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(54) **Y-SHAPED CLEANING APPARATUS**

(52) **U.S. Cl.**

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USPC ..... **15/106**; 15/105; 300/21

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(57) **ABSTRACT**

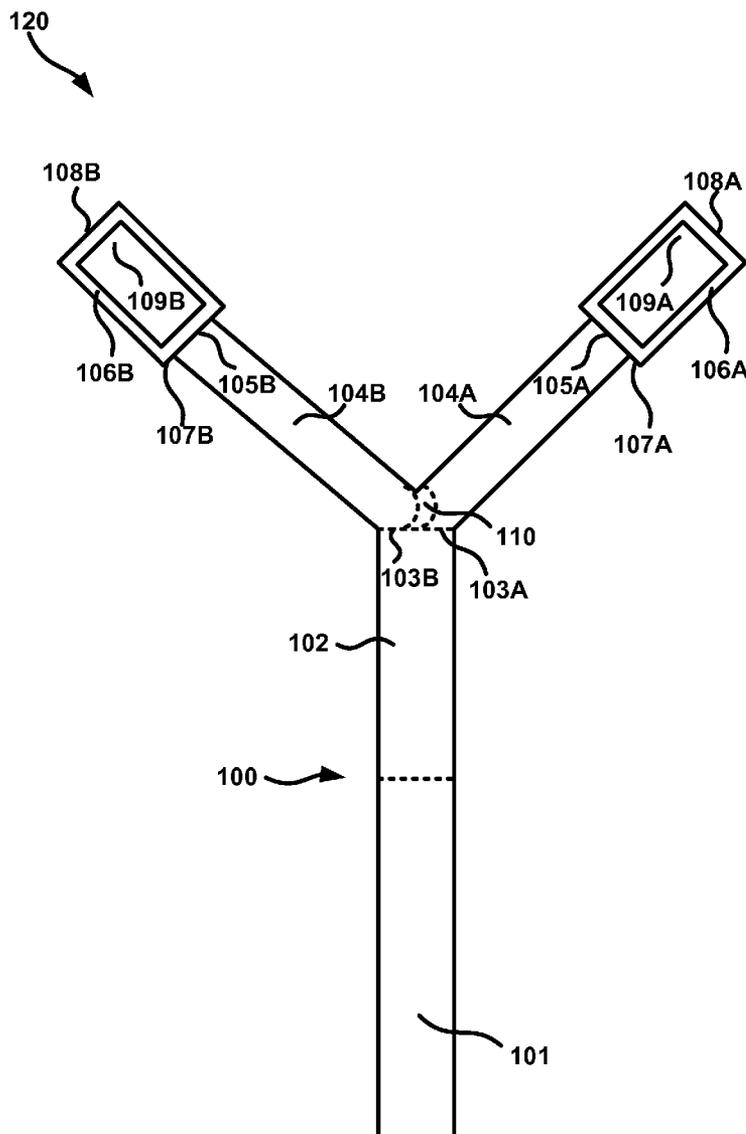
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A generally Y-shaped cleaning apparatus comprises a handle and two necks extending from a same portion thereof, each neck bearing a cleaning head that includes cleaning tools, the two cleaning heads configured to be used asynchronously and independently of each other, the longitudinal axis of a first neck intersecting the longitudinal axis of the apparatus to form an angle of between about 30 degrees and about 100 degrees on a first lateral side of the apparatus and the longitudinal axis of a second neck intersecting the longitudinal axis of the apparatus to form an angle of between about 30 degrees and about 100 degrees on an opposing lateral side.

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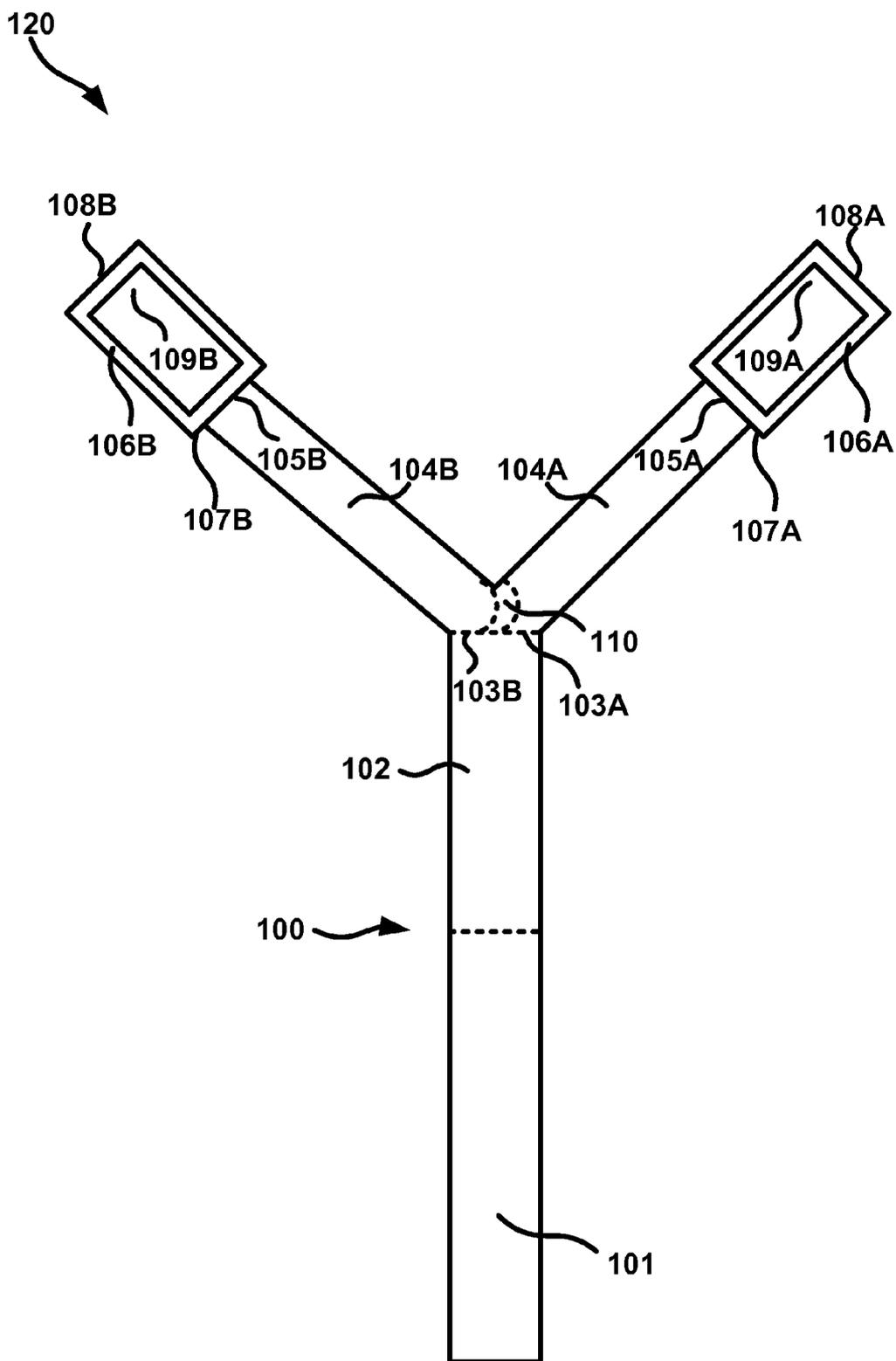


FIG. 1

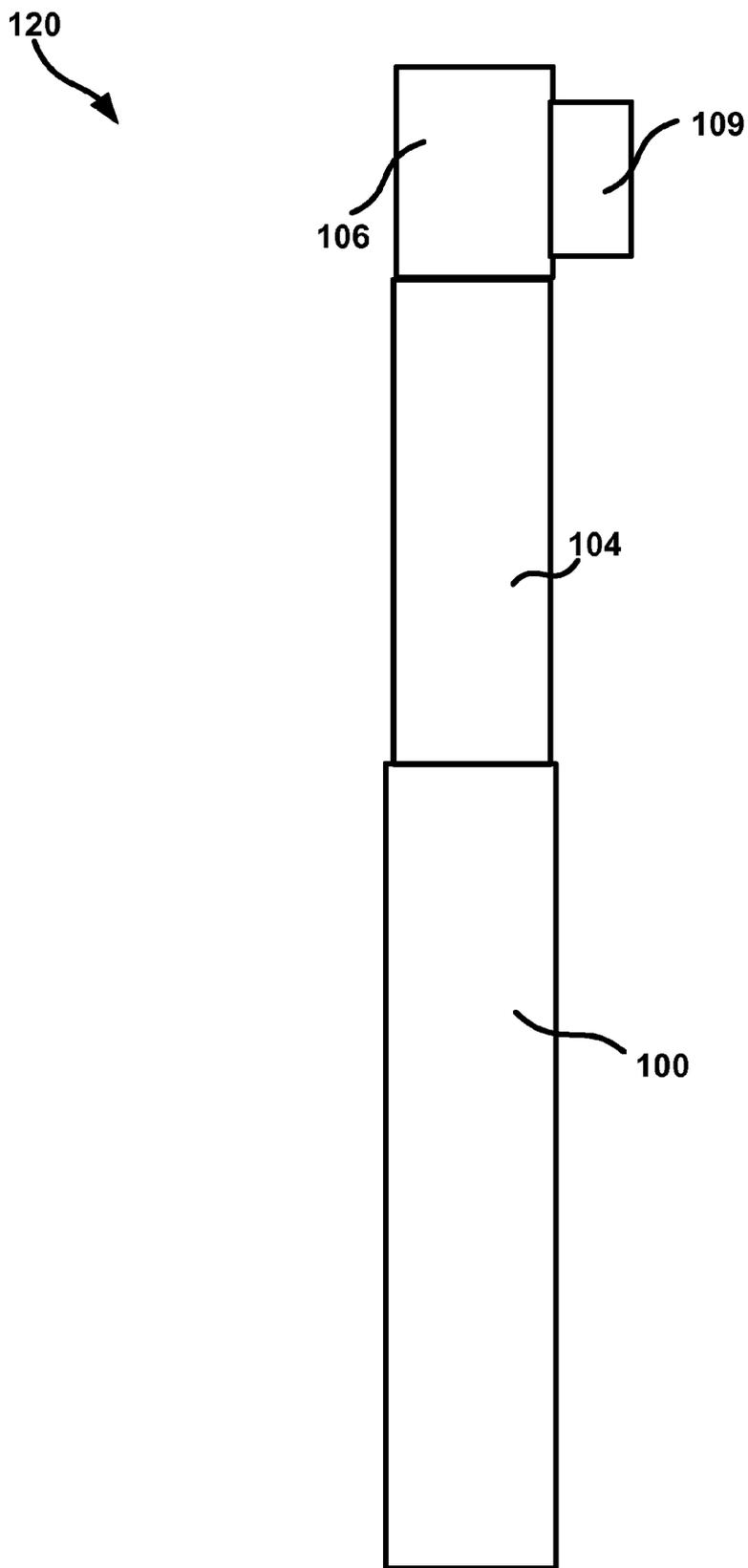


FIG. 2

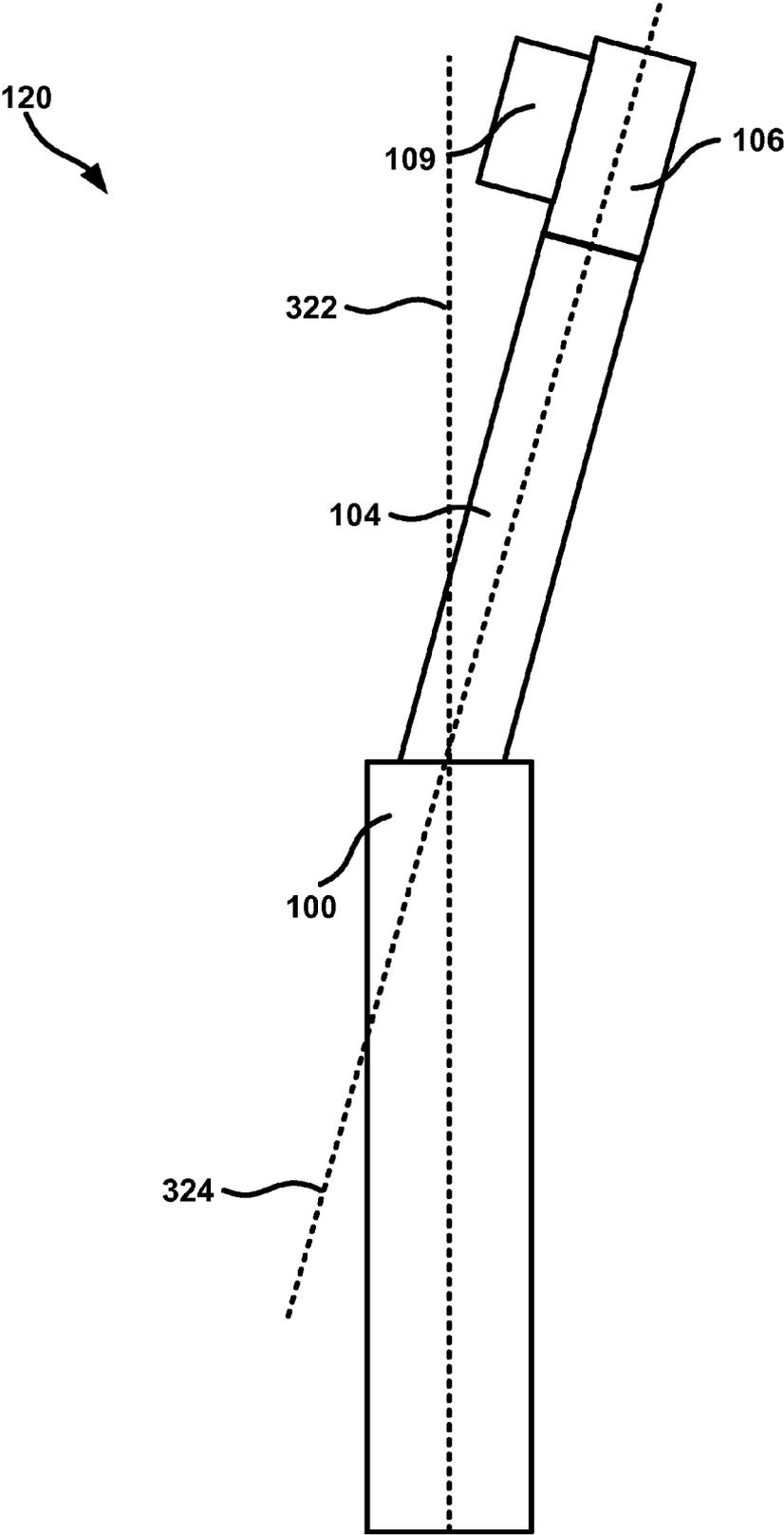


FIG. 3

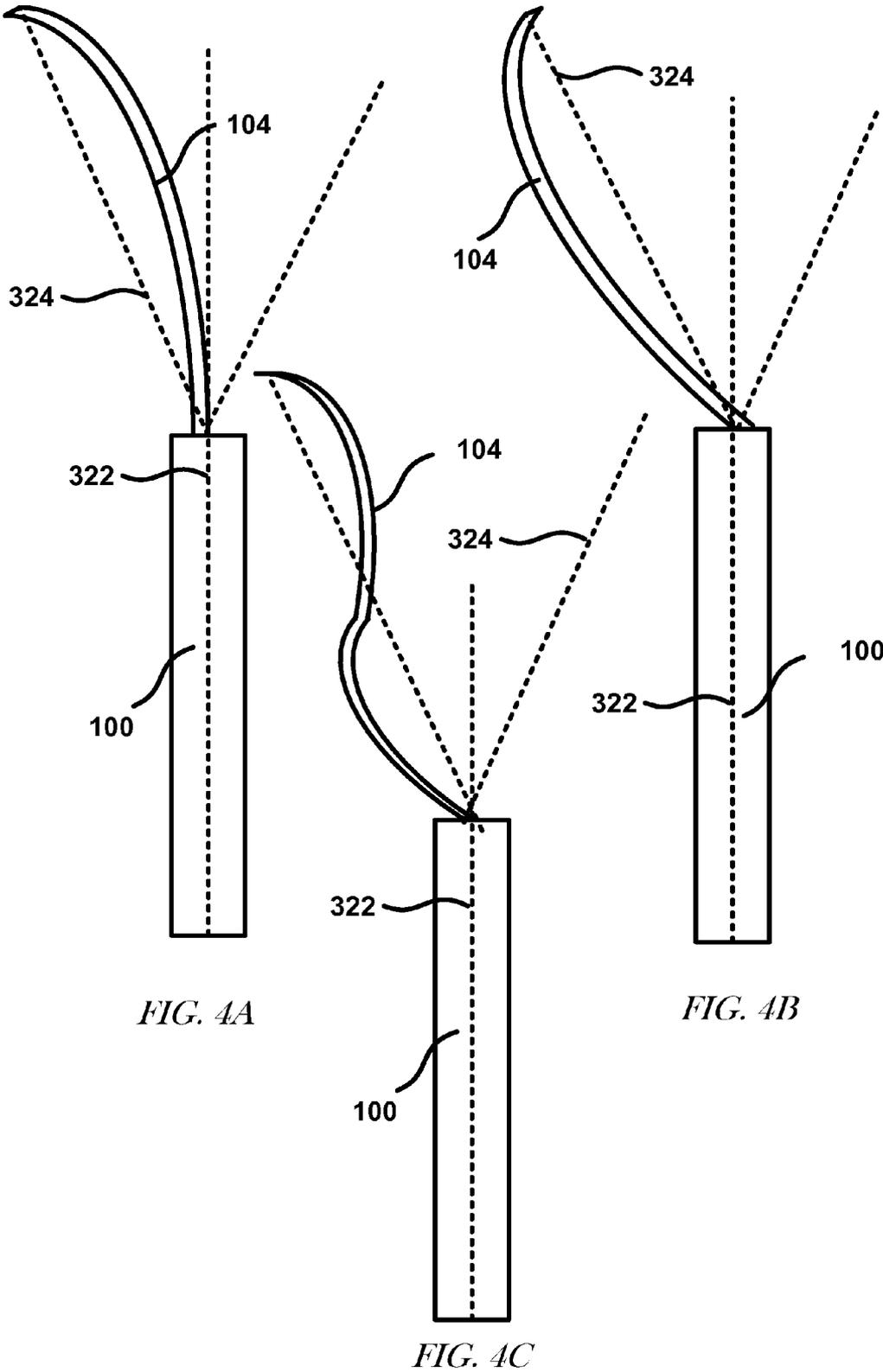


FIG. 4A

FIG. 4B

FIG. 4C

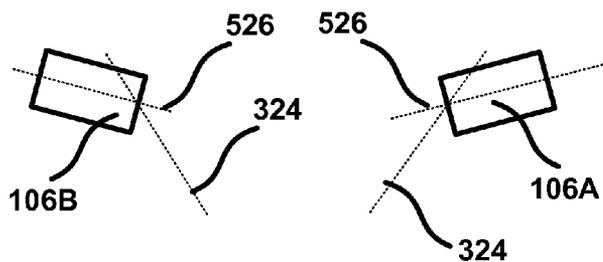


FIG. 5A

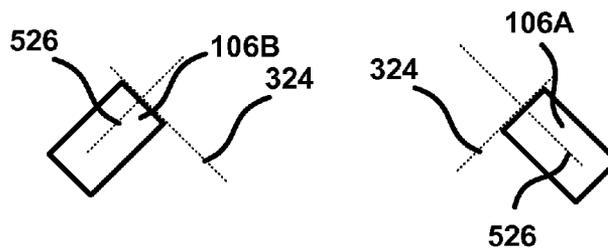


FIG. 5B

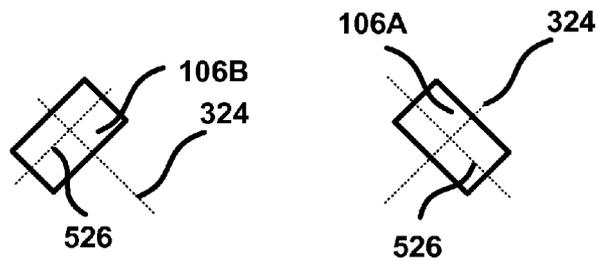


FIG. 5C

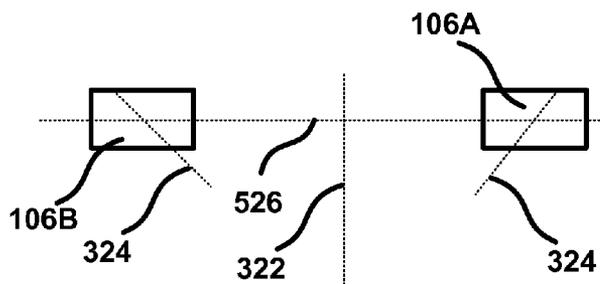


FIG. 5D

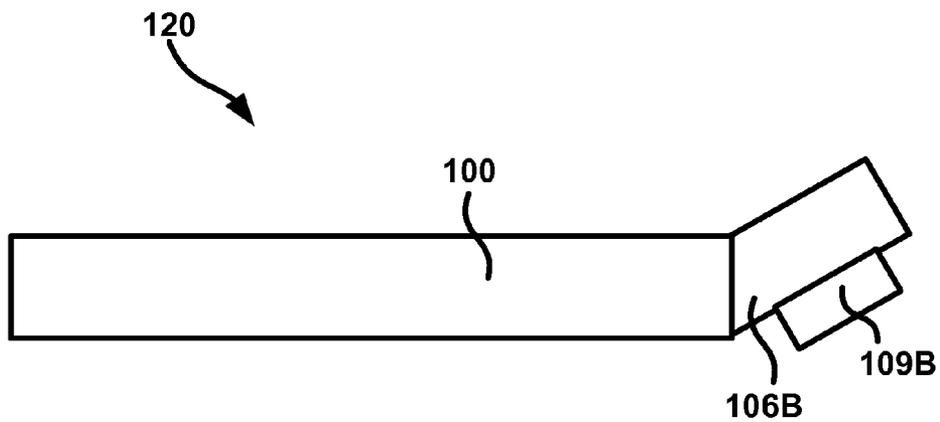


FIG. 6A

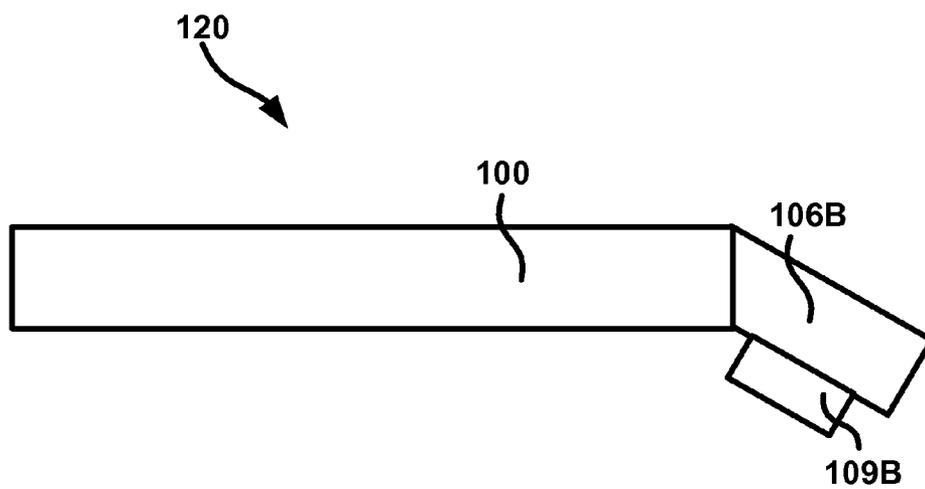


FIG. 6B

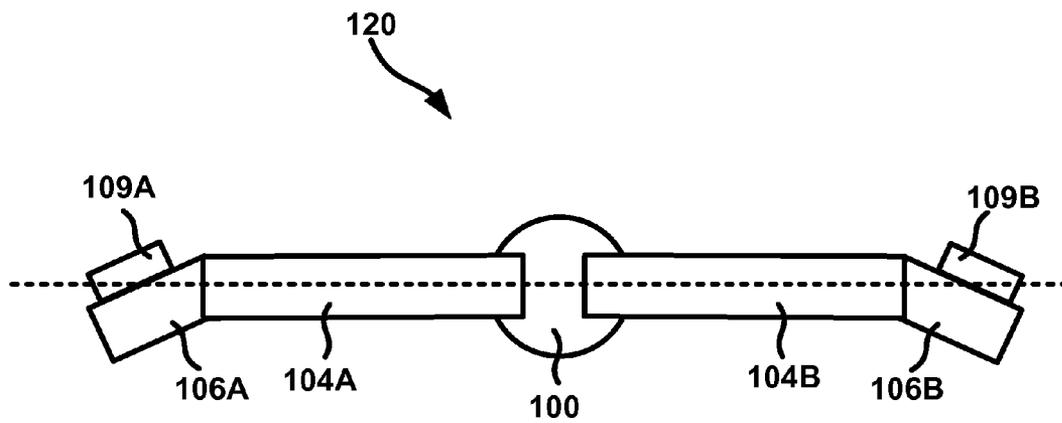


FIG. 7

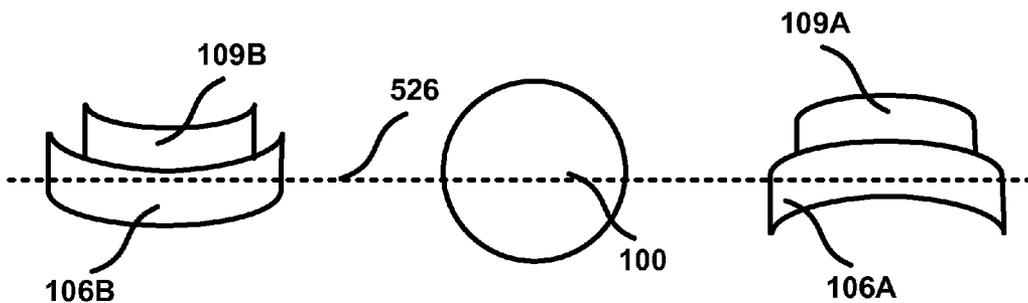


FIG. 8A

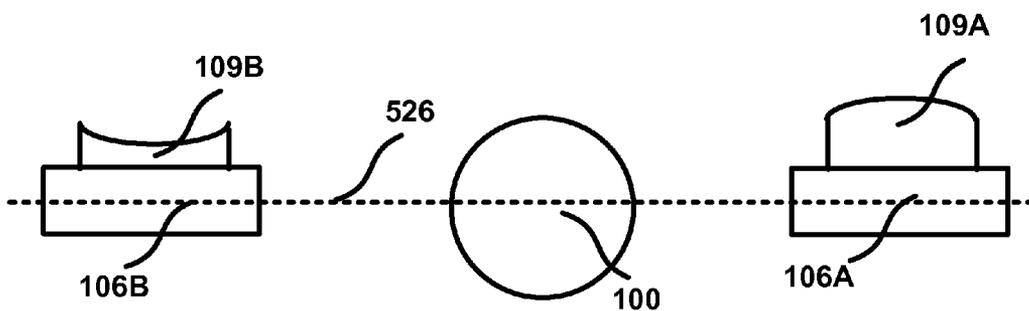


FIG. 8B

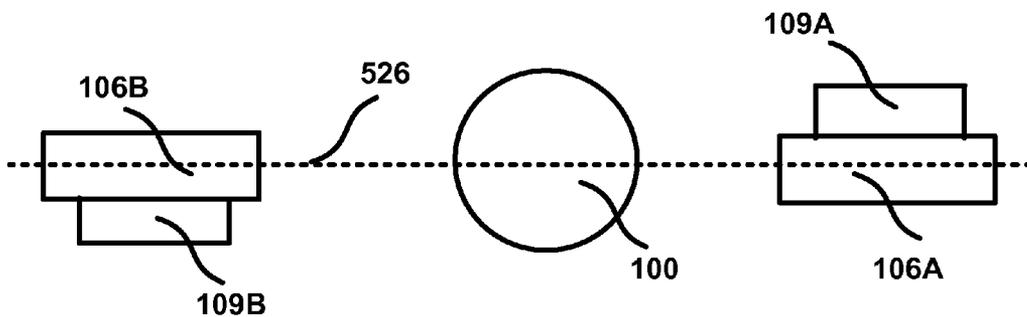
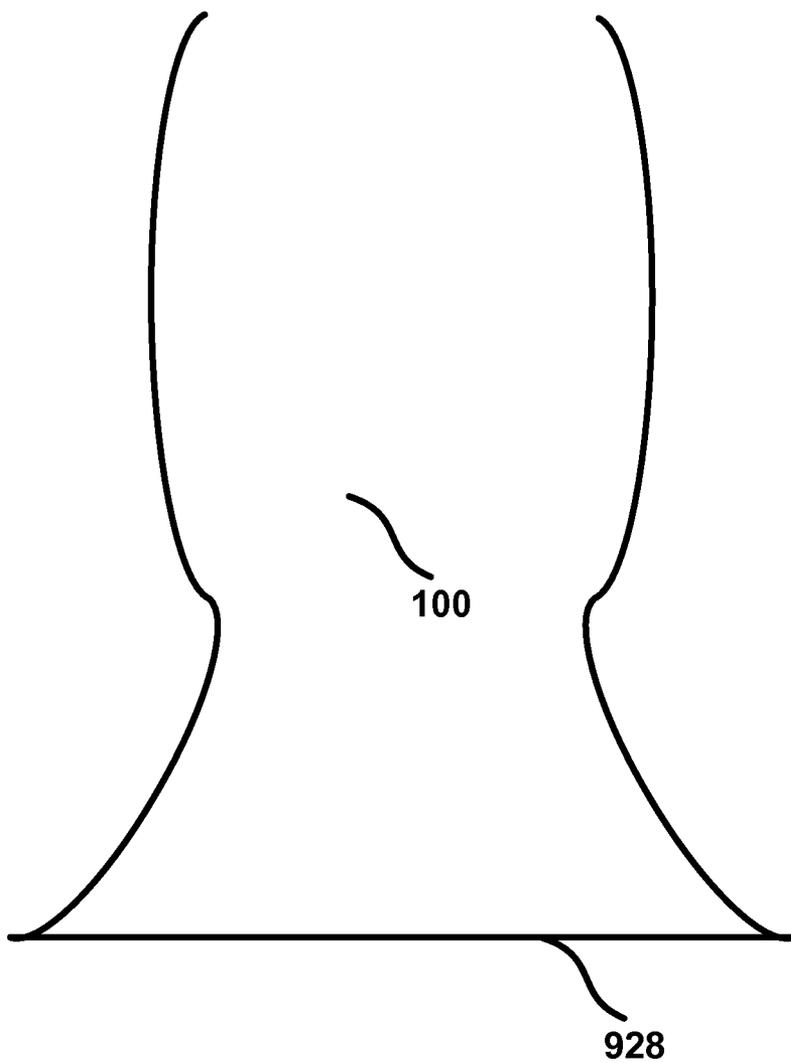


FIG. 8C



*FIG. 9*

## Y-SHAPED CLEANING APPARATUS

### TECHNICAL FIELD

**[0001]** This disclosure relates generally to cleaning apparatuses and more specifically to cleaning apparatuses with a Y-shaped profile.

### BACKGROUND

**[0002]** The configuration of a conventional, monoaxial toothbrush, including a two-headed “double-ended” toothbrush, typically encourages a user to elevate an elbow in order to make the brush head generally parallel with a row of teeth. The user then typically employs a side-to-side scrubbing motion, which can be inadequate for removing plaque and can increase the risk of damage to the teeth (e.g., abrasion) and gums (e.g., recession). A number of cleaning methods offer advantages over the side-to-side motion. For example, in the Bass, Stillman, and Charters methods, the bristles of the toothbrush are placed against the buccal and lingual surfaces and canted at a 45-degree angle, pointing either apically, when intra-sulcular cleaning is the goal, or coronally, when penetration of the interdental spaces is the goal. The toothbrush is then “vibrated” or moved either in a circular fashion or horizontally in short strokes. However, the execution of the movements entailed in such brushing techniques can be physically challenging, especially in brushing the lower quadrant of the contralateral teeth. Implementing such a technique using a longitudinally configured toothbrush requires a level of both gross and fine motor control and other skills that may be beyond the capability of people such as the young, the elderly, and those with physical or neurological limitations. Essentially the same challenges are present when brushing the teeth of an animal, and perhaps greater challenges can be encountered when caregivers are cleaning the teeth of another, particularly when the caregiver is situated behind the person.

**[0003]** The limitations of a longitudinally configured toothbrush can also be illustrated in the case of cleaning the anterior lingual teeth, both upper and lower: the brush head can be prevented from being applied parallel to the row of teeth being cleaned because, due to the dental arch, the handle or even the cleaning head itself may come into contact with teeth adjacent to those in the row to be cleaned. In addition, the ulnar-radial and radial-ulnar rotation of the wrist and forearm that can be used in cleaning the lingual surfaces can be relatively difficult to execute. Typically the user orients the toothbrush perpendicular to the row of teeth before scrubbing with the brush. Such a method can damage the gingival or palatal tissues and lead to faster wear of the bristles of the brush being used.

**[0004]** A toothbrush with a brush head that is positioned at a right angle to the handle can allow a user to hold the toothbrush in a vertical or nearly vertical position, which reduces the muscular effort required and may allow a user greater ease in holding or manipulating the brush. This biomechanical advantage can reduce the risk of applying insufficient force to the area being cleaned and, thus, can reduce the risk of achieving insufficient interdental penetration; at the same time, it may also reduce the risk of applying excessive force. Further, such comparative biomechanical efficiency decreases the likelihood of the brushing process coming to a halt before a complete cleaning has been accomplished. However, such “transversal” toothbrushes are

difficult to apply to the lingual surfaces of the anterior teeth. In order to alleviate this complication, the width of the brush head can be reduced, though such reduction can lessen the advantage of this design.

**[0005]** Some known toothbrushes include a brush head that can be manually rotated from a configuration coaxial with the handle to adopt a perpendicular relationship to the longitudinal axis of the toothbrush, giving the toothbrush the shape of the letter “L”. Other toothbrushes permit manually changing the orientation of the cleaning head to provide a “T”-shaped toothbrush. These toothbrushes can require interrupting the cleaning process to rotate the brush head and can include the user having to manipulate a wet brush head. A mechanical switching mechanism to rotate the orientation of the cleaning head can increase the cost of manufacture as well as introduce the possibility of mechanical malfunction.

**[0006]** ‘Double-ended’ toothbrushes having a cleaning head at each end of a longitudinal handle are also known. Because the brush heads are used asynchronously and independently of each other, they may include two different types of cleaning heads. In some cases, the cleaning heads are complementary or mirror images of each other, while in others, they can be different in shape or function. The longitudinal configuration of such toothbrushes requires the user to interrupt the cleaning process when changing from one brush head to the other. Unless the user has the manual dexterity required to reverse the orientation of the toothbrush using only one hand, it may be necessary to lay the toothbrush down and pick it up in a different position, or transfer the toothbrush to the other hand and then retrieve it in a different position. When using the second brush head, the first brush head, having just been used, can be wet and dripping with toothpaste or water. In addition, the cleaning head not being used may occupy a position uncomfortably close to the user’s hand or forearm.

**[0007]** The gripping portion of the handle of a monoaxial two-headed toothbrush is typically longitudinally symmetrical, since the toothbrush can be capable of being grasped by the user with the brush heads facing in either of two opposing directions. Therefore, it can be difficult to incorporate certain ergonomic principles in the gripping portion of the handle. For example, it may be difficult to include features such as a hilt, a pommel, or finger grooving in the gripping portion of the handle. In the case of an adult, it is recommended that the length of the gripping portion of the handle of a hand-held implement range between four and six inches and that the diameter range from about 1.5 to 2.0 inches (3.81 to 5.08 cm). As a practical matter, it may be difficult to provide a monoaxial two-headed toothbrush with such optimal handle dimensions.

**[0008]** The multi-headed cleaning apparatus of U.S. Pat. No. 6,588,956 B1, to Gennuso, Jr., can be used for cleaning broad surfaces and for 360-degree cleaning around protrusions. It can include a pivot structure at the end of an elongate handle, the pivot structure having a circular cleaning pad attached to it, and a plurality of arms extending from the pivot structure, with each arm end having a circular cleaning pad. The center-cleaning pad is rotatably attached to the pivot structure and the other cleaning pads are pivotally attached to the arms in order to conform to the shape of the surface being cleaned. In one or more embodiments, the handle is hollow and water under pressure can be delivered to the cleaning pads. It appears that the entirety of the apparatus is intended to be used at the same time.

## SUMMARY

**[0009]** Additional advantages and novel features will be set forth in the description that follows or may be learned by those skilled in the art through reading these materials or practicing the examples disclosed herein.

**[0010]** According to an aspect of the present disclosure a two-headed cleaning apparatus can include a handle including a first handle portion and first and second necks, each neck including a first neck end and an opposing second neck end, wherein the second neck end of both necks is coupled to the first handle portion and a longitudinal axis of the first neck forms an angle of between about 30 degrees and about 100 degrees with a longitudinal axis of the apparatus on a first lateral side of the apparatus, and a longitudinal axis of the second neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus on an opposing second lateral side thereof. The apparatus can also include first and second individual cleaning heads each coupled to the first neck end of the first and second necks, respectively, wherein the cleaning heads each have a proximal portion closest to the first neck end and an opposing distal portion farthest therefrom, wherein the coupling is between the first neck end and the proximal portion of the cleaning head, and wherein each cleaning head has an upper side facing in a substantially same direction as an upper side of the cleaning apparatus and an opposing lower side, and a lower side of each cleaning head includes cleaning tools coupled thereto.

**[0011]** According to another aspect of the present disclosure, a method of manufacturing a two-headed cleaning apparatus is described, the method comprising the steps of providing a handle having a first handle portion, providing first and second necks each having a first neck end and an opposing second neck end, and coupling the second end of both necks to the first handle portion in such a way that a longitudinal axis of a first neck forms an angle of between about 30 degrees and about 100 degrees with a longitudinal axis of the apparatus on a first lateral side thereof and a longitudinal axis of a second neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus on an opposing lateral side thereof. The method can also include providing two cleaning heads each having a first upper surface and a second opposing lower surface and attaching cleaning tools to the opposing lower surface of at least one of the cleaning heads and coupling a first cleaning head to the first neck end of the first neck and coupling a second cleaning head to the first neck end of the second neck.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0012]** The accompanying drawings illustrate various embodiments of the present disclosure and are part of the specification. The illustrated embodiments are merely examples and are not intended to be limiting.

**[0013]** FIG. 1 depicts a front view diagram of an example of a two-headed cleaning apparatus.

**[0014]** FIG. 2 is a side view diagram of an example of a two-headed cleaning apparatus.

**[0015]** FIG. 3 is a side view diagram of an example of a two-headed cleaning apparatus.

**[0016]** FIGS. 4A-C are front view diagrams of examples of two-headed cleaning apparatuses.

**[0017]** FIGS. 5A-D are partial front view diagrams of examples of two-headed cleaning apparatuses.

**[0018]** FIGS. 6A-B are side view diagrams of examples of two-headed cleaning apparatuses.

**[0019]** FIG. 7 is a top view diagram of an example of a two-headed cleaning apparatus.

**[0020]** FIGS. 8A-C are partial top view diagrams of examples of two-headed cleaning apparatuses (view of the necks omitted).

**[0021]** FIG. 9 is a partial side view diagram of an example of a handle.

## DETAILED DESCRIPTION

**[0022]** In the following description, reference is made to the accompanying drawings that form a part hereof, and in which are shown by way of illustration specific embodiments that can be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the present disclosure, and it is to be understood that other embodiments can be utilized and that structural, logical and electrical changes can be made without departing from the scope of the present disclosure. The following description of example embodiments is, therefore, not to be taken in a limited sense, and the scope of the present disclosure is defined by the appended claims.

**[0023]** Disclosed generally herein are two-headed cleaning apparatuses that can be generally Y-shaped. One or more cleaning apparatuses can include a handle and two necks extending therefrom. The two necks can extend from a same portion of the handle on opposing lateral sides of the longitudinal axis of the apparatus. The angle formed by the longitudinal axis of an individual neck and the longitudinal axis of the cleaning apparatus handle can range between about 30 degrees and about 100 degrees. Both necks can include a cleaning head coupled to their distal end. The cleaning heads can include cleaning tools affixed to a side thereof. The cleaning apparatus can be substantially laterally symmetrical. The cleaning apparatus can alternatively be laterally asymmetrical. The cleaning apparatus can have a backside opposing the cleaning tools, a front side opposing the backside, a longitudinal plane, a transverse plane, and a vertical plane perpendicular to the transverse axis and collinear with the longitudinal axis.

**[0024]** FIG. 1 shows a front view diagram of an example of a two-headed cleaning apparatus 120. As shown in FIG. 1, a substantially elongate handle 100 has a first handle portion 101 and a second handle portion 102. The handle 100 can be configured to accommodate a user placing a finger in a space 110 (e.g., a divot or recession) between first neck ends 103A and 103B to help facilitate a user to exercise greater gripping control. The diameter of handle 100 is shown as generally constant in FIG. 1, but handle 100 can optionally include a thickened medial portion, a hilt, a pommel, one or more finger grooves, or any combination thereof. The handle 100 can be a variety of lengths. In one or more embodiments, the handle 100 is long enough for the user to clean surfaces that are beyond the normal reach of the user. In one or more embodiments, the handle 100 can be non-elongate. Such non-elongate handles 100 can be configured for the needs of specialized populations, such as the physically disabled or elderly, among others. The configuration of the apparatus 120 can permit a user to grasp a proximal portion of either neck 104A-B (the portion near neck end 103A or 103B), while simultaneously grasping a gripping portion of the handle 100, to increase the user's control over the apparatus 120. Such a configuration can help the user control the neck 104A or 104B

or cleaning head **106A** or **106B** being used. In one or more embodiments, the handle **100** can include one or more apertures, divots, or recessions configured to receive one or more of the user's fingers or the thumb. In one or more embodiments, the configuration of the handle **100** may resemble a pistol grip. In one or more embodiments, the handle **100** is configured to reduce the degree of radial and/or ulnar rotation of the user's wrist. In one or more embodiments, the apparatus **100** may include an extension that extends to reach the forearm of the user, the extension configured to contact the forearm of the user and increase the ease of controlling the movement and manipulation of the apparatus **120**. In one or more embodiments, the apparatus **120** includes two necks **104A-B** that are joined at an end of the necks **104A-B**, such as shown in FIG. 1. The necks **104A-B** can be configured to be replaceable, such as by including a screw on either the neck **104A** or **104B** or handle **100** and a corresponding screw hole on the handle **100** or neck **104A** or **104B** or other male and corresponding female connection feature, among others.

[0025] First and second necks **104A** and **104B** include first neck ends **103A** and **103B**, respectively. The first neck ends **103A** and **103B** can be coupled to the second handle portion **102**. The longitudinal axes of necks **104A** and **104B** can each form an interior angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus **120**. In one or more embodiments, the angles formed with the longitudinal axis of the apparatus **120** by the two necks are non-identical. In one or more embodiments, the cross-section of a neck **104A** or **104B**, or a portion thereof, may be substantially round, ovaloid, elliptical, rectangular, or triangular, among other shapes. In one or more embodiments, a neck **104A** or **104B** is substantially rigid. In one or more embodiments, a neck **104A** or **104B** is flexible and resilient. In one or more embodiments, a neck **104A** or **104B** can have both rigid and flexible and resilient portions. The neck **104A** or **104B** has a medial side and a lateral side, wherein the medial side of the neck **104A** or **104B** is defined herein as a portion (e.g., side portion) of the neck **104A** or **104B** closer to the longitudinal axis of the handle **100** and facing the axis, and the lateral portion is defined as the side portion of the neck **104A** or **104B** further away from the longitudinal axis of the handle **100** and opposing the medial side portion. A neck **104A** or **104B** has a backside and a front side, wherein the back and the front sides are defined in accordance with whether they face in the same direction as the back or the front side of the apparatus **120**. The apparatus **120** can include a neck **104A** or **104B** of a variety of lengths. The length of the neck **104A** or **104B** can be configured to facilitate reaching certain areas to be cleaned, or to incorporate various types of axial or planar curves in the neck **104A** or **104B**.

[0026] The cleaning head **106A** or **106B** can be configured as elongate, such as shown in FIG. 1. The cleaning heads **106A** or **106B** can have a proximal portion that is defined herein as a portion closest to a coupling with the neck end **107A** or **107B**, and a distal portion, defined herein as that portion farthest from the coupling with the neck end **107A** or **107B**. The distal ends of the cleaning heads **106A-B** are labeled **108A-B**, respectively. The longitudinal axis of the cleaning head **106A** or **106B** is defined as an axis that bisects the proximal and the distal portions **108A-B** of the cleaning heads **106A-B**. A longitudinal plane of the cleaning head **106A** or **106B** is defined as a plane that is collinear with the longitudinal axis of the cleaning head **106A** or **106B**. The cleaning heads **106A-B** may be coupled to second neck ends

**105A-B**, respectively. In one or more embodiments, the cleaning head **106A** or **106B** is coaxial with the distal portion of the neck **104A** or **104B**, respectively.

[0027] The cleaning head **106A** or **106B** can be elongate and coupled to a neck **104A** or **104B**, respectively, at a location other than the proximal portion of the cleaning head **106A** or **106B**. For example, the coupling location can include a longitudinal midpoint of the cleaning head **106A** or **106B**. The cleaning head **106A** or **106B** can be non-coaxial with the distal portion of the neck **104A** or **104B** to which each is coupled. The cleaning head **106A** or **106B** can be non-elongate. The cleaning head **106A** or **106B** can be angled or canted in the direction of the upper side of the apparatus from the longitudinal plane of a distal portion of the neck **104A** or **104B** to which it is coupled. The longitudinal plane of the cleaning head **106A** or **106B** can be angled or canted in the direction of the lower side of the apparatus from the longitudinal plane of a distal portion of the neck **104A** or **104B** to which it is coupled. The cleaning head **106A** or **106B** can be tilted in the direction of, or away from, the vertical axis of the apparatus **120** or the handle **100**. The cleaning head **106A** or **106B** can have rounded corners or edges. The periphery of a top surface of the cleaning head **106A** or **106B** can be tapered, beveled, or at least partially rounded. The two cleaning heads **106A-B** can be shaped or configured differently from one another, and can be configured for different cleaning tasks.

[0028] FIG. 2 shows an example of a cleaning apparatus, such as the cleaning apparatus **120** shown in FIG. 1. The cleaning apparatus **120** can include one more cleaning tools **109A-B** extending from a lower side of cleaning heads **106A-B**. The cleaning tools **109A-B** can be made of one or more materials, such as sponges, wires, lambs' wool, steel wool, abrasive materials, pads, bristles (e.g., natural or synthetic, hair, fibers, filaments, or any combination thereof), or any combination thereof, among others. The material(s) of each cleaning tool **109A** or **109B** can be the same or different. The stiffness characteristic of each cleaning tool **109A** or **109B** can be substantially the same or can be different. For instance, the cleaning tool **109A** of one cleaning head **106A** or parts thereof may be stiffer or more flexible than the cleaning tool **109B**. The profile of the portion(s) of cleaning tool **109B** that contact surfaces can be substantially the same as, or different from that of cleaning tool **109A**. The cleaning tools **109A-B** can be of uniform or variable length. The cleaning tools **109A-B** can be configured for cleaning the tongue; alternatively, the cleaning head **106A-B** can be shaped to be a tongue cleaner.

[0029] FIG. 3 shows an example of an apparatus **120** in which the longitudinal plane **324** of one or both necks **104A-B** forms an interior obtuse angle with the longitudinal plane **322** of the apparatus **120** on a side of the apparatus plane **322** opposite that of the cleaning tools. When the apparatus **120** is configured as a toothbrush, this configuration can offer the user increased flexibility in cleaning the oral cavity by making it easier to reach certain areas of the oral cavity. The longitudinal plane **324** of the neck **104A** can form an angle of a degree with the longitudinal plane **322** of the apparatus that is different from the angle formed between the longitudinal plane of the neck **104B** and the longitudinal plane **324** of the apparatus **120**.

[0030] FIGS. 4A-C are perspective views that show examples of necks **104** with curves relative to the longitudinal plane **324** of the neck **104**, as well as the longitudinal plane

**322** of the apparatus **120**. These curves may include curves that are convex, concave, or a combination thereof relative to the longitudinal plane **324** of the neck. The necks **104** can include a compound planar curve, such as a compound curve wherein a proximal portion is convex to the longitudinal plane **324** of the neck and a distal portion is concave thereto. The necks **104** can include a compound curve wherein a proximal portion of the curve is concave to the plane **324** of the neck **104** and a distal portion is convex to the plane **324** of the neck **104**. One or both necks **104A-B** can have any of the curves described above, with the curves relative to the longitudinal plane **322** of the apparatus **120**. The necks **104A-B** may be substantially coplanar with the apparatus and have any of the aforementioned curves relative to the plane **324**. When the cleaning apparatus **120** is a toothbrush, these features may substantially improve the ease of cleaning some teeth, such as the posterior teeth.

**[0031]** FIGS. 5A-D show back views of examples of the apparatus **120** that can include one or more cleaning heads **106A-B** whose longitudinal axis creates an angle with the longitudinal axis of the neck **104A-B**, or with just a distal portion thereof. FIG. 5A shows cleaning heads **106A-B** with a longitudinal axis **526** that forms an interior obtuse angle with the longitudinal axis **324** of the neck. FIG. 5B shows the longitudinal axis **526** of one or more cleaning heads **106A-B** forming an interior angle of about 90 degrees with the longitudinal axis **324** of the neck **104**. FIG. 5C shows cleaning heads **106B** with the longitudinal cleaning head axis **526** set at a substantially perpendicular angle to the longitudinal axis **324** of the neck **104**. FIG. 5C depicts cleaning heads **106A-B** forming an angle of about 90 degrees with the neck ends (indicated by dashed lines) at or near a longitudinal cleaning head **106A-B** midpoint. FIG. 5D depicts cleaning heads **106A-B** with the longitudinal cleaning head axis **526** forming an angle that is substantially perpendicular to the longitudinal axis **322** of the apparatus **120**. The cleaning head **106** may be joined to the neck **104** at any location along the cleaning head **106**, that is, at a cleaning head midpoint or elsewhere. The relationship of the cleaning head **106** longitudinal axes to the longitudinal axis of the neck **104** the cleaning head **106** is coupled to, does not have to be the same for each cleaning head **106**. For example, the cleaning head **106A** can be coupled to the neck **106A** in the orientation as shown in FIG. 5A and the cleaning head **106B** can be coupled to the neck **106B** in the orientation as shown in FIG. 5B. While the cleaning heads **106A-B** depicted are substantially elongate, the same configurations may be incorporated in embodiments of the apparatus that comprise non-elongate cleaning heads. The shape of the cleaning head **106** can be that of an oval or other shape that does not have corners. In addition to the configurations illustrated, the cleaning heads **106** can be coupled to form a variety of angles with the individual neck element **104** that are not depicted in the FIGS.

**[0032]** FIGS. 6A-B show an embodiment of apparatus **120** that can include one or both cleaning heads **106A-B** whose longitudinal planes form an interior obtuse angle with the longitudinal plane of necks **104A-B** or with a distal portion thereof. In one embodiment, one or both cleaning heads are canted in the direction of the front of the apparatus. In another embodiment, they are canted in the direction of the back of the apparatus. In yet another embodiment, one cleaning head is canted in a first direction relative to the longitudinal plane of the neck element to which it is coupled and a second cleaning head is canted in a second (e.g., opposing) direction relative to

the longitudinal plane of the neck element to which it is coupled. Such canted cleaning heads may make it easier to reach various surfaces to be cleaned.

**[0033]** FIG. 7 shows an example of an apparatus **120** wherein the transverse plane of both cleaning heads **106A-B** is tilted in the direction of a vertical apparatus plane that is collinear with the longitudinal axis of the apparatus **120**, such that the transverse plane of the cleaning heads **106A-B** forms an interior acute angle with the vertical apparatus plane. In one or more embodiments, only one cleaning head **106A** or **106B** is tilted in such a manner. At least one cleaning head **106** can be tilted such that its lateral plane forms an interior acute angle with the vertical apparatus plane, wherein the vertex of the angle is on the upper side of the apparatus. Such configurations can be useful as a toothbrush in cleaning the buccal and lingual surfaces of the posterior teeth.

**[0034]** FIGS. 8A-C are top views of examples of the apparatus **120** with the neck omitted from view. FIG. 8A shows an embodiment of the apparatus **120** that can include cleaning heads **106A-B** that have curves, wherein a first cleaning head **106A** and its cleaning tools **109A** have a curve that is substantially concave to the longitudinal plane **526** of the cleaning head **106A** and a second cleaning head **106B** and its cleaning tools **109B** have a curve that can be substantially convex to the longitudinal plane **526** of the cleaning head **106B**. In the example shown in FIG. 8A, both cleaning heads **106A-B** face in a same direction. When the apparatus **120** is used as a toothbrush, cleaning tools **109** with a concave curve may facilitate the cleaning of the buccal surfaces, such as the anterior buccal surfaces; and cleaning tools **109** having a convex curve may facilitate the cleaning of the lingual surfaces, particularly the anterior lingual surfaces.

**[0035]** FIG. 8B depicts an embodiment of the apparatus **120** wherein the profile of the cleaning tools **109A** of a first cleaning head **106A** forms a curve substantially concave to the longitudinal plane **526** of the cleaning head **106A** and the profile of the cleaning tools **109B** of a second cleaning head **106B** have a curve substantially convex to the longitudinal plane **526** of the cleaning head **106B**. In the example shown in FIG. 8B both cleaning heads **106A-B** face in the same direction.

**[0036]** FIG. 8C shows an example of the apparatus **120** that includes a first cleaning head **106A** facing in a first direction relative to the transverse plane of the apparatus **120** and a second cleaning head **106B** facing in an opposite direction. When the apparatus **120** in this configuration is used as a toothbrush, it can offer convenience in brushing buccal surfaces, and lingual surfaces, in turn, without the user having to change his grip on the apparatus.

**[0037]** Features of the configurations shown in FIGS. 8A-C can be combined. For example, an apparatus **120** can include cleaning tools **109A-B** that can face in opposite directions with cleaning tools **109A** having a concave profile and cleaning tools **109B** having a convex profile.

**[0038]** FIG. 9 shows an example of a first handle end **928** of an apparatus **120**. The apparatus can have a substantially elongate handle **100**, wherein the plane of the first handle end **928** can be substantially flat and the angle of the plane can be such that the apparatus **120** can be stood erect. In an example of an apparatus with a non-elongate handle **100**, the portion of the handle farthest from the necks may have a flat portion the angle of whose plane permits the apparatus to be stood erect. A portion of the handle **100** or other portion of the apparatus

120 can include one or more surface portions configured to bear an inscription such as a logo, emblem, seal, or one or more words.

[0039] The handle 100 can be substantially short so as to permit a user to grasp the handle 100 in the volar surface (e.g., palm) of the use's hand. Such an implementation can include a handle 100 that is about an inch shorter than the normal handle length. The end of the handle 100 opposing the end of the apparatus that includes the cleaning heads 106 can be rounded or blunt so that the handle 100 does not hurt a user when using the apparatus in this manner. Such a configuration can increase the maximum power that can be exerted, such as without any loss of precision. Such a configuration can work synergistically with a user looping a finger over the intersection of two necks.

[0040] Due to the configuration of the cleaning apparatuses 120 disclosed herein, it may not be immediately apparent how to efficiently use the apparatus 120. In the case of an embodiment having cleaning heads 106A-B, or the contour of cleaning tools 109A-B, whose profiles have a curve or are complementary in shape, it can be appreciated that one cleaning head 106A or corresponding cleaning tools 109A can be comparatively more suitable for cleaning concave surfaces and the other cleaning head 106B or corresponding cleaning tools 109B can be comparatively better suited for cleaning convex surfaces.

[0041] When the apparatus 120 is used as a toothbrush, a user, according to the preference of the user, may employ one of several cleaning protocols. In the protocols described herein, the cleaning heads 106A-B are labeled according to their orientation when the toothbrush is configured with both cleaning heads 106A-B facing the user and canted in a same direction relative to the transverse plane of the apparatus 120. In one brushing protocol, eight quadrants of the teeth (upper, lower, left and right buccal and lingual) can be cleaned without the user having to reverse the direction the cleaning tools face. The first part of the protocol may be as follows:

- [0042] Upper left quadrant, buccal: left cleaning head
- [0043] Lower left quadrant, buccal: left cleaning head
- [0044] Upper right quadrant, lingual: left cleaning head
- [0045] Lower right quadrant, lingual: right cleaning head
- [0046] The second part of the protocol may be as follows:
- [0047] Upper right quadrant, buccal: right cleaning head
- [0048] Lower right quadrant, buccal: right cleaning head
- [0049] Upper left quadrant, lingual: right cleaning head
- [0050] Lower left quadrant, lingual: left cleaning head
- [0051] A user may prefer to begin with the second part of the protocol.

[0052] In another protocol, the cleaning heads 106A-B can be used in sequence, that is, one at a time, again without the user having to change the direction of the cleaning head 106A-B. In the protocol below, the left cleaning head is used first; however, the user may begin with either cleaning head.

- [0053] Upper left quadrant, buccal left cleaning head
- [0054] Lower left quadrant, buccal left cleaning head
- [0055] Lower right quadrant, lingual left cleaning head
- [0056] Upper left quadrant, lingual left cleaning head
- [0057] Upper right quadrant, buccal right cleaning head
- [0058] Lower right quadrant, buccal right cleaning head
- [0059] Lower left quadrant, lingual right cleaning head
- [0060] Upper right quadrant, lingual right cleaning head

[0061] In a third protocol, the orientation of the toothbrush can be changed one time. Either the buccal quadrants or the lingual quadrants are cleaned first, followed by the other

quadrants. In the following example, the user can begin with the buccal quadrants, using one of the following two alternative sequences:

- [0062] (Alternative A)
- [0063] Upper left quadrant, buccal: left cleaning head
- [0064] Upper right quadrant, buccal: right cleaning head
- [0065] Lower left quadrant, buccal: left cleaning head
- [0066] Lower right quadrant, buccal: right cleaning head
- [0067] (Alternative B)
- [0068] Upper left quadrant, buccal: left cleaning head
- [0069] Lower left quadrant, buccal: left cleaning head
- [0070] Upper right quadrant, buccal: right cleaning head
- [0071] Lower right quadrant, buccal: right cleaning head

[0072] Following this, the other quadrants are cleaned (in this example, the other quadrants are the lingual quadrants). It is at this point that the orientation of the toothbrush from the perspective of the user is changed by reversing the direction it faces from the viewpoint of the user. Either of the two following protocols may be employed for cleaning the lingual dental surfaces:

- [0073] (Alternative A)
- [0074] Upper left quadrant, lingual: right cleaning head
- [0075] Upper right quadrant, lingual: left cleaning head
- [0076] Lower left quadrant, lingual: right cleaning head
- [0077] Lower right quadrant, lingual: left cleaning head
- [0078] (Alternative B)
- [0079] Upper left quadrant, lingual: right cleaning head
- [0080] Lower left quadrant, lingual: right cleaning head
- [0081] Upper right quadrant, lingual: left cleaning head
- [0082] Lower right quadrant, lingual: left cleaning head

[0083] Other protocols are also possible inasmuch as the apparatus 120 allows a user to employ any type of variation of any of the protocols mentioned above. For example, the user may begin by cleaning the lingual surfaces rather than the buccal surfaces. Personal or individual preferences, or other factors, can lead to other brushing protocols being employed.

Additional Notes and Examples

[0084] In Example 1, a two-headed cleaning apparatus can include a handle including a first handle portion and first and second necks, each neck including a first neck end and an opposing second neck end, wherein the second neck end of both necks is coupled to the first handle portion and the longitudinal axis of a first neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus on a first lateral side of the apparatus, and the longitudinal axis of a second neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus on an opposing lateral side thereof

[0085] In Example 2, the apparatus of Example 1 can include first and second individual cleaning heads each coupled to the first neck end of the first and second necks, respectively, wherein the cleaning heads each have a proximal portion closest to the first neck end and an opposing distal portion farthest therefrom and the coupling is between the first neck end and the proximal portion of the cleaning head, and wherein each cleaning head has an upper side facing in a substantially same direction as the upper side of the cleaning apparatus and an opposing lower side, and the lower side of each cleaning head includes cleaning tools coupled thereto.

[0086] In Example 3, at least one first neck end of at least one of Examples 1-2 can be coupled to a cleaning head at a location between the portion of the cleaning head closest to

the longitudinal axis of the apparatus and the portion of the cleaning head farthest from the longitudinal axis of the apparatus.

**[0087]** In Example 4, the longitudinal axis of at least one cleaning head of at least one of Examples 1-3 forms an angle of less than 180 degrees with the distal portion of the neck to which it is coupled on the lateral side of the neck.

**[0088]** In Example 5, the longitudinal axis of at least one cleaning head of at least one of Examples 1-4 forms an angle of less than 180 degrees with the distal portion of the neck to which it is coupled on the medial side of the neck.

**[0089]** In Example 6, the longitudinal plane of at least one cleaning head of at least one of Examples 1-5 can be non-coplanar with the longitudinal plane of a distal portion of the neck to which the cleaning head is coupled.

**[0090]** In Example 7, the transverse plane of at least one cleaning head of at least one of Examples 1-6 is non-coplanar with a transverse plane of the apparatus.

**[0091]** In Example 8, the at least one cleaning head of at least one of Examples 1-7 includes at least one curve.

**[0092]** In Example 9, a profile of the cleaning tools of at least one cleaning head of at least one of Examples 1-8 includes at least one curve.

**[0093]** In Example 10, a first cleaning head of the at least one cleaning head of at least one of Examples 1-9 faces in a first direction relative to the transverse plane of the cleaning apparatus and a second cleaning head faces in an opposing direction.

**[0094]** In Example 11, a longitudinal plane of at least one neck of at least one of Examples 1-10 can be canted in a same direction as the upper side of the apparatus and forms an interior obtuse angle with the longitudinal plane of the apparatus on the upper side of the apparatus.

**[0095]** In Example 12, at least one neck of at least one of Examples 1-11 includes at least one curve.

**[0096]** In Example 13, the cleaning tools of at least one of Examples 1-12 are made of at least one material chosen from the group including a sponge, a wire, lambs' wool, steel wool, an abrasive material, a pad, bristles, or a combination thereof

**[0097]** In Example 14, the apparatus of at least one of Examples 1-13 can be configured as a toothbrush.

**[0098]** In Example 15, the apparatus of at least one of Examples 1-13 can be configured as a bath or shower brush.

**[0099]** In Example 16, a portion of the handle farthest from the second neck end of at least one of Examples 1-15 can be substantially flat and the plane of the aforesaid portion of the handle is such that the apparatus can be stood erect.

**[0100]** In Example 17, the handle of at least one of Examples 1-16 includes a portion suitable for inscription of an image or lettering.

**[0101]** In Example 18, a method can include providing a handle having a first handle portion, providing two generally elongate necks each having a first neck end and an opposing second neck end, and coupling the second end of both necks to the first handle portion in such a way that the longitudinal axis of a first neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus on a first lateral side thereof and the longitudinal axis of a second neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus on an opposing lateral side thereof

**[0102]** In Example 19, the method of Example 18 can include providing two cleaning heads each having a first upper surface and a second opposing lower surface and

attaching cleaning tools to at least the opposing lower surface of at least one of the cleaning heads and coupling a first cleaning head to the first neck end of a first neck and coupling a second cleaning head to the first neck end of a second neck.

**[0103]** In Example 20, the method of at least one of Examples 18-19 is a method for manufacturing an apparatus configured as a toothbrush.

**[0104]** In Example 21, a two-headed toothbrush can include a handle including a first handle portion and first and second necks, each neck including a first neck end and an opposing second neck end, wherein the second neck end of both necks is coupled to the first handle portion and the longitudinal axis of the first neck forms an angle of between about 30 degrees and about 100 degrees with a longitudinal axis of the toothbrush on a first lateral side of the toothbrush and the longitudinal axis of a second neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the toothbrush on an opposing lateral side of the toothbrush.

**[0105]** In Example 22, the two-headed toothbrush of at least one of Examples 1-21 can include first and second individual cleaning heads each having a proximal portion closest to the first neck end and an opposing distal portion, each cleaning head having an upper side facing in a substantially same direction as the upper side of the toothbrush and an opposing lower side, a longitudinal axis that intersects the proximal and the distal portions of the cleaning head, and at least the lower side of at least one cleaning head includes cleaning tools coupled thereto, wherein each of the cleaning heads is coupled to one of the necks at the first neck end and the cleaning head proximal portion.

**[0106]** In Example 23, one or more of the necks of at least one of Examples 1-22 is non-straight, non-coplanar, or non-coaxial, or any combination of the foregoing, with a longitudinal axis of the toothbrush.

**[0107]** The above detailed description comprises references to the accompanying drawings, which form a part of the detailed description. The drawings show, by way of illustration, specific embodiments in which the invention can be practiced. These embodiments are also referred to herein as "examples." Such examples can comprise elements in addition to those shown or described. However, the present inventor also contemplates examples in which only those elements shown or described are provided. Moreover, the present inventors—also contemplates examples using any combination or permutation of those elements shown or described (or one or more aspects thereof), either with respect to a particular example (or one or more aspects thereof), or with respect to other examples (or one or more aspects thereof) shown or described herein.

**[0108]** In this document, the terms "a" or "an" are used, as is common in patent documents, to denote one or more than one, independent of any other instances or usages of "at least one" or "one or more." In this document, the term "or" is used to refer to a nonexclusive "or," such that "A or B" comprises "A but not B," "B but not A," and "A and B," unless otherwise indicated. In this document, the terms "comprising" and "in which" are used as the plain English equivalents of the respective terms "comprising" and "wherein." Also, in the following claims, the terms "comprising" and "wherein" are opened, that is, a system, device, article, composition, formulation, or process that comprises elements in addition to those listed after such a term in a claim are still deemed to fall within the scope of that claim. Moreover, in the following claims, the

terms “first,” “second,” and “third,” etc. are used merely as labels, and are not intended to impose numerical requirements on their objects.

[0109] Method examples described herein can be machine or computer-implemented at least in part. Some examples can comprise a computer-readable medium or machine-readable medium encoded with instructions operable to configure an electronic device to perform methods as described in the above examples. An implementation of such methods can comprise code, such as microcode, assembly language code, a higher-level language code, or the like. Such code can comprise computer readable instructions for performing various methods. The code can form portions of computer program products. Further, in an example, the code can be tangibly stored on one or more volatile, non-transitory, or non-volatile tangible computer-readable media, such as during execution or at other times. Examples of these tangible computer-readable media can comprise, but are not limited to, hard disks, removable magnetic disks, removable optical disks (e.g., compact disks and digital video disks), magnetic cassettes, memory cards or sticks, random access memories (RAMs), read only memories (ROMs), and the like.

[0110] The above description is intended to be illustrative, and not restrictive. For example, the above-described examples (or one or more aspects thereof) can be used in combination with each other. Other embodiments can be taught, such as to one of ordinary skill in the art upon reviewing the above description. The Abstract is provided to comply with 37 C.F.R. §1.72(b), to allow the reader to quickly ascertain the nature of the technical disclosure. It is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims. Also, in the above Detailed Description, various features can be grouped together to streamline the disclosure. This should not be interpreted as intending that an unclaimed disclosed feature is essential to any claim. Rather, inventive subject matter can lie in less than all features of a particular disclosed embodiment. Thus, the following claims are hereby incorporated into the Detailed Description as examples or embodiments, with each claim standing on its own as a separate embodiment, and it is contemplated that such embodiments can be combined with each other in various combinations or permutations. The scope of the invention should be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled.

1. A two-headed cleaning apparatus comprising:  
a handle including a first handle portion;

first and second necks, each neck including a first neck end and an opposing second neck end, wherein the second neck end of both necks is coupled to the first handle portion and a longitudinal axis of the first neck forms an angle of between about 30 degrees and about 100 degrees with a longitudinal axis of the apparatus on a first lateral side of the apparatus, and a longitudinal axis of the second neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus on an opposing second lateral side thereof; and

first and second individual cleaning heads coupled to the first neck end of the first and second necks, respectively, wherein the cleaning heads each have a proximal portion closest to the first neck end and an opposing distal portion farthest therefrom, wherein the coupling is between the first neck end and the proximal portion of the clean-

ing head, and wherein each cleaning head has a front side and an opposing back side, and the front side of each cleaning head includes cleaning tools coupled thereto, wherein the front sides of the cleaning heads are configured in a non-opposing relationship.

2. The apparatus of claim 1, wherein at least one first neck end is coupled to a cleaning head at a location between the portion of the cleaning head closest to the longitudinal axis of the apparatus and the portion of the cleaning head farthest from the longitudinal axis of the apparatus.

3. The apparatus of claim 1, wherein a longitudinal axis of at least one cleaning head forms an angle of less than 180 degrees with a distal portion of the neck to which it is coupled on a lateral side of the neck.

4. The apparatus of claim 1, wherein a longitudinal axis of at least one cleaning head forms an angle of less than 180 degrees with a distal portion of the neck to which it is coupled on a medial side of the neck.

5. The apparatus of claim 1, wherein a longitudinal plane of at least one cleaning head is non-coplanar with a longitudinal plane of a distal portion of the neck to which the cleaning head is coupled.

6. The apparatus of claim 1, wherein a transverse plane of at least one cleaning head is non-coplanar with a transverse plane of the apparatus.

7. The apparatus of claim 1, wherein a profile of at least one cleaning head or cleaning tool includes at least one curve.

8. (canceled)

9. The apparatus of claim 1, wherein the first cleaning head faces in a first direction relative to a transverse plane of the cleaning apparatus and the second cleaning head faces in an opposing direction.

10. The apparatus of claim 1, wherein a longitudinal plane of at least one neck is canted in a same direction as an upper side of the apparatus and forms an interior obtuse angle with a longitudinal plane of the apparatus on the upper side of the apparatus.

11. The apparatus of claim 1, wherein a profile of at least one of the first and second necks includes at least one curve.

12. The apparatus of claim 1, wherein the cleaning tools include at least one material chosen from the group including sponge, wire, lambs' wool, steel wool, an abrasive material, pad, bristles, or a combination thereof.

13. The apparatus of claim 1, wherein the apparatus is configured as one of a toothbrush, a bath brush or a shower brush.

14. (canceled)

15. The apparatus of claim 1, wherein a portion of the handle farthest from the second neck end is substantially flat and such that the apparatus can be stood erect on that portion of the handle.

16. The apparatus of claim 1, wherein the handle includes a portion configured to accommodate an inscription of an image or lettering.

17. A method of manufacturing a two-headed cleaning apparatus, the method comprising the steps of:

providing a handle having a first handle portion;

providing first and second necks each having a first neck end and an opposing second neck end;

coupling the second end of both necks to the first handle portion in such a way that a longitudinal axis of a first neck forms an angle of between about 30 degrees and about 100 degrees with a longitudinal axis of the apparatus on a first lateral side thereof and a longitudinal axis

of a second neck forms an angle of between about 30 degrees and about 100 degrees with the longitudinal axis of the apparatus on an opposing lateral side thereof; providing two cleaning heads each having a front surface and an opposing back surface wherein the front surfaces of the cleaning heads are configured in a non-opposing relationship and attaching cleaning tools to the opposing back surface of at least one of the cleaning heads; and coupling a first cleaning head to the first neck end of the first neck and coupling a second cleaning head to the first neck end of the second neck.

**18.** The method recited in claim 17, wherein the method is a method for manufacturing an apparatus configured as a toothbrush.

**19.** A two-headed toothbrush comprising:  
a handle including a first handle portion;  
first and second necks, each neck including a first neck end and an opposing second neck end, wherein the second neck end of both necks is coupled to the first handle portion and a longitudinal axis of the first neck forms an angle of between about 30 degrees and about 100 degrees with a longitudinal axis of the toothbrush on a first lateral side of the toothbrush and a longitudinal axis of a second neck forms an angle of between about 30

degrees and about 100 degrees with the longitudinal axis of the toothbrush on an opposing lateral side of the toothbrush; and

first and second individual cleaning heads each having a proximal portion closest to the first neck end and an opposing distal portion farther from the first neck end, each cleaning head having a front side facing in a substantially same direction as a front side of the toothbrush and an opposing back side, and at least the front side of at least one cleaning head includes cleaning tools coupled thereto, wherein each of the cleaning heads is coupled to one of the necks at the first neck end, wherein the front sides of the cleaning heads are configured in a non-opposing relationship.

**20.** The toothbrush of claim 19, wherein one or more of the necks of the toothbrush is non-straight, non-coplanar, or non-coaxial with the longitudinal axis of the toothbrush.

**21.** The apparatus of claim 1, wherein the front sides of the cleaning heads are configured in a non-adjacent relationship.

**22.** The apparatus of claim 17, further comprising configuring the front sides of the cleaning heads in a non-adjacent relationship.

\* \* \* \* \*