

[54] CONTAINER SUPPORT

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Related U.S. Application Data

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[52] U.S. Cl. **248/360; 215/100 A; 222/181**

[51] Int. Cl.² **A61B 19/00; A47G 29/02; B65D 23/10; A61B 19/00**

[58] Field of Search **248/360, 318, 311; 215/100 R, 100 A; 222/181**

[56] **References Cited**

UNITED STATES PATENTS

1,844,342	2/1932	Berman.....	215/100 R
2,065,012	12/1936	Mulford.....	248/318
2,780,225	2/1957	Barr et al.	215/100 R UX

3,017,883	1/1962	Dickinson	215/100 R UX
3,125,255	3/1964	Kaiser	222/181 X
3,311,268	3/1967	Fields.....	222/181 X
3,630,477	12/1971	Stadler.....	248/318
3,638,822	2/1972	McCoy	248/318 X
3,807,679	4/1974	Burke	215/100 A X

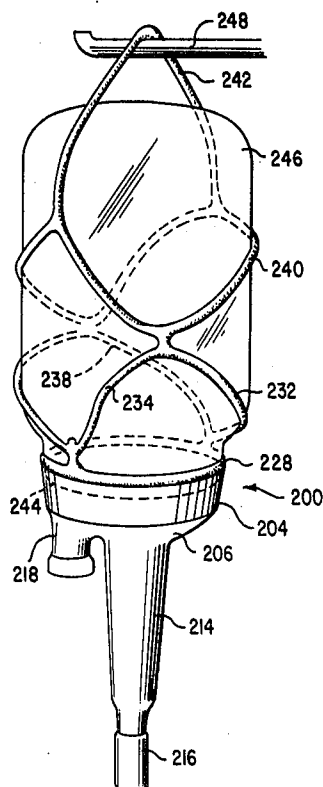
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[57] **ABSTRACT**

A support member for suspending a container which comprises a unitary flexible structure having an inner enclosure for engaging the neck of the container, an outer enclosure, a plurality of extendible segments between the enclosures joining the inner enclosure to the outer enclosure, and a hanger secured to the outer enclosure. The support member may be integral with the rim of a cap which encloses the open end of a container. Extension of the support member causes the container to be encompassed by the interconnecting segments and outer enclosure so that the container may be supported in a vertically depending manner.

9 Claims, 10 Drawing Figures



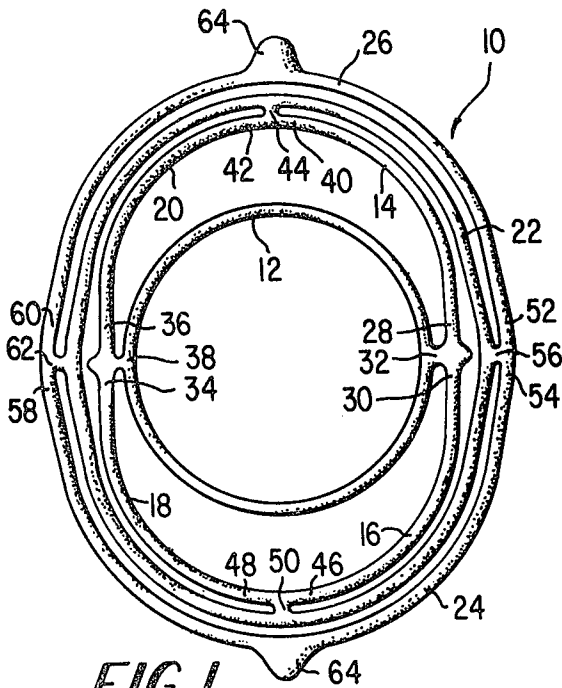


FIG. 1

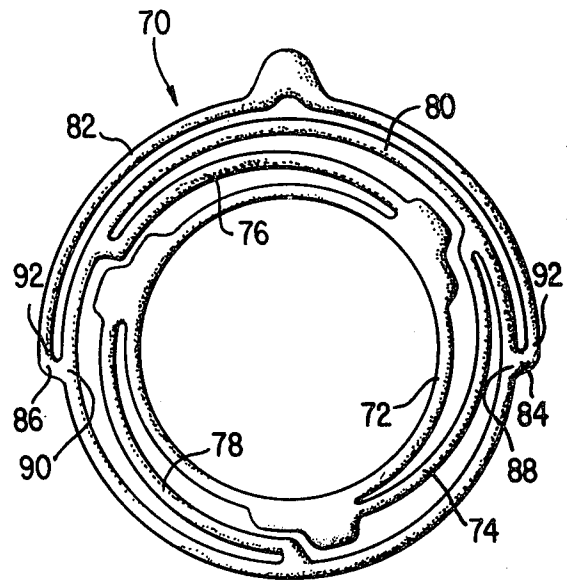


FIG. 3

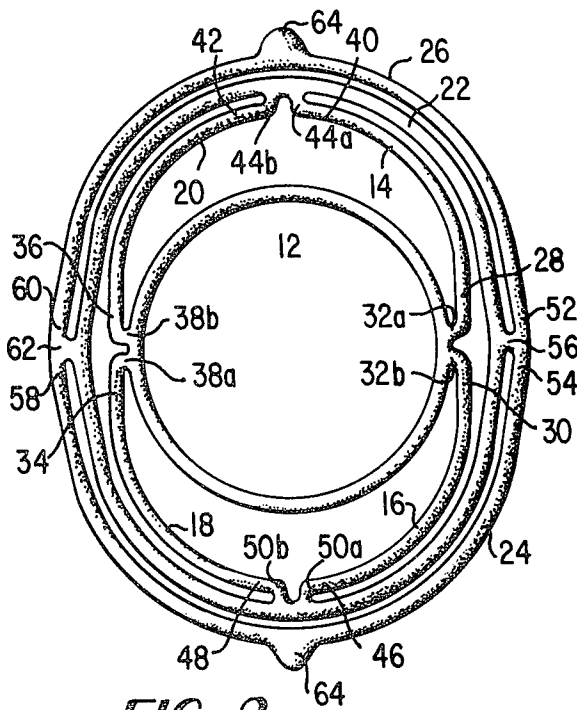


FIG. 2

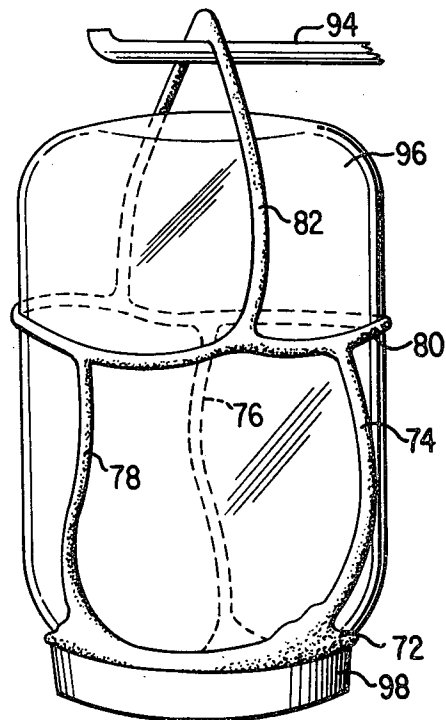


FIG. 4

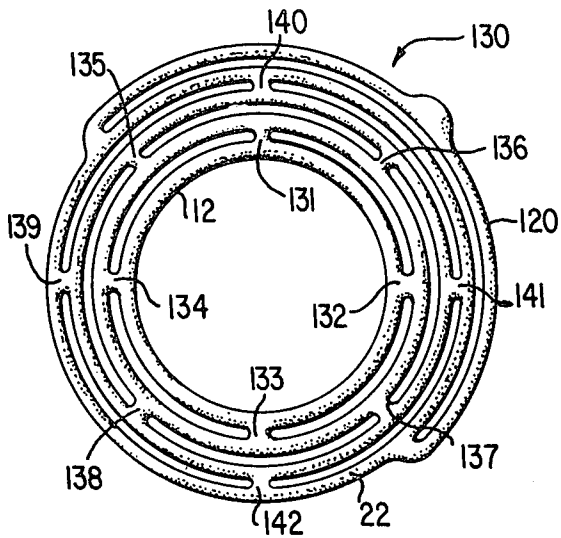


FIG. 6

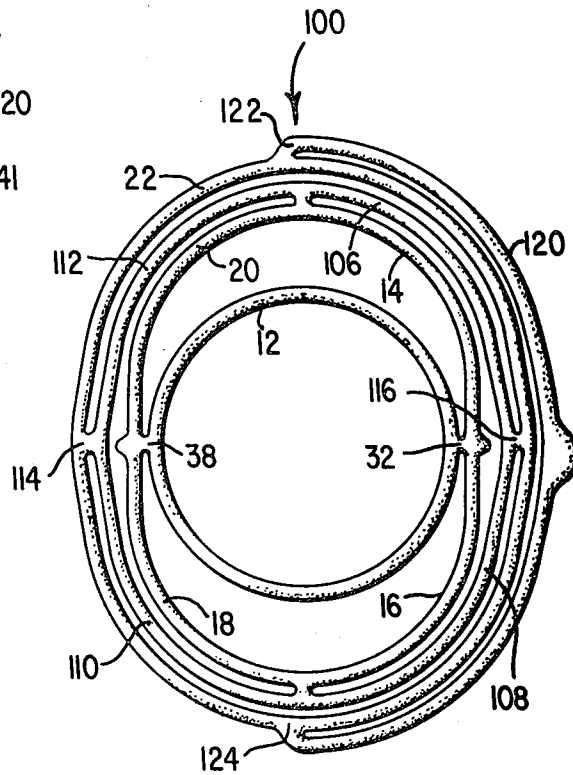


FIG. 5

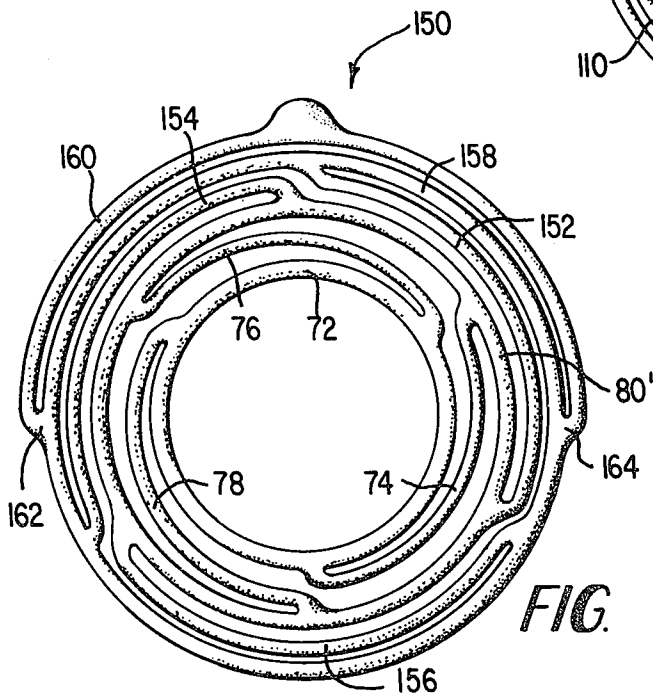
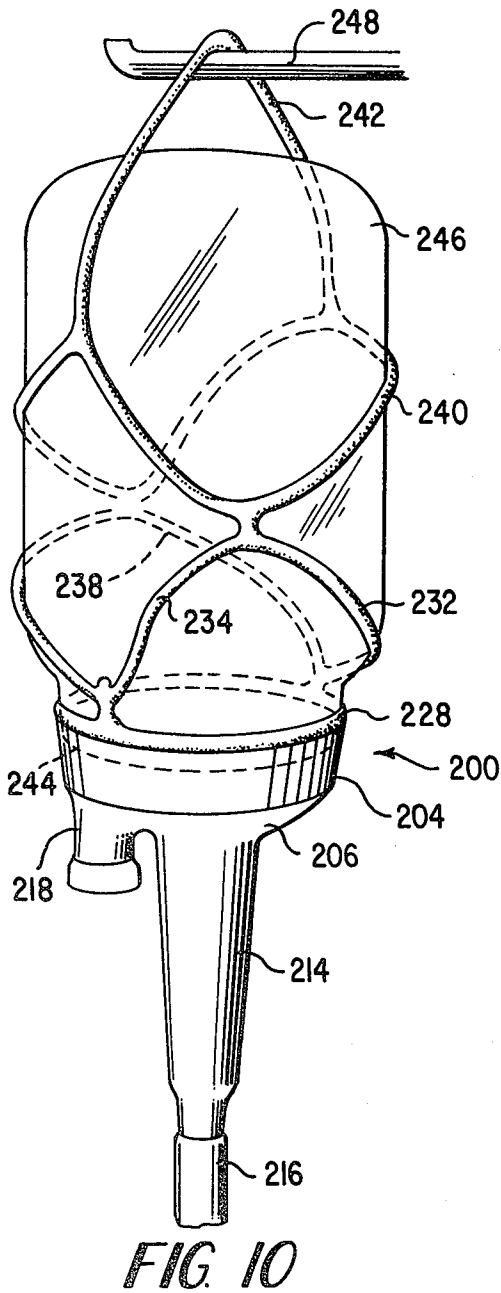
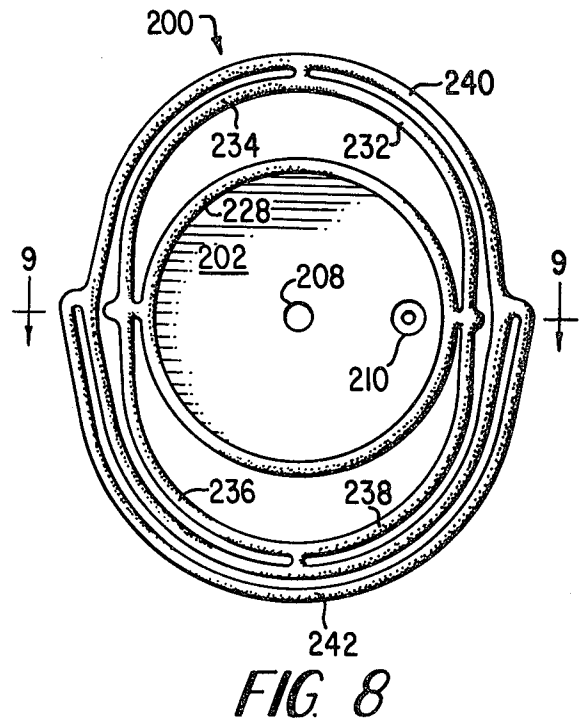
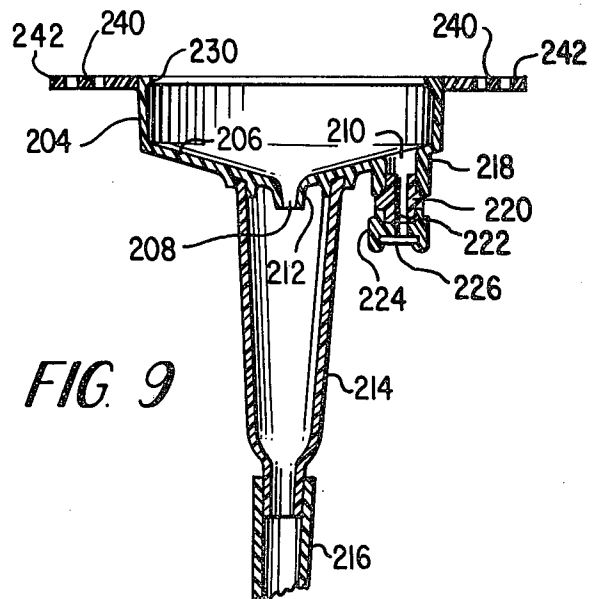


FIG. 7



CONTAINER SUPPORT

This is a division of application Ser. No. 353,373, filed Apr. 23, 1973, now U.S. Pat. No. 3,865,339.

BACKGROUND OF THE INVENTION

The invention relates to a hanger support for suspending a container. The invention also relates to a combination of a closure integral with a hanger support for containers having an open end.

There are a number of container carriers or harnesses for suspending generally cylindrical shaped containers, as for example bottles which are suspended in an inverted position during intravenous administration of fluids therefrom. One form of carrier (U.S. Pat. No. 3,688,935) consists of a continuous band surrounding the bottle near its base with a bail or handle attached to this band so that when the bottle is inverted, the bail may be supported by an elevated hook thus suspending the bottle. These carriers may be used only when the bottle has a constriction into which the band fits tightly or some other means for retaining the band so that the band cannot slip off the bottle. Bottles shaped with band-retaining means are more costly to produce and the installation of this type of carrier onto the bottle, particularly when made of metal, requires special bailing equipment and is expensive.

A bottle harness, such as that described in U.S. Pat. No. 3,366,360, provides means for encompassing an inverted bottle so that it may be suspended. However, this harness is difficult to position around a bottle and its dimensions are critical for a good fit with the bottle or else the bottle will not be securely contained. Furthermore, the production of this harness requires a number of steps, each one critical, so that the device does not lend itself to inexpensive mass production.

Many patients in hospitals get their nutritional requirements by gavage. The liquid food preparation is placed in bottles which are capped with a closure containing an air-inlet tube and a drip meter outflow tube to which is attached a flexible tube leading to the patient's stomach. Since the bottle usually has no provision for retaining a band and hanger to support the bottle in an inverted position, an attendant must stand by the patient and hold the bottle until the contents have been dispensed. This is tiring for the attendant and increases the expense of patient care.

A primary object of the present invention is to provide a support for suspending a container.

A further object of this invention is to provide a closure member integrally combined with support means for enclosing the open end of a container as well as supporting the container in a suspended manner.

Another object of this invention is to provide a support of flexible material which normally lies flat for ease in storing but which is extendible so as to encompass the body of a container and support it in a vertically depending manner.

A further object of this invention is to provide a container support with a hanger or handle means.

A still further object of this invention is to provide a support with or without closure means which is easily manufactured, inexpensive, and easily installed on a container.

SUMMARY OF THE INVENTION

The support member of the present invention is a

unitary, flexible structure comprising two or more generally concentric enclosures, one being an inner enclosure and one being an outer enclosure with a hanger attached to the outer enclosure, and a plurality of extendible segments lying between the enclosures in a path which is more or less contiguous to the paths of the enclosures, with the segments joined at their ends to adjacent enclosures. With the neck of a container placed within the inner enclosure of the support member, by pulling the hanger over and around the bottom of the container, the segments and other enclosure or enclosures extend to encompass the container, allowing the container to be supported in a stable suspended condition when the hanger is held or placed on a suspension hook. The support member may be an integral part of a closure member in which case the inner enclosure is replaced by the closure member and the segments are connected directly to the side wall of the closure member. The invention will be better understood from the following description of the preferred embodiments.

BRIEF SUMMARY OF THE DRAWINGS

In the drawings:

FIG. 1 is a top plan view of a support member of the present invention,

FIGS. 2 and 3 are top plan views of second and third embodiments of the support member of this invention;

FIG. 4 is an isometric view of the support member of FIG. 3 showing the support in an extended position on a container according to the principles of this invention;

FIGS. 5-7 are top plan views of fourth, fifth and sixth embodiments of the support member of this invention;

FIG. 8 is a top plan view of a support member as an integral part of a closure having an air inlet and drip chamber;

FIG. 9 is a side view in cross-section taken along the line 9-9 in FIG. 8; and

FIG. 10 is an isometric view of the embodiment of FIG. 8 as applied to a container in a suspended condition.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

To illustrate the basic operating principles of this invention, reference is made to FIG. 1 wherein a support member 10 is shown which includes an inner enclosure element 12, four intermediate curved, extendible segments 14, 16, 18, 20, an outer oval shaped enclosure element 22 and two hangers 24, 26. The inner enclosure element may be circular, oval, or polygonal, or any shape to fit neck portions of a container. In this embodiment it is a circular ring. The dimensions of the inner ring 12 will generally be large enough to allow it to be placed easily around the neck of a container and yet small enough that the body of a container can not slip through.

One end of each curved segment 14, 16, 18, 20 is connected to the inner ring 12. In this embodiment, ends 28 and 30 of adjacent segments 14 and 16 share the same connection 32 to the inner ring 12, and in like manner, ends 34 and 36 of adjacent segments 18 and 20 share the same connection 38. These connections 32, 38 are diametrically opposite each other on ring 12.

The remaining ends of the intermediate segments are connected to the outer oval element 22 with an end 40 of segment 14 and an end 42 of segment 20 meeting at

a connection 44 and an end 46 of segment 16 meeting with an end 48 of segment 18 at a connection 50. Connections 44 and 50 are also diametrically opposite each other but are situated 90° with respect to connections 32 and 38. Thus it will be noted that segments 14, 16, 18 and 20 form an intermediate oval shaped element.

Although the extendible segments and outer ring element are shown in this embodiment in curved and oval configurations, respectively, many other configurations are possible, including uniformly straight, polyangular or irregularly curved segments and circular or polygonal outer rings. Regardless of their configurations, the segments lie roughly in a path which is more or less contiguous to the path of the inner and outer elements 12 and 22 to which they are attached.

For some applications it is advantageous if the ends of the segments 14, 16, 18, 20 do not join to share a common connection to the inner ring 12 and outer ring 22. Note for example in FIG. 2 that the ends 28, 30, 34, 36, 40, 42, 46 and 48 have separate but closely adjacent connections 32a and b, 38a and b, 44a and b, and 50a and b. This has the advantage of distributing the stresses at the connections between the segments, the inner ring and outer oval shaped element when the support member is in use, if conditions of use require greater strength.

Lying outwardly from the outer oval shaped element 22 are hangers 24 and 26. In the embodiments of FIGS. 1 and 2, there are two hangers, each in the shape of a curved segment which are connected at adjacent ends 52 and 54 to a connection 56 and at adjacent ends 58 and 60 to a connection 62. Connections 56 and 62 are located diametrically opposite each other as well as being on a straight line extending between and beyond the connections 32 and 38 and operate to connect the hangers to the outer oval shaped element 22. Tabs 64 may be provided midway on the hangers 24 and 26 on a straight line extending through connections 44 and 50.

If a support member is constructed so that only one hanger is formed, it is preferable that the ends thereof be connected at positions slightly more than half way around the outer oval element 22 in order to maintain a better balance when the support is used on a container. Thus in the case of a single hanger, the connections 56 and 62 would not be in line with connections 32 and 38.

Regardless of the shape of the inner enclosure element 12, the outer enclosure element 22, the intermediate element formed by the curved segments 14, 16, 18, and 20, and the hangers 24 and 26, it will be noted that when the support member 10 is collapsed, all of the elements lie substantially in the same plane. In this state, the intermediate element encloses the inner element 10, the outer element 22 encloses the intermediate element, and the two hangers 24 and 26 enclose the outer element. It will be obvious that a similar relationship exists between the elements of the supports to be subsequently described in connection with FIGS. 3-7 when such supports are collapsed.

FIG. 3 illustrates a support member 70 having three intermediate segments 74, 76, 78 connected at one of their ends to an inner enclosure 72 and at their other ends an outer enclosure 80. For purposes of illustrations in this embodiment, the inner and outer enclosures are ring shaped, and it will be noted that the posi-

tions of the connections of one end of the intermediate segments to the inner ring 72 are uniformly spaced around the inner ring. The positions where the other ends of the segments are connected to the outer ring element 80 are also uniformly spaced from each other around the outer ring. The position of attachment of one end of a segment to the inner ring and the position of attachment of the other end of that segment to the outer ring is approximately 120° from each other. The segments in this embodiment are curved but other configurations are possible including straight, polyangular or irregularly curved segments which, nevertheless, lie roughly in a path which is contiguous to the path of a ring to which they are attached. This arrangement of connecting intermediate segments to the inner and outer rings can be applied to support members having more than three segments, e.g. four, five or more segments. It can also be applied to a support member having only two segments. However, a support member having three or four segments, with arrangements for connections as disclosed above, is preferred. A single handle or hanger 82 is connected by ends 84, 86 at positions 88, 90 on the outer ring element 80. The positions 88, 90 are slightly offset from being diametrically opposite each other since the hanger, when bent at right angles to the outer ring, will bend approximately at positions 92. This effectively centers the hanger relative to the body of the container supported with the support member so that the container does not tilt at an angle.

In this embodiment, the manner in which the individual segments are connected to the inner and outer rings is somewhat different from the arrangement exemplified by the embodiments of FIGS. 1 and 2. In the support member of FIG. 3, the points of attachment of two adjacent segments to the inner ring are spaced some distance apart and adjacent segments project in the same direction toward the outer ring. In the previous two embodiments, the points of attachment of two adjacent segments to the inner ring are at the same point or quite close together and the two adjacent segments project in diverging directions to the outer ring.

FIG. 4 illustrates how the support member 70 may be used to suspend and support an open-ended container 96 in an inverted and vertically depending manner. To use a support member of this invention, as typified by the embodiment of FIG. 3, the neck 98 of a container is inserted through the opening provided by the inner ring portion 72. By pulling hanger 82 up and over the body of the container, the intermediate segments 74, 76, 78 are extended and cooperate with the outer ring element 80 to encompass the body of the container. The hanger 82 may then be hung on an elevated hook 94. The embodiments in FIGS. 1, 2, 5-7 operate in like manner. The container is thus suspended in a stable, vertical position by virtue of the extended segments and the encircling outer ring element.

The size of the inner ring varies depending upon the size of the neck of the container around which this ring is to be fitted. The length of the intermediate segments will depend upon the width and length of the container which is to be encompassed. Generally the length is such that the segments extend at least halfway, and preferably somewhat more than halfway, the length of the container which the support member encompasses. The outer ring element should be at least large enough to fit comfortably around the body of the container and

preferably is somewhat larger than the circumference or perimeter of the container body so that it slips easily around the body. The shape of the inner ring, intermediate segments, outer ring and hanger elements of the support member when lying flat may be any shape, such as circular, ovate, or polygonal or combinations of any of these shapes. In cross-section, these individual elements may have a variety of shapes, such as round, oval, rectangular, or square shapes.

FIG. 5 shows a support member 100 which is a variation of the embodiment illustrated in FIG. 1 in that there are two interconnecting series of intermediate segments between inner enclosure 12 and outer enclosure 22. The first series of segments 14, 16, 18, 20 are positioned and attached to the inner ring 12 in the same manner as in support member 10. However, instead of connecting to outer enclosure 22, the first series of segments is connected to a second intermediate oval shaped element formed by segments 106, 108, 110, 112 having ends connected by connections 114 and 116 to outer ring 22. The connections 114 and 116 fall on a straight line extending between and beyond connections 32, 38. A single hanger 120 is attached to outer enclosure 22 at positions 122, 124, slightly more than halfway around enclosure 22. This embodiment provides extendible segment means in a support member which encompass and support containers that are generally of greater length than those supported by the support members of FIG. 1. It is to be understood that support members having more than two adjacent series of intermediate segments joined to each other between an inner and outer ring are within the purview of the invention.

Referring now to FIG. 6 of the drawings, there is shown a support member 130 which is a modification of the support member 100, the essential difference being that there are eight in place of four individual segments in each of the two series of intermediate segments between the inner and outer enclosures 12 and 22. This results from the formation of additional connections so that there are four connections 131-134 between the inner enclosure and first intermediate section, four connections 135-138 between the first and second intermediate sections, and four connections 139-142 between the outer enclosure and second intermediate section. In this modification, the individual segments are generally shorter as a result of there being more segments occupying about the same space. The arrangement of segments in the support member 130 is generally more useful for squat containers.

In FIG. 7 the support member 150 is similar to the support 70 of FIG. 3 except that it has a second series of intermediate segments 152, 154, 156 connected at one end to a middle or intermediate ring 80' corresponding to outer ring 80 of the embodiment of FIG. 3. The other ends of segments 152, 154, 156 are joined to outer ring 158. Beyond that hanger 160 is connected to the outer ring 158 at positions 162, 164 which are preferably located a little more than halfway around ring 158. The positions at which the first series of segments are joined to the inner ring and middle ring, and the second series of segments to the middle and outer rings, are spaced more or less uniformly so as to provide a substantially balanced distribution of segments and lend stability to a container suspended by the support member. Although this embodiment illustrates a support member having two series of three segments

interspersed between an inner, middle and outer ring, it is not outside the scope of this invention to have support members in which there are two, four, or more segments in either the first or second series of segments or support members having a number of segments in the first series different from the number of segments in the second series. It is also within the purview of the invention to include support members having more than two series of interconnecting segments or having more than one intermediate ring interspersed between series of segments as the extendible segment means between an inner and an outer ring.

An embodiment of a support member integrally combined with a closure according to the principles of this invention is illustrated in FIGS. 8-10. The combination of support member and closure 200 includes a cap 202 having a side wall 204 and an end wall 206. The end wall 206 has two apertures 208 and 210; the aperture 208 being generally located centrally in the end wall and surrounded by an outwardly extending drip tube 212. An elongated tube or drip chamber 214 is disposed about the drip tube 212 and is connected at one end to the end wall 206. At its other end, drip chamber 214 is narrowed to a smaller opening so as to accommodate flexible tubing 216 attached thereto. An outwardly projecting tubular extension about aperture 210 provides an airway channel 218. Airway channel 218 contains a plug 220 which has a narrowed passageway 222. An airway cap 224 containing a filter 226 impervious to liquid and having a bore which coincides with passageway 222 is secured to plug 220.

Cap 202 has a rim 228 at the end of side wall 204 which bears an inward projection 230. Projection 230 is designed to snap-fit over and around an outward projection on a neck of an open ended container to provide a tight seal of the cap portion with the neck of the container. Other retaining means may be used, as for example, the inner side of the side wall 204 may have spiralling grooves or ridges which match with ridges or grooves on the neck of a container so that the cap portion may be screwed onto the container.

Connected to rim 228 of the cap 202 are four intermediate segments 232, 234, 236, 238 and these segments are in turn connected to an outer enclosure element 240. The manner by which the segments are connected to the rim 228 and outer enclosure 240 is the same as previously described for the embodiment of the support member 10 of FIG. 1. A hanger 242 is connected to the outer enclosure 240 at positions slightly more than one half the distance around the enclosure similar to the way in which hanger 82 is connected in the support member 70 of FIG. 3. The support in the combination support-closure member may have configurations such as those illustrated in FIGS. 2, 3, 5-7 or it may have modifications in over-all shape and/or in numbers of intermediate segments such as has been described above.

To use the support-closure member 200 of this invention, as for example in the administration of a fluid nutrient by gavage, the closure is attached to the neck portion 244 of a container 246 and the hanger pulled up and over the body of the container so as to extend the intermediate segments and outer enclosure element to encompass the body uniformly. The hanger is draped over a suspension hook 248 and the contents of the container are ready for delivery from the drip chamber as illustrated in FIG. 10.

It should be understood that it is within the scope of this invention to have support members in which the individual segments may be joined at irregularly spaced intervals to the inner and outer enclosures so long as the support when used suspends a container adequately in a stable manner. Support members, with or without the integral closure member, in which the segments are more or less uniformly spaced are preferred. It is also understood that the support member of this invention may have other shapes wherein the inner enclosure, intermediate segments, outer enclosure and hanger do not lie flat in the same plane. For example, the hanger may lie at an angle relative to the rest of the parts making up the support, or the hanger, outer enclosure and segments may lie in a plane which angles from the inner enclosure, or other arrangements of this type are possible. However, a support member with all parts lying in the same plane when collapsed is preferred.

The support member of this invention may be made of any flexible material, such as polyolefin, polyvinyl chloride or any other flexible plastic or it can be made of metal with flexible characteristics. It can be formed by stamping from sheets of plastic or metal or it can be formed by molding. The support-closure combination is made preferably from plastics. It can be made by molding the support member and cap portion of the closure as a unit and then attaching the drip chamber, airway plug and filter elements by a suitable adhesive or by fusion using a high energy source such as radio frequency or ultrasonic means.

I claim:

1. A combination cap and support for enclosing the open end of a container and for supporting the container in the administration of fluids, comprising a closure member having a side wall with means for detachably engaging the neck of a container and an end wall integral with the side wall, a drip tube surrounding an opening in the end wall and projecting outwardly therefrom, a drip chamber connected for communication with the drip tube, and an air inlet means in the end wall and adjacent to the drip chamber; and flexible support means integral with a periphery of the closure member, the support means including an outer ring spaced outboard of the periphery of the closure member, a hanger spaced outwardly from the outer ring and joined thereto at positions which are at least halfway around the outer ring; and extendible segment means connecting the periphery of the closure to the outer ring, the extendible segment means including at least two extendible segments.

2. The combination cap and support of claim 1 wherein said flexible support means is integral with the side wall of said closure member, said extendible segment means including four arcuate segments of substantially equal length, first ends of adjacent first and second segments being joined at a first position on the side wall and first ends of adjacent third and fourth segments being joined at a second position on the side wall diametrically opposite said first position, second ends of the first and fourth segments being joined at a first position on the ring and second ends of the second and third segments being joined at a second position on the ring diametrically opposite said first position of the ring, said first positions on the side wall and the ring being substantially 90° in relation to each other, and the hanger connections being at positions which approximately fall on a straight line extending through

said first and second positions on the side wall, the hanger, ring and arcuate segments lying in a plane substantially parallel with the plane of the end wall.

3. A container support of flexible material for suspending a container in a vertically depending manner, comprising an inner support means for engaging said container adjacent one end thereof said inner support means including a cap member for engaging one end of said container, said cap member having an end wall with an opening therein and a tubular extension projecting outwardly from said opening, an elongated chamber disposed about said tubular extension having one end enclosed by said end wall, the other end being open and of reduced size for connection to tubing and an air inlet formed in said cap member, an outer element extending around said inner support means and spaced outboard thereof, and extendible intermediate means connecting the inner support means to the outer element, said extendible intermediate means including a plurality of extendible segments and operating to permit said outer element to be moved away from said inner support means longitudinally of a container engaged with said inner support means to cause said outer element and a plurality of extendible segments to encompass said container.

4. A support according to claim 3 wherein said air inlet further includes filter means detachably secured to said inlet.

5. A support for a container having a neck with an open end comprising a unitary, flat flexible member having an inner ring portion adapted to encompass the neck adjacent the open end, an outer ring spaced outwardly and around the inner ring, a hanger situated outwardly and adjacent to the outer ring and connected at positions at least halfway around the outer ring, an extendible intermediate segment means interposed around the inner ring and between the inner and outer ring, the segment means being joined to the inner and outer rings at spaced intervals, said extendible intermediate segment means operating when the support member is positioned on the neck of the container so that the hanger, outer ring and segment means are extendibly movable into planes different from the plane of the inner ring so as to encompass the container and support it in a vertically depending manner, and a cap having a peripheral edge integral with said inner ring portion, said cap including means for detachably engaging the neck of said container to close said open end, an end wall with an opening therein and a tubular extension projecting outwardly from said opening, an elongated chamber disposed about said tubular extension having one end enclosed by said end wall, the other end being open and of reduced size for connecting to tubing, and an air inlet in said cap.

6. A combination cap and support for enclosing the open end in the neck of a container and for supporting the container in the administration of fluids comprising a substantially flat, uniplanar member including a closure member for the open end of said container having a side wall with means for detachably engaging the neck of the container and an end wall integral with the side wall, a fluid outlet means formed in said closure member, and flexible support means connected to said closure member, the flexible support means including an outer element extending around said closure member and spaced outboard thereof and extendible intermediate means including a plurality of extendible seg-

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ment means connecting said closure means to said outer element, said extendible intermediate segment means being operable upon extension to permit said outer element to be longitudinally moved away from said closure member and longitudinally of a container engaged with said closure member to cause said outer element and plurality of extendible segments to encompass said container.

7. The combination cap and support according to claim 6 wherein said fluid outlet means includes an

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opening in said end wall, and a drip tube surrounding said opening and projecting outwardly from said end wall.

8. The combination cap and support according to claim 7 wherein said fluid outlet means includes air inlet means formed in said closure member.

9. The combination cap and support according to claim 8 wherein said air inlet means includes air filter means secured thereto.

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