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(54) CABLE RETAINERS FOR PACKAGING AND METHODS OF PACKAGING A CABLE

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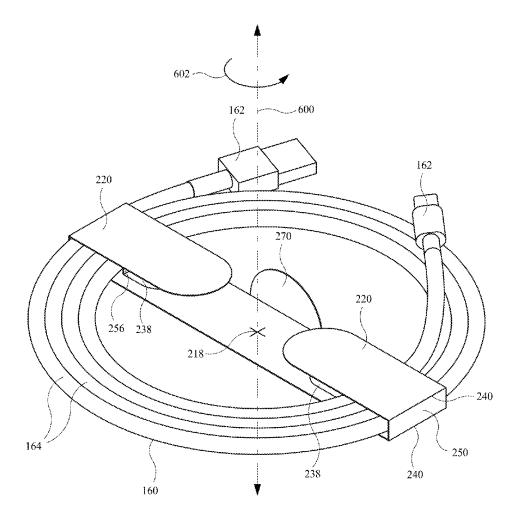
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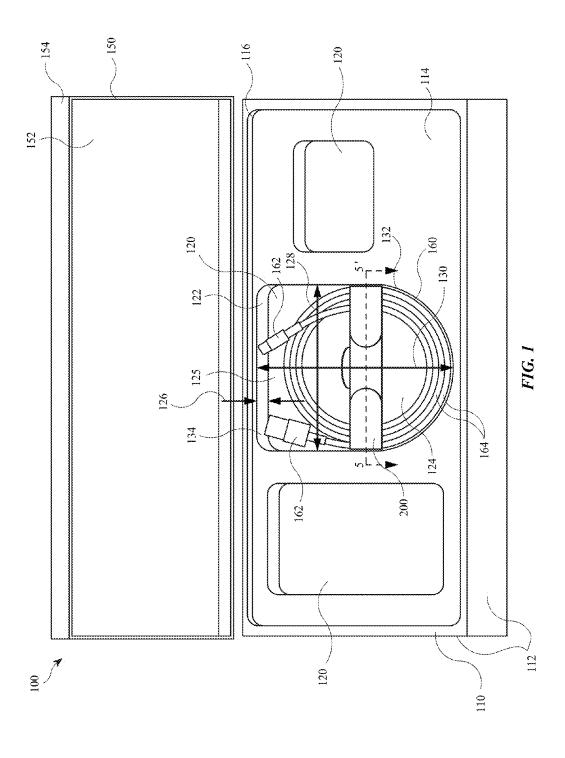
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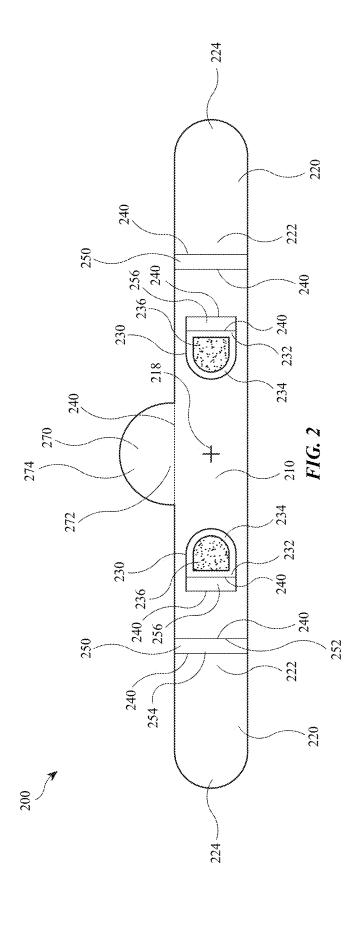
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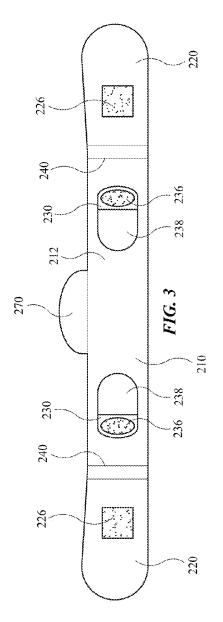
(57)**ABSTRACT**

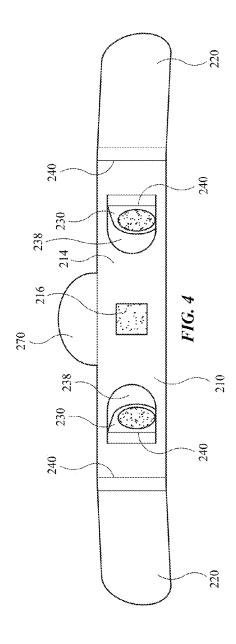
Packaging and cable retainers for packaging wound cables are provided. The packaging may include a cavity configured to receive a wound cable held by a cable retainer. The cable retainer may be a single foldable piece of material. The cable retainer may include a plurality of fingers hingedly coupled to a panel and a plurality of flaps cut from the panel and hingedly coupled to the panel. The fingers may be attached to respective flaps to thereby define passageways through which a wound cable may extend. Methods of packaging wound cables are also discussed.

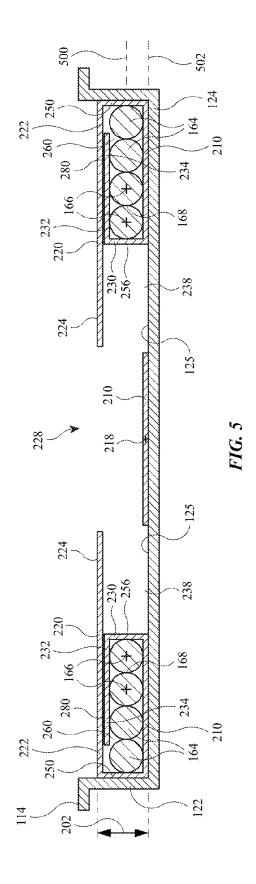


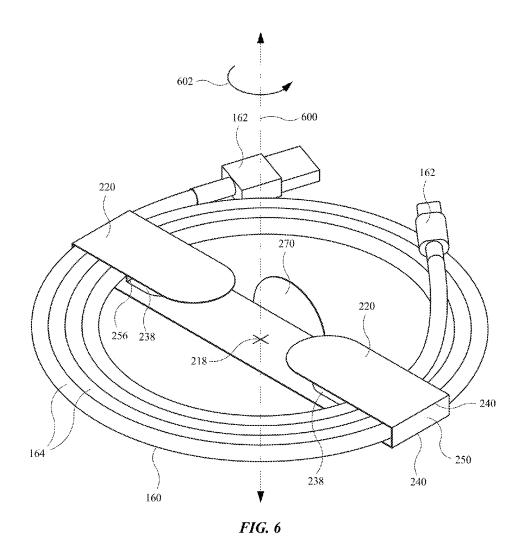


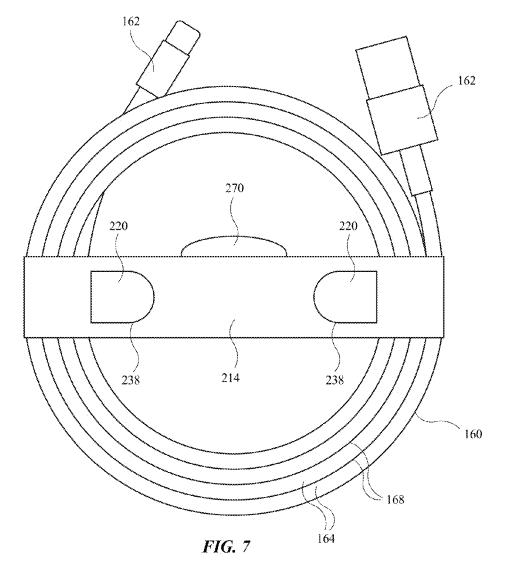


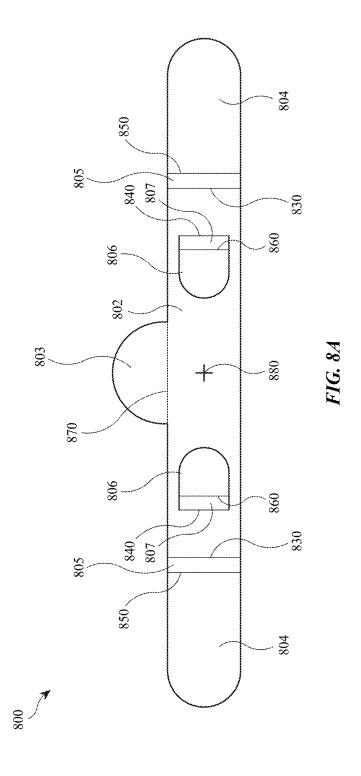


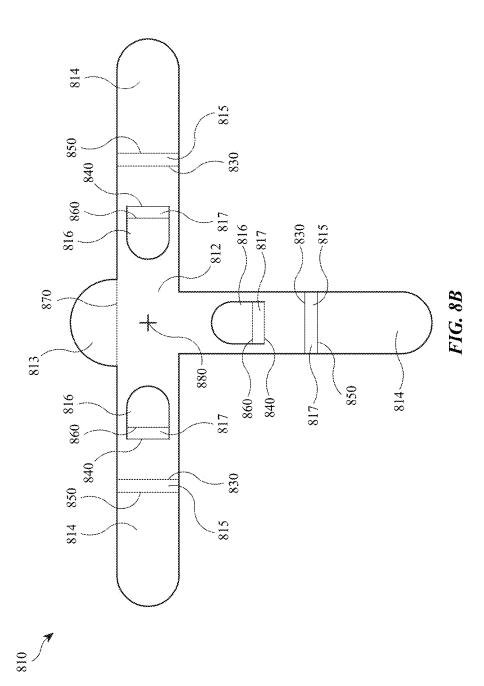


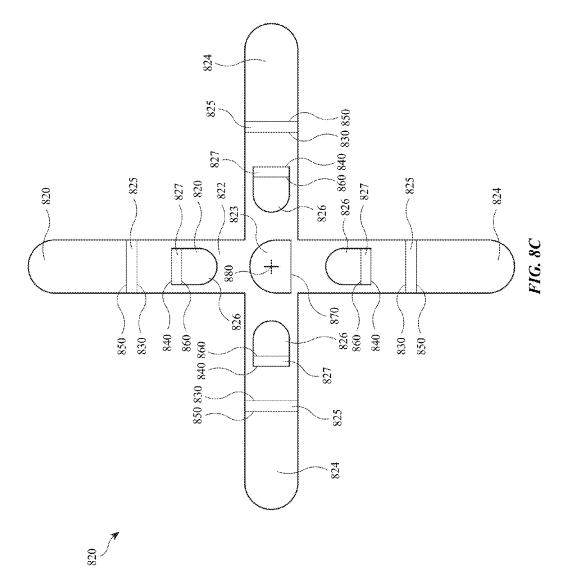


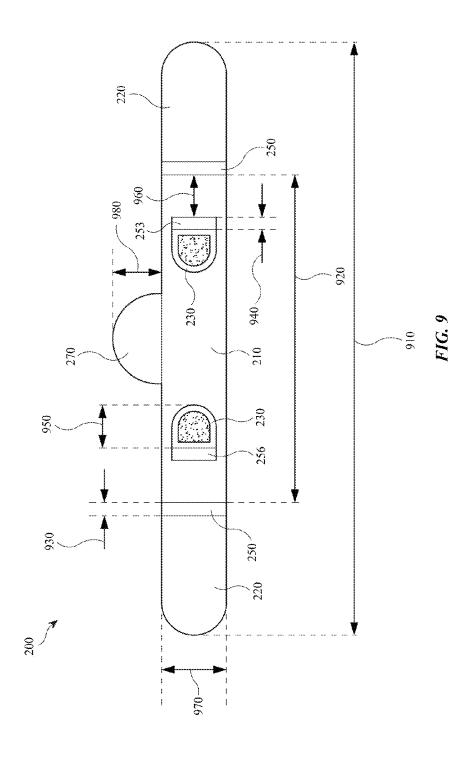












CABLE RETAINERS FOR PACKAGING AND METHODS OF PACKAGING A CABLE

FIELD

[0001] The described embodiments relate generally to cable retainers. More particularly, the described embodiments relate to cable retainers for use in packaging.

BACKGROUND

[0002] Many products utilize cables in some form or another. For example, an electronic device may utilize one or more cables to receive or transmit power and/or data (e.g., audio or video signals). In some instances, it may be desirable to store and/or package the cable(s) (e.g., between uses, in transit, or while presented for sale).

SUMMARY

[0003] Packaging for consumer products protects the products from damage and facilitates brand recognition. Effective packaging can be an important tool used to attract and retain customers. In some embodiments, packaging can be used to engage the consumer's attention and focus that attention on the product(s) rather than the packaging itself. In some embodiments packaging is easily undone for removal of a product or product component/accessory. This can reduce frustration of a customer. In some embodiments packaging, or portions thereof, may be reused by the consumer, contributing to its overall utility.

[0004] While ease of operating packaging to access a packaged product may be desirable from a consumer standpoint, efficiency and cost in manufacturing and constructing (assembling) packaging may be a consideration for manufactures and/or sellers of the packaging. For example, environmental considerations may play a role in developing packaging. Packaging made out of recyclable and/or biodegradable material can reduce environmental impact. Additionally, packaging that utilizes minimal resources, from a material, energy, and/or labor perspective, may be desirable. Further, packaging that requires a relatively small number of manufacturing and/or assembly steps may reduce costs (e.g., manpower and machine costs) associated with the packaging. Maintaining desired aesthetics and function of packaging in view of such environmental and resource considerations can be a challenge.

[0005] The packaging according to embodiments described herein, or elements thereof, accomplish one or more of these and other objectives.

[0006] Some embodiments are directed towards packaging having a base including a cavity, a cable retainer disposed within the cavity, the cable retainer including a panel extending across the cavity, a plurality of fingers, each finger hingedly coupled to the panel, and a plurality of flaps cut from the panel and hingedly coupled to the panel, where each finger is attached to a flap to thereby together define a passageway.

[0007] In some embodiments, each finger may be releasably attached to the flap via an attachment member. In some embodiments, the attachment members may include an adhesive.

[0008] In some embodiments, the passageways may extend parallel to a lower surface of the cavity. In some embodiments, the packaging may include a wound cable extending through the passageways. In some embodiments,

the wound cable may loop through the passageways multiple times, and each loop of the wound cable that extends through the passageways may be disposed on the same plane parallel to the lower surface of the cavity. In some embodiments, the cavity of the packaging may include a corner, and a plug of the cable may be positioned adjacent to the corner outside of the loops of the wound cable, such that contact between the plug and walls of the corner inhibits rotation of the wound cable.

[0009] In some embodiments, the panel, the fingers, and the flaps may be a single integrally formed piece.

[0010] In some embodiments, the panel of the cable retainer may be disposed on a lower surface of the cavity, and the cable retainer may have a maximum thickness of less than or equal to 7 millimeters measured perpendicularly from the lower surface of the cavity.

[0011] In some embodiments, the base of the packaging may include a product surface for supporting a product, and the cavity may be formed in the product surface. In some embodiments, the cavity may have a depth of less than or equal to 7 millimeters measured from the product surface to a lower surface of the cavity. In some embodiments, the cable retainer may be completely disposed within the cavity. [0012] In some embodiments, the hinged couplings between each finger and the panel may be defined by grooves on the cable retainer. In some embodiments, the hinged couplings between each finger and the panel may be defined by fold lines on the cable retainer.

[0013] In some embodiments, each finger may be hingedly coupled to a segment that is hingedly coupled to the panel. In some embodiments, the panel, the segments, the fingers, and the flaps may define the passageways of the cable retainer

[0014] In some embodiments, a free end of each finger attached to a flap points in a direction opposite the direction that a free end of the flap points.

[0015] In some embodiments, the cable retainer may be composed of a paper-based product.

[0016] In some embodiments, the cable retainer may have the same number of fingers as flaps. In some embodiments, the cable retainer may include a pull tab coupled to the panel.

[0017] In some embodiments, the panel of the cable retainer may be releasably coupled to a lower surface of the cavity.

[0018] Some embodiments are directed towards a cable retainer for packaging a wound cable, the cable retainer including a single foldable piece of material configured to fold from a flat configuration to a folded configuration, the single foldable piece of material including a panel, a plurality of fingers, each finger hingedly coupled to the panel, and a plurality of flaps cut from the panel and hingedly coupled to the panel, where, in the folded configuration, each finger is folded towards a geometric center of the panel and attached to a respective flap to define a plurality of passageways for receiving a wound cable.

[0019] In some embodiments, the attachment between the fingers and respective flaps may be a releasable attachment. In some embodiments, the releasable attachments may include one or more of an adhesive, a tab and slot coupling, a snap-fit coupling, and a hook and loop fastener.

[0020] In some embodiments, the cable retainer may include a pull tab hingedly coupled to the panel.

[0021] In some embodiments, the single foldable piece of material may be composed of a paper-based product. In some embodiments, the single foldable piece of material may be a compostable material. In some embodiments, the single foldable piece of material may be a recyclable material.

[0022] Some embodiments are directed towards a packaged cable including a cable retainer in a folded configuration and a wound cable extending through the passageways defined by the cable retainer.

[0023] In some embodiments, the wound cable may loop through the passageways defined by the cable retainer multiple times, each loop of the wound cable that extends through the passageways may be disposed on the same plane parallel to a top surface of the cable retainer panel, and no loop of the wound cable may be disposed on top of another loop of the wound cable.

[0024] Some embodiments are directed towards packaging including a base having a cavity, a cable retainer in a folded configuration disposed in the cavity, and a wound cable extending through the passageways defined by the cable retainer.

[0025] Some embodiments, are directed towards a method of assembling a packaged cable, the method including winding a cable to form a wound cable including a plurality of cable loops, folding a cable retainer about the wound cable, and positioning the cable retainer and the wound cable in a cavity formed in a packaging container, where folding the cable retainer includes folding flaps cut from a panel of the cable retainer, folding fingers hingedly coupled to the panel of the cable retainer, and attaching the fingers to respective flaps to thereby define a plurality of passageways through which the loops of the wound cable extend.

[0026] In some embodiments, each loop of the wound cable may be disposed on the same plane parallel to a top surface of the cable retainer panel. In some embodiments, the cable may be wound such that each loop of the cable is in contact with immediately adjacent loops along a majority of each loop.

[0027] Some embodiments are directed towards a blank for forming a cable retainer, the blank including a central panel connected to a plurality of fingers by a first set of upward fold lines and a plurality of flaps cut from the central panel and connected to the central panel by a second set of upward fold lines, where each upward fold line in the first set of upward fold lines is oriented parallel to an upward fold line in the second set of upward fold lines.

[0028] In some embodiments, the blank may include a plurality of segments, each segment may be disposed between the central panel and a respective finger, the segments may be connected to the fingers by the first set of upward fold lines, and the segments may be connected to the central panel by a third set of upward fold lines.

[0029] In some embodiments, the blank may include a pull tab connected to the central panel by a fourth upward fold line.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] The disclosure will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

[0031] FIG. 1 shows packaging according to an embodiment.

[0032] FIG. 2 shows a cable retainer in a flat configuration according to an embodiment.

[0033] FIG. 3 shows a top view of a cable retainer in a partially folded configuration according to an embodiment.
[0034] FIG. 4 shows a bottom view of a cable retainer in a partially folded configuration according to an embodiment.
[0035] FIG. 5 shows a cross-sectional view along the line 5-5' in FIG. 1.

[0036] FIG. 6 shows a perspective view of a cable retainer folded about a wound cable according to an embodiment.

[0037] FIG. 7 shows a bottom view of a cable retainer folded about a wound cable according to an embodiment.

[0038] FIG. 8A shows a cable retainer blank according to an embodiment.

[0039] FIG. 8B shows a cable retainer blank according to an embodiment.

[0040] FIG. 8C shows a cable retainer blank according to an embodiment.

[0041] FIG. 9 shows a cable retainer according to an embodiment.

DETAILED DESCRIPTION

[0042] Reference will now be made in detail to representative embodiments illustrated in the accompanying drawings. It should be understood that the following descriptions are not intended to limit the embodiments to one preferred embodiment. To the contrary, it is intended to cover alternatives, modifications, and equivalents as can be included within the spirit and scope of the described embodiments as defined by the appended claims.

[0043] References to "one embodiment," "an embodiment," "some embodiments," "an example embodiment," etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, but every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with an embodiment, it is submitted that it is within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

[0044] The packaging and cable retainers discussed herein may be used to hold, display, and/or transport products, one or more cables that receive or transmit power and/or data (e.g., audio or video signals), or both. A cable (which may also be referred to as a cord) typically has a length many times greater than its width. For packaging, a cable may be coiled upon itself (i.e., wound) to create a compact configuration to occupy a compact area, in order to efficiently store/package the cable. A cable may be wound any suitable number of times. Adjacent cable windings may be flush with one another.

[0045] The packaging and cable retainers discussed herein may hold and display wound cables in an aesthetically appealing and consumer-friendly fashion. Packaging and cable retainers discussed herein may maintain a wound cable in a compact configuration, which may be aesthetically appealing to consumers. In some embodiments, a cable retainer may be disposed in a cavity of a packaging container and the cable retainer and cavity may work in concert to retain the cable in a compact configuration. In some embodiments, a cable retainer may be a standalone cable retainer provided to maintain a wound cable in a compact configuration.

ration. Additionally, the packaging, and in particular the cable retainer, may present a wound cable in a fashion that facilitates easy removal of the cable retainer and/or wound cable from the packaging by a consumer.

[0046] In some embodiments, the cable retainer may be presented in such a way that a consumer intuitively knows how to remove the cable retainer from a packaging container and/or undo the cable retainer to free the retained cable. In some embodiments, a cable retainer may be folded about the wound cable and secured to itself (e.g., with an adhesive or other attachment member). The cable retainer may present one or more free ends releasably attached to other portions the cable retainer to a consumer. Pulling the free ends may release the attachment between the cable retainer and the packaging and/or between different portions of the cable retainer. Pulling on the free ends may cause the cable retainer to unfold, thereby allowing a wound cable to be removed from a packaging container and/or the cable retainer. In some embodiments, the cable retainer may be re-constructed (e.g., re-folded) by re-attaching the free ends to respective portions of the cable retainer.

[0047] Additionally, the packaging and/or cable retainers may be manufactured in a cost-effective and environmentally friendly way. In some embodiments, the cable retainer may be constructed of a single integrally formed piece of material. The single integrally formed piece of material may be a foldable material that is folded into a configuration that holds and secures a wound cable, either alone or within a cavity of a packaging container. In some embodiments, the foldable material may be a single piece of material that is cut by a single operation (e.g., a single die cutting operation). In some embodiments, the foldable material may be die cut from a stock material (e.g., a sheet or roll of material). Single integrally formed pieces of material that are cut by a single cutting operation may facilitate efficient and reproducible manufacturing of cable retainers. Moreover, such manufacturing may reduce waste by reducing waste material during manufacturing.

[0048] Cable retainers discussed herein and features thereof may be used to package merchandise other than wound cables. In such cases, the cable retainer may be referred to as a "product retainer" or "accessory retainer." For example, cable retainers discussed herein may be used to package products having a cable (or cord) physically attached to them, such as a wired headset, wired earphones, mouse, keyboard, or other device. Also, packaging and cable retainers discussed herein may be used to package nonwired products. For example, the cable retainers discussed herein may be used to package products/accessories with an opening or multiple products/accessories such that the cable retainer may be folded about the product(s)/accessory(ies). Such products/accessories may include but are not limited to, wireless headphones, wireless headsets, remote controls, or printed materials.

[0049] These and other embodiments are discussed below with reference to the figures. However, those skilled in the art will readily appreciate that the detailed description given herein with respect to these figures is for explanatory purposes only and should not be construed as limiting.

[0050] Some embodiments include packaging 100 for protecting, transporting, and/or displaying one or more consumer products. Consumer products may be, but are not limited to, electronic devices such as laptops, phones, multimedia devices, tablets, gaming devices, keyboards, headsets,

earphones, cameras, mice, trackpads, remotes, and watches. Packaging 100 may also house one or more wound cables (e.g., wound cable 160) associated with the electronic device (s). A wound cable may be, for example, a power cable (e.g., a 120/220 volt wall charger or inductive charger), or a data cable. Data cables may include, but are not limited to, a Universal Serial Bus (USB) cable (which may also deliver power), a High-Definition Multimedia Interface (HDMI) cable, or an Ethernet cable. In some embodiments, packaging 100 may house only a wound cable (i.e., the only merchandise within the packaging may be a wound cable). Wound cable 160 may be held within a cavity (e.g., cavity 120) formed in packaging 100. In some embodiments, wound cable 160 may be held and secured within cavity 120 with a cable retainer (e.g., cable retainer 200).

[0051] As shown in FIG. 1, packaging 100 may include a base 110. Base 110 includes sidewalls 112 defining a perimeter of base 110. Base 110 may include a product surface 114 for supporting a product (e.g., a consumer electronic device). In some embodiments, product surface 114 may include a product cavity 116. Product cavity 116 may be sized and shaped to receive all or a portion of a product. In some embodiments, product surface 114 and/or product cavity 116 may be sloped to accommodate the shape of a product. As shown in FIG. 1, base 110 may include one or more cavities 120 formed therein (e.g., in product surface 114). Each cavity 120 may be defined by a vertical wall 122 extending from and surrounding a horizontal wall 124. Horizontal wall 124 and/or vertical wall 122 may be configured to support a wound cable, a product, or a product component/accessory within packaging 100. Horizontal wall 124 defines a lower surface 125 of cavity 120. In some embodiments, horizontal wall 124 may be perpendicular to vertical wall 122.

[0052] Cable retainer 200 may be disposed in a cavity 120 and configured to, among other things, hold wound cable 160 in place within cavity 120, orient wound cable 160 within cavity 120, and retain the winding of wound cable 160 such that adjacent cable windings (loops) are flush with one another. Cable retainer 200 may include a panel 210 that, when disposed within cavity 120, extends across the cavity 120 (e.g., across lower surface 125 of cavity 120). In some embodiments, panel 210, or a portion thereof, may extend completely across cavity 120 in one or more directions (i.e., from one side of vertical wall 122 to an opposing side of vertical wall 122). In such embodiments, panel 210 may hold wound cable 160 in place within cavity 120 by preventing lateral movement between opposing sides of vertical wall 122.

[0053] Cavities 120 may be sized and shaped to accommodate specific products, product components/accessories, or wound cables. In other words, vertical wall 122 and horizontal wall 124 may be sided and shaped to accommodate specific products, product components/accessories, or wound cables. In some embodiments, one or more cavities 120 may have a depth 126 of less than or equal to 7 millimeters (e.g., measured from product surface 114 to lower surface 125 of cavity 120). In some embodiments, cavity 120 with cable retainer 200 disposed therein may have a maximum length 128 in the range of 95 millimeters to 105 millimeters. In some embodiments, maximum length 128 may be 90 millimeters+/-2 millimeters. In some embodiments, cavity 120 with cable retainer 200 disposed therein may have a maximum width 130 in the range of 100

millimeters to 120 millimeters. In some embodiments, maximum width 130 may be 109 millimeters+/-2 millimeters. In some embodiments, vertical wall 122 may include a curved portion 132. Curved portion 132 may have a curvature corresponding to an exterior shape of wound cable 160 (or product, product component/accessory). In some embodiments, a diameter of curved portion 132 may equal length 128. In some embodiments, curved portion 132 may aid in holding wound cable 160 within cavity 120 and may help inhibit undesired movement of wound cable 160 within cavity 120.

[0054] In some embodiments, cavity 120 may include one or more corners 134 defined by vertical wall 122 and configured to hold and secure wound cable 160 within cavity 120. In such embodiments, a plug 162 (e.g., USB plug) of wound cable 160 may be positioned within cavity 120 such that plug 162 is adjacent to a corner 134 outside the loops 164 of wound cable 160. In such embodiments, contact between plug 162 and portions of vertical wall 122 defining the corner 134 may inhibit rotation of wound cable 160 within cavity 120. In some embodiments, corner(s) 134 may be formed at approximately a 90 degree angle.

[0055] In some embodiments, base 110 may be a single integrally formed piece. In some embodiments, base 110 may include multiple pieces. For example, in some embodiments, base 110 may include a base box configured to receive all or a portion of a packaging insert the same as or similar to the base boxes and packaging inserts described in U.S. patent application Ser. No. 14/318,011, filed on Jun. 27, 2014, which is incorporated herein in its entirety by reference thereto. In some embodiments, base 110 may include a pedestal the same as or similar to the pedestals described in U.S. patent application Ser. No. 14/328,974, filed on Jul. 11, 2014, which is incorporated herein in its entirety by reference thereto.

[0056] Packaging may include a lid 150 having a top wall 152 and sidewalls 154. When assembled in a closed configuration, lid 150 may be placed over base 110 and may receive at least a portion of base 110. In some embodiments, lid 150 may receive the entire base 110. Lid 150 may be the same as or similar to the lids discussed in U.S. patent application Ser. Nos. 14/318,011 and 14/328,974.

[0057] In some embodiments, base 110 and/or lid 150 may be composed of a recyclable and/or biodegradable (e.g., compostable) material. In some embodiments, base 110 and/or lid 150 may be composed of a paper-based product. Suitable paper-based products include, but are not limited to, cardboard, paperboard (e.g., solid bleached sulfate (SBS)), or molded fiber paper. In some embodiments, base 110 and/or lid 150 may be composed of a molded fiber paper (e.g., a molded fiber paper composed of 60 wt % to 70 wt % bamboo fibers and 30 wt % to 40 wt % bagasse fibers). In some embodiments, base 110 and/or lid 150 may be composed of one or more polymeric materials. Suitable polymeric materials include, but are not limited to, polyethylene, polypropylene, polyurethane, polystyrene, polymer blends including one or more of these polymers, or copolymers including one or more of these polymers.

[0058] As shown for example in FIGS. 2-4, cable retainer 200 may include one or more fingers 220 hingedly coupled to panel 210 via a hinged coupling 240. Hinged couplings 240 may include, but are not limited to, structurally weakened regions on cable retainer 200. Structurally weakened regions may include, but are not limited to, grooves formed

in cable retainer 200, fold lines, and perforated lines. Grooves may be formed by removing material from a surface of cable retainer 200. For example, grooves may be V-shaped or U-shaped grooves formed in a surface of cable retainer 200. Fingers 220 may include a connection end 222 hingedly coupled to panel 210 at a hinged coupling 240 and a free end 224 not directly coupled to panel 210. In some embodiments, fingers 220 may include an attachment member 226. Attachment members 226 may be releasable attachment members. In some embodiments, attachment members 226 may be re-attachable attachment members. Attachment members 226 may include an adhesive, a male or female portion of a mechanical fastener (e.g., a hook portion of a hook and loop faster (e.g., Velcro®), or combination thereof. An attachment member 226 on a finger 220 may be configured to attach to a flap 230 cut from panel 210 and/or a corresponding attachment member 236 located on flap 230. [0059] Cable retainer 200 may also include one or more flaps 230 cut from panel 210 and hingedly coupled to panel 210. Flaps 230 may be cut from panel 210 such that through holes 238 are formed in panel 210 (see, e.g., FIGS. 3 and 4). Similar to fingers 220, each flap 230 may be hingedly coupled to panel 210 via a hinged coupling 240. Also similar to fingers 220, flaps 230 may include a connection end 232 hingedly coupled to panel 210 at a hinged coupling 240 and a free end 234 not directly coupled to panel 210.

[0060] In some embodiments, flaps 230 may include an attachment member 236. An attachment member 236 on a flap 230 may be configured to attach to a finger 220 hingedly coupled to panel 210 and/or a corresponding attachment member 226 located on finger 220. Attachment members 236 may be releasable attachment members. In some embodiments, attachment members 236 may be re-attachable attachment members. Attachment members 236 may include an adhesive, a male or female portion of a mechanical fastener (e.g., a loop portion of a hook and loop faster (e.g., Velcro®), or a combination thereof. In some embodiments, attachment members 226/236 may include doublesided adhesive tape or other suitable adhesive such as glue. In some embodiments, cable retainer 200 may include the same number of flaps 230 as fingers 220. Each finger 220 of cable retainer 200 may be configured to attach to a respective flap 230 via attachment members 226 and/or attachment members 236. In some embodiments, cable retainer 200 may include one finger 220 and one flap 230 configured to attach to each other.

[0061] In some embodiments, one or more fingers 220 may be hingedly coupled to a segment 250 that is hingedly coupled to panel 210. In such embodiments, segment(s) 250 may include an interior end 252 hingedly coupled to panel 210 via a hinged coupling 240 and an exterior end 254 hingedly coupled to finger 220. In some embodiments, flaps 230 may be hingedly coupled to a segment 256 that is hingedly coupled to panel 210. Segments 256 may be the same as or similar to segments 250. In some embodiments, segments 256 may have a length that is shorter than the length of segments 250 may be equal to the thickness of fingers 220. This may facilitate a flush attachment between fingers 220 and segments 230.

[0062] In some embodiments, cable retainer 200 may include a pull tab 270. Pull tab 270 may include a connection end 272 hingedly coupled to panel via a hinged coupling 240

and a free end 274 not directly coupled to panel 210. In some embodiments, pull tab 270 may be coupled to panel 210 in the same or similar fashion as finger(s) 220. In some embodiments, pull tab 270 may be cut from panel 210 in the same or similar fashion as flap(s) 230.

[0063] In some embodiments, cable retainer 200 may be a single foldable piece of material. In some embodiments, the single foldable piece of material may be an integrally formed piece of material (e.g., formed via injection molding, pressing, stamping, and/or die cutting). In other words, panel 210, finger(s) 220, flap(s) 230, segment(s) 250, segment(s) 256, and pull tab 270 may be a single integrally formed piece. In some embodiments, the foldable material may be a single piece of material that is cut using a single processing step. For example, the foldable material may be cut from a stock material (e.g., a sheet or roll of material) by a single die cutting step.

[0064] In some embodiments, cable retainer 200 may be composed of a recyclable material. In some embodiments, cable retainer 200 may be composed of a biodegradable (e.g., compostable) material. In some embodiments, cable retainer 200 may be composed of a paper-based product. Suitable paper-based products include, but are not limited to, cardboard or paperboard (e.g., solid bleached sulfate (SBS)). In some embodiments, cable retainer 200 may be composed of a polymeric material. Suitable polymeric materials include, but are not limited to, polyethylene, polypropylene, polyurethane, polystyrene, polymer blends including one or more of these polymers. In some embodiments, all or some of the exterior surfaces of cable retainer 200 may be laminated.

[0065] In operation, cable retainer 200 may be configured to fold from a flat configuration (see e.g., FIG. 2) to a folded configuration (see e.g., FIGS. 1, 6, and 7). In the folded configuration, finger(s) 220, flap(s) 230, and segment(s) 250/256 may be folded about their respective hinged couplings 240 to folded positions. When folded, each finger 220 may be folded towards a center point 218 of panel 210 between fingers 220 (i.e., free ends 224 of each finger 220 may point towards center point 218). When in the folded configuration, each flap 230 may be folded away from center point 218 of panel 210 (i.e., free ends 234 of each flap 230 may point in the opposite direction as free ends 224 of fingers 220—away from center point 218). Center point 218 may be the location on panel 210 around which fingers 220 and/or flaps 230 are radially disposed.

[0066] When folded, fingers 220 may attach to flaps 230 via attachment members 236 on flaps 230 and/or attachment members 226 on fingers 220 at attachment points 280 (see FIG. 5). In some embodiments, the attachment between a finger 220 and a respective flap 230 may be a releasable attachment. In some embodiments, the attachment between a finger 220 and a respective flap 230 may be a re-attachable attachment. The attachment between finger(s) 220 and respective flap(s) 230 may include one or more of: an adhesive, a tab and slot coupling, a snap-fit coupling, and a hook and loop fastener (e.g., Velcro®).

[0067] FIG. 5 shows a cross-sectional view of cavity 120, cable retainer 200, and wound cable 160 along the line 5-5' of FIG. 1 showing cable retainer 200 folded (i.e., in the folded configuration) about wound cable 160 within cavity 120. When disposed in cavity 120, panel 210 may be disposed on lower surface 125 of cavity 120. In some

embodiments, a bottom surface 214 of panel 210 may be in direct contact with lower surface 125 of cavity 120. In some embodiments, panel 210 may be attached to lower surface 125 of cavity 120. In some embodiments, panel 210 may be releasably attached to lower surface 125 of cavity 120 (e.g., via an attachment member 216 disposed on bottom surface 214 of panel 210 (see e.g., FIG. 4)). In some embodiments, attachment member 216 may be disposed on lower surface 125 of cavity 120.

[0068] In the folded configuration, each finger 220 may be attached to a respective flap 230 to, along with panel 210, define a passageway 260. In embodiments including segments 250/256, segments 250/256 may also define a portion of passageway 260. In other words, panel 210, finger(s) 220, flap(s) 230, and segment(s) 250/256 may define passageway (s) 260. In embodiments including segments 250/256, segments 250/256 may define a vertical dimension of passageway(s) 260 (i.e., in the vertical direction parallel to vertical axis 600 in FIG. 6).

[0069] Passageway(s) 260 may be sized and shaped to receive a wound cable 160 (e.g., a plurality of loops 164 of wound cable 160). In some embodiments, segments 250 may abut an outermost loop 164 of wound cable 160 and segments 256 may abut an innermost loop 164 of wound cable 160 to aid in holding adjacent cable loops 164 flush with one another in passageway 260. As used herein, cable loops 164 that are "flush" refers to adjacent cable loops 164 having circumferential sidewalls 168 that are in contact with each other. In some embodiments, segments 250 are the same length as a thickness of cable 160, to define a height of passageway 260 that is the same as the thickness of cable 160.

[0070] Panel 210, fingers 220, flaps 230, and segments 250/256 may form passageways 260 that are closed except for in a radial direction 602 around a vertical axis 600 extending through center point 218 of panel 210 (see e.g., FIG. 6). In some embodiments, passageways 260 may extend parallel to lower surface 125 of cavity 120, when a folded cable retainer 200 is disposed within a cavity 120 (i.e., lower surface 125 of cavity 120 may be parallel to radial direction 602 when a folded cable retainer 200 is disposed in a cavity 120).

[0071] In some embodiments, cable retainer 200 may be completely disposed within cavity 120 in the folded configuration. In other words, no portion of cable retainer 200 may extend from cavity 120 above product surface 114. In some embodiments, cable retainer 200 may have a maximum thickness 202 of less than or equal to 7 millimeters measured perpendicularly from lower surface 125 of cavity 120 (see FIG. 5).

[0072] As shown in FIG. 5, wound cable 160 may extend through passageways 260. In some embodiments, wound cable 160 may be looped through passageways 260 multiple times (e.g., one or more loops 164 of wound cable 160 may extend though passageways 260). In some embodiments, each loop 164 of wound cable 160 that extends through passageways 260 is disposed on the same plane (e.g., plane 500 in FIG. 5) parallel to lower surface 125 of cavity 120 (i.e., plane 502 in FIG. 5). In other words, the axial centers 166 of loops 164 may all be disposed on plane 500, which is parallel to plane 502. In this configuration, no loop 164 of wound cable 160 is disposed on top of another loop 164 of wound cable 160. Similarly, each loop 164 of wound cable 160 that extends through passageway 260 may be disposed

on the same plane 500 parallel to a top surface 212 of panel 210 (i.e., axial centers 166 of loops 164 may all be disposed on plane 500, which is parallel to top surface 212).

[0073] The length of fingers 220 may be such that, when folded, a gap 228 is present between the free ends 224 of two or more fingers 220. Gap 228 may be sized such that the tip of a human finger may fit in gap to facilitate gripping of a free end 224 of a folded finger 220. For example, gap 228 may have a width of 15 millimeters or more. In some embodiments, the free end 224 of one or more fingers 220 may extend significantly beyond an attachment point 280 between finger 220 and a respective flap 230 (e.g., by 20 millimeters or more). In such embodiments, the portion of finger(s) 220 extending beyond attachment point 280 may provide a location for a consumer to grip and pull finger 220. In this manner, fingers 220 may provide a visible and intuitive mechanism for undoing (unfolding) cable retainer 200, thereby increasing the ease at which a consumer may undo cable retainer 200. In a similar fashion, pull tab 270 may provide a visible and intuitive mechanism for removing cable retainer 200 from cavity 120.

[0074] FIGS. 8A-8C show cable retainer blanks 800, 810, and 820 for forming a cable retainer according to various embodiments. Each cable retainer blank 800/810/820 includes a central panel 802/812/822 with a center point 880. Similar to center point 218, center point 880 of each cable retainer blank 800, 810, and 820 may be located on central panel 802/812/822 at a point around which the fingers and/or flaps of the cable retainer blank are radially disposed. While FIGS. 8A-8C show embodiments with two, three, and four fingers/flaps, cable retainer blanks may be used to form a cable retainer with any number of finger/flap sets.

[0075] FIG. 8A shows cable retainer blank 800, which may be used to form a cable retainer with two fingers the same as or similar to cable retainer 200 discussed herein. Central panel 802 may be connected to two fingers 804 by a first set of upward fold lines 830. Central panel 802 may also include two flaps 806 cut from central panel 802 and connected to central panel 802 by a second set of upward fold lines 840. Each upward fold line in the first set of upward fold lines 830 may be oriented parallel to an upward fold line in second set of upward fold lines 840. In some embodiments, cable retainer blank 800 may include two finger segments 805, each finger segment 805 being disposed between central panel 802 and a respective finger 804. Finger segments 805 may be connected to central panel 802 by first set of upward fold lines 830 and finger segments 805 may be connected to fingers 804 by a third set of upward fold lines 850. Each upward fold line in the first set of upward fold lines 830 may be oriented parallel to an upward fold line in the third set of upward fold lines 850.

[0076] In some embodiments, cable retainer blank 800 may include two flap segments 807, each flap segment 807 being disposed between central panel 802 and a respective flap 806. Each flap segment 807 may be connected to central panel 802 by second set of upward fold lines 840 and flap segments 807 may be connected to flaps 806 by a fourth set of upward fold lines 860. Each upward fold line in the second set of upward fold lines 840 may be oriented parallel to an upward fold line in the fourth set of upward fold lines 860.

[0077] In some embodiments, cable retainer blank 800 may include a pull tab 803 connected to central panel 802 by a fourth upward fold line 870. In some embodiments, fingers

804 may be located opposite each other on opposite ends of central panel 802 (e.g., disposed radially about center point 880 and separated by 180 degrees), as shown in FIG. 8A. In some embodiments, fingers 804 may have alternative arrangements. For example, fingers 804 may be disposed radially about center point 880 such that they are separated by 90 degrees in one rotational direction and 270 degrees in the opposite rotational direction.

[0078] FIG. 8B shows a cable retainer blank 810 that may be used to form a cable retainer with three fingers. In some embodiments, cable retainer blank 810 may have a central panel 812 that is T-shaped, as shown in FIG. 8B. Central panel 812 may be connected to three fingers 814 by a first set of upward fold lines 830. Central panel 812 may also include three flaps 816 cut from central panel 812 and connected to central panel 812 by a second set of upward fold lines 840. Each upward fold line in the first set of upward fold lines 830 may be oriented parallel to an upward fold line in the second set of upward fold lines 840. In some embodiments, cable retainer blank 810 may include three finger segments 815, each finger segment 815 being disposed between central panel 812 and a respective finger 814. Finger segments 815 may be connected to central panel 812 by first set of upward fold lines 830 and finger segments 815 may be connected to fingers 814 by a third set of upward fold lines 850. Each upward fold line in the first set of upward fold lines 830 may be oriented parallel to an upward fold line in the third set of upward fold lines 850.

[0079] In some embodiments, cable retainer blank 810 may include three flap segments 817, each flap segment 817 being disposed between central panel 812 and a respective flap 816. Flap segments 817 may be connected to central panel 812 by second set of upward fold lines 840 and flap segments 817 may be connected to flaps 816 by a fourth set of upward fold lines 860. Each upward fold line in the second set of upward fold lines 840 may be oriented parallel to an upward fold line in the fourth set of upward fold lines

[0080] In some embodiments, cable retainer blank 810 may include a pull tab 813 connected to central panel 812 by a fourth upward fold line 870. In some embodiments, fingers 814 may be may be arranged radially about center point 880 in a T-shaped fashion, as shown in FIG. 8B. In some embodiments, fingers 814 may have alternative arrangements. For example, fingers 814 may be connected to central panel 812 such that each finger 814 is equilaterally arranged radially about center point 880 (i.e., each finger 814 may be separated from its neighbors by 120 degrees).

[0081] FIG. 8C shows a cable retainer blank 820 that may be used to form a cable retainer with four fingers. In some embodiments, cable retainer blank 820 may include a central panel 822 that is cross-shaped, as shown in FIG. 8C. Central panel 822 may be connected to four fingers 824 by a first set of upward fold lines 830. Central panel 822 may also include four flaps 826 cut from central panel 822 and connected to central panel 822 by a second set of upward fold lines 840. Each upward fold line in the first set of upward fold lines 830 may be oriented parallel to an upward fold line in the second set of upward fold lines 840. In some embodiments, cable retainer blank 820 may include four finger segments 825, each finger segment 825 being disposed between central panel 822 and a respective finger 824. Finger segments 825 may be connected to central panel 822 by first set of upward fold lines 830 and finger segments 825 may be connected to

fingers 824 by a third set of upward fold lines 850. Each upward fold line in the first set of upward fold lines 830 may be oriented parallel to an upward fold line in the third set of upward fold lines 850.

[0082] In some embodiments, cable retainer blank 820 may include four flap segments 827, each flap segment 827 being disposed between central panel 822 and a respective flap 826. Flap segments 827 may be connected to central panel 822 by second set of upward fold lines 840 and flap segments 827 may be connected to flaps 826 by a fourth set of upward fold lines 860. Each upward fold line in the second set of upward fold lines 840 may be oriented parallel to an upward fold line in the fourth set of upward fold lines 860.

[0083] In some embodiments, cable retainer blank 820 may include a pull tab 823 connected to central panel 812 by a fourth upward fold line 870. In some embodiments, pull tab 823 may be cut from central panel 822 in the same or similar fashion as flaps 826. In some embodiments, fingers 824 may be may be arranged about center point 880 in a cross-shaped fashion, as shown in FIG. 8C. In such embodiments, each finger 824 may be equilaterally arranged radially about center point 880 (i.e., each finger 814 may be separated from its neighbors by 90 degrees).

[0084] FIG. 9 shows dimensions of a cable retainer 200 according to an embodiment. In some embodiments, cable retainer 200 may have an overall length 910 in the range of 175 millimeters to 155 millimeters. In some embodiments, overall length 910 may be approximately 165 millimeters (as used herein in conjunction with a stated value, "approximately" includes values within 5% of the stated value). In some embodiments, panel 210 may have a panel length 920 in the range of 80 millimeters to 100 millimeters. In some embodiments, panel length 920 may be approximately 91 millimeters. In some embodiments, segments 250 may have a segment length 930 in the range of 5 millimeters to 2.5 millimeters. In some embodiments, segment length 930 may be approximately 3.5 millimeters. Segments 256 may have a segment length 940 the same as or similar to segment length 930. In some embodiments, segments 256 may have a segment length 940 that is shorter than the segment length 930 of segments 250. In some embodiments, the difference between segment length 940 and segment length 930 may be equal to the thickness of fingers 220. This may facilitate a flush attachment between fingers 220 and segments 230. In some embodiments, fingers 220 may have a thickness of approximately 0.4 millimeters. In some embodiments, panel 210, flaps 230, and segments 250/256 may have the same thickness as fingers 220.

[0085] In some embodiments, flaps 230 may have a flap length 950 in the range of 10 millimeters to 15 millimeters. In some embodiments, flap length 950 may be approximately 12 millimeters. In some embodiments, cable retainer 200 may have a passageway length 960 in the range of 10 millimeters to 15 millimeters. In some embodiments, passageway length 960 may be approximately 12 millimeters. [0086] In some embodiments, cable retainer 200 may have a panel/finger width 970 in the range of 10 millimeters to 20 millimeters. In some embodiments, panel/finger width 970 may be approximately 15 millimeters. In some embodiments, pull tab 270 may have a width 980 in the range of 10 millimeters to 20 millimeters. In some embodiments, width

980 may be approximately 15 millimeters. While FIG. 9

shows cable retainer 200 having two fingers 220, the dimen-

sions shown in FIG. 9 may apply to other cable retainer embodiments (e.g., cable retainers with three or four fingers). Additionally, the dimensions shown in FIG. 9 may be scaled up or down depending on a specific cable, product, product component, or product accessory. For example, the dimensions may be scaled up or down depending on the length and diameter of cable to be wound and packaged.

[0087] A wound cable (e.g., wound cable 160) may be packaged using the following exemplary method. The order of the processes discussed below is exemplary and may be rearranged depending on a number of factors, for example, but not limited to, optimization of the assembly process and the layout (e.g., the location of equipment and/or process flow) of a production floor.

[0088] A cable may be wound to form a wound cable (e.g., wound cable 160) with a plurality of cable loops (e.g., loops **164**). In some embodiments, the winding of the cable may be performed manually. In some embodiments, the winding of the cable may be performed using automated machinery. In some embodiments, the cable is wound such that each loop of the cable is in contact with immediately adjacent loops along a majority of each loop (i.e., the circumferential sidewalls 168 of adjacent loops 164 are in contact with each other along the majority of a loop 164). In some embodiments, a temporary restraint may be applied to wound cable 160 to hold it in its wound configuration. In some embodiments, the cable is wound from the outside in. An outside-in winding direction can help ensure proper position of plug 162 within corner 134, as described above, especially in the case where cable length may vary.

[0089] After winding, a cable retainer blank (e.g., cable retainer blank 800) may be folded about the wound cable, thereby forming a cable retainer (e.g., cable retainer 200). The folding of the cable retainer blank may include folding flaps (e.g., flaps 806) cut from a panel (e.g., central panel 802) of the cable retainer blank, folding fingers (e.g., fingers 804) hingedly coupled to the panel of the cable retainer blank, and attaching the fingers to respective flaps to thereby define a plurality of passageways (e.g., passageways 260) through which the loops of the wound cable extend. In some embodiments, an adhesive (e.g., double sided tape or Velcro®) may be placed on the fingers and/or the flaps before folding them. In some embodiments, the attachment between the fingers and the flaps may be accomplished by features formed on the fingers or the flaps (e.g., tabs and slots). In some embodiments, the folding of cable retainer blank may be performed manually. In some embodiments, the folding of the cable retainer blank may be performed using automated machinery. After folding the cable retainer about the wound cable, the temporary restraint, if present, may be removed.

[0090] Once folded about the wound cable, the cable retainer and the wound cable may be positioned within a cavity (e.g., cavity 120) formed in a packaging container (e.g., packaging 100). In some embodiments, the cable retainer may be releasably attached to the cavity (e.g., adhesively attached to a lower surface of the cavity). In some embodiments, a plug (e.g., plug 162) of the wound cable may be positioned adjacent to a corner (e.g., corner 134) of the cavity outside of the wound cable's loops such that contact between a plug and the walls of the corner inhibits rotation of the wound cable within the cavity. This

may help ensure that wound cables are consistently positioned and oriented with cavities of different packaging containers.

[0091] The foregoing descriptions of the specific embodiments described herein are presented for purposes of illustration and description. These exemplary embodiments are not intended to be exhaustive or to limit the embodiments to the precise forms disclosed. All specific details described are not required in order to practice the described embodiments.

[0092] It will be apparent to one of ordinary skill in the art that many modifications and variations are possible in view of the above teachings, and that by applying knowledge within the skill of the art, one may readily modify and/or adapt for various applications such specific embodiments, without undue experimentation, without departing from the general concept of the present invention(s). Such adaptations and modifications are intended to be within the meaning and range of equivalents of the disclosed embodiments, based on the teaching and guidance presented herein.

[0093] The Detailed Description section is intended to be used to interpret the claims. The Summary and Abstract sections may set forth one or more but not all exemplary embodiments of the present invention(s) as contemplated by the inventor(s), and thus, are not intended to limit the present invention(s) and the appended claims.

[0094] The present invention(s) have been described above with the aid of functional building blocks illustrating the implementation of specified functions and relationships thereof. The boundaries of these functional building blocks have been arbitrarily defined herein for the convenience of the description. Alternate boundaries can be defined so long as the specified functions and relationships thereof are appropriately performed.

[0095] The phraseology or terminology used herein is for the purpose of description and not limitation, such that the terminology or phraseology of the present specification is to be interpreted by the skilled artisan.

[0096] The breadth and scope of the present invention(s) should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the claims and their equivalents.

What is claimed is:

- 1. Packaging comprising:
- a base comprising a cavity;
- a cable retainer disposed within the cavity, the cable retainer comprising:
 - a panel extending across the cavity,
 - a plurality of fingers, each finger hingedly coupled to the panel;
 - a plurality of flaps cut from the panel and hingedly coupled to the panel;
- wherein each finger is attached to a flap to thereby together define a passageway.
- 2. The packaging of claim 1, wherein each finger is releasably attached to the flap via an attachment member.
- 3. The packaging of claim 2, wherein the attachment members comprise an adhesive.
- **4**. The packaging of claim **1**, wherein the passageways extend parallel to a lower surface of the cavity.
- 5. The packaging of claim 4, further comprising a wound cable extending through the passageways.
- 6. The packaging of claim 5, wherein the wound cable loops through the passageways multiple times, and wherein

each loop of the wound cable that extends through the passageways is disposed on the same plane parallel to the lower surface of the cavity.

- 7. The packaging of claim 5, wherein the cavity includes a corner, and wherein a plug of the cable is positioned adjacent to the corner outside of the loops of the wound cable, such that contact between the plug and walls of the corner inhibits rotation of the wound cable.
- **8**. The packaging of claim **1**, wherein the panel, the fingers, and the flaps are a single integrally formed piece.
- 9. The packaging of claim 1, wherein the panel is disposed on a lower surface of the cavity, and wherein the cable retainer has a maximum thickness of less than or equal to 7 millimeters measured perpendicularly from the lower surface of the cavity.
- 10. The packaging of claim 1, wherein the base comprises a product surface for supporting a product, and wherein the cavity is formed in the product surface.
- 11. The packaging of claim 10, wherein the cavity has a depth of less than or equal to 7 millimeters measured from the product surface to a lower surface of the cavity.
- 12. The packaging of claim 1, wherein the cable retainer is completely disposed within the cavity.
- 13. The packaging of claim 1, wherein the hinged couplings between each finger and the panel are defined by grooves on the cable retainer.
- 14. The packaging of claim 1, wherein the hinged couplings between each finger and the panel are defined by fold lines on the cable retainer.
- 15. The packaging of claim 1, wherein each finger is hingedly coupled to a segment that is hingedly coupled to the panel.
- 16. The packaging of claim 15, wherein the panel, the segments, the fingers, and the flaps define the passageways.
- 17. The packaging of claim 1, wherein a free end of each finger attached to a flap points in a direction opposite the direction that a free end of the flap points.
- 18. The packaging of claim 1, wherein the cable retainer is composed of a paper-based product.
- 19. The packaging of claim 1, wherein the cable retainer comprises the same number of fingers as flaps.
- 20. The packaging of claim 1, further comprising a pull tab coupled to the panel.
- 21. The packaging of claim 1, wherein the panel is releasably coupled to a lower surface of the cavity.
- 22. A cable retainer for packaging a wound cable, the cable retainer comprising:
 - a single foldable piece of material configured to fold from a flat configuration to a folded configuration, the single foldable piece of material comprising:
 - a panel, a plurality of fingers, each finger hingedly coupled to the panel, and a plurality of flaps cut from the panel and hingedly coupled to the panel;
 - wherein, in the folded configuration, each finger is folded towards a geometric center of the panel and attached to a respective flap to define a plurality of passageways for receiving a wound cable.
- 23. The cable retainer of claim 22, wherein the attachment between the fingers and respective flaps is a releasable attachment.
- **24**. The cable retainer of claim **23**, wherein the releasable attachments comprise one or more of the following: an adhesive, a tab and slot coupling, a snap-fit coupling, and a hook and loop fastener.

- 25. The cable retainer of claim 22, further comprising a pull tab hingedly coupled to the panel.
- **26**. The cable retainer of claim **22**, wherein the single foldable piece of material is composed of a paper-based product.
- 27. The cable retainer of claim 22, wherein the single foldable piece of material is a compostable material.
- **28**. The cable retainer of claim **22**, wherein the single foldable piece of material is a recyclable material.
 - 29. A packaged cable comprising:
 - the cable retainer of claim 22 in the folded configuration, and
 - a wound cable extending through the passageways defined by the cable retainer.
- 30. The packaged cable of claim 29, wherein the wound cable loops through the passageways defined by the cable retainer multiple times,
 - wherein each loop of the wound cable that extends through the passageways is disposed on the same plane parallel to a top surface of the cable retainer panel, and wherein no loop of the wound cable is disposed on top of
 - 31. Packaging comprising:

another loop of the wound cable.

- a base comprising a cavity;
- the cable retainer of claim 22 in the folded configuration disposed in the cavity, and
- a wound cable extending through the passageways defined by the cable retainer.
- **32.** A method of assembling a packaged cable, the method comprising:
 - winding a cable to form a wound cable including a plurality of cable loops;
 - folding a cable retainer about the wound cable, wherein the folding comprises:

- folding flaps cut from a panel of the cable retainer, folding fingers hingedly coupled to the panel of the cable retainer, and
- attaching the fingers to respective flaps to thereby define a plurality of passageways through which the loops of the wound cable extend; and
- positioning the cable retainer and the wound cable in a cavity formed in a packaging container.
- 33. The method of claim 32, wherein each loop of the wound cable is disposed on the same plane parallel to a top surface of the cable retainer panel.
- 34. The method of claim 32, wherein the cable is wound such that each loop of the cable is in contact with immediately adjacent loops along a majority of each loop.
- 35. A blank for forming a cable retainer, the blank comprising:
 - a central panel connected to a plurality of fingers by a first set of upward fold lines; and
 - a plurality of flaps cut from the central panel and connected to the central panel by a second set of upward fold lines:
 - wherein each upward fold line in the first set of upward fold lines is oriented parallel to an upward fold line in the second set of upward fold lines.
- **36**. The blank of claim **35**, further comprising a plurality of segments, each segment disposed between the central panel and a respective finger;
 - wherein the segments are connected to the fingers by the first set of upward fold lines, and wherein the segments are connected to the central panel by a third set of upward fold lines.
- 37. The blank of claim 35, further comprising a pull tab connected to the central panel by a fourth upward fold line.

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