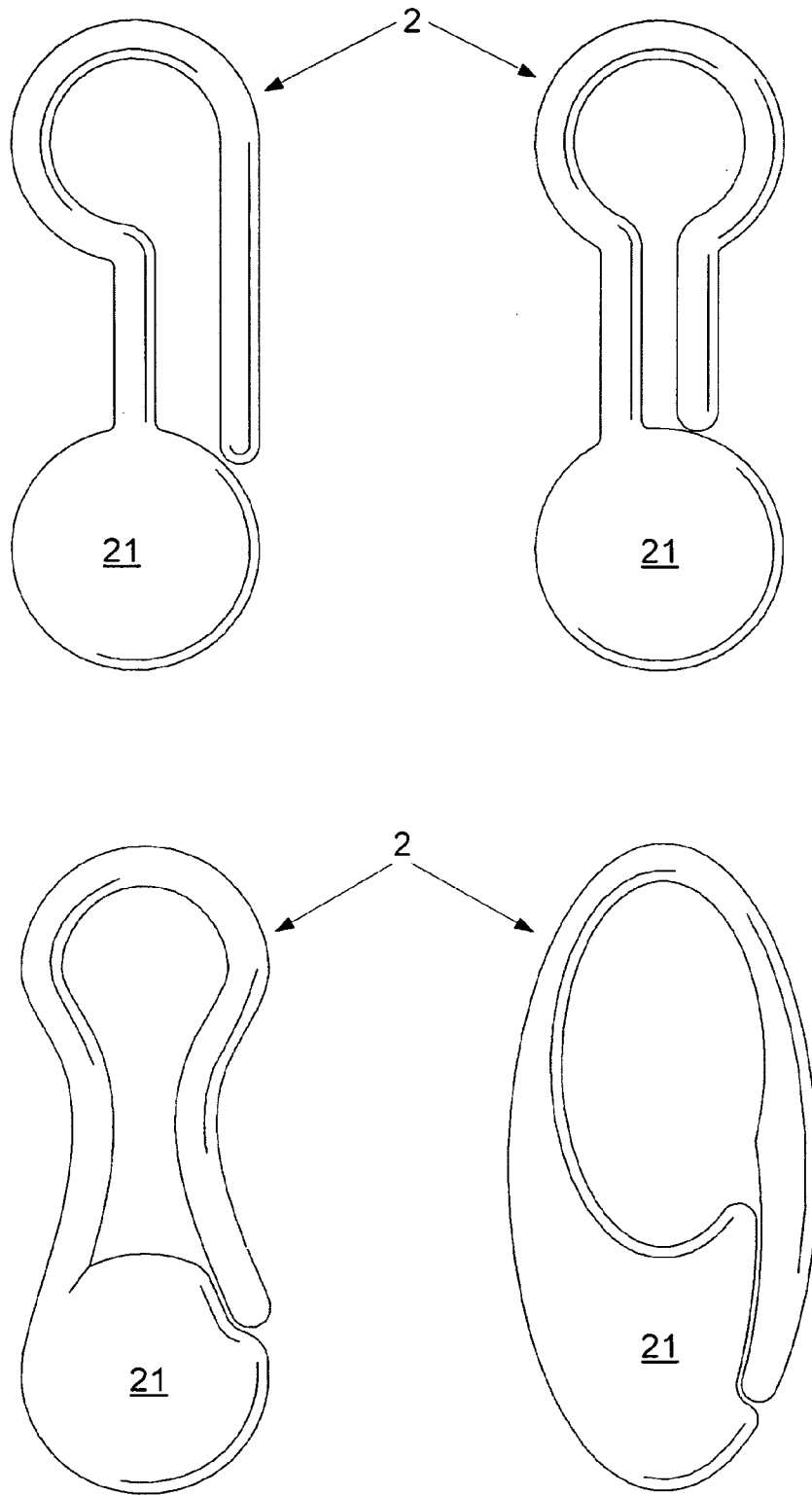


Figure 9

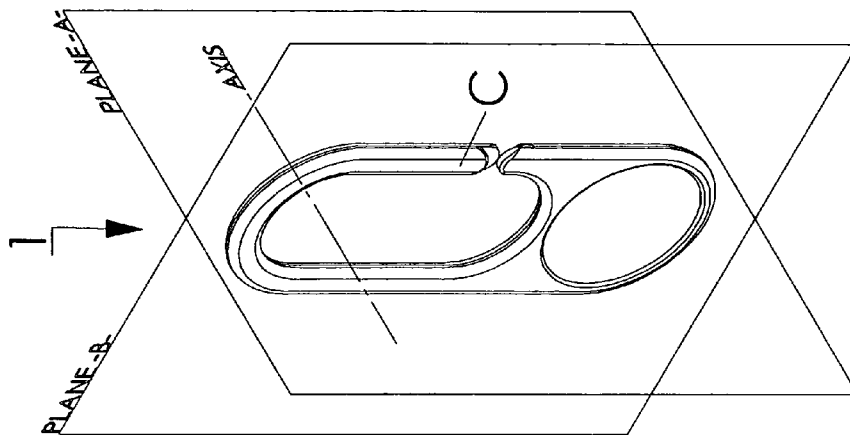


FIGURE 10C

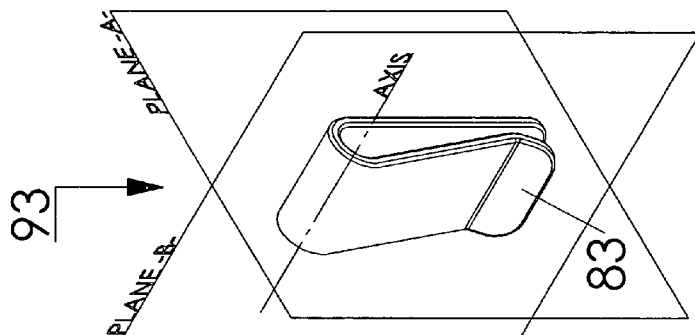


FIGURE 10B

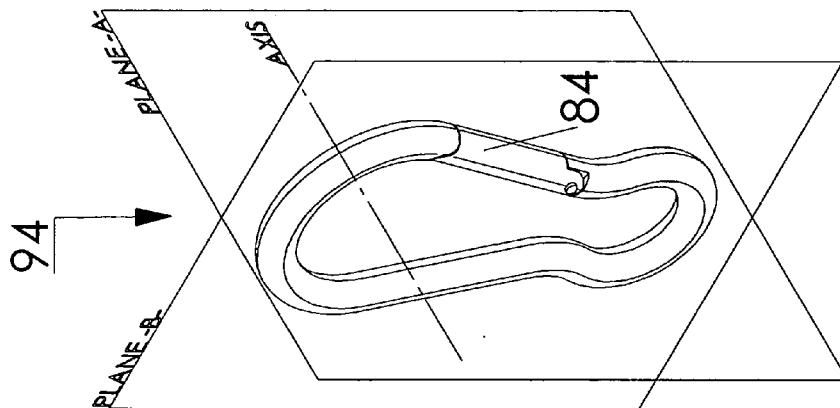


FIGURE 10A

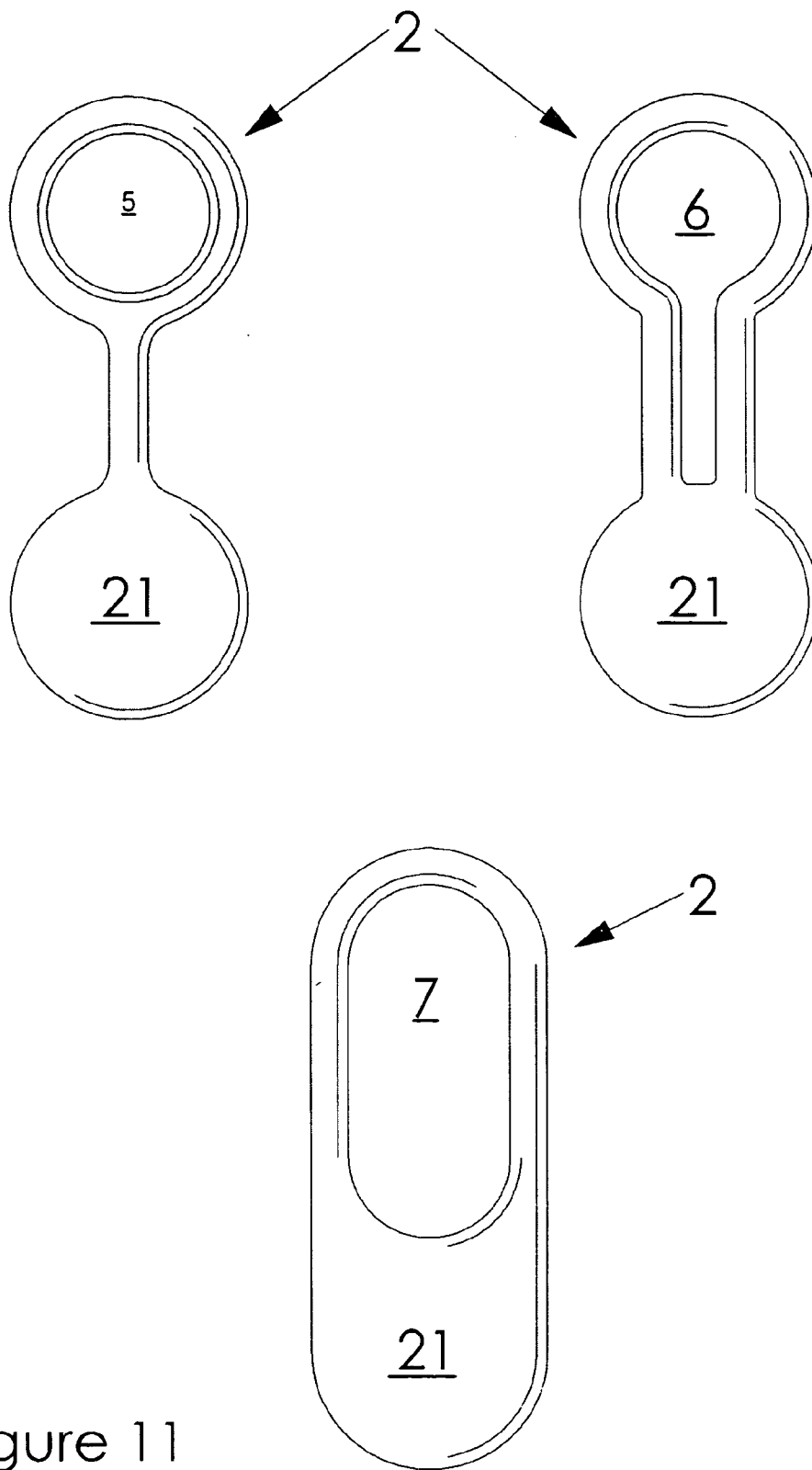


Figure 11

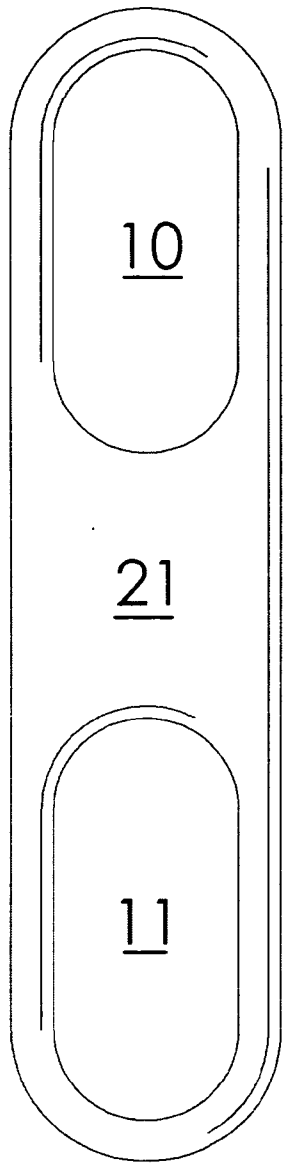


Figure 12

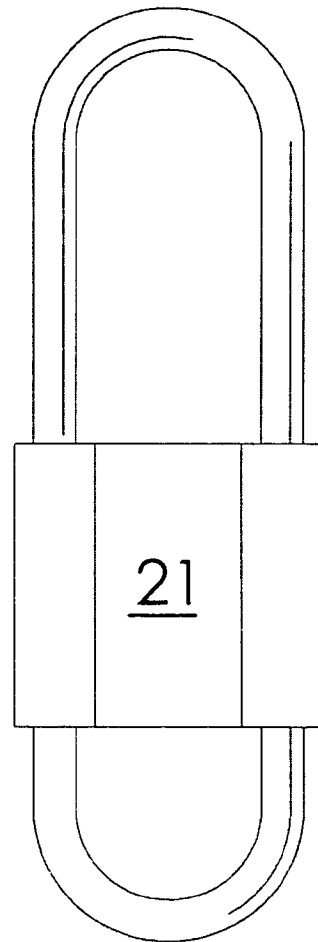


Figure 13

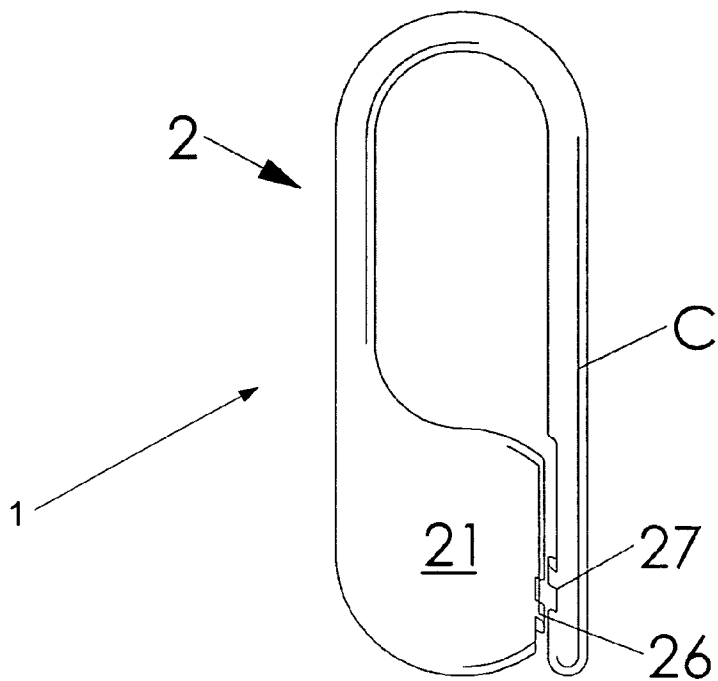


Figure 14

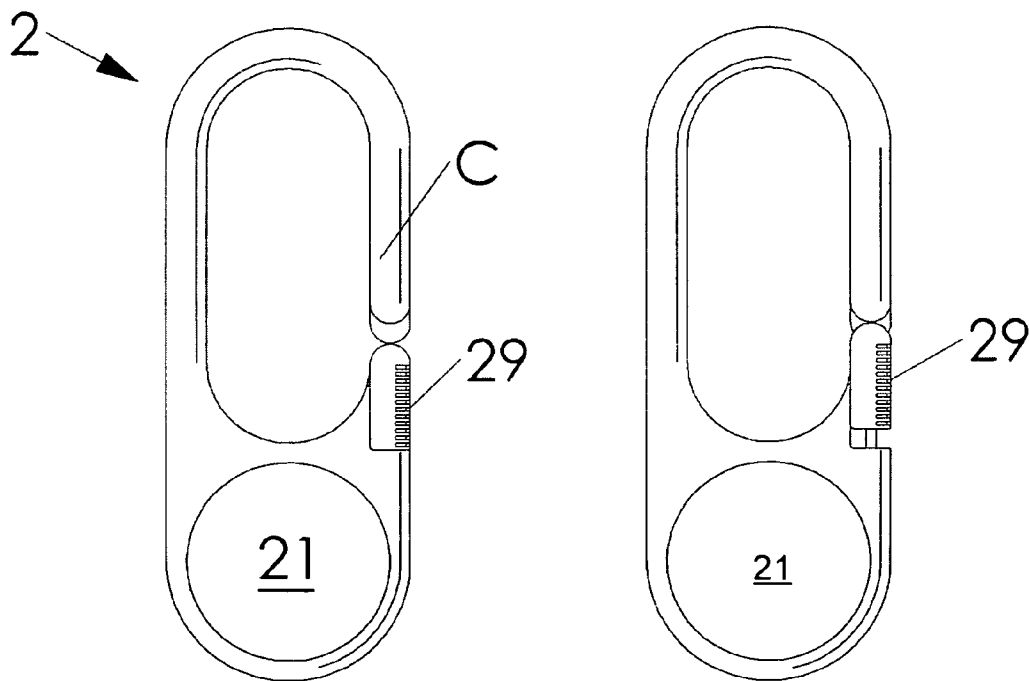


FIGURE 15A

FIGURE 15B

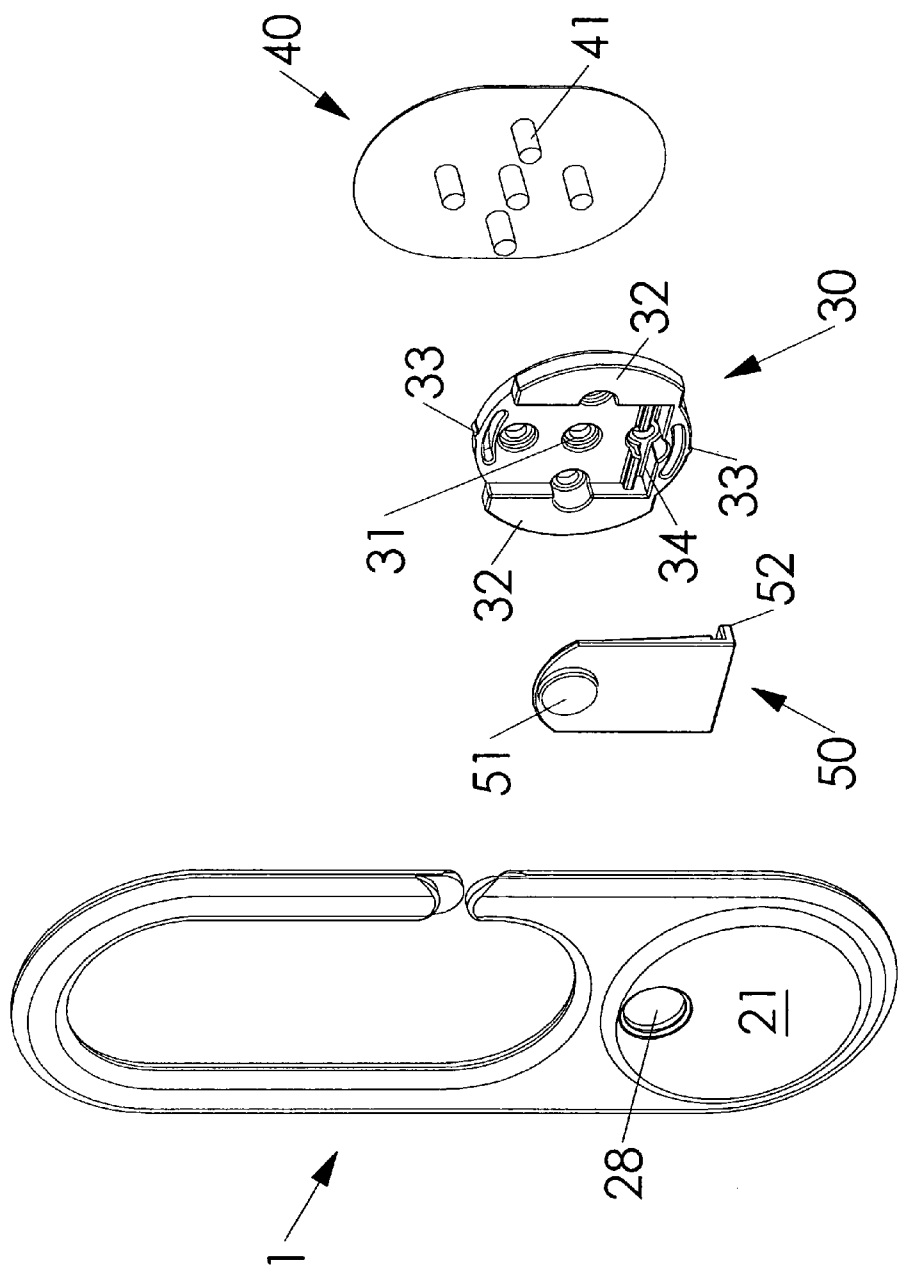


Figure 16

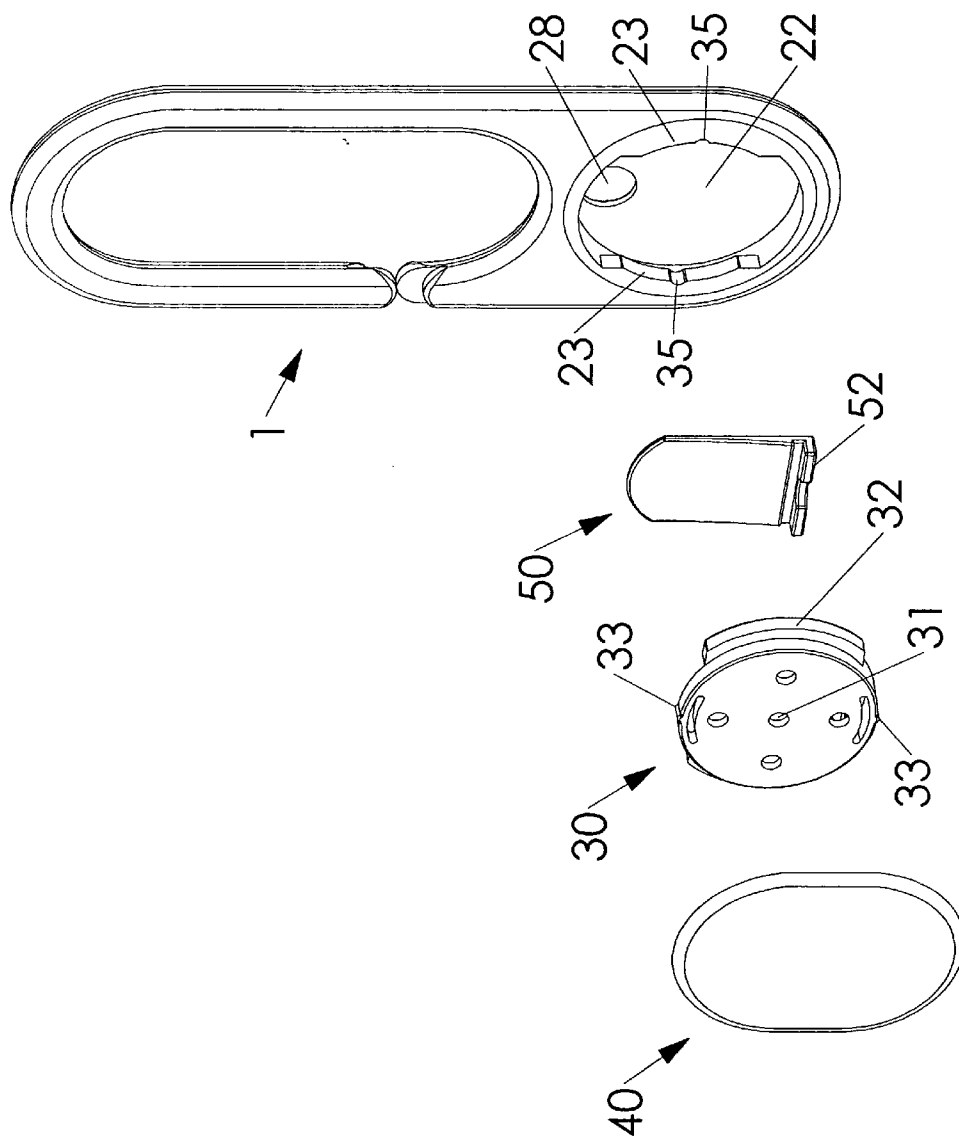


Figure 17

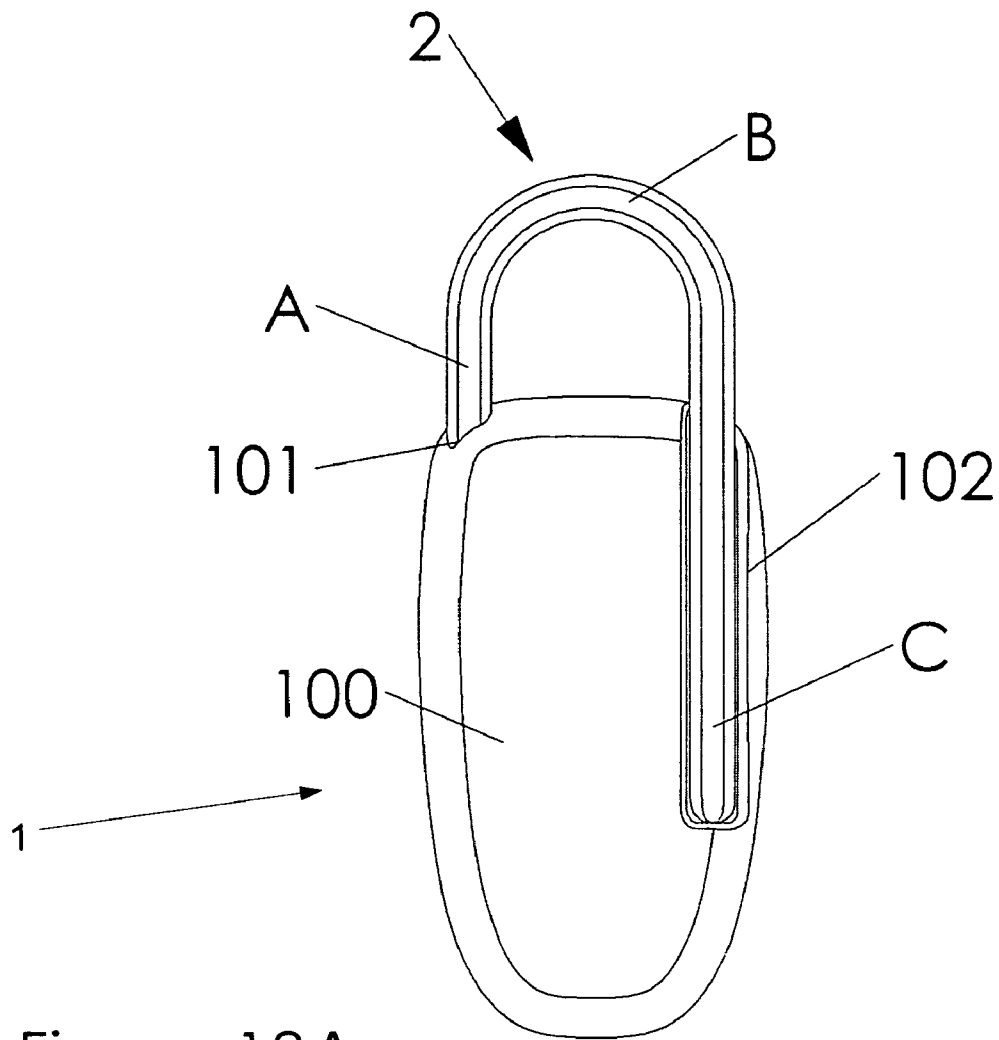


Figure 18A

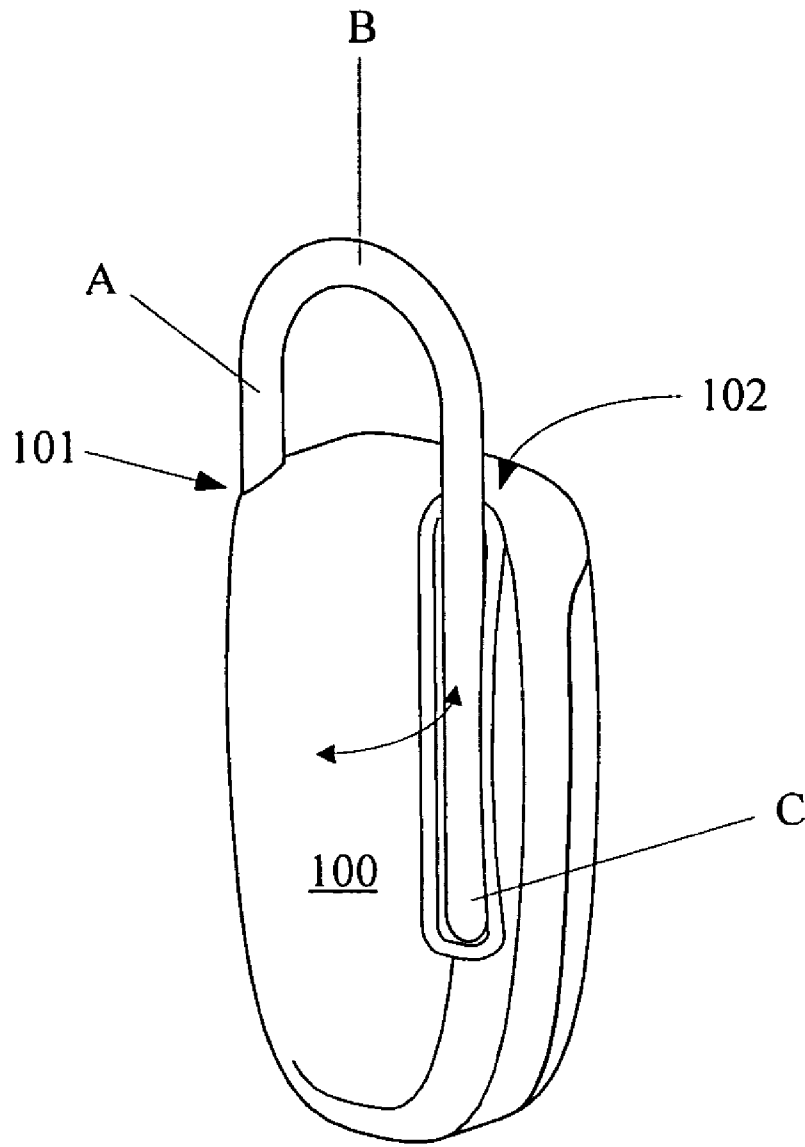


FIGURE 18B

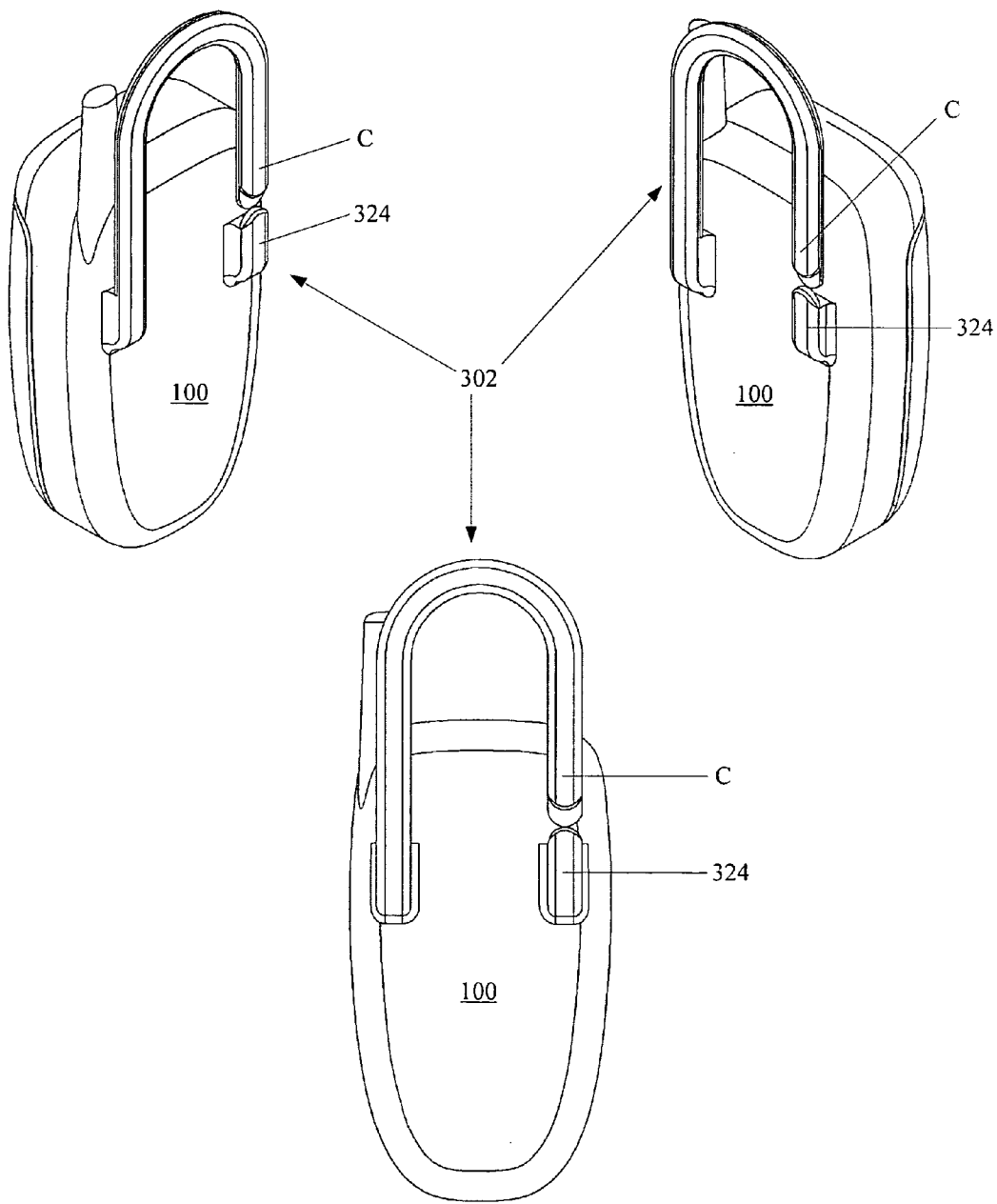
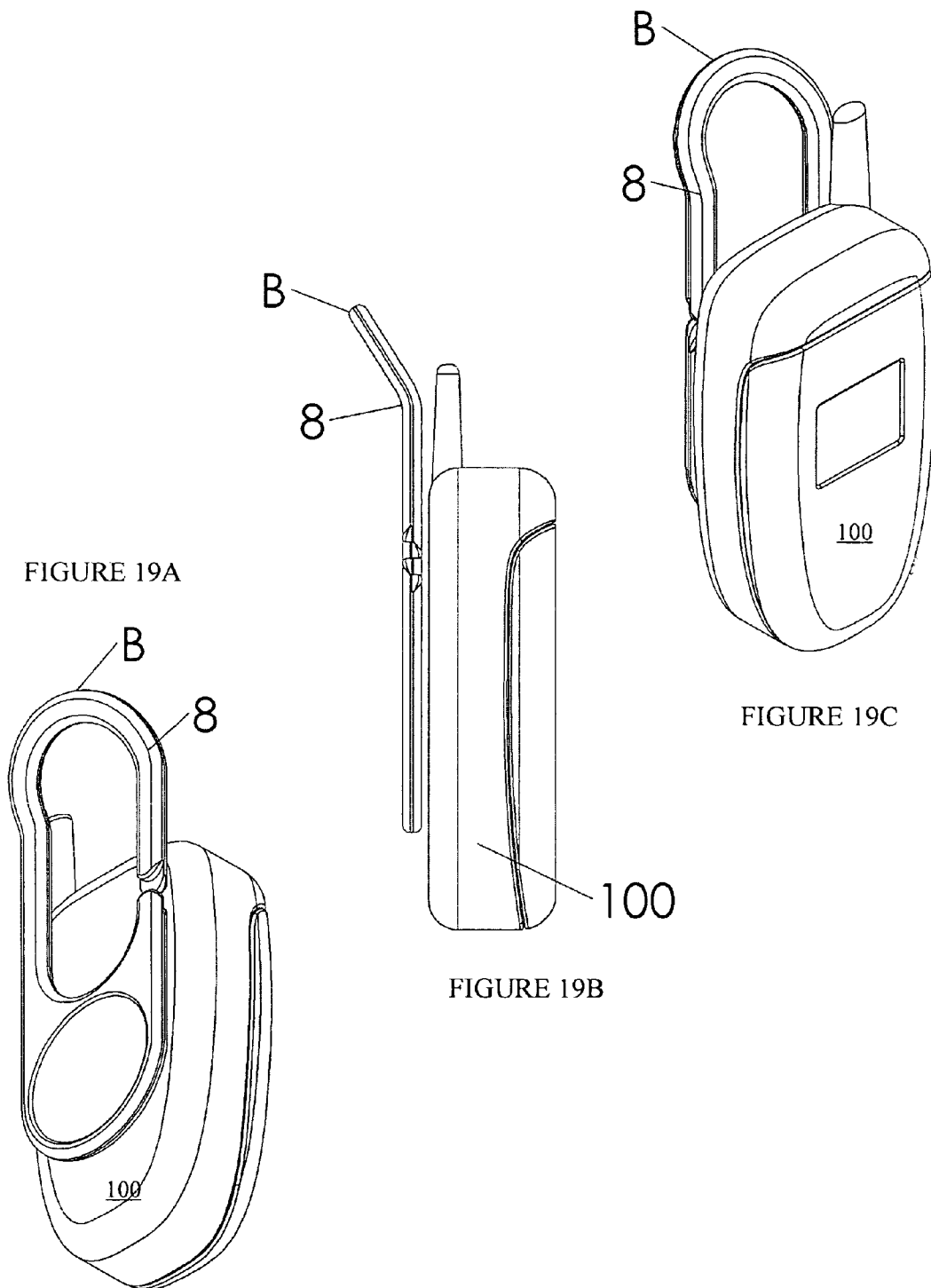


FIGURE 18C



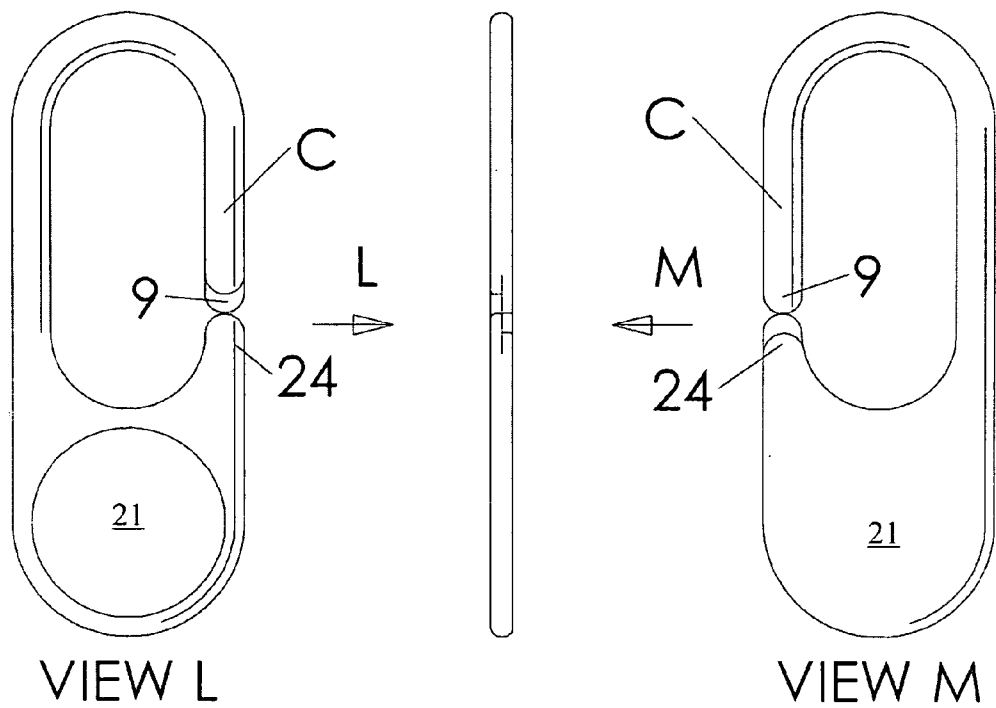


Figure 20

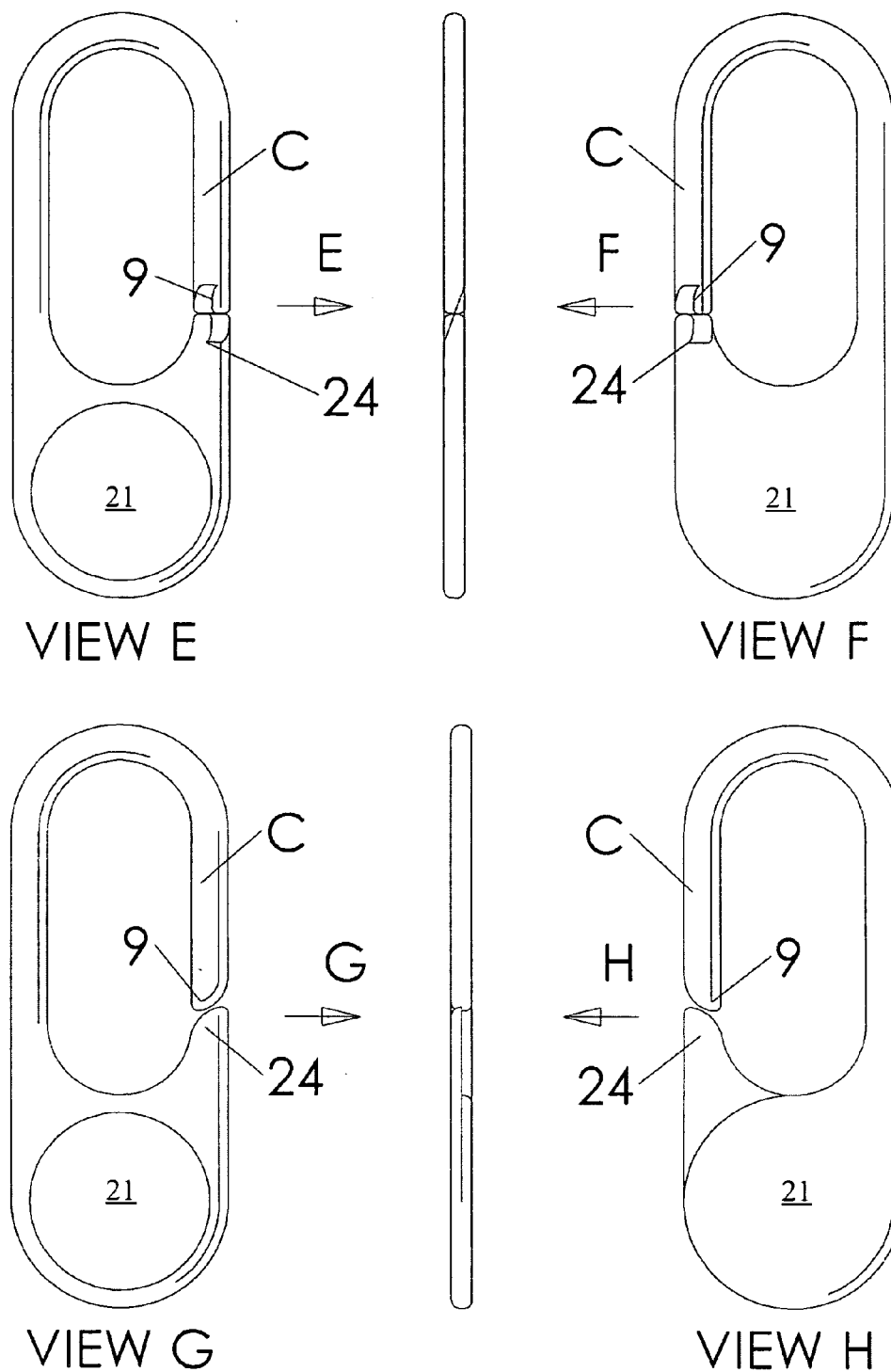


Figure 21

FIGURE 22A

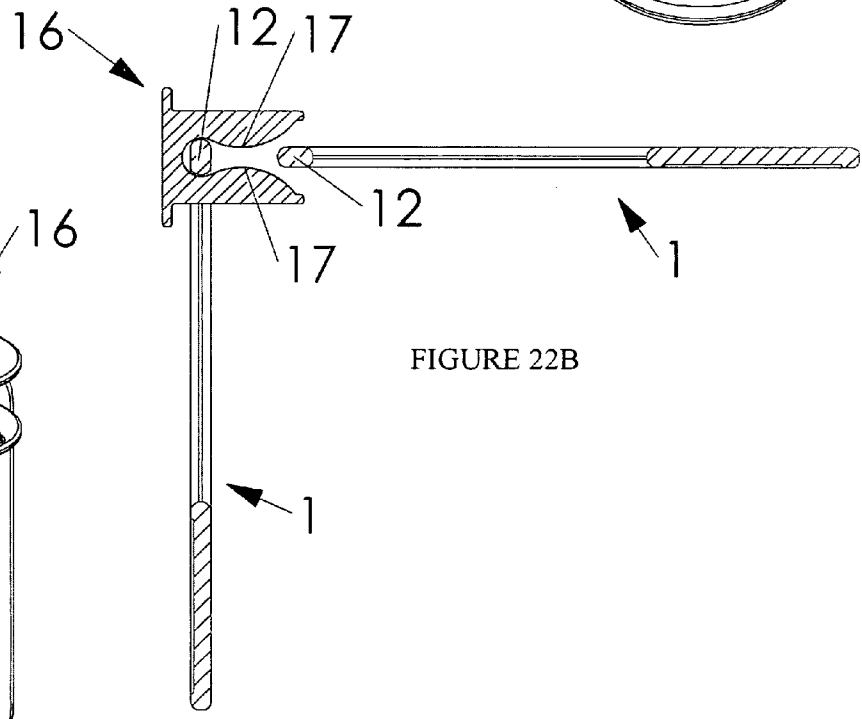
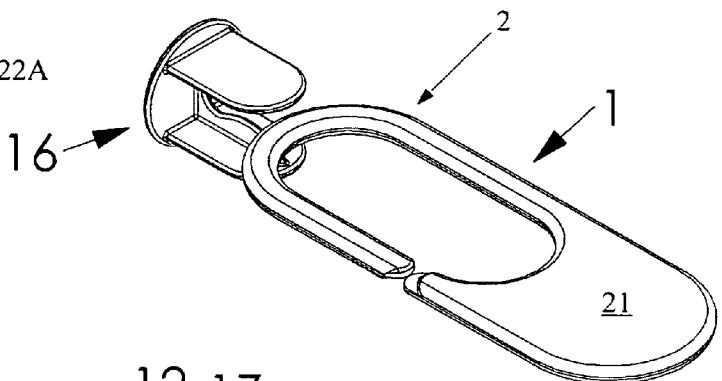


FIGURE 22B

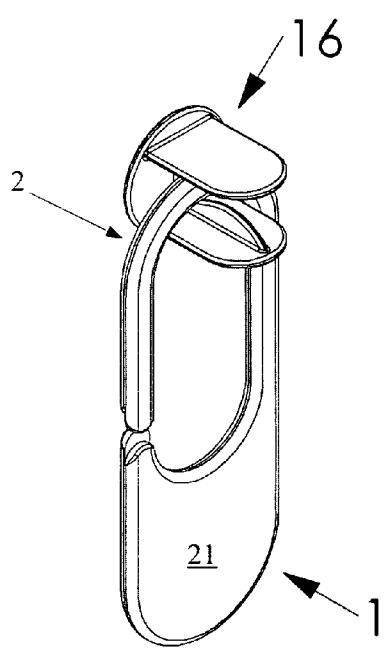


FIGURE 22C

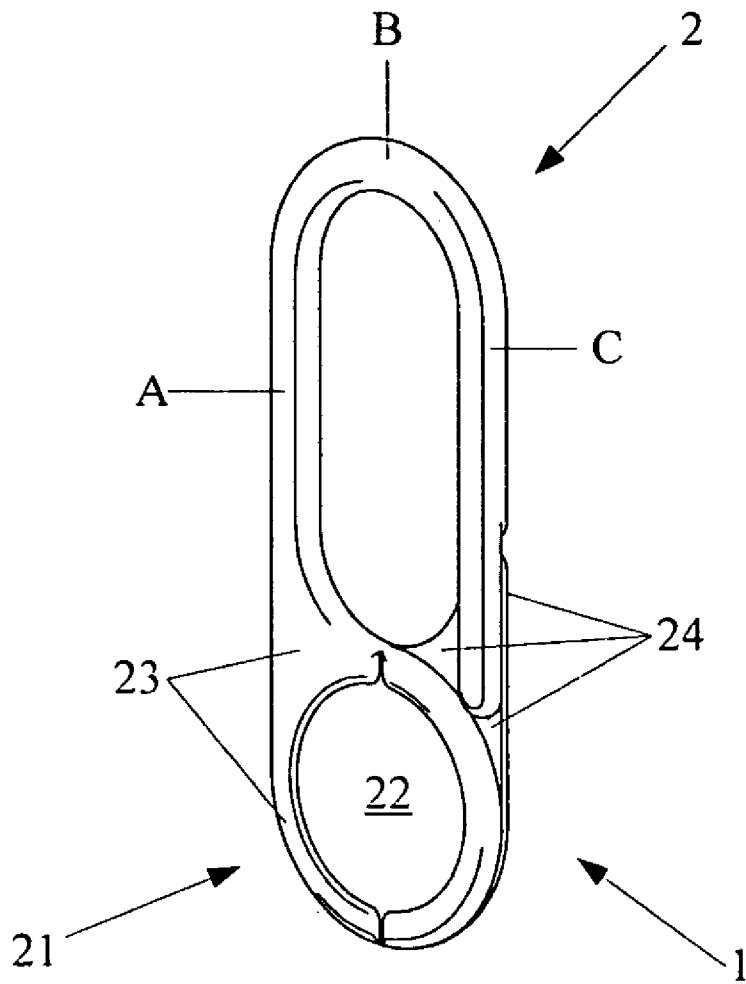


FIGURE 23

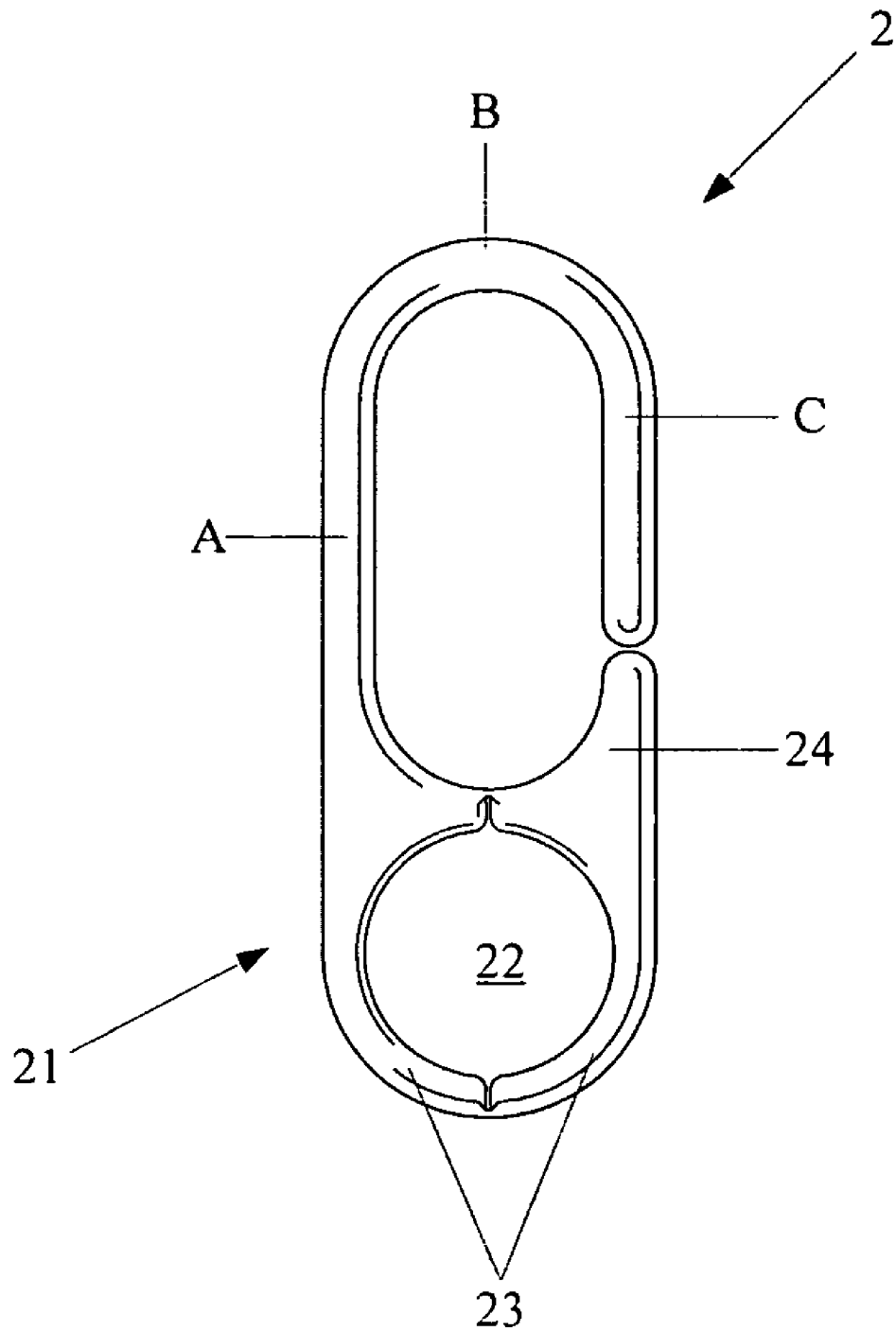


FIGURE 24

ATTACHMENT FOR PORTABLE ELECTRONIC DEVICES AND METHODS FOR USING THE SAME

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority of U.S. Patent Application Ser. No. 60/583,769, filed Jun. 29, 2004, and is a continuation-in-part of U.S. patent application Ser. No. 10/941,662, filed Sep. 15, 2004, the entire disclosures of which are incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The invention relates to apparatus for portable electronic devices and methods for using the same. More particularly, the invention relates to apparatus for portable devices that are used to attach, secure, and remove the portable device to a specific location or a specific object, such as a user.

BACKGROUND OF THE INVENTION

[0003] By their nature, portable devices (especially portable electronic devices) are meant to be carried by a user in a hand. Often, however, the user would like to attach the portable device to a specific location (usually to an object) and have it remain there until it is removed. This situation often occurs with portable telephones, such as wireless or cellular telephones, where a user attaches the wireless telephone to a belt or other part of the clothing until the telephone is needed (i.e., when someone calls the user).

[0004] There are currently several attachment devices that are used to attach portable devices to an object. Some of these devices contain a clip mechanism that attaches the portable device to a belt. These types of clips can be mounted directly to the portable device or to a case designed to hold the portable device. The clip and case are designed to stay with the portable device. Another attachment device contains a holster mechanism where the portable telephone rests in the holster or similar apparatus (that is itself attached to the belt with a clip) when not in use. When the portable telephone is removed, the holster stays attached to the belt of the user. Still another attachment device contains two interlocking pieces with one piece clipped to the belt and the other piece attached to the portable device or to a case holding the portable device. The pieces can be locked together to hold the portable device to the belt and unlocked when the portable device is removed. Examples of these types of devices are exemplified in **FIGS. 1A, 1B, and 1C** and some of U.S. Pat. Nos. 1,724,003; 2,830,478; 3,142,933; 3,146,925; 3,148,883; 3,307,754; 3,970,228; 4,157,166; 4,306,434; 4,319,384; 4,658,479; 4,993,613; 5,077,850; 5,414,596; 5,499,429; 5,540,367; 5,622,296; 5,727,290; 5,729,870; 5,730,342; 5,752,632; 5,779,115; 5,806,146; 5,850,996; 5,893,497; 5,906,031; 5,946,839; 5,983,686; 5,988,577; 5,955,700; 5,996,184; 6,006,969; 6,015,073; 6,062,521; 6,076,789; 6,173,875; 6,200,056; 6,223,402; 6,225,777; 6,233,788; 6,279,362; 6,352,186; 6,357,641; 6,364,184; 6,401,504; 6,427,293; 6,439,017; 6,481,058; 6,540,122; 6,550,108; 6,567,651; 6,606,769; 6,626,333; 6,626,336; 6,729,512; 6,733,153; 6,742,685; 6,752,305; 6,790,046; 2002/0030071; 2003/0064751; 2003/0075576; 2003/0094561; 2003/0111496; 2003/0127477; 2003/0233736; 2004/0029623; 2004/0050123; 2004/0069821;

2004/0069822; 2004/0069823; 2004/0069824; 2004/0124220; 2004/0129745; 2004/0200872; 2004/0232180; 2004/0204169; 2004/0251286; the disclosures of which are incorporated herein by reference.

[0005] Most of the known attachment devices are designed to be attached to a belt. Because of their configurations, these attachment devices do not lend themselves well to being attached to dissimilar objects. For example, these attachment devices do not work well with a belt loop, a pocket, or a peg.

[0006] As well, these attachment devices tend to be bulky. The mechanisms used for attachment typically extend away from the body as seen in **FIGS. 1A, 1B, and 1C**. Consequently, the devices can only be comfortably attached to certain locations on the belt, usually on the side of the user. They are rarely attached on—or near—the front of a user because the bulk of the devices can cause discomfort.

[0007] Most attachment devices in the art, however, are also damaged easily. Because they are bulky, for the reasons described above, they are typically worn on the side of the body. These devices are also fairly rigid and do not yield or move when bumped. When the user walks too close to a wall (or a similar solid object), the portable device can impact the wall and results in damage. A similar event happens when the user sits down in a chair and the portable device impacts the arm of the chair.

[0008] Wireless and cellular telephones, like other electronic devices, are getting smaller and smaller. Consequently, the attachment devices are becoming larger and larger relative to the size of the telephone. The attachment devices therefore make transportation of telephones more conspicuous and awkward because of their relative increased size.

[0009] Finally, the known attachment devices do not provide any mechanism for grasping the portable telephone. Thus, attachment devices do not enhance a user's ability to carry and use a portable telephone in the hand.

SUMMARY OF THE INVENTION

[0010] The invention relates to an apparatus for portable devices—especially portable electronic devices—and methods for using such apparatus. The apparatus is connected to the portable device, or a component or an accessory thereof, and is used to attach the portable device (i.e., a cellular phone) to an object (i.e., a belt loop). The apparatus of the invention comprises a base means that is connected to the portable device, or a component or an accessory of the portable device. The apparatus also contains a hooking means with one part that is connected to the base means and another part that can be attached to the object by a hooking action. The apparatus permits easy and quick attachment (and removal) of the portable device to an object (i.e., the belt loop) while providing secure retention when not in use. The apparatus can also be used to carry and hold the portable device when it is being used.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The following description of the invention can be understood in light of the Figures, in which:

[0012] **FIGS. 1A, B, and C** depict various conventional attachment devices in the art;

[0013] FIGS. 2A, B, and C depict the attachment apparatus in combination with a wireless telephone in one aspect of the invention;

[0014] FIGS. 3 and 4 depict another aspect of the attachment apparatus of the invention;

[0015] FIGS. 5A, B, and C depict the action of the attachment apparatus in one aspect of the invention;

[0016] FIGS. 6A and 6B depicts the attachment apparatus in relation to a hanger in one aspect of the invention;

[0017] FIGS. 7A, B, and C depicts the attachment apparatus attached to the carrying case of a wireless telephone in one aspect of the invention;

[0018] FIGS. 8 and 9 depict various aspects of the attachment apparatus of the invention;

[0019] FIGS. 10A, B, and C illustrate the attachment apparatus in one aspect of the invention compared to conventional devices;

[0020] FIGS. 11-13 illustrate various modifications of the attachment apparatus in several aspects of the invention;

[0021] FIGS. 14, 15A, and 15B illustrate aspects of a locking mechanism that can be incorporated into the attachment apparatus in several aspects of the invention;

[0022] FIGS. 16 and 17 illustrate aspects of a rotation mechanism that can be incorporated into the attachment apparatus in several aspects of the invention;

[0023] FIGS. 18A, 18B, 18C, 19A, 19B, and 19C illustrate various modifications of the attachment apparatus in yet other aspects of the invention;

[0024] FIGS. 20-21 depicted various modifications of the attachment apparatus in several aspects of the invention;

[0025] FIG. 22 depicts the attachment apparatus in relation to a hanger in another aspect of the invention; and

[0026] FIGS. 23 and 24 depict the attachment apparatus in yet another aspect of the invention.

[0027] The Figures presented in conjunction with this description are views of only particular—rather than complete—portions of the devices and methods of making the devices according to the invention. Together with the following description, the Figures demonstrate and explain the principles of the invention. In the Figures, the thickness of layers and regions may be exaggerated for clarity. The same reference numerals in different drawings represent the same element, and thus their descriptions will be omitted.

DETAILED DESCRIPTION OF THE INVENTION

[0028] The following description provides specific details in order to provide a thorough understanding of the invention. The skilled artisan, however, would understand that the invention can be practiced without employing these specific details. Indeed, the invention can be practiced by modifying the illustrated device and can be used in conjunction with apparatus and techniques conventionally used in the industry. The invention described below deals primarily with portable telephones like wireless and cellular telephones. The invention, however, could be modified for any other portable electronic devices, such as two-way radios, mp3

players, pagers, stop watches, time pieces, remote controls, flashlights and the like. Indeed, the invention could be used for any non-electronic portable device, such as a wallet, coin purse, key ring, key chain, tools (like a tape measure), security or ID cards. As well, the invention is primarily described for attaching such devices to an object (like an individual user by using a belt loop), but could be attached to different objects (other than a user, like the dashboard of a car or a wall) or to other locations on a user (such as a finger).

[0029] As described above, the invention includes an apparatus that is connected to a portable device, including a component or an accessory of that device. The apparatus can be used to retain the portable device to an object (i.e., a belt loop of a user) when the portable device is not being used. The apparatus also helps a user of the portable device carry and hold the portable device when it is being used.

[0030] Any apparatus that operates in the above manner can be used in the invention. In one aspect of the invention, the apparatus 1 is comprised of a hooking means (such as hook 2) and a base means (such as a base 21) as shown in FIGS. 2A, 2B, and 2C. The base 21 of the apparatus 1 is connected to the portable device 100 (or a component or an accessory) and serves as the anchor for the hook 2. The first portion (A) of the hook 2 is connected to the base 21. The second portion (B) and third portion (C) of the hook 2 are used to attach the portable device 100 to an object via a hooking action.

[0031] An example of this hooking action is depicted in FIG. 3, where the second portion B and the third portion C of the hook 2 of the apparatus 1 holds the portable device 100 to the belt loop 15 of a user. As depicted in FIG. 4, the apparatus 1 can also provide a mechanism for a user to hold the portable device 100 in their hand during use, with added security from accidental dropping than provided merely by the hand alone.

[0032] In one aspect of the invention, the portable device 100 can be attached to an object by moving the third portion C of the hook 2 (also referred to as the free end) away from the portable device 100 (as shown in FIGS. 5A, B, and C). This action creates an opening 4, or enlarges an existing opening. The third portion C of the hook 2 can then be inserted through a part of the object, such as through a belt loop. When the third portion C of the hook 2 is released, it returns to its original position and closes the opening 4. In this position, the portable device 100 hangs from the object from the second (or curved) portion B of the hooking means as shown in FIG. 3. To remove the portable device 100, the process is reversed. In another aspect of the invention, the second portion B of the hooking means can just be slipped over an object (such as a finger) without moving the free end of the hooking means, as shown in FIG. 4.

[0033] The apparatus of the invention can be used to attach and retain a portable device 100 to any given location on an object that is capable of accepting the apparatus. Examples of such objects are the clothes of a user (belt, belt loop, pocket . . .), a knob, a loop, a hole, a hook, a ring, a peg, a post, a finger or the specially designed hanger 16 depicted in FIGS. 6A and 6B. Thus, the hooking means can be captured (or be retained) by many types of objects, or a portion of an object, and remain secured until intentionally removed by a user.

[0034] The apparatus of the invention need not be directly attached to the portable device **100**. In this aspect of the invention, the apparatus **1** can be attached to an auxiliary component or an accessory of the portable device. Examples of such auxiliary components include a chain, a hook, a plate, a hinge, a swivel, a tab, a stand-off, a spacer, a battery, a battery cover, a leather case, or a holster. In one aspect of the invention, the auxiliary component comprises the carrying case **91** that holds a cellular telephone as depicted in **FIG. 7B**. In a similar aspect of the invention, the auxiliary component comprises a belt holster **92** for the portable device **100**, and the apparatus **1** of the invention is retained to the belt holster **92** as shown in **FIG. 7C**. In another aspect of the invention, the auxiliary component comprises a battery **103** (or battery cover) for the portable device **100** as shown in **FIG. 7A**.

[0035] The overall dimensions of the apparatus are such that the invention can be adapted to a variety of different portable devices. These dimensions can be changed as needed to suit a specific end use (such as a specific model of wireless telephone) and still retain the functionality of the invention. As well, the invention can be configured to be used with a wide array of portable devices of different sizes, shapes, and weights.

[0036] The apparatus of the invention adds very little depth to the portable device, especially relative to the devices known in the art. As shown in **FIG. 2B**, the plane of the apparatus **1** is substantially parallel to the surface of the portable device **100** to which it is attached, thereby minimizing the overall depth of the combined product (portable device and apparatus). As shown in **FIG. 1**, other apparatus known in the art extend away from the surface to which they are attached. Such mechanisms therefore drastically increase the depth of the combined product (portable device and attachment device) and limit the types of objects to which they can be secured.

[0037] The actual depth added to the portable device by the apparatus of the invention depends on the configuration of the base means and hooking means, the material used in the apparatus, the size and weight of the portable device, and the means of attachment. Where the portable device is a cellular telephone with a depth of about 1 inch, the depth of the apparatus can range from about 0.060 to about 0.300 inch, thereby increasing the depth of the telephone by only about 7% to about 33%. For a similar cellular telephone, conventional attachment devices added a depth of up to as much as 1 inch, thereby increasing the depth by about 100%.

[0038] The apparatus of the invention can be made of any material(s) that allows it to operate as described herein, as well as any material(s) that meets the desired aesthetic and functional requirements. Examples of such materials include plastics, elastomers, composites, spring steel, other metals, wood, or combinations thereof. These materials can optionally be treated to provide different finishes or appearances to enhance marketability. Examples of such treatments include color, texture, opacity, other visual and tactile effects, and combinations thereof.

[0039] The apparatus can be made by any known process that provides the apparatus with any of the configurations mentioned above. Examples of such processes include molding or stamping. In one aspect of the invention, a plastic injection molding process is used to make the apparatus of the invention.

[0040] The apparatus of the invention can also be part of a system for attaching a portable device to an object. Thus, the apparatus of the invention could be a part of the system that also contains accessories or add-ons for portable devices. When the portable device is a cellular phone, the accessories or add-ons can be a leather case modified to work with the apparatus of the invention, a holster adapted to work with the apparatus of the invention, or a replacement battery or battery cover designed to accept the apparatus. In another aspect of the invention, the system could contain the hanger **16** described above and/or a replacement apparatus (i.e., with different colors or shapes) for the original apparatus.

[0041] As mentioned above, the apparatus of the invention can comprise a hooking means and a base means. The hooking means of the apparatus is designed to capture (or be retained by) many types of objects, or a portion of an object, and remain secured until intentionally removed by a user. Any hooking means that operates in this manner can be used in the invention, including the hooking means known in the art and described in the publications cited above. In one aspect of the invention, the hooking means illustrated in **FIGS. 2 and 8** is used in the invention. In these Figures, the hooking means (i.e., hook **2**) is connected to the portable device **100** via any suitable base means, such as base **21**.

[0042] The hooking means in this aspect of the invention contains three portions. A first portion A extends away from the base **21**, typically in a substantially straight line. The second portion B comprises a curved portion connected to the first portion A and the third portion C. The curve of the second portion B can vary depending on design requirements, but typically can range from about 120 to about 360 degrees. In one aspect of the invention, the curve of the second portion B is about 180 degrees. The axis of the second portion B lies in a plane substantially perpendicular to the mounting plane of the portable device **100**. The third portion C of the hooking means extends from the second curved portion B typically in a substantially straight line and can stop short of, along side of, overlap, or extend past the base **21**, as shown in **FIG. 8**.

[0043] The lengths and widths of these three portions, as well as the curvature of the second portion B, depend on the material used, the type of portable device and its configuration, and the location of the hooking means relative to the portable device **100**. For example, when used with cellular telephones, the length of the first portion A can range from about 1.5 to about 3 inches, the length of the second portion B can range from about 1 to about 2 inches, and the third portion C can range from about 1 to about 3.5 inches. While the widths of the 3 portions are typically about the same, they need not be. For example, when used with cellular telephones, the widths can range from about 0.06 to about 0.25 inches. As well, the hooking means can be designed with several different cross-sections or bent into different shapes to appeal to visual interest and for varying functions, as shown in **FIG. 9**.

[0044] The hooking means provides a degree of flexibility that enhances the ability of the user to attach the portable device **100** to an object. In the aspect of the invention depicted in **FIG. 5**, the flexibility is provided when the third portion C (or free end) of the hooking means moves generally perpendicular to the plane in which the apparatus lies.

This movement facilitates the ability of the hooking mechanism to capture—and be captured by—a portion of an object (such as a ring or loop). In one aspect of the invention, the amount of flexibility provided must be balanced with the rigidity required to secure the portable device to the desired object.

[0045] The required flexibility, in this and other aspects of the invention, can be obtained by several methods. The first method is by exploiting the characteristics of the materials used in the hooking means. Another method to achieve this flexibility is by using a spring-loaded hinge or similar mechanism. Yet another method is by using the configuration of the hooking means described and illustrated herein.

[0046] As shown in FIGS. 10A, B, and C, the hooking means is distinctive when compared to other attachment devices such as the standard belt clip 93 or carabiner 94. This distinctiveness comprises the plane in which the axis of the second or curved portion B lies and the direction of movement of the third portion C (or free end). As shown in these Figures, all three of these devices lie in plane B. The axis of the second portion B lies in the same plane (plane A) as the carabiner 94. However, the movement of the third portion C of the apparatus 1 is perpendicular to plane B while the movement of the carabiner latch 84 is parallel to plane B. Further, while the third portion C of the apparatus 1 moves similar to the end 83 of the belt clip 93 (both perpendicular to Plane B), the axis of each device are in a different plane.

[0047] In one aspect of the invention, the hooking means of the apparatus can be modified to comprise a loop that is closed relative to itself or closed relative to the base means. An example of a loop that is closed in this manner is depicted in FIG. 11, where the loop of the hooking means is self-enclosed to form a ring 5, is substantially self-enclosed to form shape 6, and can form shape 7. Other shapes for the self-enclosed loops, such as square, triangles, rectangles, polygons, and the like can be used in the invention. Other details of the configurations of the loop are described in U.S. patent application Ser. No. 10/941,662, the entire disclosure of which is incorporated herein by reference. In another aspect of the invention, the hooking means contains loop 3 with a fixed section and a flexible section as described in U.S. patent application Ser. No. 10/941,662, the entire disclosure of which is incorporated herein by reference.

[0048] The hooking means is connected to the portable device in any manner that allows it to operate as described above. In one aspect of the invention, the hooking means is directly connected or attached to the portable device 100. In another aspect of the invention, the hooking means is connected to the portable device through a base means, as described below, and is therefore indirectly connected to the portable device 100.

[0049] The base means serves as a base or anchor for attaching the hooking means to the portable device 100. Any base means that operates in that manner can be used in the apparatus 1, including the base 21.

[0050] The base means can be either permanently or removably connected to the portable device 100. The base means is permanently attached to the portable device 100 with an adhesive or other chemical bonding agent, a

mechanical fastener, or as a feature molded into the portable device itself. The base means is removably attached to the portable device by adhesive tape, a mechanical fastener, hook and loop fabric, molded feature, or other mechanisms that clamp, bind, or secure the base means properly to the portable device or component or accessory thereof. The base means can contain any features necessary to aid in its connection to the portable device that are known in the art, including those described in the publications disclosed above. The base means can also contain several parts that act in concert for rotation, hinging, locking, attachment, and detachment as known in the art.

[0051] The base means can have any shape that allows attachment to the portable device while serving as a base or anchor for the hooking means. Examples of such shapes include circular, square, rectangular, polygonal, and poly-morphic, as well as those shapes illustrated in FIG. 8. In one aspect of the invention, the base means has the configuration of base 21 illustrated in FIGS. 23-24, where a portion 24 extends from the remainder of the base 21 to the proximity of the third portion C of the hooking means 2. In this aspect of the invention, the base 21 has a lowered middle portion 22 and raised edges 23.

[0052] The base 21, or a portion thereof, can be either integrated into the portable device 100 or can be configured as an add-on item. The base 21 is integrated by any method that manufactures the portable device with the base means or portion thereof as a component of the device. Such components include battery covers, batteries or the back of the portable device itself. It is also possible for the base means to comprise a clamp that can be secured by mechanical or chemical means to an antenna or other protrusion from a portable device. As an add-on item, the base 21 can be permanently or removably attached using any of the mechanisms described above, or can be incorporated into a case or holster which holds the portable device.

[0053] The base 21 can be located on any desired portion of the portable device 100. The exact location will depend on the desired position of the hooking means and the expected use of the portable device 100. When used with a cellular telephone, for example, the base 21 is located so that when connected to the hook 2, the hook 2 is located in the upper portion of the back of the portable device 100, making it easy to attach to a user. Since the hooking means can be located in any location, the base means can likewise be located in corresponding locations of the portable device 100.

[0054] The base means can also contain features for either enhancing its function or for providing additional features. In one aspect of the invention, such features include a space for a logo or other advertising. In another aspect of the invention, the features include a depression to index an adhesive tab. In yet another aspect of the invention, the features aid in identification and use of the portable device.

[0055] The apparatus of the invention can be modified in several ways. The apparatus can be configured to be ambidextrous or reversible to accommodate the needs of the user. The overall dimensions of the apparatus can be modified for adaptation to a variety of different portable devices. These dimensions can be changed as needed to suit a specific end use (such as a specific model of wireless telephone) and still

retain the functionality of the invention. As well, the invention can be configured to be used with a wide array of portable devices.

[0056] Another modification of the apparatus allows a versatility to meet the needs of any individual user. One way in which this versatility is accomplished is by allowing the user to dictate the orientation of the apparatus in relation to the portable device (or vice versa). This orientation can be accomplished at the time of mounting by choosing the desired orientation of the apparatus in relation to the portable device.

[0057] In another modification, the hooking mechanism can be designed with several different cross-sections. In this modification, the different portions A, B, and/or C can have different cross-sections that support the different functions they serve. As well, the hooking mechanism can have or be bent into different shapes to appeal to visual interest and for varying functions.

[0058] In another modification, the apparatus of the invention can contain an antenna means (as illustrated in **FIGS. 18A and 18B**) that enhances the reception of portable devices using wireless methods of communication. In fact, for cellular telephones, the antenna and apparatus **1** could be combined. In a like manner, functional components of other portable devices could be combined with, or added to, the apparatus of the invention.

[0059] In another modification, more than just one apparatus could be used with any given portable device. As well, the apparatus of the invention could be configured for larger/heavier portable devices than cellular telephones.

[0060] Although the base means and the hooking means of the apparatus of the invention are usually described as being of a single piece, they can also be separate pieces in another modification of the device. In this aspect of the invention, the hooking means can be designed such that it is removable from the base means (which remains mounted to the device) and then reattached in a different position. The ability to separate the hooking means and the base means also allows disparate materials to be used for manufacture, as well as appealing to different market segments.

[0061] The apparatus can also be modified to contain more than a single loop, if desired. In this aspect of the invention, the apparatus contains a first loop **10** and a second loop **11** as shown in **FIG. 12**. This aspect of the invention can be very useful as it provides dual points which can be used to attach and remove the portable device to an object.

[0062] In the aspect of the invention shown in **FIG. 12**, the two loops **10** and **11** are separate from each other. Alternatively, the two loops can be connected to each other and attached to the base means so that the loops slide back and forth relative to the portable device as shown in **FIG. 13**. This configuration allows the size of the loop to change as needed by the user when handling the portable device. Other configurations for the loops are described in U.S. patent application Ser. No. 10/941,662, the entire disclosure of which is incorporated herein by reference.

[0063] In another modification, the apparatus can contain locking means. The locking means functions to lock the base means and hooking means together, thereby preventing the hooking means from slipping off the object (and conse-

quently the portable device from disengaging from the object). An example of one locking means is illustrated in **FIG. 14**, where the third portion or free end C of the hook **2** and the base **21** contain mating portions **26** and **27**. The mating portion **27** of the free end C can be moved in and out of the mating portion **26** of the base **21** to connect (or lock) and disconnect (or unlock) the attachment device of the invention.

[0064] Another aspect of the locking means is shown in **FIGS. 15A and 15B**. The base **21** contains a sliding mechanism (such as slider **29**) that moves toward and away from the free end of the hook **2**. In the "down" position shown in **FIG. 15A**, the slider remains on the base **21**. When the slider **29** moves to the "up" position shown in **FIG. 15B**, it overlaps the free end of the hooking means and effectively locks the hook **2** to the base **21**.

[0065] In another modification, the apparatus can be modified to house electronic components. In this aspect of the invention, the apparatus of the invention can contain an antenna means that enhances the reception of portable devices using wireless methods of communication. In another aspect, the apparatus might contain a means for wireless transmission of signals from the portable device to an earpiece worn by the user.

[0066] In yet another modification, the apparatus of the invention can optionally contain rotation means. The rotation means allows the apparatus to be rotated relative to the portable device. In turn, the portable device can be rotated relative to the object to which it is attached. In one aspect of the invention, the rotation means can be configured to allow the portable device to rotate to one or several indexed positions and then allow it to be locked into a position. This rotating means can be configured to have any degree of desired rotation, including about 45, about 90, and even up to 360 degrees.

[0067] Any rotating means known in the art that functions in the manner described above can be used in the invention. In one aspect of the invention, the rotating means comprises the mechanism described in U.S. patent application Ser. No. 10/941,662, the disclosure of which is incorporated herein by reference. In another aspect of the invention, the rotation means comprises the mechanism depicted in **FIGS. 16 and 17**. In this aspect of the invention, the rotating means comprises several components that work together to rotate and retain the apparatus in relation to the portable device.

[0068] The rotating means shown in **FIGS. 16 and 17** comprises a hub **30** to which all other parts of the rotating means connect to and/or revolve. The hub **30** contains a plate with receiving holes **31**, lugs **32**, stops **33**, and a receiving slot **34**. The hub **30** is attached to the portable device, or a component or an accessory thereof by any means known in the art, such as adhesive tape. In another aspect, the hub **30** is molded as an integral part of the portable device, a component, or an accessory.

[0069] The hub **30** is retained by a capture plate **40**. The hub **30** contains receiving holes **31** designed to receive the prongs **41** which extend from the capture plate **40** and therefore correspond in size and shape to the receiving holes **31** in the hub **30**. The capture plate **40** can be of any shape and thickness that meets design requirements. For example, the capture plate **40** can be designed to retain the hub **30** to

any thin-walled object, such as an accessory (i.e., a carrying case) that holds the portable device. The capture plate can be located on the “outside” of the accessory or on the “inside” of the accessory with the prongs 41 protruding through the wall of the accessory to the outside of the accessory and away from the portable device.

[0070] The hub 30 is mated to the capture plate 40 through the receiving holes 31. In this configuration, the wall of the accessory is sandwiched between the hub 30 and the capture plate 40. Once the capture plate and the hub are mated, these two components can be either permanently or removably connected to each other. These two components can be permanently connected by any mechanism, such as deforming the ends of the prongs 41 to retain the hub 30. These components can be removably connected by any mechanism known in the art.

[0071] The hub 30 also contains two outward lugs 32. A cavity 22 is created in the base 21 of the apparatus to accept the hub 30. The base 21 also contains two inward lugs 23 which act against the outward lugs 32 of the hub 30 to retain the hub and the base together. The lugs of each component are engaged when the apparatus is in the desired position, i.e., vertical position shown in FIGS. 16 and 17. The lugs can be disengaged in any alternate position, i.e., when the apparatus is rotated to the horizontal position or 90 degrees either side of engagement. In this disengaged position, the apparatus can be removed from the hub 30. Similarly, the apparatus must be in this position to accept the hub 30 and be rotated to engage the lugs for retention.

[0072] The hub 30 also contains at least one stop 33 which act against the ends of the inward lugs 23 of the base 21. In this configuration, the apparatus is designed to operate within a 90 degree arc or within 45 degrees each side of the desired position (i.e., the vertical position). This degree of rotation can be very useful when using the apparatus of the invention with a cellular phone that has the capability of capturing images (i.e. camera phone or video phone) and the apparatus needs to be moved so that it does not interfere with this feature. The stop 33 acts against the ends of the inward lugs 23 to keep the apparatus within this rotation range and to avoid accidental removal. To remove the apparatus, the stops 33 can be flexed inwardly by applying extra rotational force to the apparatus. The inward lugs 23 also contain a notch 35 to accept the stops 33 when the apparatus is in the disengaged position. This allows the base 21 to easily accept the hub 30 prior to rotating the apparatus to engage the lugs for retention.

[0073] The hub 30 also contains a receiving slot 34. This receiving slot is designed to accept, locate, and capture the lock spring tab 52 of the lock spring 50. The button 51 on the lock spring 50 mates with a hole 28 in the base 21 of the apparatus when modified for the rotational means. When the button 51 and hole 28 are engaged, the apparatus is locked in position, thereby precluding rotation of the apparatus in relation to the hub 30 and consequently the portable device 100. To unlock and rotate the apparatus, the button 51 of the lock spring 50 is depressed, disengaging the button 51 from the hole 28 in the base 21 and allowing the apparatus to rotate on the hub 30. When the apparatus is rotated to the engaged position, the lock spring 50 automatically forces the button 51 into the hole 28 of the base means 21 and locks the apparatus into that position.

[0074] Using this rotating means provides some interchangeability of any particular apparatus 1 that is used with a portable device 100. Since the apparatus is only connected to the portable device by using the rotating means, other apparatus (that contain the modified base means) can be used in the invention. This allows the user to change the style, color, shape, etc. of the apparatus 1 that is used with any given portable device 100.

[0075] This rotation means can also be modified so that it attached to the apparatus rather than the portable device. In this aspect of the invention, plate 40 would be attached to a modified based means with the prongs extending towards the portable device. The outer plate would be connected to the portable device. The rest of the components of the rotating means would be connected and rotated as indicated above.

[0076] In another modification of the apparatus, the hooking means can be directly connected or attached to the portable device 100 so the portable device itself acts as the base means. In this aspect of the invention, the hooking means can be either integrated into the design of the portable device or can be configured as an add-on item. When integrated into the design of the portable device, the portable device is manufactured so the hooking means is manufactured as a part of the portable device.

[0077] This aspect of the invention can be illustrated in FIGS. 18A and 18B, where the portable device 100 is made with a hole 101 where the first portion A of the hooking means can be located and attached. The portable device 100 is also made with a groove 102 or indentation where the third portion C of the hooking means 2 can be inserted or contained. The hole 101 and the end of the first portion A are connected so that free end (or third portion C) can move or rotate towards and away from the groove 102 (as shown by the arrow in FIG. 18B). This configuration allows the user to move the third portion C away from the groove, attach the portable device 100 to the desired object (such as a belt loop 15 by sliding the free end or third portion C through the loop, and then allowing the third portion C to move back into the groove 102. To remove the portable device 100 from the object, the third portion C of the hooking means 2 is simply moved or rotated away from the groove 102 and the portable device pulled away from the object. Any known retaining mechanism for retaining or locking the free end of the hooking mechanism in the groove 102, such as a friction fit, can be used in the invention.

[0078] In a similar aspect of the invention, the portable device need not contain a groove, as depicted in FIG. 18C. In this aspect of the invention, the hooking means (i.e., hook 302) contains a first end that is connected to the portable device 100. The free end C of the hook 302 remains free to move away from the portable device in the manner described above. Thus, the portable device 100 acts as the base means. In this aspect of the invention, an extension 324 (similar to extension 24) can be provided so that it is located proximate the free end C.

[0079] In this aspect of the invention, the hooking means can be either permanently or removably attached to the portable device. The hooking means can be permanently attached by any means known in the art, such as molding, bonding, or mechanical capture. The hooking means can also be removably attached by any known means, such as by a friction fit, a snap fit, or a screw.

[0080] The hooking means can be located on any desired portion of the portable device that does not interfere with its operation. In the aspect of the invention where the portable device is a cellular phone, the hooking means is usually located on an upper portion on the back of the phone so that it remains in an upright position when attached to the object by using the hooking means, as illustrated in FIG. 3. The hooking means, however, could be attached to the bottom or sides of the back of the portable device 100. As well, the hooking means could be attached to the front of the portable device if desired.

[0081] When removably attached, the hooking means can be configured to be moved to different positions of the portable device. In this aspect of the invention, the portable device is configured with the removable attaching means described above in those locations where the hooking means will be attached. The hooking means can be moved and attached from one location to another by removing and then re-attaching the hooking means.

[0082] In yet another modification, the apparatus of the invention can be provided with an extension means. Cellular telephones and certain other portable electronic devices emit radiation during their operation. There has been concern that such radiation (when the portable device is too close to the body) can be potentially harmful to users when exposed to such radiation over long periods of time. To decrease that risk, the apparatus of the invention can be modified so that the portable device is extended away from the body of a user, thereby decreasing the SAR (specific absorption rate) of the user. While any distance from the body that satisfies this SAR reduction can be used, the extension distance can generally range up to about 0.900 inches, and even from about 0.00 to about 1.00 inch.

[0083] The extension away from the body for the desired distance can be achieved by any known extension means. The extension means can be provided in the hooking means, the base means, or both. In the aspect of the invention depicted in FIGS. 19A, B and C, the extension means comprises a portion of the hooking means that does not run substantially parallel to the plane of the portable device 100. In this configuration, the second portion B of the hooking means contains a bend 8 that angles away from the portable device 100. The axis of the second portion, however, as much as possible lies in a plane relatively perpendicular to the plane in which the apparatus lies. When the apparatus is attached to the belt loop and hangs, the bend 8 makes the portable device hang a specified distance away from the belt loop. This modification also provides a relief channel for larger objects (such as a purse strap) and allows the portable device to hang appropriately. This modification also allows a more natural and comfortable hold when using the apparatus as a means of carrying the portable device.

[0084] Another modification of the apparatus of the invention involves the configuration of the distal portion 9 of the free end (that portion near the extension 24 of the base 21). A balance needs to be maintained for a configuration that is both is easy to attach to the belt loop (and does not unnecessarily catch the belt loop), yet stays hooked on the belt loop despite the movements of the user (and easily catches the belt loop). One desired configuration for the distal portion 9 makes the apparatus of the invention easy to attach to and remove from the belt loop, stays hooked on the

belt loop despite the movements of the user, and is easy to manufacture. These requirements can be met by the configuration depicted in FIG. 20. Examples of other types of configurations for the distal portion 9 that can be used in the apparatus of the invention are illustrated in FIG. 21.

[0085] The apparatus of the invention can also be used to attach and retain a portable device to a flat surface such as on a wall or the dashboard of a car using the specially designed hanger 16 shown in FIG. 6. In this aspect of the invention, the hanger 16 is removably or permanently attached to the surface of the wall or dashboard. The second portion B of the hooking means is then placed in the hanger to retain the portable device in that location. Optionally, the cross section 12 of the second portion B can be configured so that it will only fit between the extensions 17 of the hanger 16 when properly oriented as shown in FIGS. 22A, B, and C. Thus, to attach (and remove) the portable device, it is inserted at an angle so that the thinnest part of the cross section 12 will pass through the extensions 17. However, in a hanging position, the portable device cannot be removed, especially by accident, because the thickest part of the cross section 12 is oriented so that it cannot pass through the extensions 17 of the hanger.

[0086] The apparatus is illustrated as attaching to the flat surface of a portable device. In one aspect of the invention, the apparatus can be modified to attach to non-flat surfaces. In this aspect of the invention, the base means could be manufactured with a curve matching the expected curvature of the surface to which it will be attached. The hooking means would also be modified so that it can still operate as described above.

[0087] The apparatus of the invention has numerous advantages and improvements over the known attachment devices in the art. First, the apparatus is configured to be a single piece that remains with the portable device. A second piece is not required to retain the portable device on the desired object and therefore cannot be lost. Second, the apparatus is very simple and highly durable. Third, the apparatus of the invention makes holding and retaining the portable device (i.e., cellular telephone) easy, both when carrying the device and when using it (such as talking on cellular telephone). Fourth, smaller portable devices can be attached and retained to a belt loop using the apparatus of the invention and the user hardly notices the presence of the portable device. Fifth, the apparatus can be placed on smaller portable devices and still be hooked on—or stored in—the pocket of clothes (or similar confined space) and can then be easily retrieved with one finger without using the entire hand. Sixth, the apparatus can be mounted directly to the portable device with double-sided tape or can be directly affixed to a case used to enclose the portable device. Seventh, it is easily and quickly attached to, and removed from a belt loop, peg, or hook. Eighth, the apparatus can be very thin in profile and therefore adds minimal bulk to the portable device. Ninth, the apparatus allows “give” when the portable device is bumped into another object, like a wall or chair and thereby reduces the potential for damage. Tenth, the apparatus can be configured to accommodate SAR and EMI requirements. Eleventh, the apparatus allows the portable device to be comfortably worn, whether on the front or side of a user, and does not scratch or damage the belt (or other clothing). Finally, the apparatus of the invention can provide protection to external protrusions on the portable

device, such as the antenna of a portable device, in both the horizontal and vertical direction.

[0088] Having described the preferred aspects of the invention, it is understood that the invention defined by the appended claims is not to be limited by particular details set forth in the above description, as many apparent variations thereof are possible without departing from the spirit or scope thereof.

What is claimed is:

1. An apparatus for attaching a portable device to an object, comprising hooking means attached to the portable device and extending in a plane substantially parallel to the surface of the portable device, the hooking means comprising one end attached to the portable device and one, unattached free end.

2. The apparatus of claim 1, wherein the hooking means comprises a first portion attached to and extending away from the portable device, a second curved portion, and a third portion extending back toward the first portion.

3. The apparatus of claim 2, wherein the third portion extends in a substantially straight line and can stop short of, along side of, overlap, or extend past the position of the base means.

4. The apparatus of claim 1, wherein the free end of the hooking means can move perpendicular to the plane of said surface.

5. The apparatus of claim 4, wherein the free end moves away from the portable device to attach and remove the portable device to the object.

6. The apparatus of claim 5, wherein the free end moves toward the portable device to retain the portable device on the object.

7. The apparatus of claim 1, wherein the hooking means comprises means for extending the portable device away from the object while being attached.

8. An apparatus for attaching a portable device to an object, comprising:

base means connected to the portable device; and

hooking means attached to the base means, the hooking means being in a plane substantially parallel to the surface of the portable device and containing one end attached to the base means and one, unattached free end that can move perpendicular to said plane.

9. The apparatus of claim 8, wherein the hooking means comprises a first portion attached to and extending away from the portable device, a second curved portion, and a third portion extending back toward the base means.

10. The apparatus of claim 9, wherein the base means and the free end of the hooking means are proximate each other.

11. The apparatus of claim 8, wherein the free end moves away from the portable device to attach and remove the portable device to the object.

12. The apparatus of claim 8, wherein the free end moves toward the portable device to retain the portable device on the object.

13. An apparatus for attaching a portable device to an object, comprising:

base means connected to the portable device; and

hooking means attached to the base means, the hooking means extending in a plane substantially parallel to the surface of the portable device and containing one end

attached to the base means and one, unattached free end that can move perpendicular to said plane, the free end moving away from the portable device to attach and remove the portable device to the object and moving toward the portable device to retain the portable device on the object.

14. The apparatus of claim 13, wherein the hooking means comprises means for extending the portable device away from the object while being attached.

15. The apparatus of claim 13, wherein the base means and the free end of the hooking means are located proximate each other.

16. A system for retaining a portable device to an object, the system containing a mechanism comprising:

base means connected to the portable device; and

hooking means attached to the base means, the hooking means being in a plane substantially parallel to the surface of the portable device and containing one end attached to the base means and one, unattached free end that can move perpendicular to said plane.

17. The system of claim 16, wherein the hooking means comprises means for extending the portable device away from the object while being attached.

18. The system of claim 16, wherein the base means and the free end of the hooking means are located proximate each other.

19. A portable device having an attachment for retaining the device to an object, the attachment comprising:

base means connected to the portable device; and

hooking means attached to the base means, the hooking means being in a plane substantially parallel to the surface of the portable device and containing one end attached to the base means and one, unattached free end that can move perpendicular to said plane.

20. The device of claim 16, wherein the hooking means comprises means for extending the portable device away from the object while being attached.

21. The device of claim 16, wherein the base means and the free end of the hooking means are located proximate each other.

22. A method of making an attachment for retaining a portable device to an object, the method comprising:

providing base means for connection to the portable device; and

attaching hooking means to the base means, the hooking means being in a plane substantially parallel to the surface of the portable device and containing one end attached to the base means and one, unattached free end that can move perpendicular to said plane.

23. A method for attaching a portable device to an object, the method comprising:

providing a portable device;

connecting base means to the portable device;

attaching hooking means to the base means, the hooking means being in a plane substantially parallel to the surface of the portable device and containing one end attached to the base means and one, unattached free end that can move perpendicular to said plane;

providing an object; and

attaching the portable device to the object using the hooking means.

24. The method of claim 23, including attaching the portable device by moving the free end away from the portable device.

25. A method for retaining a portable device on an object, the method comprising:

providing a portable device;

connecting base means to the portable device;

attaching hooking means to the base means, the hooking means being in a plane substantially parallel to the surface of the portable device and containing one end

attached to the base means and one, unattached free end that can move perpendicular to said plane;

providing an object; and

retaining the portable device on the object using the hooking means.

26. The method of claim 25, wherein the object is the finger of a user of the portable device.

27. The method of claim 25, wherein the object is the pocket or belt loop of a user.

28. The method of claim 25, including retaining the portable device by moving the free end toward the portable device.

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