An end openable handle structure is provided for association with an object, such as a container or the like. The handle structure includes an elongated arm for hand grasping, a leg for supporting the arm at one end, and a bridging link for extending between the other or open arm end and an object to which the leg is attached. One end of the bridging link is attached pivotably to either the open arm end or to the object. The other end of the bridging link either abuts against the other one of either the object or the open arm end, thereby closing the bridging link handle structure, or pivots to an spaced, gap defining position relative to the closed position. Stop means limits travel of the bridging link beyond the closed position, and spring biasing means yieldingly urges the bridging link into the closed position.
HANDLE WITH OPENABLE END

FIELD OF THE INVENTION

[0001] This invention relates to openable handles, and more particularly to handles having an openable, biased, self-closing link at one end.

BACKGROUND OF THE INVENTION

[0002] Small transportable objects, including hand-held beverage containers and the like, have come into widespread use. Often, such a container even with a handle is not conveniently transported. Typically, such a container is relatively bulky and is not well suited for transporting or storing in a user’s pocket, briefcase, purse or backpack, and so must be carried and moved while held by one hand of the user.

[0003] It would be desirable for a beverage container or other small, transportable object to have an associated handle with an openable, but normally closed, end region so that the container can be connected to, for example, a strap, handle, ring or the like of a user’s other carried equipment, and thereby transported. Then, both hands of the user would be free for other operations.

[0004] Although various openable handle structures have previously been proposed, such as, for example, the structures disclosed in Weiss et al. U.S. Pat. No. 5,270,909 and Sarver U.S. Pat. No. 5,433,339, the prior art openable handle structures typically include components and features that are cumbersome, difficult to use or even unsafe. More than one hand may be needed for their utilization, such as in one or more of the operations of grasping, opening, support association or carrying. Even holding and transporting the object by hand can be difficult because the prior art openable handle structure may interfere, or be perceived by a user to interfere, with normal manual grasping and carrying of the handle structure. For example, sometimes, the structure of the openable prior art handle structure can interfere with its ability to connect with and to safely engage some accessible and handle-supporting component of the user’s transported equipment, and, after connection, to stay connected as a user moves.

[0005] The openable handle structure of Weiss et al. ’909 and of Sarver ’339 are similar to each other in that both handle structures require a pair of curved legs. Each leg is fixed at one end to a container or other portable object while the respective opposite end of each leg extends in spaced relationship relative to the other. These leg ends are interconnected together across a mid-region therebetween by an intervening, separate connecting arm. One end of this arm pivotally associates with the open end of one leg and the opposite arm end loosely slidably engages with the open end of the other leg. Experience indicates that this type of handle structure is perceived by a user as uncomfortable, and even difficult, to grasp and carry. Also, the requirement for this type of handle structure to have not only two separate legs that each outwardly extend from association with a container or other object, but also an interconnected, intervening, mid-region arm, can result in a difficulty, or even an inability, to hook the handle structure safely and effectively to or over a connecting support member, such as can exist with equipment being transported by a user.

[0006] For example, sometimes it is not convenient to advance the open mid-region gap of the handle structure over a connecting support member, sometimes the resulting hooked association is such that the releasable arm of the handle structure bears part of the handle’s associated container (or other object) weight, and sometimes the rocking or twisting action exerted on the hooked and mounted handle structure as the user moves, places stress forces on the releasable arm so that the releasable arm can open and release the handle structure from its support. As a result, the prior art handle structure can appear to a user to be unsafe or unreliable. The uses, applications and marketability of this type of prior art handle structure, particularly when associated with a beverage container, are thus limited.

[0007] Accordingly, the present invention aims to overcome the prior art openable handle problems and to provide an improved openable handle structure that is easy and convenient to associate with an object or to grasp with a hand, provides an improved ability to hook over and disengageably connect to a support member, and achieves a secure association with such a support member.

SUMMARY OF THE INVENTION

[0008] More particularly, this invention relates to an end-openable handle structure for association with an object, preferably a relatively small, transportable object, such as, for example, a beverage container, and for connection, if desired, to a support member for transporting in a hands-free manner.

[0009] The handle structure includes an elongated, hand graspable arm that is supported at a proximal end portion thereof by the joined first end portion of a leg. The opposite or second end portion of the leg is connectable to the object.

[0010] The handle structure further includes a pivotable bridging link for extending between the distal end portion of the arm and a spaced, adjacent portion of the object to which the handle structure may be connected. The bridging link has opposing forward and rearward portions. The rearward portion is pivotally mounted to one of either the distal end of the arm or the adjacent portion of the connected object. The forward portion is locatable at a link closed or first position that is in adjacent abutting relationship relative to the other one of either the object or the distal end. Thus, the bridging link forward portion is reversibly pivotable relative to its rearward portion for translation from the first position to a second position that is in spaced relationship relative to the first position. Thereby, in the second position, a gap is defined between the distal end portion of the arm and the bridging link through which, for example, an associatable and connectable support member for the handle structure may be extended.

[0011] The first end portion of the leg can be considered to include joining means for connecting the arm proximal end portion to the first end portion so that preferably a fixed, angular relationship is provided between the arm and the leg.

[0012] The second end portion of the leg can be considered to include connecting means for connecting the second end portion to the object so that a fixed angular relationship can exist between the leg and the object.

[0013] The joining means and the connecting means are preferably such that the elongated arm can be hand grasped
and moved (translated) without disrupting or breaking either the joined or the connected relationships achieved by the joining means and the connecting means, respectively.

[0014] The rearward portion of the bridging link can be considered to include pivotal mounting means that pivotally mounts the rearward portion as above indicated so that the forward portion of the bridging link is thus pivotable, as indicated above. The interrelationship between the pivotal mounting means and the distal end portion of the arm is such that the bridging link is pivotable and spatially movable inwards relative to the arm and leg subassembly when the end region of the handle structure is to be opened.

[0015] A stop means is provided that is preferably cooperatively associated with the first or link closed position. The stop means limits pivoting travel of the bridging link forward portion so that, when in the first position, further pivoting of the bridging link cannot normally occur in a direction that is outwards relative to the arm and leg subassembly. Thus, the bridging link can be pivoted inwards relative to the arm and leg subassembly when, for example, a hookably-associatable support member is applied there to, so that the hookably engageable member is inerably between the arm distal end portion and the object, yet, when the bridging link is thereafter positioned in the first or link closed position, the bridging link disengages the hookably engageable member from connected relationship with the hand and the object.

[0016] Preferably, spring biasing means is cooperatively associated with the bridging link, preferably in the vicinity of the pivotal mounting means, so that the bridging link forward portion is yieldingly urged into the indicated desired contacting relationship in the first or link closed position, whereby the bridging link is yieldingly biased into a self-closing orientation relative to, and between, the distal end portion of the arm and an associated object.

[0017] While the inventive handle structure is presently most preferably associated with an object that is relatively small lidded container, those skilled in the art will readily appreciate that many other objects can alternatively be associated with the handle structure.

[0018] Other and further objects, aims, features, purposes, advantages, embodiments, variations and the like will become apparent to those skilled in the art from the teachings of the present specification taken with the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] In the drawings:

[0020] FIG. 1 is a perspective view of one embodiment of a handle structure of the present invention, the handle structure embodiment being illustratively shown in association with a beverage container and an associated beverage lid that are shown in phantom;

[0021] FIG. 1A is an enlarged, fragmentary, detail view of the upper end region of the FIG. 1 embodiment showing the manner in which the foot portion of the handle structure mounts to the container;

[0022] FIG. 2 is a perspective view of another embodiment of the handle structure of the present invention, the handle structure embodiment being illustratively shown in association with another beverage container that is shown in phantom;

[0023] FIG. 2A is an enlarged, fragmentary, detail longitudinal sectional view taken along the line IIa-IIa of FIG. 2 in the lip region of the container structure;

[0024] FIG. 3 is a side elevational view of the handle structure embodiment shown in FIG. 2, but with a portion of the container’s side wall being broken away and with a portion of the handle structure embodiment’s support ring being broken away to show details of the ring structure;

[0025] FIG. 4 is a top plan view of the handle structure embodiment of FIG. 2;

[0026] FIG. 5 is a longitudinal sectional view through the handle structure and container combination of FIG. 2 with the container being shown in phantom and some parts of the handle structure being broken away;

[0027] FIG. 6 is a bottom plan view of the handle structure of FIG. 2 with the container being shown in phantom;

[0028] FIG. 7 is an exploded plan view of the bridging link and pivoting assembly employed in each of the handle structure embodiments of FIGS. 1 and 2;

[0029] FIG. 8 is a partially assembled but inverted view of the assembly shown in FIG. 7;

[0030] FIG. 9 is an enlarged, fragmentary, detail, plan view of the upper end region of handle assembly of FIG. 2 looking upwards from under the upper end of the handle structure showing bottom end portions of the handle structure fastening means, with the container being shown in fragmentary phantom, some parts thereof being broken away;

[0031] FIG. 10 is an enlarged, fragmentary, detail, view in longitudinal mid-section of the handle assembly of FIG. 2 showing the plug separated from the matingly engageable window in the downwardly projecting end of the foot upper end portion and showing fragmentary phantom the associated adjacent container side wall;

[0032] FIG. 10A is an enlarged, fragmentary, detail, perspective view of the upper end portion of the handle structure core employed in the handle structure embodiment of FIG. 2, this view being taken along the line XA-XA of FIG., 10;

[0033] FIG. 11 is a top view of the plug shown in FIG. 10;

[0034] FIG. 12 is a front view of the plug of FIG. 10;

[0035] FIG. 13 is a back view of the plug of FIG. 10;

[0036] FIG. 14 is an enlarged, fragmentary, detail view of a portion of the outside side wall of the associated container where the side wall supporting hook connects with an edge portion of the pivot leaf for the bridging link of the handle structure shown in FIG. 2;

[0037] FIG. 15 is a fragmentary side elevational view of the lower portion of an alternative embodiment of a handle structure embodiment of the invention, the handle structure illustratively here being in association with a container which has a radially constricted side wall mid-region, the
container being fragmentarily shown, some parts being broken away, and one position of the bridging link being shown in phantom;

[0038] FIG. 15A is an enlarged, fragmentary, detail, perspective view of the upper end region of the handle core structure of the alternative handle structure embodiment shown in FIG. 15;

[0039] FIG. 16 shows fragmentarily the lower region of an alternative handle structure embodiment of the invention wherein the pivoting link pivots from the distal end of the arm;

[0040] FIG. 17 is a view similar to FIG. 16 but showing a further alternative embodiment of such an alternative handle structure embodiment;

[0041] FIG. 18 is a perspective view of another embodiment of a handle structure of this invention, this handle structure being in associated combination with a cage-type handle structure support, this combination of handle structure and support being slidably and detachably associated with side wall portions of a container that is shown in phantom;

[0042] FIG. 19 is an opposite perspective view, relative to FIG. 18, of the handle structure and support structure combination shown in FIG. 18 with the associated container being shown in phantom;

[0043] FIG. 20 is an exploded perspective view of the handle structure and handle support combination of FIG. 18; and

[0044] FIG. 21 is an enlarged, fragmentary, detail perspective view of the handle structure and handle support combination assembly of FIG. 20 showing the manner in which the handle structure detachably associates with the handle supporting structure.

DETAILED DESCRIPTION

[0045] Referring to FIG. 1 and FIG. 1A, there is seen an embodiment 30 of an end-openable handle structure of the present invention. The handle structure 30 includes an elongated arm 31 that is adapted for grasping in and across the palm region of a hand. The arm 31 has a proximal end portion 32 and a generally opposed distal end portion 33. The handle structure 30 further includes a leg 35 having a first end portion 36 and a generally opposed second end portion 37. The first end portion 36 is joined to the proximal end 32 preferably integrally so as to define a unitary or one-piece type combination structure comprising leg 35 and arm 31. The arm 31 preferably extends at an acute angle approaching about 90° relative to the leg 35. For hand grasping convenience, preferably adjacent exterior inside (relative to the arm 31 and adjacent leg 35) surface portions between the arm 31 and the leg 35 define a curved surface region, and preferably the (hypothetical) longitudinal center line (not shown) of the leg 35 is preferably generally straight, and the (hypothetical) longitudinal center line (not shown) of the arm 31 is preferably slightly curved.

[0046] Exterior inside (relative to the arm 31 and adjacent leg 35) surface portions of the arm 31 preferably define transversely extending ridges or corrugations 34 arranged in longitudinally adjacent relationship to one another so as to provide intervening depressions that are adapted for contact with portions of a user’s fingers. Preferably the exterior configurations of the arm 31 and of the leg 35 are such as to adapt each for cooperative grasping of the arm 31 by the fingers and palm of a user’s hand with a side portion of the user’s forefinger optionally resting against a portion of the leg 35 and/or with a forward portion of the user’s thumb optionally resting upon an opposed portion of the leg 35. Various configurations for the arm 31 and the leg 35 can be employed as those skilled in the art will readily appreciate.

[0047] In the handle structure 30, the leg 35 and the arm 31 are unitarily formed of molded plastic, or here preferably and illustratively, a weldable metal. The second end portion 37 of the leg 35 is terminally transversely concavely and enlarged transversely and longitudinally so as to adapt the second end portion 37 for matingly fitting against a selected outside, upper, circumferentially extending, but longitudinally elongated, side wall surface portions of a container 43 that is fitted with a lid 42 that is adapted to close and cover the container mouth at the container 43 upper end. The container 43 here illustratively has steel (preferably stainless) exterior surface portions. The second end portion 37 is illustratively mounted to the indicated side wall surface portions adjacent to the container mouth by side weldments 38 (see FIG. 1A) or the like.

[0048] A component attachment site is preferably provided at a local location on the side wall of the container 43. Here, somewhat below the distal end portion 33 of the arm 31, a pivot leaf 45 is abutted against the container 43 sidewall and is welded thereto by further side weldments 38, or the like. The pivot leaf 45 preferably has circumferentially spaced, parallel, opposed side wall portions.

[0049] The handle structure 30 is provided with a bridging link 39 that has opposing forward 40 and rearward 41 portions. The bridging link 39 is conveniently formed of molded metal (preferred) or plastic, and it can be overcoated with a protective or distinctively colored identification layer, if desired. The rearward portion 41 is pivotally mounted to the pivot leaf 45. The forward portion 40 is located in adjoining or abutting relationship to a portion of the distal end 33 of arm 31 to define a first or bridging link 39 closed position such as illustrated in FIG. 1.

[0050] To pivotally mount the rearward portion 41 to the pivot leaf 45, the rearward portion 41 is provided a pair of ears 46 that preferably are integrally formed with, that extend preferably rearwardly therefrom the bridging link 39, and that preferably and as shown are in spaced, parallel relationship relative to each other. Each of the ears 46 is adapted to be received over and adjacent to a different one of the opposed side wall portions of the pivot leaf 45. Through aligned, transversely extending channels defined in the ears 46 and the pivot leaf 45, a pinle pin 48 is extended. Thereby, the forward portion 40 is adapted to pivot relative to the rearward portion 41, the pivot pin 48 and the pivot leaf 45, and thus the forward portion 40 is reversibly pivotable relative to the rearward portion 41 and so is movable from the indicated first position to a second position that is in spaced relationship relative to the first position whereby a gap is defined between the distal end portion 33 and the bridging link 39. Various pivotal mounting arrangements can be employed, as those skilled in the art will appreciate.

[0051] The interrelationship between the pivotal mounting assembly comprised of the ears 37, the pivot leaf 45 and the
pintle pin 48 at the rearward portion 41 of the bridging link 39 and the distal end 33 is such that the bridging link 39 is
spatially movable inwards relative to the arm 31 and leg 35 subassembly when the lower end region or distal end 33 of
the handle structure 30 is to be opened from the indicated first position by pivoting of the bridging link 39. Thus, the
forward portion 40 is reversibly pivotable relative to the rearward portion 41 from said first position to a second
position that is in spaced relationship relative to said first position, the pivotal movement being generally inward
relative to the arm 31 and generally towards the leg 35, thereby defining at said second position a gap between said
distal end portion 33 and the bridging link 39. While various directions (or planes) of pivotal movement can be defined by
the bridging link 39 relative to the pivot leaf 45, it is presently most preferred to have the pivot axis as set by the
location of the pintle pin 48 be substantially perpendicular to the (hypothetical) center plain defined by the mid-line or
center line of the arm 31.

[0052] To limit pivoting travel of the bridging link 39 relative to distal end 33 outwardly beyond the distal end 33, a stop
means is provided so that outward travel of the forward portion 40 cannot normally occur in a direction that is
outwards relative to the arm 31 and leg 35 subassembly and distal end 33. In the handle structure 30, the stop means
is achieved by the angle and shape of the respective adjoining faces of the forward portion 40 and the distal end portion
33. Thus, when the bridging link 39 is in its first or link closed position, as indicated above, these respective faces are
preferably and as shown in an abutting, face-to-face engagement that effectively terminates pivotal movement of
the forward portion 40 relative to the distal end portion 33. The combination of the stop means and the pivotal
movement of the bridging link 39 thus provided in effect preferably achieves, as desired, a type of lock that prevents a
support member for the handle structure 30 (not illustrated) that is positioned between the arm 31 and the object (here
container 43) and that is thus engaged with the handle structure 30 from becoming disengaged therefrom through
outward pivoting of the forward portion 40 beyond the distal end 33, as those skilled in the art will appreciate.

[0053] A spring biasing means is preferably provided that is cooperatively associated with the bridging link 39 and that
yieldingly urges the bridging link 39 into the indicated first or link closed position. Here, a coiled spring 49 (not detailed
in FIG. 1 but see FIG. 7, for example) is positioned around the shank of the pintle pin 48 with one opposite end of the
spring 49 resting against an adjacent portion of the pivot leaf 45 and the other opposite end of the spring 49 resting against
an adjacent region of the rearward portion 41 of the bridging link 39 in the assembled structure 30, as illustrated in FIGS.
7 and 8 for, and as employed in, the embodiment 51 of the handle structure (described below).

[0054] The handle structure 30 or other handle structure of the invention can be mounted to various containers, as will
be readily appreciated by those skilled in the art. The term “container” can be regarded herein as being used in a generic
sense to include various types of vessels with various types of names, including, for example, mugs, thermos-type
bottles and other types of bottles, flasks, jars, cups, holders, presses (including coffee presses), molds, and the like.
Alternatively, various objects can be associated with the handle structure 30 or other handle structures of the inven-
tion, including for example, a flashlight, a coil spring or other component of a machine, an air tank, a suitcase, an
umbrella, a ladder, a shovel or other hand tool, mountain climbing equipment, or the like. Various categories of users
can find a handle structure of the invention, such as the handle structure 30, useful with various objects including,
for example, commuters, travelers such as hikers, vehicle drivers, vehicle passengers, pilots, equipment operators,
office workers, students, teachers, researchers, developers, and testing persons, bird watchers, hunters, sports partic-
pants and sports enthusiasts, soldiers, sailors, security personnel, police officers, fire fighters, laborers, rescue workers,
forestry workers, farmers, assembly workers, mechanics, machinists, and the like. Indeed, the category of associateable
objects, especially transportable objects, with handle structures of the invention is very large, even not practically
limited.

[0055] As those skilled in the art will readily appreciate, many different types of mounting means can be used to
associate or connect the second end portion 37 with an object. For present illustration purposes, a few particular
suitable mounting means are shown, but those skilled in the art will appreciate that many different and other mounting
means can be utilized, if and as desired. The joining means associated with and connecting the first end portion 36 and
the proximal end portion 32, as those skilled in the art will readily appreciate, can be variously comprised. A handle
structure of the invention can be variously comprised and constructed.

[0056] A more preferred embodiment 51 of a handle structure of the invention is shown, for example, in FIGS.
2-14. Components and portions of handle structure 51 which are similar to, or correspond generally in function, purpose
or operation to, corresponding components and portions of the handle structure 30 are correspondingly numbered but
with the addition of prime marks added thereto for convenient identification purposes.

[0057] In the handle structure 51, the arm 31' and leg 35' have a common core 59 (see, for example, FIGS. 5 and 10).
The core 59 is conveniently and preferably comprised of a metal, such as steel. Preferably core 59 has a hollow interior
60. Convenantly, the core 59 is formed of two mating pieces of stamped and crimped sheet metal with respective edge
portions that interengage, as those skilled in the art will readily appreciate, or otherwise, if desired.

[0058] Alternatively, in another handle structure embodiment 65 such as shown, for example, FIGS. 15 and 15A,
one can employ, if desired, in place of the hollow core 59, a core 59A that is a solid, elongated, molded body comprised
of a metal or a rigid plastic. In handle structure embodiment 65, components which are similar to the components of
handle structure 30 or 51 are similarly numbered but with the addition of prime marks thereto for convenient
identification and reference purposes. In the handle structure 65, the flanges 63, 64 are integrally formed with the core 59A
(as shown in FIG. 15A).

[0059] Over surface portions of the core 59 or the core 59A, a plastic overlayer 61 is molded, thereby to form unitarily
the arm 31' and the leg 35'. Various overlayer plastics can be employed, but those skilled in the art will readily appreciate
that a preferred overlayer plastic is one of the well-known type which has easily gripped surface char-
acteristics that are tactilely comfortable when contacted by, and thereby sensed through, a user’s hand.

[0060] Alternatively, if desired, a unitary structure of leg 35 and arm 31, as in handle structure 30, can be formed by molding of metal or plastic, or by welding or adhesively bonding together the first end portion 36 of a preformed leg 35 with the proximal end portion 32 of a preformed arm 31 members, or otherwise, if desired. Also, if desired, mechanical means (particularly, for example, rivets, screws, or the like) can interconnect overlapping or abutting edge portions of respective preformed legs 35 and arm 31, or the like, and, if desired, the mechanical means can be adjustable, so as to alter, if desired, the angle between the leg 35 and the arm 31.

[0061] In the handle structure 51, the hollow common core 59 of the arm 31 and the leg 35 at the second end portion 37 terminates in a pair of downturned (relative to the distal end 33 of arm 31) flanges 63 and 64 that are located in a nested radially respective outward and inward relationship relative to each other and relative to an associated lip 68 of the mouth 69 of the container 74 (see FIG. 10, for example). Each flange 63, 64 is preferably uniformly formed of the sheet material of the core 59. The shape of portions of the molded plastic overlayer 61 at the second end portion 37, and the configuration and the spacing between each of the flanges 63 and 64 at the second end portion 37, is such as to permit the second end portion 37 to fit over and against local circumferenceal portions of the curved outer edge of the lip 68 of the mouth 69 of the container 44 with which the handle structure 51 associates. Terminal portions of the molded plastic overlayer 61 at second end portion 37 are in adjacent, abutting relationship with exterior cylindrical surface portions of the container 44. Flange 63 is in adjacent, abutting relationship with outside surface portions of the lip 48, and flange 64 is in adjacent, abutting relationship with inside surface portions of the lip 48. Conveniently and preferably, the container 44 and the lip 68 are relatively thin walled and are preferably comprised of a durable sheet material, such as stainless steel (preferred), plastic, or the like.

[0062] Preferably in the handle structure 51, the plastic overlayer 61 at the second end portion 37 is extended and formed preferably unitarily during the molding of plastic overlayer 61 to include an integrally molded handle structure-supporting ring structure 74. The ring structure 74 is oriented, configured and adapted to have respective portions that fit over and extend along edge portions of the lip 68 so that opposed portions of the ring structure form inside and outside surface portions of the lip 68 about the mouth 69 of the container 44. Preferably, as shown for example in FIG. 2, the radially inside portions 74A of the ring structure 74 extend downwardly (relative to the edge of the lip 68) along inside edge portions of the lip 68 further than the radially outside portions 74B of the ring structure 74 extend downwardly along outside edge portions of the lip 68, as shown, for example, in FIGS. 2 and 3.

[0063] A now preferred cross sectional configuration of the ring structure 74 is as illustrated in FIG. 2A where, for decorative purposes, a circumferentially extending bead 76 that can be variously colored if desired extends around the apex region of the ring structure 74 over or adjacent to edge portions of the lip 68. To retain the bead 76 in association with the adjacent portions of the ring structure 74, a circumferentially outwardly extending edge portion 77 of the bead 76 extends downwardly and seats in a mating groove defined in adjacent portions of the ring structure 74 at the lip 68 to retain the bead 76 in association with the ring structure 74. Bonding means, such as heat fusion or an adhesive, can be employed to fix the relationship between the edge portion 77 and contacting portions of the ring structure 74.

[0064] During assembly of the handle structure 51 with the container 74, regions of the inside portions of the ring structure 74 that are radially adjacent to the flange 63 can be raised or bent upwards and outwards angularly. During assembly of handle structure 51 with container 44, the flanges 63, 64 are compressed (clamped) together radially on each side of the lip 48 and the combination is spot welded (or heat welded, in the case of plastic) together while the arm 31 is held oriented in a fixed, longitudinal position relative to the outside of container 44.

[0065] The molded plastic overlayer 61 at second end portion 37 is conveniently and preferably provided with a downwardly extending (relative to the edge of the lip 48) projection 70. Defined perpendicularly, centrally and radially (relative to container 44) through projection 70 is a window 71 through which access to outer surface portions of the flange 63 are available. After the flanges 63, 64 are mounted to the lip 68, a mating plug 72, which is preferably comprised of a plastic similar to that used in the plastic overlayer 61 and its projection 70, is inserted into the window 71. The plug 72 serves to effectively mask exteriorly the flange 64 and any associated otherwise exteriorly visible marks from welding or the like. After flanges 63 and 64 are mounted over the lip 68, the ring structure 74 is positioned over the lip 68, thereby masking the presence of the flanges 63, 64 and related incidentally visible features.

[0066] The inside portions of the ring structure 74 conveniently and preferably have defined therein raised screw threads 75 (shown, for example, in FIG. 2) that are adapted to threadably and matingly engage with a cap (not detailed) that is adapted to fit over and close the mouth 69 of the container 44.

[0067] The handle structure 51, like the handle structure 30, incorporates a bridging link 39 that is similarly comprised and that extends between the distal end portion 33 and a preferably generally radially adjacent portion 80 (see, for example, FIG. 14) of the side wall of container 44 where a pivot leaf 45 can be mounted as in the handle structure 30. Here, however, alternatively, as a different mounting means for the pivot leaf 45, the side wall portion 80 of the container 44 is cut to provide an inverted U-type configuration and the flap thus defined is bent and formed into a hook like member 81 that is associated at its bottom with the side wall portion 80. A cavity is defined in the back wall portion of the pivot leaf 45 which is adapted to fit over and receive therein the hook-like member 81 thereby to provide a support for the pivot leaf 45. Portions of the pivot leaf 45 back wall, including the hook-like member 81, that are adjacent to the side wall portion 80 are mounted thereto by welding, adhesive, or the like as desired. Like pivot leaf 45, the pivot leaf 45 preferably has circumferentially spaced, parallel, opposed side wall portions.

[0068] The rearward portion 41 of bridging link 39 is pivotally mounted to the pivot leaf 45 similarly to the manner in which the pivot leaf 45 is pivotally mounted to the pivot leaf 45 using the ears 46 and the pivot pin 48.
Thereby, as in the case of the pivot link 39 of the handle structure 30, the forward portion 40 of the bridging link 39' is adapted to pivot relative to its rearward portion 41; and the pivot pin 48 and the pivot leaf 45, and thus the forward portion 40 is reversibly pivotable relative to the rearward portion 41 and so is movable from the indicated first position to a second position that is in spaced relationship relative to the first position whereby a gap is defined between the distal end portion 33 and the bridging link 39'. Various pivotal mounting arrangements can be employed, as those skilled in the art will appreciate.

[0069] As in the case of the bridging link 39, the interrelationship between the pivotal mounting assembly comprised of the ears 37, the pivot leaf 45 and the pintle pin 48 at the rearward portion 41 of the bridging link 39 and the distal end 33 is such that the bridging link 39' is spatially movable inwards relative to the arm 31' and leg 35 subassembly when the lower end region or distal end 33' of the handle structure 30 is to be opened from the indicated first position by pivoting of the bridging link 39. In the first position, the forward portion 40 abuts against the distal end 33'. Pivoting travel of the bridging link 39' relative to distal end 33' outwardly beyond the distal end 33 is limited by this abutment so that a stop means is provided that prevents outward travel of the forward portion 40 beyond the distal end 33'. The effectiveness of this stop means is adjustable and enhanceable by the angle and shape selected for the respective adjoining faces of the forward portion 40 and the distal end portion 33'.

[0070] To enhance the effectiveness of the stop means, and achieve an interlocking engagement between the distal end portion 33' and the forward portion 40, the forward portion 40 is provided with a forwardly projecting tab 83 that is preferably integrally formed with the bridging link 39 while the distal end portion 33' is provided with a slot 84 that is matingly engageable with the tab 83 when the forward portion 40 is pivoted to the location where it abuts against the distal end portion 33'. This arrangement is desirable and preferred because it reduces and even avoids the occurrence of the possibility that, under a loading force applied against the inside surface region of the bridging link 39' when in the first position, the forward portion 40 will be displaced laterally relative to the distal end 33. The position of the bridging link 39' when in the second position is illustrated in phantom in FIG. 15.

[0071] In an alternative handle structure embodiment 85 that is shown fragmentarily in FIG. 16, and is otherwise similar to the handle structure 30, the distal end 33 is provided with a terminal pivot leaf 86 (not detailed) that is preferably integrally formed with the arm 31 and that is similar in structure to the pivot leaf 45. Here, the rearward portion 91 (that is similar to the rearward portion 41 of bridging link 39) of a bridging link 90 is pivotably connected to the pivot leaf 86 by a pintle pin 89 (similarly to the pintle pin 48), and the forward portion 92 of bridging link 90 abuts when in the first position against a stop abutment button 88 that is bonded (preferred) or welded to the container 43 in a location chosen to connect with the forward portion 92 when the bridging link 90 is pivoted about pintle pin 89 to such first position. The position of the bridging link 90 when in its second position is shown in phantom in FIG. 16.

[0072] In an alternative handle structure embodiment 95 that is shown fragmentarily in FIG. 17, and that is otherwise similar to the handle structure 51, the distal end 33 is similarly provided with a terminal pivot leaf 97 (not detailed) that is preferably integrally formed with the arm 31' and that is similar in structure to the pivot leaf 45. Here, the rearward portion 96 (that is similar to the rearward portion 41 of bridging link 39) of a bridging link 98 is pivotably connected to the pivot leaf 97 by a pintle pin 99 (similarly to the pintle pin 48), and the forward portion 100 of bridging link 98 abuts when in the first position against a stop abutment button 101 that is bonded (preferred) or welded to the container 44 in a location where the abutment button 101 connects with the forward portion 100 when the bridging link 98 is pivoted about pintle pin 99 to such first position. The abutment button 101 is forwardly provided with a shelf notch 102 that is adapted to engage with a spur projection 103 on the forward portion 100 of bridging link 98 when the bridging link 98 is in the first position. The cooperative action between the spur projection 103 and the shelf notch 102 is comparable to that achieved between the tab 83 and the slot 84. The position of the bridging link 98 when in its second position is shown in phantom in FIG. 16.

[0073] In another handle structure embodiment 106 that is shown in FIGS. 18-21, the second end portion 107 of leg 108 is provided with a mounting support ring 109 that is preferably longitudinally flattened as shown and that is adapted to extend slidably and circumferentially around cylindrical side wall portions of an illustrative container 111. Lower circumferential edge portions of the ring 109 are configured to engage frictionally and reversibly with top circumferential edge portions of the top ring 112 of a mounting cage structure 114 with ring 112 and ring 109 being in a predetermined assembled position relative to each other, as illustrated in FIG. 21, for example. The mounting cage structure 114 incorporates unifiably the top ring 112 and a bottom ring 115 that are interengaged with one another by a plurality of longitudinally extending spars 116 (preferably four spars are employed) that are preferably circumferentially equally spaced from one another. The top ring 112 and the bottom ring 115 are each preferably longitudinally flattened, as shown. The mounting cage structure 114 is conveniently and preferably comprised of a molded plastic. The mounting cage structure 114 is adapted to slidably engage frictionally but disengageably circumferentially around the cylindrical side wall portions of the container 111.

[0074] The bottom ring 115 is provided with a preferably unitarily formed pivot leaf 117 that is similar in structure and form to the pivot leaf 45. A bridging link 118 that is similar in structure and form to the bridging link 39 is pivotably connected through a pair of laterally spaced, parallel ears 113 at its rearward portion 119 with the pivot leaf 117 by means of a pintle pin 120 that is similar in structure and form to the pin 48. The forward portion 121 of the bridging link 118 abuts against the distal end portion 123 of the arm 122 of the handle structure 106 when in its first position. The forward portion 121 is provided with a forwardly projecting tab or tongue 124 that is adapted to be matingly received in a slot or groove (not detailed) defined in the distal end portion 123 in a manner similar to the tab 83 and slot 84 in the handle structure 51, thereby to achieve a similar function. A spring 126 like the spring 49 has a coiled body that extends around the pintle pin 120 and yieldingly biases the forward portion 121 into engagement with the distal end.
portion 123. If desired, the channel provided through each of the ears 113 for the pintle pin 120 can be provided with outer end caps 127.

[0075] The mounting cage structure 114 functions, when engaged with the ring 109 and with the bridging link 118, to support the handle structure 106 in a removable but longitudinally and circumferentially adjustable position about and relative to the container 111.

[0076] Those skilled in the art will readily appreciate from the foregoing teachings that the end openable handle structures of this invention can be employed in combination with many different objects and structures. When the object or structure is a container, the container can be, for example, a mug, a thermos-type vessel for insulating hot or cold liquids, a coffee press, a baby feeding bottle, a vessel for holding materials for a laboratory experiment, or any other similar or comparable type of dispenser or container.

[0077] As those both skilled and unskilled, particularly in the container closure and cap arts will further appreciate, numerous structural and functional modifications and adaptations may be made in the handle structures of the present invention without departing from the spirit and scope of the invention.

What is claimed is:

1. An end openable handle structure for association with an object, said handle structure comprising in combination:

an elongated arm for grasping in a hand, said arm having a proximal end portion and an opposite distal end portion;

a leg for supporting said proximal end portion, said leg having a first end portion and an opposed second end portion, said first end portion being joined to said proximal end portion and including joining means, and said second end portion being connectable to said object;

a bridging link for extending between said distal end portion and said object, said bridging link having opposing forward and rearward portions, said rearward portion including pivot means that is connectable to one of either said distal end or said object whereby said forward portion is locatable at a first position that is in adjacent, abutting relationship relative to the other one of either said object or said distal end, and whereby said forward portion is reversibly pivotable relative to said rearward portion from said first position to a second position that is in spaced relationship relative to said first position, is generally inward relative to said arm, and is generally towards said leg, thereby defining at said second position a gap between said distal end portion and said bridging link;

spring biasing means cooperatively associated with said bridging link for yieldingly urging said bridging link into said first position; and

stop means cooperatively associated with said first position for limiting travel of said forward portion beyond said first position in a direction generally opposite to said second position;

whereby, when a force sufficient to cause said bridging link to pivot towards said second position is applied to said bridging link, said forward portion is pivotable to said second position.

2. The handle structure of claim 1 wherein said object is transportable.

3. The handle structure of claim 2 wherein said object is a lidded container.

4. The handle structure of claim 1 wherein said first end portion and said proximal end are integrally joined together with an acute angle therebetween.

5. The handle structure of claim 1 wherein said second end portion is associated with connecting means for connecting said second end portion to said object.

6. The handle structure of claim 5 wherein said connecting means includes clip means adapted to engage a portion of said object.

7. The handle structure of claim 6 wherein said object is a container having a mouth that defines a lip, and said clip means is adapted to extend over and engage a portion of said lip whereby said handle structure is engaged with said container.

8. The handle structure of claim 7 wherein said second end portion further includes an integrally formed ring structure that is adapted to extend around, overlie said clip means, and engage portions of said lip.

9. The handle structure of claim 1 wherein said rearward portion is pivotably engaged with said object and said first position is located between said distal end portion and said forward portion.

10. The handle structure of claim 1 wherein said rearward portion is pivotably engaged with said distal end and said first position is located between said object and said forward portion.

11. The handle structure of claim 1 wherein said rearward portion includes:

a pair of outwardly extending terminal ears that are pivotably associated with a leaf member by a pintle pin that associates with said ears and said leaf member, and said leaf member is connectable with one of either said distal end or said object, including connecting means.

12. The handle structure of claim 1 wherein said rearward portion includes:

a pair of outwardly extending terminal ears, and

one of either said distal end or said object has an outwardly extending leaf member that extends between said terminal ears, and that is pivotably connected therebetween by a pintle member;

whereby said rearward portion is pivotable about said pintle member.

13. The handle structure of claim 11 wherein said leaf member is integrally formed with said arm at said distal end portion.

14. The handle structure of claim 11 wherein said leaf member associates with a hook-like projection on said object.

15. The handle structure of claim 11 wherein said spring biasing means includes a spring that has a central coil which extends around portions of said pintle member and that has outwardly extending opposite end portions that each rest yieldingly against a different one of said bridging link and said leaf member.
16. The handle structure of claim 11 wherein said forward portion includes a forwardly extending tongue and the other one of either said object or said distal end has a groove defined therein that is sized to receive therein said tongue when said forward portion is in said first position.

17. The handle structure of claim 11 wherein said bridging link pivots about said pin member in a direction that extends towards said leg.

18. The handle structure of claim 1 wherein said arm and said leg are unitarily formed.

19. The handle structure of claim 18 wherein said arm and said leg have a core portion over which is molded a plastic.

20. The handle structure of claim 19 wherein said core includes a hollow central, elongated portion.

21. The handle structure of claim 20 wherein, at said second end portion, said core defines clip means that is adapted to extend over and engage an edge portion defined in said object whereby said handle structure is engageable with said object.

22. The handle structure of claim 21 wherein said clip means is fixed relative to said edge portion.

23. The handle structure of claim 1 wherein said second end portion and said rearward portion are each connected to support means that is is associateable with said object.

24. The handle structure of claim 23 wherein said support means is fixedly connected to said object.

25. The handle structure of claim 23 wherein said support means is disconnectably connected to said object.

26. The handle structure of claim 25 wherein said support means comprises a mounting cage-type structure that connects with said second end portion and also with said rearward portion and that slidably and circumferentially is extendable around cylindrical side wall portions of a container.

27. The handle structure of claim 26 wherein said mounting cage type structure comprises in unitary combination a top ring to which said second end portion is connected, a bottom ring to which said rearward portion is connected, and a plurality of longitudinally extending, circumferentially spaced spars whose respective upper end portions are joined to said top ring and whose respective lower end portions are joined to said bottom ring.

28. The handle structure of claim 27 wherein said second end portion is unitarily formed with a support ring that is adapted to extend circumferentially around said cylindrical side wall portions and that has bottom edge portions that are configured to engage with mating top edge portions of said top ring of said mounting cage type structure.

29. An end openable handle structure for association with an object, said structure comprising in combination:

an elongated arm for grasping in a hand, said arm having a proximal end portion and an opposite distal end portion;

a leg having a first end portion and an opposed second end portion, said first end portion being joined to said proximal end portion and including joining means, and said second end portion including connecting means for connecting said second end portion to said object;

a bridging link for extending between said distal end portion and a portion of said object that is located in spatially adjacent, spaced relationship to said distal end portion, said bridging link having opposing terminating forward and rearward portions, said rearward portion being pivotally mounted to one of either said distal end or said adjacent object portion and including pivotal mounting means, and said forward portion being locatable in adjacent, abutting relationship relative to the other one of either said adjacent object portion or said distal end, whereby said forward portion is reversibly pivotable relative to said pivotal mounting means between a first location that corresponds to said adjacent abutting relationship and a second location that corresponds to a spatial position that is in spaced, adjacent relationship relative to said first location;

spring biasing means cooperatively associated with said pivotal mounting means and with said bridging link for yieldingly biasing said bridging link into said adjacent, abutting relationship; and

stop means cooperatively associated with said first position for limiting travel of said forward portion beyond said first position in a direction generally opposite to said second position;

the interrelationship between said handle structure and said object when said connecting means is so connected with said object being such that:

(a) when said bridging link is pivoted by said pivoting means, said distal end is exposed and available for a reversible hooking-type association with a hookably associatable structure that is engageable with said elongated arm by relative movement of said hookably-associatable structure through the spatial region located between said distal end and said adjacent object portion, and

(b) after said arm is so associated with said hookably-associatable structure, said bridging link is self-pivotable by means of said spring biasing means back into said first position.

30. The handle structure of claim 29 wherein connecting means and said pivotal mounting means are each connected to a support means that is disconnectably associated with said object.