

**WEARABLE CAMERA SYSTEMS AND APPARATUS AND METHOD FOR
ATTACHING CAMERA SYSTEMS OR OTHER ELECTRONIC DEVICES TO
WEARABLE ARTICLES**

CROSS-REFERENCE TO RELATED APPLICATIONS

- [001] This application claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/032,589 entitled "EYEWEAR WITH CAMERA SYSTEM AND ATTACHMENT MECHANISM", filed August 3, 2014. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [002] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/045,246 entitled "MULTI-USE ATTACHABLE EYEGLASS CAMERA", filed September 3, 2014. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [003] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/086,747 entitled "CAMERA SYSTEM FOR EYEWEAR", filed December 3, 2014. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [004] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/091,697 entitled "EYEWEAR SYSTEM FOR CAMERA", filed December 15, 2014. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [005] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/153,999 entitled "CAMERA SYSTEM CAPABLE OF WIRELESS ENERGY TRANSFER", filed April 28, 2015. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [006] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/048,820 entitled "EYEWEAR WITH TEMPLE TRACK", filed September 11, 2014. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.

- [007] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/052,910 entitled "FASHIONABLE EYEWEAR COMPRISING A TRACK", filed September 19, 2014. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [008] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/053,275 entitled "EYEWEAR COMPRISING A TRACK", filed September 22, 2014. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [009] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/140,276 entitled "OPTIMIZED EYEWEAR TRACK AND ATTACHMENT MEANS FOR ELECTRONIC DEVICE," filed March 30, 2015. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [010] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/154,007 entitled "EYEWEAR TRACK, WIRELESS ENERGY TRANSFER SYSTEM AND ATTACHMENT MEANS FOR ELECTRONIC DEVICE," filed April 28, 2015. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.
- [011] This application also claims the benefit under 35 U.S.C. 119 of the earlier filing date of U.S. Provisional Application 62/080,437 entitled "EYEWEAR WITH GUIDE FOR WEARABLE DEVICES", filed November 17, 2014. The aforementioned provisional application is hereby incorporated by reference in its entirety, for any purpose.

TECHNICAL FIELD

- [012] The present disclosure relates to wearable electronic devices, for example wearable camera systems, and more particularly to apparatuses and methods for attaching electronic devices such as camera systems to eyewear or other wearable articles.

BACKGROUND

[013] The world is quickly becoming a world of instant or near instant information availability. Certain of this information are photographs and videos. In addition, intelligent wireless devices and apps allow for the transfer of this information quickly, seamlessly and effortlessly. It is estimated that over one trillion digital photos will be taken in 2015 with the vast majority being taken by mobile phone cameras. Further, there are now over 6 billion mobile phones owned and actively used in the world or which approximately 4 billion have cameras associated.

[014] There are 2 Billion individuals in the world who wear prescription eyeglasses and over an estimated 300 Million pairs of eyeglasses sold in the world each year. Conventional eyeglasses may not include a camera, mainly because eyeglasses / eyewear are perceived to be a fashion item by the consumer. Attaching a conventional camera to eyewear by any conventional techniques may distract from the cosmetics or fashion-look of the eyeglasses or eyewear. Examples in the present disclosure may address some of the shortcomings in this field.

SUMMARY

[015] Wearable electronic device systems, for example wearable camera systems, and apparatuses and methods for attaching electronic devices such as cameras to eyewear or other wearable articles are described.

[016] An electronic device system according to some examples of the present disclosure may include an eyewear frame including a temple and a first guide integral with the temple, the temple having a finished surface, and the first guide extending between a first location on the temple and a second location on the temple. The first guide may be formed on a side of the temple and extend partially through a thickness of the temple or protrude from the temple, the first guide comprising a base and at least one sidewall adjacent to the base, the finished surface of the temple including surfaces of the base and the at least one sidewall. The system may further include an electronic device movably coupled to the temple, the electronic device comprising a second guide coupled to the first guide, and an attachment system securing the electronic device to the temple, whereby the electronic device is movable along the guide while remaining secured to the temple. In some examples, the first guide may include a rail or a groove.

[017] An electronic device system according to further examples of the present disclosure may include an eyewear frame including a temple and a first securing guide integral with the temple, the temple having a finished surface and the first securing guide extending between a first location on the temple and a second location on the temple. The first securing guide may be formed on a side of the temple and may extend partially through a thickness of the temple or may protrude from the temple. The first securing guide may include a base and at least one sidewall adjacent to the base, the finished surface of the temple including surfaces of the base and the at least one sidewall. The first and second securing guides may be configured to maintain the electronic device on the temple as the electronic device is moved along the first guide. In some examples, the first securing guide may include a rail or a groove.

BRIEF DESCRIPTION OF THE DRAWINGS

[018] The above objectives, features, aspects and attendant advantages of the present invention will become apparent from the following detailed description of various embodiments, including the best mode presently contemplated of practicing the invention, when taken in conjunction with the accompanying drawings, in which:

[019] FIG. 1 is a view of a system including a securing guide according to some examples of the present disclosure;

[020] FIG. 2 is another view of the system in FIG. 1;

[021] FIG. 3 is yet another view of the system in FIG. 1;

[022] FIG. 4 is a partial view of a system including a non-securing guide according to some examples of the present disclosure;

[023] FIG. 5A is a partial view of a system including a securing guide according to further examples of the present disclosure;

[024] FIG. 5B is another partial view of the system in FIG. 5A;

[025] FIG. 6 is a side view of a bifurcated temple for eyewear according to some examples of the present disclosure;

[026] FIG. 7 are views of temples including guides according to examples of the present disclosure;

[027] FIG. 8 is a view of a temple including an offset according to examples of the present disclosure;

- [028] FIGS. 9A-9D are cross-sectional views of temples including guides according to some examples herein, for example a non-securing guide (FIG. 9A), and securing guides (FIGS. 9B, 9C, 9D);
- [029] FIGS. 10A and 10B are cross-sectional views of guides including a female groove according to some examples herein;
- [030] FIGS. 11A-11F are cross-sectional views of guides according to further examples herein;
- [031] FIGS. 12A-12C are cross-sectional views of securing guides including magnetic means for securing the electronic device to the temple;
- [032] FIGS. 13A-13E are views of a camera according some examples of the present disclosure;
- [033] FIGS. 14A and 14B are views of cameras configured for slidable engagement with a temple using a shoe according to some examples herein;
- [034] FIG. 15 is a view of a camera according to further examples of the present disclosure;
- [035] FIG. 16 is a view of a camera according to yet further examples of the present disclosure;
- [036] FIG. 17A shows cross sectional views of a guide including a dove tail female groove configured for engagement with a split male rail according to examples herein;
- [037] FIG. 17B shows a split male rail according to the example in FIG. 17A;
- [038] FIG. 17C shows a dove tail female groove according to the example in FIG. 17A;
- [039] FIGS. 18A-18C are views of an electronic device slidably and pivotably coupled to a temple according to some examples herein;
- [040] FIGS. 19A-19D are top, front, side, and partial isometric views of a system according to some examples of the present disclosure; and
- [041] FIGS. 20A-20D are top, front, side, and partial isometric views of a system according to further examples of the present disclosure.
- [042] FIGS. 21A-21C are views of a camera according to further examples of the present disclosure.
- [043] FIG. 22 is a view and a cross section of a stretchable band in the form of an O-ring according to an example of the present disclosure.

DETAILED DESCRIPTION

[044] An electronic device system according to some examples of the present disclosure may include an eyewear frame including a temple and a first guide integral with the temple, the temple having a finished surface, and the first guide extending between a first location on the temple and a second location on the temple. The first guide may be formed on a side of the temple and extend partially through a thickness of the temple or protrude from the temple, the first guide comprising a base and at least one sidewall adjacent to the base, the finished surface of the temple including surfaces of the base and the at least one sidewall. The system may further include an electronic device movably coupled to the temple, the electronic device comprising a second guide coupled to the first guide. In some examples, the first guide may include a rail or a groove. In some examples, the first and second securing guides may be configured to maintain the electronic device on the temple as the electronic device is moved along the first guide. In some examples, the system may include an attachment system securing the electronic device to the temple, whereby the electronic device is movable along the guide while remaining secured to the temple.

[045] FIGS. 1-3 are views of a wearable camera system 100 according to some examples of the present disclosure. The system 100 includes eyewear 105 and electronic device 130 attached thereto. The eyewear 105 includes an eyewear frame 110 which includes a temple 112. Typically, an eyewear frame 110 includes a pair of temples 112 (e.g., left and right temples), one for each side of a wearer's head. In some examples, the temples 112 are pivotably coupled to a lens portion 117 of the frame via a hinge 113. The lens portion may include a pair of lenses 102, for example and without limitation prescription lenses, non-prescription lenses, tinted lenses, changeable tint lenses, variable focus lenses, switchable focus lenses, or any combinations thereof. The lens portion may include a rim 104, as in the example in FIGS. 1-3, or the lens portion may be rimless in other embodiments.

[046] One or both of the temples 112 of eyewear frame 110 may include a guide 120 for coupling an electronic device 130 to the temple of eyewear frame 110. The guide 120 may be part of an attachment system including a first guide and a second guide configured for slidable engagement with one another. In this regard, the guide 120 may be a first guide configured for slidable engagement with a second guide on the

electronic device 130. The first guide (e.g., guide 120) may include a rail or a groove, which may be implemented according to any of the examples herein, and the second guide on the electronic device may include a groove or a rail configured for cooperating fit with the rail or groove of the first guide 120. The electronic device 130 may be a miniaturized self-contained electronic system such as a camera system or simply camera 132. The electronic device 130 may be virtually any miniaturized electronic device, for example and without limitation a camera, image capture device, IR camera, still camera, video camera, image sensor, repeater, resonator, sensor, hearing aid, sound amplifier, directional microphone, eyewear supporting an electronic component, spectrometer, directional microphone, microphone, camera system, infrared vision system, night vision aid, night light, illumination system, sensor, pedometer, wireless cell phone, mobile phone, wireless communication system, projector, laser, holographic device, holographic system, display, radio, GPS, data storage, memory storage, power source, speaker, fall detector, alertness monitor, geo-location, pulse detection, gaming, eye tracking, pupil monitoring, alarm, CO sensor, CO detector, CO₂ sensor, CO₂ detector, air particulate sensor, air particulate meter, UV sensor, UV meter, IR sensor IR meter, thermal sensor, thermal meter, poor air sensor, poor air monitor, bad breath sensor, bad breath monitor, alcohol sensor, alcohol monitor, motion sensor, motion monitor, thermometer, smoke sensor, smoke detector, pill reminder, audio playback device, audio recorder, speaker, acoustic amplification device, acoustic canceling device, hearing aid, video playback device, video recorder device, image sensor, fall detector, alertness sensor, alertness monitor, health sensor, health monitor, fitness sensor, fitness monitor, physiology sensor, physiology monitor, mood sensor, mood monitor, stress monitor, pedometer, motion detector, geo-location, pulse detection, wireless communication device, gaming device, eye tracking device, pupil sensor, pupil monitor, automated reminder, light, alarm, cell phone device, phone, mobile communication device, poor air quality alert device, sleep detector, dozing detector, alcohol detector, thermometer, refractive error measurement device, wave front measurement device, aberrometer, GPS system, smoke detector, pill reminder, speaker, kinetic energy source, microphone, projector, virtual keyboard, face recognition device, voice recognition device, sound recognition system, radioactive detector, radiation detector, radon detector, moisture detector, humidity detector, atmospheric pressure indicator, loudness indicator, noise indicator, acoustic sensor, range finder, laser system, topography sensor, motor, micro motor, nano motor, switch,

battery, dynamo, thermal power source, fuel cell, solar cell, kinetic energy source, thermo electric power source.

[047] The guide 120 may be provided on any side of temple 112, for example an outside side 111, on a top and/or bottom sides (e.g., as in FIG. 5A and 5B), or any combinations thereof. The guide 120 may be configured to guide a movement of the electronic device 130 (e.g., camera 132) along a predetermined direction, e.g., as indicated by arrow 140. For example, the guide 120 may constrain one or more degrees of freedom of the electronic device 130 when the electronic device 130 is coupled to the temple 112. As such, movement of the electronic device 130 may be confined to one or more predetermined directions. In some examples, the guide 120 may be configured to guide movement of the electronic device 130 substantially along a longitudinal direction 140 of the temple. The longitudinal direction, also referred to herein as length-wise direction, may be a direction oriented substantially along a length of the temple 112. The guide may begin at the front of the temple and extend to the back of the temple. The guide may begin at the front one half of the temple and extend to the back one half of the temple. The guide may begin at the front one third of the temple and extend to the back one third of the temple. The guide may start at the front of the temple and extend to the back one half of the temple. An electronic device can be loaded on the guide at a point between the front of the guide and the back of the guide. An electronic device can be loaded on the guide at the front of the guide. An electronic device can be loaded on the guide at the back of the guide. An electronic device can be loaded on the guide at the front of the temple. An electronic device can be located on the guide at the back of the temple.

[048] Guides according to the present disclosure may be configured as securing guides or non-securing guides. A securing guide may be configured to guide movement of the electronic device (e.g. camera 132) along a predetermined direction (e.g., longitudinal direction 140) and to maintain the electronic device (e.g. camera 132) in position (e.g., in engagement with the temple 112). For example, a securing guide may include features configured to maintain the electronic device (e.g. camera 132) in engagement with the guide 120. In some examples, a securing guide may be configured to constrain five (all three rotational and two of the three translational) of the six degrees of freedom of the camera 132 leaving one degree of freedom (translation in a predetermined direction, for example the longitudinal direction 140) unconstrained.

[049] A non-securing guide may be configured to guide movement of the electronic device 130 along a predetermined direction while also allowing movement of the electronic device 130 along other direction including a direction which may cause the device to disengage from the guide 120. That is, a non-securing guide may only constrain one or more degrees of freedom as appropriate to guide the electronic device 130 along a path corresponding to the predetermined direction of movement. In such examples, a securing mechanism may be included to maintain the electronic device 130 in engagement with the guide 120. In some examples, securing mechanism may comprise one or more bands, as will be further described below, e.g., with reference to FIG. 4. An example of a band, without limitation, may be an adjustable strap, an elastic ring such as an O-ring, a stretchable slide member, or combinations thereof. In some examples, an attachment system for attaching an electronic device to eyewear may include a plurality of band configured for coupling the electronic device to temples that have different sizes and/or geometries. For example, the plurality of bands may comprise a plurality of elastic rings (e.g., O-rings) having different diameters. In some examples, the securing mechanism may comprise magnetic means. For example, the temple may include a metallic material (e.g., a metallic member) which may be attached to or embedded within the temple for magnetically coupling to a magnet on the electronic device as will be further described, e.g., with reference to FIGS. 11A and 11B as well as FIGS. 12A and 12B.

[050] In the example in FIGS. 1-3, guide 120 comprises a female groove 122 which is configured to receive a male rail 124 of a second guide at least partially therein. The male rail 124 may be provided on an electronic device and may be shaped for a cooperating fit with the female groove 122. For example, the male rail 124 may include a protrusion which is sized and shaped for insertion into a groove of the female groove 122. In the example in FIGS. 1-3, guide 120 is configured as a securing guide. The female groove 122 comprises a cross-sectional shape selected to prevent the male rail 124 from disengaging from the female groove 122. In this example, the female groove 122 has a generally trapezoidal cross-section and the male rail 124 has an inverted generally trapezoidal cross-section which is shaped and sized to fit within the female groove 122. The female groove 122 having a generally trapezoidal cross-section implies that a width of the female groove 122 at the top of the groove is smaller than a width of the female groove 122 at the base of the groove 122 thereby preventing movement of the male rail 124 in a direction generally perpendicular to the groove.

The geometry of the slidable joint defined by the groove and rail in the example in FIG. 2 may also be referred to as a dovetail geometry. As such, the slidable joint may also be said to have a dove-tail cross-sectional shape. In the present disclosure, groove may be interchangeably used with female groove and rail may be interchangeably used with male rail.

[051] As further illustrated in FIG. 1-3, the electronic device (e.g. camera 132) may be coupled to temple 112 using an intermediate component, e.g., a shoe 134. The shoe may be formed of a rigid material, such as a rigid plastic material, and may include the second guide. The shoe may be configured to slidably engage with the first guide 120 via the second guide. For example, if guide 120 comprises a female groove 122 as in the present example, the shoe may include a male rail 124. In other example, the shoe may include a female groove and the temple 112 may include a male rail configured for insertion into the female groove of the shoe 134. In some example, the shoe 134 may be removably coupled to the electronic device 130 (e.g., camera 132). In some examples, the shoe may have a geometry configured to at least partially wrap around the camera 132. In some examples, the shoe may have a generally C-shaped cross section. In further example, the shoe may have a generally I-shaped cross section, e.g., as in the example in FIGS 5A and 5B described further below.

[052] The shoe 134 may include a generally planar body 136 and generally perpendicular extensions (only one of the extensions in the pair, extension 137, is visible in FIG. 2) disposed on opposite ends of the body 136. The extensions may be configured to engage with opposite sides of the electronic device 130 (e.g., camera 132), for example top and bottom sides. In some examples, the shoe 134 may engage with forward and aft sides of the electronic device 130 (e.g., camera 132). Each of the extensions in the pair may be configured to snap into engagement with a housing 154 of the camera 132. For example, the extensions 137 may include attachment features which may be received into surface features of the housing 154. The shoe 134 may have a length, which may be substantially the same as a length of the camera (e.g., as in FIG. 16B) or shorter than a length of the camera (e.g., as in FIGS. 1-3). The length may be selected such that the shoe 134 firmly engages with the camera 132 when coupled thereto. In some examples, the length of the shoe 134 may be between about one half and one quarter of the length of the camera 132. In some examples, the length of the shoe may be about one third of the length of the camera 132.

[053] As described herein, a guide may extend along a temple between a first location on the temple and a second location on the temple. In some examples, the first guide may be formed on an outside side of the temple, e.g., as illustrated in the examples in FIGS. 1-4. The first location on the temple may be a location at a forward end of the temple and the second location on the temple may be a location near an aft end of the temple. For example, the second location may be a location which is a distance of about 1/3 of the length of the temple forward of the aft end of the temple. In some examples, the guide may extend a certain percentage of the length of the temple, for example the guide may extend about 50%, about 60%, about 70%, or about 80% of the length of the temple or anywhere between about 40% to about 90% of the length of the temple.

[054] In some examples, the guide extends sufficiently far along the temple such that an electronic device can be moved to a location nearest the ear where a width of the electronic device is greater than a distance between the inside of the temple and the wearer's head. For example, the electronic device may be positioned at least partially above, below, or outside the temple such that it may be moved along the guide toward the wearer's ear far enough back that it reaches a place where the width of the electronic device would have caused it to hit the wearer's face if it were positioned inside the temple. The guide may be inside the temple, outside the temple, on the top or bottom of the temple, or combinations thereof.

[055] FIG. 4 is a partial view of a system 200 comprising a temple 212 of an eyewear frame 210 (only partially shown in FIG. 4). In some examples, the system may also include a camera 232 slidably engaged with the temple 212. The camera 232 is slidably engaged with the temple 212 via guide 220 such that the camera 232 is movable along the temple 212. For example, the camera 232 may be movable between a first position and a second position along a length of the temple 212. The first position may be a forward position and the second position may be an aft position. When the camera 232 is in the first position, a forward end 233 of the camera 232 may be at substantially at, slightly forward of, or slightly aft of a forward end 206 of the temple 212. The aft position may be a position selected to substantially conceal the camera 232 from view (e.g., behind an ear of a person wearing the eyewear frame 210).

[056] In the example in FIG. 4, the guide 220 is configured to guide movement of the camera 232 along a length-wise direction 240 of temple 212. In this regard, the guide 220 extends along at least part of the length of temple 212. In some examples,

the temple includes a first portion 214 and a second portion 216. The first portion 214 (e.g., forward portion 214) of temple 212 may extend from the forward end 206 of the temple 212 to a location where the temple 212 curves downward, e.g., for engagement with the wearer's head and more specifically for placement behind the wearer's ears. The second portion 216 (e.g., aft portion 216) of temple 212 may extend from the location where the temple curves downward to the aft end 215 of the temple. In some examples, the guide may extend along at least part of the length of temple 212, for example the length of the first portion. In some examples, the guide may extend partially along the length of the first portion or beyond the first portion. The guide 220 may be a first guide which is configured to engage with a second guide on the camera 232.

[057] As previously described, guides according to the present disclosure may be securing guides or non-securing guides. A securing guide holds an electronic device in place as the device is moved along the guide. A non-securing guide may not hold an electronic device in place as it is moved along the guide. A securing mechanism may be used with a non-securing guide in order to secure an electronic device to the non-securing guide as it moves along the guide. In some examples, the guide may include a non-securing female groove (e.g., as in the example in FIG. 4), a securing female groove (e.g., as in the previous example in FIGS. 1-3), a non-securing male rail, or a securing male rail as will be further described. As will be understood, guides according to the present disclosure may include one or more rails or one or more tracks disposed or coupled to one or more sides of a temple and/or disposed or coupled to an electronic device. The specific examples of guides described herein, for example with reference to FIGS. 9-12, are illustrative only. Any of the rails and/or tracks according to the present disclosure may interchangeably be provided on either the temple or the electronic device. Temples and attachment systems for electronic devices to eyewear may include guides with one or more of any of the rail(s), groove(s), and features thereof described herein in any combination.

[058] In the example in FIG. 4 the guide 220 is implemented as a non-securing guide, in that the guide 220 guides movement of the camera 232 but does not otherwise secure the camera 232 to the eyewear. By securing, it is implied that the camera is coupled to the eyewear such that it remains in engagement with the guide 220, e.g., in engagement with the rail or groove provided on the temple. The guide 220 in FIG. 4 includes a non-securing female groove configured to receive a male rail (not shown).

The male rail may be integrated into or coupled to the camera 232. For example, the male rail may be integrated into a housing 254 of camera 232. In further example, the male rail may be incorporated into an intermediate component (e.g., a shoe as illustrated in the example in FIGS. 1-3), and the intermediate component may be coupled to the camera 232.

[059] In some examples, the system 200 may include a securing mechanism 250. In some examples, the securing mechanism may include one or more bands 252, which may be configured to engage with surface features 256 on a housing 254 of camera 232 to maintain the camera 232 in engagement with the guide 220. The bands 252 may be stretchable bands. For example, the bands 252 in FIG. 4 are implemented as elastic rings 253 (e.g., O-rings as in the example in FIG. 22), which bias the camera 232 towards the temple 212 while allowing movement of the camera 232 along the length of the temple 212. A stretchable band may adapt to changes in the design, contour, thickness and width of the eyewear temple while securing the electronic device on a non-securing guide. In some examples, a securing mechanism may be used with a securing guide for added protection, e.g., for reducing a risk of the electronic device accidentally becoming disengaged from the securing guide. The surface features 256 may include ribs, which may extend from a surface of the housing 254. The elastic ring 253 may engage with the surface features 256, for example by being positioned between a pair of ribs to bias the camera 232 towards the temple 212. In some examples, the surface features 256 may include indentations in a surface of the housing 254, which may receive the elastic ring 253 therein. The surface features reduce the risk of the securing mechanism (e.g., stretchable band) sliding off the electronic device as the electronic device is moved along the guide. In this manner, the surface features may maintain the securing mechanism in attachment with the electronic device while the electronic device is moved along the guide. In other examples, the securing mechanism 250 may include magnetic means, e.g., as will be described with reference to FIGS. 12A-12C.

[060] Referring now to FIGS. 5A and 5B, attachment systems including first and second guides for attaching an electronic device to eyewear according to further examples will be described. FIGS. 5A and 5B show partial views of a system 300 according to the present disclosure. System 300 includes a temple 312 of an eyewear frame, the temple 312 comprising a first guide 320. Guide 320 is configured for slidable engagement with a second guide on an electronic device 330. In some

examples, the electronic device may be a camera. The guide 320 in this example is implemented as a securing guide. The guide 320 comprises a pair of female tracks 322 disposed on opposite sides of temple 312. That is, guide 320 includes a first groove 322-1 (e.g., top groove 322-1) provided on a first side 318 (e.g., top side 318) of temple 312 and a second groove 322-2 (e.g., bottom groove 322-2) provided on a second side 319 (e.g., bottom side 319) of temple 312. The tracks 322-1, 322-2 comprise grooves having a generally U-shaped cross section, also referred to as closed grooves. In some examples, and without limitation, tracks according to the present disclosure may have other cross-sections such as an L-shaped cross section (also referred to as open groove), a generally C-shaped cross section (also referred to as hook groove), an inverted T-shaped cross section, a V-shaped cross section, or a dovetail cross section. A partially closed groove includes two opposing side walls extending from a base of the groove, the side walls having the same or dissimilar heights. An open groove includes only one side wall. A hook groove includes a side wall and a top wall adjacent to the side wall and opposite a base of the groove. A groove having an inverted T-shaped cross section includes partial top wall extending toward one another from opposing side walls of the groove, thereby defining a groove having a base which is wider than the top portion and/or opening of the groove. A groove with a V-shaped cross section includes a base which generally defines an angle between the sidewalls of the groove.

[061] In this example, the electronic device 330 is coupled to the temple 312 using an intermediate component such as a shoe 334. The shoe 334 is disposed between the electronic device 330 and the temple 312. The shoe 334 is configured for slidable engagement with guide 320 and is further configured for engagement with the electronic device 330. The shoe 334 is generally I-shaped in cross-section. That is, the shoe 334 includes a body 336 having a generally planar geometry. The shoe 330 further includes a guide comprising a pair of male rails 324-1, 324-2 extending from opposite ends of the body towards a first direction generally perpendicular to the body 336. Each of the male rails 324-1 and 324-2 is configured for insertion into respective ones of the female tracks 322 (e.g., first and second tracks 322-1, 322-2, respectively). The shoe 334 is further configured to be coupled to the electronic device 330, e.g., via the extensions 337 and 338 which extend from body 336 in a second direction opposite the first direction.

[062] Referring now to FIGS. 6-8 additional features of temples according to the present disclosure are described.

[063] In some examples, it may be desirable to provide an extended guide, which may enable a user to slide the electronic device further aft, such as to better conceal the electronic device behind the user's ear, than may otherwise be possible without an extended guide. FIG. 6 illustrates a partial view of another system 600 including an electronic device 630 slidably engaged with a temple 612, in this case a bifurcated temple 612. The temple 612 includes a guide 620 which includes a groove 622. Although not specifically illustrated, it will be understood that the guide 620 may, in other examples, include a rail. In this example, the electronic device 630 is slidably coupled to a guide 620 using a shoe 634.

[064] The temple 612 includes a forward portion 614 and an aft portion 616. The aft portion is forked into an aft upper portion 616-1 and aft lower portion 616-2. The aft upper portion 616-1 may be generally in line with the forward portion 614, while the aft lower portion 616-2 may be curve downward, thus also referred to as curved portion 616-2. The guide 620 extends along the forward portion 614 and the aft upper portion 616-1 of temple 612. The guide 620 may extend along some or substantially all of the lengths of the forward and aft upper portions 614 and 616-1, respectively. The curved portion 616-2 of temple 612 may be generally shaped to fit behind and/or around a user's ear. In some examples, a guide may terminate proximate or ahead of the curved portion, e.g., as illustrated in the examples in FIGS. 1-5. In such examples, the farthest position to which the electronic device may be movable may be a position at or ahead of the curved portion. In the example in FIG. 6, the bifurcated temple 612 may extend the amount of travel available to the electronic device 630 such that the electronic device 630 may be positionable farther back relative to the lens portion (not shown in this figure) and thus be better concealed from view.

[065] FIG. 7 illustrates three examples 700, 700', and 700'' of temples with guides having different geometries. In a first example 700, temple 712 includes a guide 720 which comprises a groove 722. The groove 722, when viewed in plan, has a generally rectangular shape. A distance d between the sidewalls of groove 722 remains substantially constant along the length of the groove 722. In a second example 700', temple 712' includes a guide 720'. The guide 720' comprises a groove 722', which has a tapered geometry, in plan view. In example 700', a forward portion of the groove 722' narrows towards a forward end of the groove. In a third example 700'', temple 712'' includes a guide 720'' comprising a groove 722'', which also has a tapered geometry, in plan view. In this third example 700'', the groove 722'' tapers toward the

aft end of the groove. That is, an aft portion of the groove 722'' narrows towards an aft end of the groove. As such, a distance d' between the sidewalls of the groove 722' decreases along at least a portion of the length of the groove 722'. Similarly, a distance d'' between the sidewalls of the groove 722'' decreases along at least a portion of the length of the groove 722''.

[066] A groove according to the present disclosure typically includes at least one sidewall and may also include a second opposite sidewall, a top wall, or combinations thereof. A sidewall is a wall of the groove that extends from a base of the groove and spans a portion of the length of the groove. A top wall is a wall of the groove that extends from one of the side walls. A top wall may be a partial wall which may be arranged generally opposite the base of the groove and may also span at least a portion of a length of the groove. In some examples, the groove may include a forward groove wall, an aft groove wall, or both. The forward and aft groove walls are walls of the groove which extend from the base of the groove and span the distance between the sidewalls. The groove 722 has an open forward end and a closed aft end. That is, the groove 722 includes an aft groove wall but does not include a forward groove wall. The groove 722' has a closed aft end and an open forward end, which is tapered. In this example, the groove 722' includes an aft wall but does not include a forward groove wall. The groove 722'' has a closed forward end and an open aft end, which is tapered. That is, the groove 722'' includes a forward groove wall but does not include an aft groove wall. It will be appreciated that tracks according to the present disclosure may have other geometries than the examples specifically illustrated. For example, a groove may have both a closed forward end and a closed aft end, e.g., as illustrated in FIG. 3. In some examples, the groove may taper both towards the forward end and towards the aft end. In further examples, the groove may include a closed end, which is tapered.

[067] FIG. 8 is a partial top view of a system 800 including a temple 812 with an offset according to further examples of the present disclosure. The system 800 includes a temple 812 of an eyewear frame and an electronic device 830 (e.g., camera 832). The electronic device 830 is slidably coupled to the temple 812. The system 800 further includes a securing mechanism 850 (e.g., bands 852-1 and 852-2). The securing mechanism is configured to maintain electronic device 830 in engagement with a guide provided on the temple 812. The temple 812 includes a first portion 814 and a second portion 816. The second portion 816 is offset from the first portion 814 by an offset

distance 821 selected to accommodate the securing mechanism 850 or portions thereof. For example, the offset distance 821 may be greater than or equal to a dimension 823 of the securing mechanism, such as a thickness t of any of the bands 852-1 and 852-2. In some examples, the thickness t may be about 2mm or less. In some examples, the bands 852-1 and 852-2 may have a rounded cross-section (e.g., a circular cross-section). In such examples, the thickness may interchangeably be referred to as a diameter of the cross-section. It will be understood that embodiments of the present disclosure may include any combinations of features described with reference to any of the specific examples herein. For example, a temple may be a bifurcated temple as described with reference to FIG. 6 and may also include an offset as described with reference to FIG. 8. Temple according to the present disclosure may include any of the features of temples and/or any of the guides described herein in any combination.

[068] With reference now to FIGS. 9-14, features of guides according to the present disclosure will be further described. A guide according to the present disclosure may include a male rail or a female groove. By male rail (interchangeably rail) it is meant that the rail includes one or more protrusions configured for insertion into a female groove. Similarly, by female groove (interchangeably groove) it is implied that the groove includes one or more grooves which are shaped to accommodate the rail at least partially therein. In some examples, the term groove is meant to imply not only an indentation in a surface of a temple but also a through feature such as a slot through a thickness of the temple. In examples herein, a female groove may comprise a single groove or a plurality of tracks, which may be located on one or more sides of a temple, for example a top side of the temple, a bottom side of the temple, an outside side of the temple, an inner side of the temple, or combinations thereof. In examples, a female groove may comprise a single groove or a plurality of tracks on any side of an electronic device. Any number of tracks may be included having any combination of geometries as may be desired. Analogously, a male rail according to the present disclosure may comprise a single rail or a plurality of rails located on one or more sides of the temple, for example a top side of the temple, a bottom side of the temple, an outside side of the temple, an inner side of the temple, or combinations thereof. In examples, a male rail may comprise a single rail or a plurality of rails on any side of an electronic device.

[069] Any number of tracks may be included having any combination of geometries as may be desired. Attachment systems according to the present disclosure may

include a first guide which is incorporated into the temple (e.g., embedded into or coupled to the temple), which may comprise either one of the rail or the groove, the attachment system further including a second guide provided on the electronic device (e.g., embedded into or coupled to the electronic device), the second guide comprising a corresponding rail or groove configured to be coupled to the rail or groove of the temple. The terms embedded or integrated are meant to imply that a feature is integral with or non-removably attached to a component (e.g., the electronic device or the temple). The term incorporated or incorporating includes coupling as well as integrating or embedding components. That is, a component which is incorporated may be removably coupled to another component or it may be embedded into the other component. It will be appreciated that the illustrations in the figures herein are provided to facilitate an understanding of the present disclosure and some or all of the temples, guides, rails, tracks, and/or features thereof may not be to scale and/or some of the illustrations may be simplified so as not to obfuscate the present disclosure. In some examples, the guide may be integral with the temple and may be part of the design of the temple. In some examples, the guide may be built into the surface contour of the temple. In some examples, the guide may be manufactured separately from the temple and attached thereto, removably or irremovably, by any appropriate known techniques, for example and without limitation by screws, bolts, hooks, temperature shrink material, glue, adhesive, Velcro, magnet, strap(s). In some example, the guide may be detachable from the temple. In this regard, a separate guide, which is attachable to an existing eyewear frame may serve to address the eyewear aftermarket, e.g., for retrofitting eyewear that is already been manufactured and/or sold to consumers. In examples, a guide may be integral with the electronic device and may be part of the design of the electronic device (e.g., integral with a housing of the electronic device). In some example, the guide may be coupled to the electronic device, e.g. via a shoe or another intermediate component. In some examples, the electronic device may include a guide integral to the electronic device and may also be operable to couple to an intermediate component for engaging with different guides from the guide provided integral to the electronic device, as described in further detail below.

[070] An attachment system according to some examples may include an elongate member configured to be coupled to a wearable article, the elongate member comprising a guide extending along a length of the elongate member and configured for slidable engagement with the electronic device. In some examples, the electronic

device may be a camera. In some examples, the attachment system may be provided as a kit which includes the elongate member including a rail or a groove and the electronic device which includes the other opposing rail or groove. The elongate member may attach to the temple, for example by way of fasteners, adhesive, straps, bands, elastic rings, or the like, or using one or more magnets. In some examples, the system may also include a securing mechanism configured to bias the electronic device toward the elongate member and the wearable article when the elongate member is coupled thereto. For example, the securing mechanism may include a band, an adjustable strap, an elastic ring, a stretchable slide member, or combinations thereof. In some examples, a plurality of bands, adjustable straps elastic rings, and/or slide members may be included in a single kit to enable the user to couple the electronic device to any of a variety of temples of different shapes and sizes. In some examples, the securing mechanism between the electronic device and the elongate member comprising the guide may be a magnetic mechanism, for example as described below with reference to FIG. 12.

[071] According to some examples of the present disclosure, an electronic device kit may include an electronic device and a stretchable band, whereby the electronic device comprises a surface feature to engage the band and whereby the electronic device can be applied to an eyewear temple allowing movement of the electronic device and the band from a point located within the front one third of an eyewear temple to a point within the back one third of the eyewear temple while the electronic device and band remains attached to the eyewear temple and while the eyewear is being worn by a wearer. The stretchable band may be an O-ring having a rounded core cross section, for example as described with reference to FIG. 22.

[072] FIGS. 9A-9D show cross-sectional views of guides including a male rail according to some examples herein. It will be appreciated that some or all of the temples, guides, rails, tracks, and/or features thereof may not be to scale and the illustrations are provided only to facilitate an understanding of the present disclosure. It will be further appreciated that while examples of rails described here with reference to FIGS. 9A-9F are illustrated in the context of being incorporated into a temple, any of the embodiments of rails according to the present disclosure may instead be provided on the electronic device for coupling to a rail provided on the temple.

[073] FIG 9A shows, in cross section, a temple 912a comprising a guide 920a, in this example a non-securing guide. The guide 920a comprises a rail 924a having a

generally rectangular cross-sectional shape. The rail 924a includes sidewalls 961a which are generally parallel to one another from a base 962a to a top 963a of the rail 924a. In some examples, the rail may have a generally rounded cross-sectional shape (e.g., as shown in dashed line), such as a semi-circular cross-sectional shape or a semi-ovular cross-sectional shape. In further example, the protrusion may have a generally trapezoidal cross-sectional shape. The rail 924a in this example is located on an outside side 911a of the temple 912a. In some examples, the rail 924a may be on a top side 918a, a bottom side 919a, or combinations thereof.

[074] FIG. 9B shows, in cross section, another example of a temple 912b comprising a guide 920b, in this example a securing guide. The guide 920b comprises a rail 924b having a generally T-shaped cross-section. The rail 924b includes a head portion 964b and a neck portion 966b. The width 965b of the head portion 965b is greater than a width 967b of the neck portion 966b. By including a narrower neck portion 966b, the rail 924b is configured to engage securing features of the groove such that the electronic device 930 is maintained in engagement with the guide 920b when coupled thereto. In the example in FIG. 9B, side walls 968b of the neck portion 966b are generally parallel to one another.

[075] FIG. 9C shows, in cross section, a temple 912c comprising a guide 920c, in this example a securing guide. The guide 920c comprises a rail 924c which includes a head portion 964c and a neck portion 966c. A width 965c of the head portion 964c is greater than a width 967c of the neck portion 966c. In this manner, the rail 924c may serve to maintain an electronic device (not shown) in engagement with the guide 920c. In this example, the neck portion 966c is tapered. The side walls 968c of the neck portion 966c are angled towards one another such that a width 967c of the neck portion 966c decreases from a base 962c of the rail 924c towards the head portion 964c.

[076] FIG. 9D shows, in cross section, a temple 912d comprising a guide 920d, in this example a securing guide. The guide 920d comprises a rail 924d including a head portion 964d and a neck portion 966d. The neck portion 966d is arranged on a platform 969d, which may provide clearance for certain features and/or components of an electronic device coupled to the temple 912d. In this example, the neck portion 966d may be configured similarly to the neck portion 966c in that it tapers along its length. However, in this example, the neck portion 966d tapers in an opposite direction of neck portion 966c in FIG. 9C. Side walls 968d of the neck portion 966d may be angled towards one another such that a width 967d of the neck portion decreases from the head

portion 964d towards the base 962d of the rail 924d. In other examples, the neck portion 966d may taper in the same direction as in the example in FIG. 9C.

[077] Referring now to FIGS. 10-14, temples including guides comprising tracks according to examples herein will be further describes. The tracks may have virtually any shape as may be desired, for example, the tracks may have a generally rectangular, square, rounded, triangular, trapezoidal or inverted trapezoidal shape, or any combinations thereof. While tracks having different cross sections are described with reference to guides on a temple, guides on electronic devices which include tracks with any of the cross sections described herein are also within the scope of this disclosure.

[078] FIGS. 10A and 10B show cross-sectional views of temples comprising guides 1020a and 1020b, both configured as securing guides. Guide 1020a in FIG. 10A includes a groove 1022a having an inverted generally T-shaped cross section. The groove 1022a is configured to receive a rail 1024a of an electronic device 1030a, the rail 1024a having a generally T-shaped cross-section. The rail 1024a may include some or all of the features of rail 924b described previously with reference to FIG. 9B. To that end, the groove may have a first width 1072a selected to accommodate a head portion of the rail and a second width 1074a selected to accommodate a neck portion of the rail, the second width being smaller than the width of the head portion. The groove may comprise a groove defined by sidewalls 1061a and partial top walls 1070a extending towards one another from the sidewalls. The partial top walls 1070a may extend inward towards the neck portion thereby retaining the rail into engagement with the groove.

[079] Guide 1020b in FIG. 10B is a securing guide which comprises a plurality of tracks including first groove 1022b-1, second groove 1022b-2, and third groove 1022b-3. In this examples, one of the tracks features for securing a rail on the electronic device into engagement with the guide 1020b. For example, the first groove 1022b-1 may include some or all of the features of groove 1022a described with reference to FIG. 10A. For example, groove 1022b-1 includes a groove which has an inverted generally T-shaped cross section defined by sidewalls 1061b and partial top walls 1070b extending towards one another from the sidewalls. Other ones of the plurality of tracks may be securing or non-securing and may have virtually any geometry as may be desired. In the specific example herein, grooves 1070b-2 and 1070b-3 are non-securing and have a generally rectangular geometry. All of the grooves in this example are arranged on an outside side 1011b of the temple 1012b. In other example, grooves may

be disposed on a top side, bottom side, outside side, inner side, or combinations thereof. In the context of the present disclosure, the outside side of the temple is the side of the temple which is farthest away from the wearer's head, when the eyewear is worn, and the inner side being the side closest to the wearer's head. The top side is the side closest to a top of the wearer's head and the bottom side is the side opposite the top side and farthest from the top of the wearer's head. It will be understood that the designations of top, bottom, inner and outside are arbitrary but provided herein for illustration of examples of the present disclosure.

[080] With reference now also to FIGS. 11A-11F, further examples of guides comprising tracks according to the present disclosure are described. FIGS. 11A-11F are cross-sectional views of guides including at least one groove disposed on a top side of the temple.

[081] FIG. 11A shows a cross-sectional view of a temple 1112a including a guide 1120a, in this example a non-securing guide having an open groove geometry. The groove 1122a has a generally L-shaped cross section defined by a base 1171a and a single sidewall 1161a. The guide 1120a in this example is located on a top side 1118a of the temple 1112a. In some examples, the temple may include a metal portion 1180a, indicated generally by the dashed line, and the groove 1122a may be located in the metal portion 1180a. Locating the groove in the metal portion may enhance the structural integrity of the groove which may have a relatively thin sidewalls. In some examples, the guide may include additional tracks, for example tracks located on an outside side of the temple (e.g., tracks 1122a-2, 1122a-3) or on a bottom side of the temple as will be described further with reference to FIG. 11F. The tracks may have virtually any geometry, for example a second groove 1122a-2 may have a generally U-shaped cross section. In some examples, a third groove 1122a-3 may have a generally V-shaped cross section defined by a groove with walls angled to one another towards a base of the groove.

[082] FIG. 11B shows a cross-sectional view of a temple 1112b including a guide 1120b, in this case a securing guide. The guide 1120b includes a plurality of tracks including a first groove 1122b-1 and a second groove 1122b-2. The first groove 1122b-1 is located on a top side 1118b of the temple 1112b. The first groove 1122b-1 has an open groove geometry. That is, groove 1122b-1 has a generally L-shaped cross section defined by a base 1171b and a single sidewall 1161b-1. The second groove 1122b-2 is located on a side of the temple adjacent to the top side 1118b, in this cases

the outside side 1111b, groove 1122b-1 is configured to constrain the downward and partially the lateral movement of the electronic device (not shown) relative to guide 1120b, groove 1122b-2 constrains the upward movement as well as lateral movement of the electronic device. The second groove includes a partial top wall 1170b, which extends from one of the sidewalls 1161b-2 of the second groove. In this manner, the second groove also restrains a rotational degree of freedom of the electronic device when the electronic device is coupled thereto by virtue of the partial top wall. The first and second tracks also constrain the remaining two rotational degrees of freedom to thereby guide the electronic device along a longitudinal direction of the temple (e.g., in and out of the page). In this manner, the combined first and second tracks function as a securing guide. The temple 1112b may, in some examples, include a metal portion (e.g., portion 1180b) and the first groove, the second groove, or both may be located in the metal portion.

[083] FIG. 11C shows a cross-sectional view of a temple 1112c including a guide 1120c, in this case a securing guide. The guide 1120c includes a plurality of tracks including a first groove 1122c-1 and a second groove 1122c-2. The first groove 1122c-1 may be similar to groove 1122b-1 of the example in FIG. 11B. For example, groove 1122c-1 is located on a top side of the temple and has an open groove geometry. The second groove 1122c-2 is located on an adjacent side of temple 1112c, in this case on the outside side 1111c. The temple 1112c may, in some examples, include a metal portion (e.g., portion 1180c) and the first groove, the second groove, or both may be located in the metal portion. The second groove 1122c-2 may be angled relative to the first groove 1122c-1, which may improve functionality of guide 1120c as a securing guide. For example, groove 1122c-2 may be oriented such that centerline 1177c-2 of groove 1122c-2 defines an obtuse angle relative to centerline 1177c-1 of groove 1122c-1. Such relative orientation of the tracks 1122c-1 and 1122c-2 may better constrain any rotation of an electronic device coupled thereto about the longitudinal direction of temple 1112c.

[084] FIG. 11D shows a cross-sectional view of a temple 1112d including a guide 1120d, in this case a non-securing guide. The guide 1120d includes a groove 1122d which is located on a top side of the temple and has a generally C-shaped geometry. That is, groove 1122d comprises a groove (e.g., a hook groove), which includes a single sidewall 1161d and a top wall 1170d. The top wall 1170d may be a partial top wall having a width 1173d selected such that component(s) of the electronic device

1130d and/or attachment system (e.g., rail 1124d) does not contact the user's head when the rail is provided into engagement with the groove. For example, the top wall 1170d may have a width 1173d which is less than a width 1176d of the base of the groove by an amount which is substantially the same or greater than a cross-section dimension 1178d of the rail 1124d. The groove 1122d is configured to engage with a rail 1124d which may extend from a top side of the electronic device 1130d. However, in some examples the rail 1124d may extend from another wall, for example a bottom wall, or a sidewall of the electronic device 1130d.

[085] FIG. 11E shows a cross-sectional view of another example of a temple 1112e comprising a guide 1120e, in this case a securing guide. The guide 1120e includes a plurality of tracks, including a first groove 1122e-1 configured to receive a first rail 1124e-1 and a second groove 1122e-2 configured to receive a second rail 1124e-2. The first and second groove 1122e-1, 1122e-2, respectively, are located on adjacent sides of the temple 1112e, in this case the top side and outside side, respectively. The first groove 1122e-1 is a generally U-shaped groove comprising a groove defined by to opposing sidewalls. The second groove 1122e-2 is a also a generally U-shaped groove (e.g., a groove having a generally rectangular cross section). The temple 1112e may include one or more metal portions, e.g., metal portion 1180e. One or more of the tracks may be in the metal portion, in this example the first groove 1122e-1 is in the metal portion 1180e and the second groove 1122e-2 is in a plastic portion 1181e of the temple. It will be understood that the temple, in some examples may not include a plastic portion and may be made entirely of metal. In some examples, the temple may be made entirely of plastic. In some examples, the temple can be made of both plastic and metal. In some cases the temple can comprise one of or any combination of, by way of example only, plastic, rubber, metal, wood. The guide can be made of the same material as that of the temple or different material than that of the temple. In many examples the guide is comprised of the same material and finish as that of the finished outer surface of the temple. In many examples, the guide is a contour design of the outer finished surface of the temple. In many examples, the guide is free of an aperture and maintains the integrity of the outside finish of the temple.

[086] FIG. 11F shows a cross-sectional view of yet another example of a temple 1112f comprising a guide 1120f, in this case a securing guide. The guide 1120f includes a plurality of tracks, including a first groove 1122f-1 configured to receive a first rail 1124f-1 and a second groove 1122f-2 configured to receive a second rail

1124f-2. The first and second groove 1122f-1, 1122f-2, respectively, are located on opposite sides of the temple 1112f, in this case the top side and bottom side, respectively. The first groove 1122f-1 is a generally U-shaped groove comprising a groove defined by two opposing sidewalls. The second groove 1122f-2 is also a generally U-shaped groove (e.g., a groove having a generally rectangular cross section). The second groove 1122f-2 comprises sidewalls having dissimilar heights. The temple 1112f may include one or more metal portions, e.g., metal portions 1180f-1 and 1180f-2. One or more of the tracks may be in the metal portion, in this example both the first and second tracks 1122f-1, 1122f-2, respectively are in the metal portions 1180f-1, 1180f-2.

[087] FIGS. 12A-12C are partial cross-sectional views of further examples of systems according to the present disclosure. The systems in FIGS. 12A-12C include magnetic means for securing an electronic device to the temple. FIG. 12A shows a cross section of a temple 1212a comprising a guide 1220a which is similar to the guide 1120a in FIG. 11A. For example, the guide includes a groove 1222a having a generally L-shaped cross section and located on a top side of the temple 1212a, the groove 1222a configured to receive a rail 1224a coupled to or integrated with the electronic device 1230a. The system further includes a securing mechanism 1250a coupled to the temple 1212a. The securing mechanism 1250a includes a metallic strip 1291a located on the outside side 1211a of the temple 1212a. The metallic strip 1291a is positioned for engagement with a magnet 1292a located on the electronic device 1230a. In this example, the metallic strip 1291a is located in an indentation in the surface of the temple 1212a with one side of the metallic strip 1291a exposed. The metallic strip 1291a may be removably or irremovably attached to the temple 1212a. The magnet 1292a may be attached to or embedded within a housing 1254a of the electronic device 1230a. The metallic strip 1291a may extend substantially along the length of the groove such that the magnet may retain, via magnetic attraction, the electronic device 1230a in engagement with the guide at any position of the electronic device along the groove.

[088] FIG. 12B shows a cross section of another example of a system including a temple 1212b. The temple 1212b includes a guide 1220b according to the present disclosure. In this example, the guide 1220b includes a groove 1222b having a generally U-shaped cross section and located on a top side of the temple 1212b, the groove 1222b configured to receive a rail 1224b coupled to or integrated with the

electronic device 1230b. The temple 1212b includes a metal portion 1280b and the groove 1222b is in the metal portion 1280b. The electronic device 1230b is slidably engaged with the guide 1220b and is further secured into engagement with the guide 1220b by means of magnetic attraction. To that end, the rail 1224b includes a magnet 1292b, which may be coupled to an end of the rail 1224b or it may be embedded within the rail 1224b. In some examples, the rail 1224b itself or portions thereof may be made of a magnetic material. In this manner, the magnet 1292b which is coupled to the electronic device 1230b may maintain the electronic device 1230b in engagement with the guide 1220b, e.g., by way of magnetic attraction between the magnet 1292b and metal portion 1280b in which the groove 1222b is provided.

[089] FIG. 12C shows a cross section of yet another example of a system including a temple 1212c which includes a guide 1220c according to the present disclosure. In this example, the guide 1220c includes a groove 1222c having a generally U-shaped cross section and located on a top side of the temple 1212c, the groove 1222c configured to receive a rail 1224c coupled to or integrated with the electronic device 1230c. The temple 1212c may include a metal portion 1280c, and the groove 1222c may be in the metal portion 1280c. The electronic device 1230c is slidably engaged with the guide 1220c and is further secured into engagement with the guide 1220c by means of magnetic attraction. To that end, the system may include a securing mechanism 1250c comprising a metallic strip 1291c which may be embedded in the temple 1212c. The metallic strip 1291c may be positioned for engagement with a magnet 1292c which may be coupled to or embedded within the electronic device. It will be appreciated that in other examples, the location of the magnet and metallic material may be reversed, for example, the temple may include a strip of magnetic material coupled to or embedded within the temple and the electronic device may include a metallic member coupled to or embedded in the electronic device.

[090] FIGS. 13A-13E are views of a camera (also referred to as camera system or self-contained point and shoot camera) according to some examples of the present disclosure. The camera 10 includes an image capture device 12, which may be located in a first portion 20, e.g., a forward portion, of the camera 10. The camera 10 further includes a battery 14 and circuitry 16, which may be located in a second portion 21, e.g., an aft portion, of the camera 10. The camera 10 may be coupled to a temple of an eyewear, for example by slidably engaging the camera 10 with a guide incorporated into the temple, e.g., as illustrated in FIG. 14A and FIGS. 19 and 20. The camera 10

may include one of a groove (e.g., groove 22) or a rail and may engage with a rail or a groove provided on the temple. The groove or rail may be coupled to a housing 23 of the camera 10 or it may be integral with the housing 23. The electronic device in the form of a camera can comprise a female groove that acts to engage a non-securing guide in the form of a male rail on the outside side of the temple. The electronic device in the form of a camera can comprise a male rail that acts to engage a non-securing guide in the form of a female groove on the outside side of the temple. The electronic device in the form of a camera can comprise a male rail that acts to engage a securing guide in the form of a female groove on the outside side of the temple. The electronic device in the form of a camera can comprise a female groove that acts to engage a securing guide in the form of a male rail on the outside side of the temple.

[091] In some examples, the camera may include software for automatically centering an image, also referred to as auto-centering or auto-alignment software. Auto-centering or auto-alignment software may be embedded software on the camera or may reside on a remote electronic device (e.g., a smart phone or other mobile device to which the camera may be communicatively coupled to transfer images thereto). In examples, the circuitry 16 of camera 10 may include a processor and memory comprising processor-executable instructions (e.g., software) for modifying an image prior to or after capture of the image. For example, the instructions may program the camera to adjust a size and/or orientation of the image. In some examples, the memory may include instructions for centering an image captured by the camera. The instructions may program the camera to detect a center of the image and relocate the center of the image by cropping the image.

[092] In some examples, the instructions may program the camera to center the image in a horizontal direction by detecting a horizontal center of the image and cropping the image in the horizontal direction such that the horizontal center is equally spaced between left and right sides of the image. Instructions for centering an image in a horizontal direction may include instructions for counting a number of objects (e.g., a number of people, a number of heads) in an image and determining the horizontal center of the image by referencing a first look-up table. The first look-up table may, for example, indicate that if five heads are counted, the horizontal center of the image is at or near the third head. The first look-up table may indicate that if two heads are counted, the horizontal center of the image is at or approximately between the two heads. Instructions for centering an image in the horizontal direction may thus include

instructions for automatically relocating the horizontal center of the image to a location determined based on the information in the first look-up table.

[093] Instructions for centering an image in a vertical direction may include instructions for determining a position of the horizon, for example by detecting a color difference. For example, the instructions may program the camera to detect a first object in the captured image which corresponds to the sky and a second object in the captured image which corresponds to the ground or land based on a difference in color between the first and second objects in the captured image. The instructions may further program the camera to crop the image such that the horizon is relocated to a new position. The new position may be determined by referencing a second look-up table. The second look up table may indicated that an image may be centered in the vertical direction by relocating the horizon to a position at which the image comprises a certain percentage of sky and a certain percentage of land, for example 50% sky and 50% land, or 40% sky and 60% land, or 30% sky and 70% land, any percentages in between. In some examples, the instructions may program the camera to crop the image such that the horizon is relocated to a position at which the image comprises about 1/3 sky and 2/3 land.

[094] The first portion 20 of the camera 10 may be pivotably coupled to the second portion 21 of the camera 10 using a pivot joint 18, such that an orientation of the image capture device 12 may be changed. For example, the forward portion 20 may be coupled to the aft portion 21 using a ball and socket type joint, e.g., as best seen in the cross-sectional view in FIG. 13E. In other examples, the forward and aft portions 20, 21, respectively, may be pivotably coupled to one another using a pin and connector type joint. Any suitable pivot joint may be used. In some examples, the pivot joint may enable rotation of the forward portion 20 and thereby the image capture device 12 about a first axis, a second axis, a third axis, or combinations thereof, the first, second, and third axes being generally parallel with respective x, y and z axes of the camera.

[095] The camera 10 includes a rail which may be inserted into a groove provided on the temple. In the case of a non-securing groove, the camera 10 may include securing features for engaging with a securing mechanism and thereby maintaining the camera 10 into engagement with the temple. The camera 10 in the example in FIG. 13 includes surface features 13 configured to engage with a securing mechanism in the form of a stretchable band (not shown in this figure). The surface features 13 may be ribs, which may be spaced apart a sufficient distance to accommodate the securing mechanism in

the form of a stretchable band there between. The camera 10 in this example further includes features 15 for engaging with attachment features of a shoe (also not shown in this figure). That is, the camera 10 of this example may be coupled to the temple having a groove via the rail 22 embedded into the camera. In some examples, e.g., if a user wishes to couple the camera 10 to a temple which instead comprises a rail, the camera 10 may be coupled to a shoe which may comprise a groove configured to be received in the rail of the temple. The camera 10 of this particular example is operable to be coupled to any number of temples comprising a variety and/or types of rails or tracks.

[096] In some examples, as best seen in FIG. 13D, the camera 10 may include a privacy indicator 17. The privacy indicator may comprise one or more LEDs 19 which may illuminate when an image (e.g., a still image or video) is being captured. The illumination may notify others that an image is being captured. In some examples, the camera may also include a functional indicator 37 which may provide feedback to the wearer as to whether an image was successfully captured. For example, the functional indicator 37 may include one or more LEDs 39 which may for example, illuminate, change color, or blink upon the successful capture of the image. In some examples, an illumination in one color may indicate a successful capture while illumination in a different color may indicate a failed capture. In other examples, successful or failed capture may be indicated by way of different number or different speed of blinking of the LED. In yet further examples, the functional indicator may include a vibration source, a speaker, a buzzer, or other audio generating device and the feedback may be provided by tactile or audible means.

[097] The cameras according to the present disclosure may be a miniaturized self-contained electronic device. The camera may have a length L of about 8mm to about 50mm. In some examples, the camera may have a length from about 12mm to about 45mm. In some examples, the camera may have a length not exceeding 30mm. In some examples the camera may be about 12mm long. The camera may have a width W of about 6mm to about 12mm. In some examples, the camera may be about 8mm wide. In some example, the camera may have a width not exceeding about 10mm. In some example, the camera may have a height of about 6mm to about 12mm. In some examples, the camera may be about 8mm high. In some examples, the camera may have a height H not exceeding about 10mm. In some examples, the camera may weigh from about 5grams to about 10 grams. In some examples the camera may weigh be

about 7 grams or less. In some examples, the camera may have a volume of about 6,000 cubic millimeters or less. In some examples, the camera may have a volume of about 3,000 cubic millimeters or less. In some examples, the camera may have a volume of about 2,000 cubic millimeters or less. In some examples, the camera may be a waterproof camera. In some examples, the camera can be water resistant. In some examples, the camera can be sweat resistant. In some examples, the camera may include a compliant material or coating on an external surface of the housing 23, for example to reduce or eliminate the camera damage (e.g., scratches) to the finished surface of the eyewear temple including the guide as the camera is moved along the guide.

[098] The camera may be configured to capture an image (e.g., still image or video image). An image capture functionality of the camera may be activated by a variety of triggers, for example by a touch switch, membrane switch, capacitance switch or sensor, motion detector sensor such as by way of example only, a micro accelerometer, voice or sound recognition system. In some examples, the swipe of a finger forward or backward may serve as a trigger and may cause an image to be captured. In other examples, a tap of the temple of the eyewear, or a movement of a forced blink may cause an image to be captured. In some examples, a tap of the temple or a tapping of the temple can cause the camera to capture an image.

[099] In yet further examples, the clicking of the wearer's teeth may serve as a trigger and may cause an image to be captured. When the wearer clicks his or her teeth, a sound may be generated which may function as the trigger. In yet further examples, the trigger may be a predetermined word, tone, or a phrase. In examples according to the present disclosure, the circuitry 16 may include voice recognition software. The camera may include a microphone, which may detect the sound such that the camera may determine if a trigger has been generated. If a trigger was generated, the image capture functionality of the camera may be activated responsive to the trigger.

[0100] FIGS. 14A and 14B are partial views of systems including electronic devices configured for slidable engagement with a temple using a shoe according to some examples herein. The system 1400a in FIG. 14A includes an electronic device which may be the camera 10 of FIG. 15. The camera 10 is coupled to a temple 1412a via a shoe 1434a. The temple 1412a includes a female groove 1422a, which may be a securing groove. The shoe 1434a may include a securing rail, in which case no additional means for securing the camera 10 to the temple 1412a may be required. In

some examples, the groove may be a non-securing groove and the system may further include one or more bands which may engage with the surface features 13 on the camera 10.

[0101] FIG. 14B shows another example of a camera 50 having a generally cylindrical or semi-cylindrical body. The camera 50 may include an image capture device, a battery and circuitry within a single housing 53. The camera 50 may be slidably coupled to the temple 1412b using a shoe 1434b. The temple 1412b in this example includes a securing guide, comprising a groove with a generally trapezoidal cross-section. The shoe 1434b includes a rail with an inverted generally trapezoidal cross-section. The groove incorporated into temple 1412b and the rail on the shoe 1434b are configured to form a slidable dovetail joint, which not only serves to guide movement of the camera 50 along the groove but also secures the camera 50 to the groove and thereby secures the camera 50 to the temple 1412b. The camera 50 may optionally include surface features 55 for engaging with a band (e.g., an elastic ring, a strap), in the even that a user desires to couple the camera 50 to a temple which includes a non-securing guide, e.g., as show in the example in FIG. 15 and described further below.

[0102] FIGS. 15 shows a partial view of a system 1500 including an electronic device (e.g., camera 50) configured for slidable engagement with a temple 1512. The temple 1512 in FIG. 15 comprises a guide 1520, which is a non-securing guide. The guide may be implemented according to any of the example herein. The camera includes surface features 55 (e.g., ribs) configured to engage with a band 57 (e.g., an elastic ring such as an O-ring). The band 57 (e.g., an elastic ring) biases the camera 50 towards the temple 1512 such that the camera 50 remains into engagement with the guide 1520, while the elasticity of the band 57 allows for movement of the camera 50 along the temple 1512, the thickness and/or width of which may vary along the length of the temple 1512. In the examples in FIGS. 14-15, the cameras are positioned adjacent to an outside side of the temple. It will be understood that cameras which are positioned adjacent a top side, a bottom side and/or an interior side of the temple are within the scope of the present disclosure.

[0103] FIG. 16 shows a partial view of another example of a camera 60 according to the present disclosure. The camera 60 is configured for engagement with a securing guide. The camera 60 includes a rail 62 comprising a pair of legs 64 spaced a distance 66 apart from one other. A rail comprising a plurality of legs may be referred to as a split rail. In this example, the distance 66 between the legs increases from the base 63

of the rail to the top 65 of the rail. The rail 62 is configured to be inserted into a groove having a generally trapezoidal geometry. When inserted therein, the rail 62 and groove form a slidable dovetail joint. By using a split rail as in this example rather than a solid rail having an inverted generally trapezoidal cross section, the system may offer an added weight savings. Variations of split rail configurations may further enable coupling between the rail and the groove by way of a snap fit as will be described further with reference to FIGS. 17A-17C.

[0104] FIGS. 17A-C shows cross sectional views of an attachment system including guides according to further examples herein. The guide 1720 includes a first guide incorporated into temple 1712 and comprising a female groove 1722 having a generally U-shaped geometry. The groove 1722 is configured for engagement with a rail 1724 of a second guide, e.g., which may be provided on an electronic device, the rail 1724 also having a generally U-shaped cross section to form a slidable joint with the groove 1722. The slidable joint formed by the first and second guides is illustrated at different stages 1700a-1 through 1700a-3 of coupling the rail to the groove. The rail 1724 is a split rail comprising a pair of legs 1796. The rail 1724 is configured to couple to the groove 1722 by a snap fit. For example, the rail 1724 may be sized for a press fit into the groove 1722, as described herein. The rail 1724 has a first rail width 1793 at its widest location, which may be an intermediate location between the base and top of the rail, for example a midpoint location. The groove may have a first groove width 1794 at its narrowest location, which may be an intermediate location along the height of the groove, for example a midpoint location. The first rail width 1793 may be greater than the first groove width 1794 such that the rail may be press fit into the groove.

[0105] In a first stage 1700a-1 (e.g., pre-installation), the rail and groove are shown adjacent one another prior to inserting the rail into the groove. In this stage, the rail and groove are in a zero engagement state with the rail decoupled from the groove and freely movable with respect to the groove. In a second stage 1700a-2 (e.g., during installation), the rail is partially inserted into the groove by moving the rail in a direction 1795 of the insertion force. At this stage 1700a-2, the rail and groove are in a partial engagement state. Due to the width of the rail at its widest location being greater than a width of the groove at its narrowest location the legs 1796 may deflect inward (e.g., toward one another) when the rail is moved in the direction 1795. The rail is fully inserted into the groove by further movement of the rail along the direction 1795 until the rail and groove are provided in a third stage 1700a-3 (e.g., post-

installation). As the rail is further inserted into the groove, the legs 1796 may deflect outward (e.g., spring back to their neutral position) to lock the rail into engagement with the groove. At this stage 1700a-3, the rail and groove are in a full engagement state. In this stage 1700a-3, the top of the rail (e.g., ends of the legs) may abut the surface at the base of the groove. In some example, some clearance may remain between sidewalls of the rail and sidewalls of the groove to facilitate sliding of the rail within the groove.

[0106] FIGS. 17B shows a cross sectional view of the second guide including the split rail with a partial detail view of one of the legs 1796 of the split rail. The split rail comprises a pair of legs 1796 including a first leg 1796-1 and a second leg 1796-2 spaced apart from the first leg 1796-1. A width of the rail may vary along its height. For example, the rail may have a first rail width at the base of the rail, a second rail width at the top of the rail and a third rail width at an intermediate location of the rail between the base and the top. The first, second, and/or third rail widths may be different. In some examples, the first rail width may be substantially the same as the third rail width and may be less than the second rail width. The intermediate location may be referred to as the widest location of the rail. A distance between the legs 1796 may also vary. In some example, the distance between the legs may be the same along the height of the rail.

[0107] FIG. 17C shows a cross sectional view of the first guide including the groove 1722 with a partial detail view of one of the sidewalls 1797-1 of the groove. The groove comprises a generally U-shaped groove defined by sidewalls 1797 which narrow from a base to an intermediate location along the height of the groove and then widen from the intermediate location to the top (e.g., opening) of the groove. As such, the width of the groove varies along the height of the groove such that the groove has a first groove width at the base of the groove, a second groove width at the top of the groove and a third groove width at an intermediate location of the groove between the base and the top. The first, second, and/or third groove widths may be different. In some examples, the first groove width may be substantially the same as the third groove width and may be greater than the second groove width. In this regard, the intermediate location may be referred to as the narrowest location of the groove. In some example, the first and/or third groove widths may be greater than the first and/or third rail widths to provide clearance for sliding movement of the rail 1724 within the groove 1722. In other examples, the location of the first and second guides may be

reversed. That is, a temple may include a split rail similar to split rail 1724 of the example in FIGS. 17A-C, and an electronic device or an intermediate component attachable to the electronic device may include a groove 1722 similar to the groove 1722 of the example in FIGS. 17A-C and configured for coupling to a split rail as described herein.

[0108] Guides according to the present disclosure may be provided on a finished surface of the temple. That is, the groove or tracks, or rail or rails of the guide may be formed such that they comprise a finished surface of the temple which does not distract from the cosmetic appearance of the eyewear. Furthermore, guides according to the present disclosure may include low profile guides which may be incorporated into relatively thin temples of eyewear. For example, the height of a rail (e.g., the split rail 1724) may be about 1mm or less and a width of the rail may be about 3mm or less. In a specific example, a split rail having a height of about .5mm and a width of about 1.5mm was implemented and shown to effectively couple an electronic device to a temple of an eyewear frame. The thickness of each of the legs may in some examples be less than about .5mm and in some examples, less than about .3mm. Such relatively thin cross section of the legs may allow for elastic deformation when moving from the first 1700a-1 through the second 1200a-2 and to the third 1700a-3 stages described with reference with FIG. 17A. Low profile guides according to the present disclosure may have the added advantage that they may be nearly unperceivable by an onlooker without close inspection of the eyewear. In this regard, guides according to the examples herein may function to preserve the aesthetic look of the eyewear. In some examples, a guide in the form of a male rail according to the present disclosure may be about 3mm wide or less, about 1.5mm high or less, and between about 10mm and about 145mm long. In some examples, a guide in the form of a female groove may be about 4mm wide or less, about 1.5mm deep or less, and between about 10mm and about 145mm long. In some example, a guide may be in excess of about 40mm long. In some examples, a guide may be in excess of about 80mm long. In some cases a guide may be in excess of 145 mm long as in the case of a guide on a bifurcated temple. The guide may be located on the outside side of a temple. The guide may be located on the inside side of a temple. The guide may be located on the top edge of the temple. The guide may be located on the bottom edge of the temple.

[0109] In some examples, the electronic device (e.g., camera) may be pivotably coupled to the temple, for example using a hinge joint or a pivot joint, e.g., as

illustrated in the example in FIGS. 18A-18C. FIGS. 18A-18C are views of an electronic device slidably and pivotably coupled to a temple according to further examples herein. The electronic device may be a camera 70 which includes an image capture device enclosed within a housing 72. The camera 70 may further include surface features 74 incorporated into the housing and configured for engagement with a band. The camera 70 may include an image capture device.

[0110] The camera 70 may be coupled to the temple using an intermediate component (e.g., an interface 80), which may be pivotably coupled to the camera 70 via the pivot joint 82. In some examples, the pivot joint 82 may enable rotation of the camera 70 and thereby a rotation of the image capture device, about an axis of the camera, e.g., the x axis of the camera. One advantage may be the ability to align the image capture device with a desired object or scene to be capture even if the temple is otherwise angled relative to the object or scene. The pivot joint 82 may be configured to enable up to 20 degrees of upward and downward rotation about the x axis. In some examples, the pivot joint 82 may be configured to enable up to about 15 degrees of upward and/or downward rotation of the camera 70. As described herein, the intermediate component 70 may comprise a rail or a groove for slidably engaging with a groove or a rail on the temple 1812. In the specific example illustrated, the interface includes a split rail of the type described with reference to FIG. 17 and a groove configured for cooperating fit with the rail. In some examples, the camera 70 may be coupled to the temple via a hinge joint having a hinge axis generally parallel to a longitudinal axis of the temple. In such examples, the hinge joint may be operable to rotate the camera about the longitudinal axis of the temple, for example to change an orientation of the image capture device from a portrait orientation to a landscape orientation and vice versa.

[0111] FIGS. 19 and 20 show top, front, side, and partial isometric views of systems according to some examples of the present disclosure. System 1900 in FIG. 19 may include an eyewear frame 1910 including a temple 1912. The system 1900 may further include an electronic device, for example camera 10, as described previously with reference to FIG. 13. The camera 10 may be slidably engaged with the temple 1912 via a shoe (e.g., shoe 1434 of FIG. 14A). The camera 10 may include a forward portion 20 which comprises an image capture device. The forward portion 20 may be pivotably coupled to an aft portion 21 of the camera such that an orientation of the image capture device 12 may be changed, for example to compensate for misalignment of the camera

10 with a desired line of sight of the camera. In some examples, the camera 10 may include a ball and socket joint which may enable rotation of the forward portion about one or more axes parallel one or more of the axes (e.g., the x-axis, the y-axis, and the z-axis) of the camera 10.

[0112] The camera 10 may be coupled to the temple 1912 such that the camera 10 is generally parallel with a longitudinal axis of the temple 1912. In some examples, the longitudinal axis of the temple 1912 may be aligned with a neutral axis which may be generally parallel to a line of sight of the user and may thus be aligned with a desired line of sight for the capture of an image (e.g., still image, or a video image). In some examples, the longitudinal axis may not be aligned with the neutral axis but may instead be angled upward or downward with respect to the neutral axis. For example, the temple may be in a first inclined position (shown in dashed line), which may be angled upward relative to the neutral position, thus causing the image capture device of the camera to be oriented downward relative to a desired object or scene. In other examples, the temple may be in a second inclined position (shown in dashed line), which may be angled downward relative to the neutral position, thus causing the image capture device of the camera to be oriented upward relative to a desired object or scene. In this example, an image capture device of the camera 10 may be rotated about an axis that is parallel to the x axis of the camera 10. That is the forward portion of camera 10 may be rotated and the rotation of the forward portion about an axis that is parallel to the x axis would effect a change in orientation of the image capture device in an upward or downward direction relative to the line of sight of the user.

[0113] With further reference to FIGS. 20A-20D, system 2000 may include an eyewear frame 2010 comprising a temple 2012. The system 2000 may further include an electronic device, for example camera 10, as described previously with reference to FIG. 13 and FIG 19. The camera 10 may be slidably engaged with the temple and the forward portion of the camera may be pivotably coupled to an aft portion of the camera such that an orientation of the image capture device may be changed.

[0114] The camera 10 may be coupled to the temple 2012 such that the camera 10 is generally parallel with a longitudinal axis of the temple 2012, which in some examples may be generally aligned with a neutral axis and thus may be aligned with a desired line of sight. In some examples, the temple may instead be angled inwardly or outwardly with respect to the neutral axis. For example, the temple may be in a first deflected position (shown in dashed line), which may be angled inward relative to the

neutral axis, thus causing the image capture device of the camera to be oriented outward relative to a desired object or scene. In other examples, the temple may be in a second deflected position (shown in dashed line), which may be angled outward relative to the neutral axis, thus causing the image capture device of the camera to be oriented inward relative to a desired object or scene. In such examples, the camera may be rotated about an axis which is generally parallel to the y axis of the camera. Rotation about an axis which is parallel to the y axis of the camera may effect a change in orientation of the image capture device in a side to side or inward and outward direction with respect to a line of sight of the user.

[0115] In further examples, the image capture device may be angularly misaligned. For example, by reasons of an irregularly shaped temple 2012, the x and y axes of the camera 20 and/or the image capture device may be rotated by an angle relative to the x and y axes of the eyewear frame. As such, an image captured by the camera in such an orientation may have an angular misalignment (e.g., be rotated about the z axis). Such misalignment may be resolved according to the examples herein by rotation of the forward portion of the image capture device about the z axis as illustrated in FIG. 20D.

[0116] FIG. 21 shows yet another example of an electronic device according to the present disclosure, which may, by way of example, be a camera 90. The electronic device (e.g., camera 90) may include some or all of the features of electronic devices described herein. The camera 90 in this example includes a male rail 94 which is located on a bottom side 95 of the camera 90. When the camera 90 is coupled to a temple according to the examples herein, the bottom side 95 of the camera 90 is provided opposite the temple such that the guide in the form of a male rail 94 is in engagement with a guide on the temple. As will be appreciated, the rail 94 may extend along the length of the camera or partially along the length of the camera. For example, the rail 94 may have a length L_R which is less than a length L_C of the camera 90. The rail 94 may be positioned proximate the aft end 92 of the camera. The rail 94 may be spaced from the front end 91 of the camera 90 by a distance 96. Positioning of the rail 94 a distance 96 aft of the front end of the camera may enable the front end 91 of the camera 90, to be positioned in line with the front of the eyewear or slightly in front of the eyewear while the camera remains engaged with the guide on the temple. While the specific example illustrated shows a camera including a guide in the form of a rail, in other examples, the camera may include a guide in the form of a groove. In some examples, the rail may be part of a shoe attached to the electronic device. The rail

incorporated in the shoe may similarly be spaced from a front end of the shoe to enable placement of the camera in line with or ahead of the eyewear frame.

[0117] FIG. 22 shows an example of a stretchable band in the form of an O-ring according to examples of the present disclosure. The O-ring 97 may be generally circular and may have an outside diameter (ID). In some examples, an outside diameter (ID) of the O-ring 97 may range from about 8mm to about 16mm. The O-ring may have a rounded cross section, for example a circular cross section as illustrated in FIG. 22. A cross-sectional diameter 98 (e.g., the radial cross section diameter, the axial cross section diameter, or both) of the O-ring 97 may range from about 1mm to about 2mm. In some examples, the O-ring may be circular in cross section and the radial cross section diameter and axial cross section diameters of the O-ring may be about 1mm. A rounded cross section of the O-ring may facilitate sliding of the O-ring along the temple without excessive twisting of the O-ring or otherwise impeding the movement of the electronic device along the temple. The O-ring 97 may be made from rubber, for example Buna N A70 durometer rubber. In some examples, the stretchable band may be an elastic ring made from other elastic materials such as silicon or ethylene propylene diene terpolymer (EPDM). One or more O-Rings can be applied to secure the electronic device to the eyewear temple and also the temple guide when it is present. The O-Ring can be applied in a manner whereby it covers one or more outer surfaces of the electronic device and the inside side of the eyewear temple. The O-Ring can be used to completely encircle the electronic device and the eyewear temple including the eyewear guide when and if present. One or more surface features located on the electronic device can receive the O-ring and prevent the O-Ring from becoming disengaged when the electronic device is being moved from a point near the front of the eyewear temple to a point near the back of the eyewear temple. The surface feature can form a depression on the surface of the electronic device for receiving the O-Ring. The depression can have a depth ranging from 0.50mm – 2.2mm. When an O-Ring is used having a cross section of 1.0mm the surface depression ranges from 0.75mm to 1.25mm.

[0118] Although the present disclosure includes, by way of example, illustration and description of some embodiments, it will be understood by those skilled in the art that several modifications to the described embodiments, as well as other embodiments are possible without departing from the spirit and scope of the present invention. It will be appreciated that any of the components, features, or aspects from any of the disclosed

embodiments may be used in combination with one another, without limitation, and without departing from the scope of the present disclosure.

CLAIMS

What is claimed is:

1. An electronic device system comprising:
 - an eyewear frame including a temple and a first guide integral with the temple, the temple having a finished surface, and the first guide extending between a first location on the temple and a second location on the temple, wherein the first guide is formed on a side of the temple and extends partially through a thickness of the temple or protrudes from the temple, the first guide comprising a base and at least one sidewall adjacent to the base, the finished surface of the temple including surfaces of the base and the at least one sidewall;
 - an electronic device movably coupled to the temple, the electronic device comprising a second guide coupled to the first guide; and
 - an attachment system securing the electronic device to the temple, whereby the electronic device is movable along the guide while remaining secured to the temple.
2. The electronic device system of claim 1, wherein the first guide comprises a rail or a groove.
3. The electronic device system of claim 1, wherein the first guide is formed on an outside side of the temple, and wherein the first location is at a forward end of the temple and the second location is at a distance of about 1/3 of a length of the temple from an aft end of the temple.
4. The electronic device system of claim 1, wherein the first guide is a groove and a depth of the groove is 2 mm or less.
5. The electronic device system of claim 1, wherein the first guide is a groove and a width of the groove is 4 mm or less.
6. The electronic device system of claim 1, wherein the first guide is a groove and a length of the groove is between 10mm and 145mm.

7. The electronic device system of claim 1, wherein the electronic device comprises surface features configured to engage with the attachment system, and wherein the attachment system comprises an elastic band having a rounded cross-section and wherein a diameter of the cross-section is 2mm or less.
8. The electronic device system of claim 7, wherein the temple comprises a first portion and a second portion offset from the first portion by an offset distance, the offset distance greater than or equal to a thickness of the elastic band.
9. The electronic device system of claim 1, wherein the temple comprises a metal portion and wherein the first guide is located in the metal portion.
10. The electronic device system of claim 1, the eyewear frame further comprising a metallic strip in the temple configured to engage with a magnet coupled to or embedded in the electronic device.
11. The electronic device system of claim 1, wherein the electronic device is a camera removably coupled to the temple.
12. The electronic device system of claim 1, wherein the camera is pivotably coupled to the temple.
13. The electronic device system of claim 1, wherein the electronic device is a camera comprising an image capture device configured to be angled relative to an axis of the camera.
14. The electronic device system of claim 1, wherein the electronic device is a camera and wherein the camera is waterproof.
15. The electronic device system of claim 1, wherein the electronic device is a camera and wherein the camera comprises a compliant material provided on an external surface of the housing.

16. The electronic device system of claim 1, wherein the electronic device is a camera and wherein the camera is configured to capture an image responsive to a tap of the temple or responsive to a voice command.

17. The electronic device system of claim 1, wherein the electronic device is a camera, the camera comprising a camera front end and wherein the camera is configured to position the camera front end in line with or in front of the eyewear frame when the camera is moved to the first location on the temple.

18. The electronic device system of claim 1, wherein the electronic device is a camera having a width and a height of about 8mm each and a length of about 25mm to about 30mm.

19. The electronic device system of claim 1, wherein the electronic device is a camera having a volume of less than 6,000 cubic millimeters.

20. The electronic device system of claim 1, wherein the electronic device is a camera having a volume of less than 3,000 cubic millimeters.

21. The electronic device system of claim 1, wherein the electronic device is a camera having a volume of less than 2,000 cubic millimeters.

22. The electronic device system of claim 1, wherein the electronic device is a camera having a height between 6mm and 12mm.

23. The electronic device system of claim 1, wherein the electronic device is a camera having a width between 6mm and 12mm.

24. The electronic device system of claim 1, wherein the electronic device is a camera having a length between 12mm and 45mm.

25. The electronic device system of any of claims 12 through 24, wherein the camera comprises a processor and memory comprising processor-executable instructions for centering an image captured by the camera, the processor-executable

instructions configured to program the camera to detect a center of an image and relocate the center of the image by cropping the image.

26. The electronic device system of claim 25, wherein the processor-executable instructions are further configured to program the camera to center the image in a vertical direction by determine a position of the horizon by detecting a color difference between a first object in the captured image which corresponds to the sky and a second object in the captured image which corresponds to the ground, and further configured to program the camera to center the image in a horizontal direction by detecting a horizontal center of the image and cropping the image in the horizontal direction such that the horizontal center is equally spaced between left and right sides of the image.

27. The electronic device system of any of claims 1 through 24, further comprising one or more lenses coupled to the eyewear frame, the one or more lenses comprising a prescription lens, a non-prescription lens, a tinted lens, a changeable tint lens, a variable focus lens, a switchable focus lens, or combinations thereof.

28. An electronic device system comprising:

- an eyewear frame including a temple and a first securing guide integral with the temple, the temple having a finished surface, and the first securing guide extending between a first location on the temple and a second location on the temple, wherein the first securing guide is formed on a side of the temple and extends partially through a thickness of the temple or protrudes from the temple, the first securing guide comprising a base and at least one sidewall adjacent to the base, the finished surface of the temple including surfaces of the base and the at least one sidewall;

- an electronic device movably coupled to the temple, the electronic device comprising a second securing guide coupled to the first securing guide; and

- wherein the first and second securing guides are configured to maintain the electronic device on the temple as the electronic device is moved along the first guide.

29. The electronic device system of claim 28, wherein the first securing guide comprises a groove or a rail.

30. The electronic device system of claim 28, wherein at least one of the first or second securing guides has a cross-sectional shape configured to maintain the electronic device on the temple as the electronic device is moved along the first guide.