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### MOUTHPIECE APPARATUS

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#### Abstract

The present invention relates to a mouthpiece apparatus for bridging the mismatch in shape between the generally circular cross section of a tube, such as a straw, and the more oval or elliptic shape of a person's mouth. The mouthpiece has an input interface, an output interface, and a continuous passageway connecting the input interface and the output interface. The input interface forms a socket in which to seat the tube, and the output interface conforms generally to the shape of the lips of a person's mouth in a natural state. In alternate embodiments, the adapter may be formed with, or pre-mounted to, a tube or straw, or to a vessel such as a juice box.

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## Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION [0001] The present application is a continuation of patent application Ser. No. 16/997,083 filed on Aug. 19, 2020, which claims benefit of provisional application 62/890,035, filed on Aug. 21, 2019, both of which are hereby incorporated by reference.

### FIELD OF THE INVENTION

[0002] The present invention relates generally to the field of mouthpieces. More specifically, the present invention relates to a novel mouthpiece apparatus that reduces the strain that is otherwise placed on an individual's jaw and/or facial muscles when utilizing a drinking straw, a mouth tube, inhaler, or the like. Accordingly, the present specification makes specific reference thereto. However, it is to be appreciated that aspects of the present invention are also equally useable with other like applications, devices and methods of manufacture.

### BACKGROUND

[0003] The shape of a person's mouth does not typically match the cylindrical shape of a tube, a straw, or inhaler. More specifically, given the laterally extending opening of the human jaw, the mouth tends to have a dominant opening direction that extends laterally relative to the tube, straw or inhaler. Therefore, when engaging a straw, tube, or inhaler, the facial muscles of the person must flex, or deflect, in an un-natural manner to form a seal around the cylindrical shape in order for it to function as intended. Prolonged use of straws, tubes and inhalers can cause muscle strain and discomfort, as well as lead to the formation of wrinkles on the user's face.

[0004] Therefore, there exists a long felt need in the art for a mouthpiece apparatus that can be used in conjunction with a straw, a tube, an inhaler or the like to reduce the strain otherwise placed on the face of the user. There is also a long felt need in the art for a mouthpiece apparatus that more closely resembles the natural profile of the user's mouth, and that does not require the pursing or puckering of the user's lips when utilizing a straw, a tube, or an inhaler. Finally, there is a long felt need in the art for a mouthpiece apparatus that is easily transportable and reusable.

### SUMMARY

[0005] The following presents a simplified summary in order to provide a basic understanding of some aspects of the disclosed innovation. This summary is not an extensive overview, and it is not intended to identify key/critical elements or to delineate the scope thereof. Its sole purpose is to present some general concepts in a simplified form as a prelude to the more detailed description that is presented later.

[0006] In an aspect of the invention there is a mouthpiece tube end adapter. The adapter is comprised of a body having an opening of a passageway extending therethrough, wherein the passageway is further comprised of both an inlet and an outlet and an axial direction. The inlet defines a socket for removably receiving an end of a straw, a tube or an inhaler, and forming an interference and generally water-tight fit therebetween. The body is further comprised of an exterior wall extending peripherally about the passageway. The peripheral exterior wall presents an engagement surface for a user's lips. The body is further comprised of a major dimension and a minor dimension extending cross-wise to the axial direction. The minor dimension defines a mouthpiece height and the major dimension defines a mouthpiece width, wherein the major dimension is larger than the minor dimension. In a preferred embodiment, the body diminishes in height from a maximum height at the minor dimension to a lesser height at first and second opposed ends of the major dimension.

[0007] In one embodiment of the invention, the body is symmetrical relative to the passageway. In another embodiment, the socket includes an internal axial stop limiting axial depth of the socket. In yet another embodiment, the socket tapers inwardly. In still another embodiment, the body is a

hollow shell. In a yet further embodiment, when viewed axially, the mouthpiece adapter is one of: (a) a predominantly polygonally shape; (b) a predominantly elliptical shape; and (c) a predominantly oval shape. In still another embodiment, when viewed sideways along the major dimension, the body is radiused to present a smooth surface facing away from the socket. In another embodiment, the major dimension is at least double the minor dimension, and the body tapers to points at either end of the major dimension. In still another embodiment, the socket is generally non-circular in its cross-section. In a further embodiment, the inlet of the passageway has a chamfered lead-in.

[0008] To the accomplishment of the foregoing and related ends, certain illustrative aspects of the disclosed innovation are described herein in connection with the following description and the annexed drawings. These aspects are indicative, however, of but a few of the various ways in which the principles disclosed herein can be employed and is intended to include all such aspects and their equivalents. Other advantages and novel features will become apparent from the following detailed description when considered in conjunction with the drawings.

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## Description

### BRIEF DESCRIPTION OF THE DRAWINGS

[0009] These and other aspects and features of the invention may be more readily understood with the aid of the illustrative Figures below, showing an example, or examples, embodying the various aspects and features of the invention, provided by way of illustration, and in which:

[0010] FIG. 1*a* illustrates a perspective view of one possible embodiment of the mouthpiece adaptor of the present invention in accordance with the disclosed architecture;

[0011] FIG. 1*b* is the same view of the adaptor of FIG. 1*a* with hidden lines shown;

[0012] FIG. 1*c* is a top view of the adaptor of FIG. 1*a*;

[0013] FIG. 1*d* is a bottom view of the adaptor of FIG. 1*a*;

[0014] FIG. 1*e* is a front view of the adaptor of FIG. 1*a*, the rear view being the same;

[0015] FIG. 1*f* is a left-end or left-side view of the adaptor of FIG. 1*a*, the right-end or right-side view being the same;

[0016] FIG. 1*g* is a central cross-sectional view of the adaptor of FIG. 1*a* taken on the major axis;

[0017] FIG. 1*h* is a central cross-sectional view of the adaptor of FIG. 1*a* taken on the minor axis;

[0018] FIG. 2*a* illustrates a perspective view of an alternative embodiment of the mouthpiece adaptor of the present invention in accordance with the disclosed architecture, and comprising an entry chamfer and an internal stop shoulder;

[0019] FIG. 2*b* is the same view of the adaptor of FIG. 2*a* with hidden lines shown;

[0020] FIG. 2*c* is a top view of the adaptor of FIG. 2*a*;

[0021] FIG. 2*d* is a bottom view of the adaptor of FIG. 2*a*;

[0022] FIG. 2*e* is a front view of the adaptor of FIG. 2*a*, the rear view being the same;

[0023] FIG. 2*f* is a left-end or left-side view of the adaptor of FIG. 2*a*, the right-end or right-side view being the same;

[0024] FIG. 2*g* is a central cross-sectional view of the adaptor of FIG. 2*a* taken on the major axis;

[0025] FIG. 2*h* is a central cross-sectional view of the adaptor of FIG. 2*a* taken on the minor axis;

[0026] FIG. 3*a* illustrates a perspective view of an alternative embodiment of the mouthpiece adaptor of the present invention in accordance with the disclosed architecture, and comprising an entry chamfer, an internal stop shoulder, and a hollow shell body;

[0027] FIG. 3*b* is the same view of the adaptor of FIG. 3*a* with hidden lines shown;

[0028] FIG. 3*c* is a top view of the adaptor of FIG. 3*a*;

[0029] FIG. 3*d* is a bottom view of the adaptor of FIG. 3*a*;

[0030] FIG. 3*e* is a front view of the adaptor of FIG. 3*a*, the rear view being the same;

[0031] FIG. **3f** is a left-end or left-side view of the adapter of FIG. **3a**, the right-end or right-side view being the same;

[0032] FIG. **3g** is a central cross-sectional view of the adapter of FIG. **3a** taken on the major axis;

[0033] FIG. **3h** is a central cross-sectional view of the adapter of FIG. **3a** taken on the minor axis;

[0034] FIG. **4a** illustrates a perspective view of an alternative embodiment of the mouthpiece adaptor of the present invention in accordance with the disclosed architecture;

[0035] FIG. **4b** is a top view of the adapter of FIG. **4a**;

[0036] FIG. **4c** is a front view of the adapter of FIG. **4a**, the rear view being the same;

[0037] FIG. **5a** illustrates a perspective view of an alternative embodiment of the mouthpiece adaptor of the present invention in accordance with the disclosed architecture, and comprising an integrally formed or pre-connected tube;

[0038] FIG. **5b** is a top view of the adapter of FIG. **5a**;

[0039] FIG. **5c** is a bottom view of the adapter of FIG. **5a**;

[0040] FIG. **5d** is a front view of the adapter of FIG. **5a**, the rear view being the same;

[0041] FIG. **5e** is a central cross-sectional view of the adapter of FIG. **5a** taken on the major axis;

[0042] FIG. **5f** is a left-end or left-side view of the adapter of FIG. **5a**, the right-end or right-side view being the same;

[0043] FIG. **5g** is a central cross-sectional view of the adapter of FIG. **5a** taken on the minor axis;

[0044] FIG. **6a** illustrates a perspective view of an alternative embodiment of the mouthpiece adaptor of the present invention in accordance with the disclosed architecture, and mounted to a chamber or container;

[0045] FIG. **6b** shows the adapter and container of FIG. **6a** in a front view, the rear view being the same;

[0046] FIG. **6c** shows an end or side view of the adapter and container of FIG. **6a**, the opposite side or end view being the same;

[0047] FIG. **6d** shows a top view of the adapter and chamber or container of FIG. **6a**;

[0048] FIG. **7a** illustrates a perspective view of an alternative embodiment of the mouthpiece adaptor of the present invention in accordance with the disclosed architecture;

[0049] FIG. **7b** shows a front view of the adapter of FIG. **7a**;

[0050] FIG. **7c** is a top view of the adapter of FIG. **7a**;

[0051] FIG. **7d** is an end or side view of the adapter of FIG. **7a**, the opposite end being the same;

[0052] FIG. **8a** illustrates a perspective view of an alternative embodiment of the mouthpiece adaptor of the present invention in accordance with the disclosed architecture;

[0053] FIG. **8b** is a top view of the embodiment of FIG. **8a**;

[0054] FIG. **8c** is a front view of the embodiment of FIG. **8a**, the back or rear view being the same; and

[0055] FIG. **8d** is a side or end view of the embodiment of FIG. **8a**.

#### DETAILED DESCRIPTION

[0056] The innovation is now described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding thereof. It may be evident, however, that the innovation can be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form in order to facilitate a description thereof. Various embodiments are discussed hereinafter. It should be noted that the figures are described only to facilitate the description of the embodiments. They are not intended as an exhaustive description of the invention or do not limit the scope of the invention. Additionally, an illustrated embodiment need not have all the aspects or advantages shown. Thus, in other embodiments, any of the features described herein from different embodiments may be combined.

[0057] For the purposes of this disclosure, a Cartesian frame of reference may be employed. In

such a frame of reference, the long, or largest, dimension of an object may be considered to extend in the direction of the x-axis, the base of the article, where substantially planar, may be considered to extend in an x-y plane, and the height of the article may be measured in the vertical, or z-direction. In other contexts, the z-direction may be the through thickness of a substantially planar panel where the major dimensions lie in the x- and y-directions. The largest projected facing view of objects described herein may be designated arbitrarily as either the front and rear or sides, faces, or portions of the container. Similarly, the top and bottom are arbitrarily designated, as these terms may be appropriate for the customary orientation in which the objects may usually be found, sold, or employed, notwithstanding that the objects may be picked up and placed on one side or another from time to time at the user's choice. That is, to the extent that various items are used with drinking or inhaling tubes or straws, and have a passageway along which a liquid flows, the outlet of the straw or tube is understood to be the top end, and the inlet is understood to be the bottom end. Accordingly, the portion of the adapters discussed herein that is on the inlet side is arbitrarily the bottom, and the portion that is on the outlet side is the top, whether or not these faces are precisely vertically facing.

[0058] Referring initially to the drawings, FIGS. **1a-1h** illustrate one possible embodiment of the mouthpiece adaptor **20** of the present invention for a tube end. Mouthpiece adaptor **20** may also be referred to herein as a connector, a coupling, an interface, or an apparatus, and comprises a body **22**. A bore or continuous opening is formed through body **22** to define a passageway or passage **24**. Passage **24** is comprised of an inlet **26** and an outlet **28**. An internal wall **30** extends about, and defines the periphery of the passage **24**. Part or all of internal wall **30** defines an accommodation, or seat, or tube adapter interface identified as a socket **32**, as best shown in FIG. **1h**. Socket **32** is shaped and sized to receive the end of a tube, straw, inhaler or the like (not shown). The inlet direction of socket **32** faces downward, i.e., so that a tube may be introduced in the upward direction (or z-direction) to seat in socket **32**. As best shown in FIG. **1a**, internal wall **30** is preferably cylindrical in shape and having a circular. In a preferred embodiment, socket **32** may have a shallow draft angle  $\alpha$ , such that it is tapering and narrowing as the tube or straw is advanced upward along passage **24**. The provision of a shallow draft angle  $\alpha$  may tend to (a) facilitate manufacturing of apparatus **20**; (b) allow a slight mis-match in size, or range of sizes, relative to the tube diameter of the tube or straw to be engaged therein; and (c) function as a wedge to squeeze the end of the tube or straw as it is inserted, thereby compressing the end circumferentially and forming an interference fit, and tending to form a seal about the outside of the tube. The draft angle  $\alpha$  is exaggerated for the purpose of illustration, and is preferably of the order of less than 3 degrees of arc.

[0059] Body **22** is further comprised of an external wall **40** that extends around, and faces outwardly away from, passage **24**. External wall **40** comprises a surface, or land **42**, that extends in the axial direction, and that extends peripherally about body **22**. That surface, or land **42**, presents a sealing surface, or sealing interface such as may be engaged by a person's lips. In this regard, land **42** defines an adapter output interface. As such, body **22** had an adapter input interface for engagement with a tube or straw, defined by socket **32**; and an adapter output interface for engagement with a person's mouth, as defined by peripherally extending land **42** of external wall **40**. Body **22** is also comprised of a rearward facing portion, region, surface, or wall **34** that extends radially outwardly away from outlet **24** to the portion of external wall **40** defining the land **42**. Similarly, body **22** is further comprised of a forwardly (i.e., toward the tube) facing region, portion, surface or wall **36** that extends radially away from inlet **26** to land **42**.

[0060] In the embodiment depicted in FIG. **1a**, external wall **40** is generally cylindrical, or predominantly cylindrical in shape. It may have, and in the embodiment illustrated does have, a generally elliptical shape, as seen in the bottom and top views depicted in FIGS. **1c** and **1d**. External wall **40** has a minor axis and a major axis. The minor axis extends generally in the y-direction, and the major axis extends generally in the x-direction. Furthermore, and as best shown

in FIGS. **1c**, **1f** and **1h**, external wall **40** has a corresponding major dimension  $L_{\text{sub.40}}$ , being its overall length in the x-direction, a minor dimension  $W_{\text{sub.40}}$ , being its overall width in the y-direction, and a through-thickness dimension  $h_{\text{sub.40}}$  in the axial direction. Inasmuch as body **22** is to fit in a person's mouth, the major dimension is larger than the minor dimension. In the particular embodiment shown in FIGS. **1a** through **1h**, the major dimension is more than double the minor dimension. For the comfort of the user, the ratio of the length (i.e., major dimension) to width (i.e., minor dimension) may be in the range of 2:1 to 8:1. More narrowly, it may be in the range of 2½:1 to 5:1. In the embodiment shown it is approximately 4:1. In this arrangement the sides extending away from the central bore can be thought of as first and second or left and right hand wings, generally suited to the shape of a person's mouth. Although passage **24** could be eccentric or asymmetric relative to body **22**, it is convenient and it simplifies design and construction for passage **24** to be centered in body **22** such that body **22** has first and second, or left-hand and right-hand wings **44**, **46** (as best shown in FIG. **3a**) that extend symmetrically to either side of passage **24**.

[0061] In the embodiment illustrated in FIGS. **2a-2h**, there is a connector, or coupling, or fitting, or interface, or an adapter **50**. As before, it has a body **52** having a bore defining a passageway **54**. Passageway **54** is comprised of first and second ends identified as an inlet **56** and an outlet **58**. As with adapter **20**, the exterior of body **52** has a surface **60** defining a land to be engaged by a person's mouth. As before, a socket is formed within passageway **54** in which to receive the end of a tube, straw, inhaler or the like. Also as before, passageway **54** may be, and as illustrated is, generally cylindrical with a circular in cross-section.

[0062] Nonetheless, adapter **50** differs from adapter **20** insofar as body **52** has an internal surface of a bore **62** that defines passageway **54** and also has an internal abutment, or stop, or dog, or shoulder **64** located axially inwardly of inlet **56**. Shoulder **64** may be, and in the example illustrated is, located at or near the second end or outlet **58** of passageway **54**, and may then define the range-of-motion limiting element that establishes the inner end of socket **68** into which the tube or straw locates. The radially inward extent of shoulder **64** may be the same as, or roughly the same as, the wall thickness of the tube, such that, when installed, the inside surface of the tube is generally flush with the circumferentially extending inside face of shoulder **64**, though the same is not required for adaptor **50** to function as intended. However, if shoulder **64** stands radially further inwardly, then the cross-section of the flow path is reduced, and shoulder **64** may then function as a vena contracta, or flow restrictor, which may not necessarily be desirable. In any case, whether shoulder **64** extends about the full periphery of the circumference, or extends only partially thereabout, or is made of one or more partial sectors, or even nubs or other radially inward protrusions, it functions as an abutment, or abutments, to limit the axial range of travel of the end of the tube inwardly (i.e., upwardly) along the socket defined within passageway **54**. Additionally, in a preferred embodiment of the present invention, inlet **56** is chamfered, or radiused, as at **66**, to provide a lead-in to facilitate introduction of the tube or straw into the socket **68**.

[0063] As may be noted, in the embodiment of FIGS. **1a-1g** and in the embodiment of FIGS. **2a-2g**, adapters **20** and **50**, as may be the case, have substantially solid bodies **22**, **52**, such as may be made as molded plastic or metal slugs, or solid wooden pieces, or fired ceramics. In the embodiment of the present invention illustrated in FIGS. **3a-3g**, there is an apparatus that is a connector, interface, coupling, or fitting that is identified as adapter **70**. It may be taken as being the same as adapter **20** or adapter **50**, as may be the case, but rather than being a substantially solid body, adapter **70** has a body **72** that is substantially hollow in its interior. That is, body **72** has a central portion or region or structure **74** that may have the form of a tube **76** forming the central flow passageway **96**. Tube **76** also defines a receptacle or accommodation or socket **78** into which the end of a tube, straw, inhaler or the like is received, as before. Body **72** is further comprised of a shell **80** that is substantially hollow, and a peripheral wall **82** that extends in the axial direction and defines a land **84** against which the lips of a person may form a seal. Shell **80** also has a rearwardly

facing member or plate **88** that closes off the radially and circumferentially extending gap that would otherwise exist between outlet **86** and the periphery of wall **82**, thereby blocking the passage of fluid through that gap. Shell **80** mates with central structure **74** such that outlet **58** and plate **88** are connected. In the embodiment illustrated in FIGS. **3c** and **d**, adapter **70** is a molded part in which central structure **74** and outer shell **80** are formed as a single monolithic member.

[0064] In effect, each of adapters **20**, **50** and **70** is a form of pipe coupling having a first connection or first interface in the form of a seat, or receptacle or socket or accommodation for a tube end; and a second connection in the form of a seat or land, or socket, or accommodation for a non-circular connection or seal formed by a person's lips. In the first instance, the first socket is a female socket that accepts a male fitting, namely the tube or straw end that seats inside the socket. This fitting could also be in the form of a male socket that fits inside the end of the tube or straw, but such an arrangement would have the potential disadvantage of constricting the flow passageway by reducing its internal cross-sectional area. In the second instance, the second connection is effectively a second pipe fitting in the form of a male fitting that mates with an external female fitting. In each of these examples, the size and shape of the first connection is different from the size and shape of the second connection. That is, the first connection is generally cylindrical, and typically circular in cross-section, to correspond with the size and shape of the associated fitting of the end of the tube, straw, inhaler or the like. By comparison, the second connection or fitting is relatively larger, and circumscribes the first fitting. The second connection is also comprised of a major dimension and a minor dimension, wherein the major dimension is larger than the minor dimension.

[0065] In the embodiment illustrated in FIGS. **4a-4c**, there is a connector, or coupling, or interface, or fitting or adapter **100**. It may be taken as being the same as, or substantially the same as, any of adapters **20**, **50** or **70**. It differs therefrom in having a body **102** having a passageway **104** formed therethrough having an inlet **106** and an outlet **108**. More specifically, passageway **104**, while being cylindrical, or substantially cylindrical subject, for example, to the formation of a draft angle or taper, is of a non-circular cross-section. For example, the cross-section of passageway **104** may be oval or elliptical, as best shown in FIG. **4b**. The arc length of the periphery of internal wall **108** may remain the same as the circumference of the tube or straw that mates with the socket, seat or accommodation formed within passageway **104**, such that, again, a sealing interference fit is formed. A change in the shape of the section to an ellipse may tend to change, namely reduce, the cross-sectional flow passage area of the passageway, and may thereby tend to define a restriction. It is understood that adapter **100** may have a stop or abutment, and an inlet radius or chamfer as previously shown in the context of adapters **50** and **70**.

[0066] In the embodiment illustrated in FIGS. **7a** through **7d**, there is a mouthpiece, connector, coupling or adapter **120** that has the general physical appearance of a bow-tie. That is to say, adapter **120** has a body **122** that has a bore **124** defining a passageway **126** therethrough. The passageway **126** is comprised of a first end defining an inlet **118**, and a second end defining an outlet **128**. As before, the walls of the bore may have a slight draft angle or taper, as best illustrated in the embodiment illustrated in FIGS. **1a** through **1h**. Alternatively or additionally, there may be an internal stop or shoulder **64** as in adapters **50** and **70**, and the inlet may have a radius or chamfer as a lead-in. Furthermore, adapter **120** may have the hollow shell form of adapter **70**.

[0067] Adapter **120** is further comprised of a central portion **130** having a first side portion or wing **132**, and a second side portion or wing **134**. Central portion **130** has a bore **124** formed therethrough, that is generally cubic. First and second wings **132**, **134** are generally trapezoidal when viewed in plan view as in FIG. **7b**, with the narrow end of the trapezoid adjoining the generally cubic body of central portion **130**. That is, the trapezoidal sides or surfaces **146**, **148** combine with the flat sides of central portion **130** to form a continuous land for engagement by a person's mouth. The widening or diverging portion of the trapezoid may tend to present a shape that conforms to the shape of a person's mouth, wherein the jaws and teeth form a general U-shape

when seen from above. When seen in the front or rear views of FIG. 7c, wings **132**, **134** have an outwardly tapering, diminishing profile such as may correspond to the general shape of a person's mouth, and which may be triangular, or generally triangular as at **142**, **144** respectively. The first and second end faces **136**, **138** of body **122**, which include respective faces **142**, **144** and the forward and rearward faces of central portion **130** through which bore **124** is formed, are closed, as before, and prevent fluid flow other than through passageway **126**. Body **122** is axially cylindrical as illustrated, and the faces of the central and wing portions are individually flat and planar, such that the body is a polygon. The body, or its various elements or portions **130**, **132**, **134** need not have flat planar faces, and each of the portions could be axially tapering or narrowing in the direction away from the tube or straw.

[0068] In FIG. **8a** through **8d**, the mouthpiece, coupling, connector or adapter **150** has a body **152** that has a bore **154** defining a passageway **156**, as in any of the embodiments discussed above. However, rather than having an axially cylindrical external peripheral surface defining a land, and a radially-circumferentially extending portion of face defining a body or plate obstructing the difference in area between bore **154** and the exterior bore, these two elements or portions are combined in a single surface that extends generally radially, circumferentially and axially as a continuous curved surface **160**. That is, the curved surface includes radial, circumferential and axial components in a single compound curvature. The profile of the curve or contour from side to side is seen in the view of FIG. **8c**, and the profile of the rearwardly radiused shape in the direction of the minor dimension is seen in the end or side view of FIG. **8d**. The person's lips may meet the shape of surface **160** on the compound curvature, rather than on a purely axially extending surface. The leading portion of surface **160** may terminate in an axially cylindrical portion or border, or skirt **162**. As before, body **152** may be solid as in adapters **20**, **50** and **70**, or it may be a hollow shell, as in adapter **70**, and it has first and second wings **164**, **166** that extend laterally away from a central core.

[0069] In FIGS. **5a** through **5g**, an apparatus **180** is illustrated in which the outlet end adapter and the inlet tube have been provided in a single unit. That is, apparatus **180** is comprised of a tube portion, region or component **182**, and an adapter portion, region or component **184** which may have the outlet connection interface shape and function of any of adapters **20**, **50**, **70**, **100**, **120** or **150**, respectively. Again, there is a transition from a cylindrical tubular input, which may be a tube or straw of generally circular cross-section, to a larger, non-circular output interface in the form of a peripheral external surface **186** defining a land **188** for engagement by a person's lips. In the alternate embodiment of FIG. **5a**, adapter **170** has a stem or tube portion **172** and a body **174**, which are substantially the same as tube portion **182** and adapter portion **184**, except that the tube wall of tube portion **182** is relatively thicker, and the distal end of tube portion **182** (i.e., the end furthest from adapter portion **174**) has an internal shoulder **176** and a socket **178** into which to receive another tube or straw or like fitting. Tube portion **172** may be longer or shorter to suit the needs or preferences of the user. In effect, adapter **170** is analogous to a short pipe that extends between an inlet connector or coupling, namely socket **178**, and an outlet connector or coupling, namely body **174**.

[0070] In FIGS. **6a** through **6d**, there is an apparatus **190** that has the form of a combination of an adapter **192**, having the shape and function of any of adapters **20**, **50**, **70**, **100**, **120** or **150**, that is mounted to a fluid reservoir **194**, such as may be a drink box, bladder, or other similar device. In the illustrations, it is shown as a drink box, but it could be a different type of container. Such containers may typically be made of cardboard, and flex in size depending on the relative pressure inside and outside the container. In each case the outlet mouthpiece or connector or coupling or adapter is formed to correspond more closely and naturally to the shape of a person's mouth, rather than presenting merely a circular cylindrical tube end. The apparatus may, optionally, include an internal riser, or foot, in the form of a tube **196** that reaches down from adapter fitting **192** at the top to the bottom of the chamber, and is open at the bottom end to permit the user to draw fluid



from the bottom region of the chamber reservoir without inverting the apparatus.

[0071] As may be appreciated, and particularly in respect of adapters **20, 50, 70, 100, 120, 150** and **192**, the adapters may be provided in a range of distinctive colors or patterns, so that a person may recognize their own mouthpiece or adapter, as distinct from one being used by another person. Furthermore, where the adapter is removable, as are adapters **20, 50, 70, 100, 120** and **150**, they may themselves be re-washable and re-usable. Furthermore, the ability to remove the mouthpiece adapter from the tube may allow the tube to be removed and washed and sterilized. That is, the tube member may be made of stainless steel, or of a food-grade washable plastic, either of which may be either reusable or recyclable.

[0072] Notwithstanding the forgoing, the various adaptors of the present invention can be of any suitable size and configuration as is known in the art without affecting the overall concept of the invention, provided that it accomplishes the above stated objectives. One of ordinary skill in the art will appreciate that the size, configuration and material of the various adaptors shown in the FIGS. are for illustrative purposes only, and that many other sizes and configurations of the adaptor are well within the scope of the present disclosure. Although the dimensions of the various adaptors and their respective components are important design parameters for user convenience, the adaptors may be of any size that ensures optimal performance during use and/or that suits the owners' needs and/or preferences.

[0073] What has been described above includes examples of the claimed subject matter. It is, of course, not possible to describe every conceivable combination of components or methodologies for purposes of describing the claimed subject matter, but one of ordinary skill in the art may recognize that many further combinations and permutations of the claimed subject matter are possible. Accordingly, the claimed subject matter is intended to embrace all such alterations, modifications and variations that fall within the spirit and scope of the appended claims. Furthermore, to the extent that the term “includes” is used in either the detailed description or the claims, such term is intended to be inclusive in a manner similar to the term “comprising” as “comprising” is interpreted when employed as a transitional word in a claim.

## Claims

1. A mouthpiece adapter comprising: a body, the body comprising a first wing and a second wing adjoined by a cubic central portion, wherein each of the first wing and second wing comprise a trapezoidal shape when viewed in plan view and wherein a narrow end of the trapezoidal shape of each of the first wing and the second wing adjoins the cubic central portion; a bore defining a passageway therethrough in the cubic central portion, the bore comprising an inlet in fluid communication with an outlet.
2. The mouthpiece adapter of claim 1 wherein the passageway comprises an internal axial stop.
3. The mouthpiece adapter of claim 1 wherein the passageway is inwardly tapered.
4. The mouthpiece adapter of claim 1 wherein the body is symmetrical relative to the passageway.
5. The mouthpiece adapter of claim 1 wherein the inlet has a chamfered lead-in.
6. The mouthpiece adapter of claim 1 wherein the trapezoidal shape of each of the first and second wing adjoin with flat sides of the cubic central portion to form a continuous lip engagement surface.
7. The mouthpiece adapter of claim 1 wherein the body comprises a major dimension defining a length of the mouthpiece adapter and a minor dimension defining a width of the mouthpiece adapter, the major dimension being larger than the minor dimension.
8. The mouthpiece adapter of claim 7 wherein the first wing and second wing comprise an outwardly tapering, diminishing profile when viewed from a front or rear view along the major dimension, the outwardly tapering, diminishing profile of each of the first wing and the second wing forming a triangle shape.

9. The mouthpiece adapter of claim 7 wherein the major dimension is larger than the minor dimension by a factor of about 2 to about 4.
10. The mouthpiece adapter of claim 1 further comprising a stem portion in fluid communication with and extending from the passageway.
11. The mouthpiece adapter of claim 1 wherein the body comprises a hollow portion.
12. A mouthpiece adapter and tube combination for drinking or inhaling a fluid, comprising: a body having an inlet connected to a perpetually open outlet by a passageway comprising a continuous opening, and an exterior wall, wherein the cross-section of the inlet is substantially the same size and shape as the cross-section of the perpetually open outlet; a length of tube extending outwardly from the inlet, the passageway positioned between, and in fluid communication with, the perpetually open outlet and the length of tube, and, wherein the exterior wall extends peripherally about the passageway and comprises a lip engagement surface wherein the lip engagement surface defines a sealing interface for engaging with a user's lips.
13. The mouthpiece adaptor and tube combination of claim 12 wherein the body further comprises a major dimension and a minor dimension, the major dimension being larger than the minor dimension.
14. The mouthpiece adaptor and tube combination of claim 12 wherein the body is symmetrical relative to the passageway.
15. The mouthpiece adapter and tube combination of claim 12, wherein the exterior wall extends peripherally about the passageway and comprises a lip engagement surface.
16. The mouthpiece adapter and tube combination of claim 12 further comprising a stem portion extending from the inlet, the stem portion having a distal end with an internal shoulder and socket for receiving the tube.
17. A mouthpiece apparatus, the mouthpiece apparatus comprising, a body, the body comprising, an input interface defined by a passageway with an inlet and an outlet; an output interface conforming generally to a shape of a human's mouth; a rearward facing portion extending radially outwardly from the outlet towards the output interface; and, a forward facing portion extending radially outwardly from the inlet towards the output interface.
18. The mouthpiece apparatus of claim 17 wherein the body is symmetrical relative to the passageway.
19. The mouthpiece apparatus of claim 18 wherein the output interface comprises a surface extending peripherally about the body and axially tapering in a direction away from the passageway.
20. The mouthpiece apparatus of claim 17 wherein the passageway comprises an internal axial stop.
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