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EUROPEAN PATENT APPLICATION

⑲ Application number: 78300182.9

⑥① Int. Cl.²: A 61 M 5/14

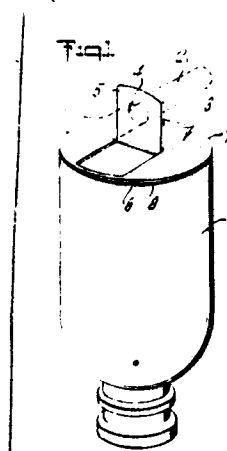
⑳ Date of filing: 21.07.78

③① Priority: 25.07.77 US 818629
 ④③ Date of publication of application:
 07.02.79 Bulletin 79/3
 ⑤④ Designated contracting states:
 BE CH DE FR GB LU NL SE

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⑤⑥ Suspension device.

⑤⑦ An inexpensive device for suspending articles generally,
 and particularly for parenteral, especially intravenous
 administration of medicament solutions or suspensions,
 which comprises an article, or particularly a container, espe-
 cially made of glass, (1), for dispensing medicament solu-
 tions or suspensions from an inverted position, and a sus-
 pension device (3) stuck to the article, or to the container (1)
 at the end opposite to that from which the medicament solu-
 tions or suspensions are dispensed. The suspension device
 (3) comprises a pressure-sensitive adhesive layer (8) by
 means of which the suspension device (3) is stuck to the
 article or container (1), and, affixed to the opposite side of the
 adhesive layer (8), a unitary support layer (6) having a con-
 figuration that will engage a support device (2) from which
 the article or container (1) is to be suspended.



1 TITLE OF THE INVENTION

Suspension Device

BACKGROUND OF THE INVENTION

5 The present invention is concerned with a suspension device suitable for adhering to an article for the purpose of suspending said article from a support device.

10 Particularly, the present invention is concerned with a suspension device suitable for adhering to a container used for dispensing solutions or suspensions, for the purpose of suspending said container from a support device.

15 The present invention is also concerned with a device for dispensing solutions or suspensions, and particularly with a device for parenteral, especially intravenous administration of medicament solutions or suspensions.

20 More particularly, the present invention is concerned with the parenteral, especially intravenous administration of various medicament solutions or suspensions from containers which are inverted during dispensing and are suspended from a support device by means of a suspension device adhered to the end of the container opposite to the end from which the
25 medicament solutions or suspensions are dispensed.

1 The improved suspension device of the
present invention is very inexpensive, may be readily
and semipermanently adhered to a wide variety of
articles, including containers, especially glass
5 containers, particularly those for dispensing medi-
cament solutions or suspensions, and has a configura-
tion which will engage a support device from which
the article or container is to be suspended.

 The art related to devices for suspending
10 articles, particularly containers, especially those
employed in dispensing medicament solutions or sus-
pensions, is replete with a variety of such devices,
which exhibit different types of suspension techniques.
For example, the suspension device may be formed as
15 an integral part of a container from which some liquid
is to be dispensed. U.S. Patent No. 2,698,619 des-
cribes a flexible bag with an opening and fitted
therein a grommet for suspending the bag from a hook.
See also U.S. Patent Nos. 3,171,412; 3,482,572; and
20 3,583,460. It will be noted that the disclosures of
all of these patents concern containers that are
fabricated from flexible plastic materials.

 Other suspension devices involve the per-
manent attachment of the device to a container. For
25 example, see U.S. Patent No. 3,153,414, which des-
cribes attachment of a handle to the inner wall of
a flexible container by means of dielectric, thermal,
or chemical sealing. See also U.S. Patent Nos. 2,
328,569 and 2,409,734.

30 Yet another type of suspension device is
that which serves as a separate holder for a con-
tainer from which some liquid is to be dispensed,
contacting the container, but without being affixed

1 or otherwise attached to the container. See, for
example, U.S. Patent No. 2,362,523 which describes
a suspension member comprising a base plate of ductile
material having a hook formed therefrom; U.S. Patent
5 No. 2,579,701 which describes an infant's bottle
holder; U.S. Patent Nos. 3,366,360, 3,395,882 and 3,
865,339 which describe harness-like bottle holders;
U.S. Patent No. 3,402,910 which describes a disposable
bottle holder; U.S. Patent No. 3,807,679 which describes
10 a one-piece molded bottle band; U.S. Patent No. 3,893,
495 which describes a bag-like bottle holder; and U.S.
Patent No. 3,913,879 which describes a bottle holder
comprising a tubular body of mesh construction.

15 Other types of suspension devices require
some type of modification of a container which is
to be suspended in order to assure secure fastening
of the suspension device to the container. See,
for example, U.S. Patent Nos. 2,825,521; 3,311,268;
and 3,638,822.

20 The suspension device of the present invention
differs from suspension devices hitherto employed in
the art in not having to be an integral part of the
article or container to be suspended, or in not having
to be permanently attached to the article or container,
25 or in not requiring some modification of the article or
container in order to assure secure fastening of the
suspension device to the article or container, or in
not involving some elaborate configuration which en-
compasses most, or a significant part of the article or
30 container which is to be suspended. The suspension
device of the present invention is, accordingly, of
simple construction and of very little cost, yet
reliable and easy to employ.

1 The suspension device of the present in-
vention also possesses particular advantages with
respect to containers made of glass. Typically,
such containers in the past have required special
5 construction in order to accommodate suspension
devices of the type described in U.S. Patent No.
3,638,822; or otherwise, suspension devices encompass-
ing most of the glass container have been employed.
By contrast, the suspension device of the present
10 invention is adhered only to the end portion of the
container, and no special construction features for
the container are required.

SUMMARY OF THE INVENTION

15 The present invention provides a suspension
device for adhering to an article, particularly a
container, especially one used for parenteral, adminis-
tration of medicament solutions or suspensions, where-
by the article or container may be suspended from a
support device.

20 The term "article" is intended to broadly
describe any of a wide variety of pieces of goods to
which the suspension device of the present invention
might be adhered where it would be desirable to sus-
pend said piece of goods. For example, items for
25 sale in a retail establishment would be readily
placed on display with the aid of the suspension
device of the present invention.

 Likewise, the term "container" is intended
to be broadly descriptive of a wide variety of re-
30 ceptables in various shapes and sizes and manufactured
from a number of different materials.

1 The term "medicament solutions or suspen-
sions" is intended to include all liquids normally
dispensed during the course of some therapeutic
treatment, and is understood to include conventional
5 intravenous saline and glucose solutions as well as
solutions or suspensions of various drugs which are
intended for intravenous, or some other form of
parenteral administration.

 The container from which the medicament
10 solution or suspension is to be dispensed may be,
basically, of any construction configuration and may
be made, essentially, of any material. Thus, the
container may be of the usual configuration employed
for glass bottles used to dispense various pharmaceuti-
15 cal liquids. The container may also be, on the other
hand, of the typical bag-like configuration associated
with use of flexible plastic materials in construction.

 The suspension device of the present invention
is adhered to an article, particularly a container, for
20 the purpose of suspending the article or container
from a support device. The support device may be any
means, such as a pole, peg, hook, or the like, whereby
the article or container, with the aid of the adhered
suspension device, is suspended from the support device.
25 The purpose served by suspending the article or con-
tainer may be that of storage, display, gravity-as-
sisted dispensing of a liquid from a container, or
some other purpose.

 The suspension device of the present inven-
30 tion is adhered to a container from which medicament
solutions or suspensions are to be dispensed, for
the purpose of suspending the container from the arm
of a support device, whereby the medicament solution
or suspension may be continually dispensed, usually
35 by gravity flow.

1 Such support devices for use in adminis-
tering medicament solutions or suspensions are well
known and typically include an upright pole supported
by a platform stand. The pole in turn carries one
5 or more arms. From these arms containers for dis-
pensing medicament solutions or suspensions are hung.

 The suspension device of the present inven-
tion comprises, first, a pressure sensitive adhesive
layer. The composition from which this adhesive
10 layer is made may be selected from a number of
natural and synthetic resin materials which would
suggest themselves as suitable to the artisan.
Particularly, polyester resins and synthetic rubber
latex materials have been found especially suitable
15 for making the adhesive layer. The adhesive com-
position is made to adhere to the surface of the
container to which it is to attach the suspension
device of the present invention, by the application
of pressure. The adhesive composition then becomes
20 semi-permanently bonded to the container surface,
i.e., the bond will fail before destruction or
separation of the article or container surface and
before separation or delamination of the adhesive
layer from the support layer of the suspension
25 device. The support layer of the suspension device
will be described hereinafter.

 The composition of the pressure sensitive
adhesive must possess sufficient adhesive strength
to adhere satisfactorily and reliably to the surface
30 of the article or container and it must have sufficient
cohesive strength to support the weight of the article
or container and of the contents of the container,
particularly of a solution or suspension being

1 dispensed, for an extended period of time. Of course,
it will be appreciated that the extent of the adhesive
layer, i.e., its total area, will also be determina-
5 tive of the weight which the suspension device of
the present invention will be able to support.
Nevertheless, it would, in any case, be desirable
to minimize the size of the suspension device, and,
thus, the adhesive and cohesive strength of the pres-
sure sensitive adhesive composition remain important.
10 The adhesive compositions described herein have been
found to possess these required characteristics. Other
adhesive compositions which would be suitable would
suggest themselves to the skilled artisan.

The suspension device of the present inven-
15 tion comprises, second, a unitary support layer. The
term "unitary" describes the particular advantageous
feature of the suspension device of the present inven-
tion that it is formed from a single thickness of
material, without separate interconnected parts, and
20 is thus characterized by simplicity and low cost.

The support layer of the suspension device
of the present invention must have a configuration
which will engage a support device, particularly the
arm of a support device used to administer medicament
25 solutions or suspensions. A number of such configura-
tions are possible.

The term "unitary" also describes a preferred
configuration of the suspension device of the present
invention wherein the support layer comprises a hori-
30 zontal portion and a vertical portion. These portions
are made from the unitary support layer by cutting,
stamping, or in some other way separating the two
portions from each other on the support layer. The

1 separation is complete except for one side by which
the vertical portion remains hingingly attached to
the horizontal portion. Initially, at the time the
suspension device is made, the horizontal portion
5 and the vertical portion are coplanar. As a result
of the one unseparated side by which the two portions
are hingingly attached, the vertical portion is
adapted to be moved at an angle to the horizontal
portion, whereby it is able to engage a support de-
10 vice and thereby suspend the article or container,
especially a container from which medicament solu-
tions or suspensions are to be dispensed. Thus, the
terms "horizontal" and "vertical" describe the rela-
tive positions of the two portions of the unitary
15 support layer when the suspension device of the pre-
sent invention is in use, adhered to the bottom of
some article, particularly a bottle container which
has been inverted for the purpose of dispensing medi-
cament solutions or suspensions therefrom.

20 In the particular configuration just described,
the vertical portion of the support layer is provided
with an opening or aperture to engage the support de-
vice, particularly, to accommodate the arm of a
support device used to administer medicament solu-
25 tions or suspension. This aperture is readily made
at the time the horizontal and vertical portions are
separated during manufacture of the suspension device.
The aperture is most appropriately circular and its
diameter is chosen to accommodate conventional sup-
30 port devices and support device arms. The aperture
may also be star-shaped with a multiplicity of points
which tend to grip and hold the arm of a support de-
vice when it is inserted through the aperture.

1 A particular advantage of the configura-
tion just described is that it permits the hori-
zontal and vertical portions of the support layer
to reassume a coplanar relationship, which greatly
5 facilitates storage of containers to which suspension
devices of the present invention have been adhered.

 The support layer must be made from a
material which has sufficient strength, particularly
tear-resistance, to provide secure suspension of
10 the article or container, especially a container
from which medicament solutions or suspensions are
dispensed, for an indefinite period of time. The
material must be able to withstand the consider-
able stress under which it will be placed by
15 movement of the article or container on the support
device from which the article or container is
suspended, during typical manipulation while in
use. Thus, the support material should have a
Strip Tensile strength, for a 1 inch strip, of at
20 least 45 lbs/inch Machine Direction (M.D.), and of
at least 40 lbs/inch Cross Direction (C.D.) as
measured by TAPPI Method T404M50. It has been
found that especially suitable materials are those
made from high density polyethylene fibers by an
25 integrated spinning and bonding process. Such a
material is that available under the trademark
Tyvek, from the E.I. DuPont de Nemours Company.

 The pressure sensitive adhesive layer
and the support layer of the suspension device of
30 the present invention may be coextensive, i.e.,
the support layer may be uniformly affixed to the
pressure sensitive adhesive layer at all points.
However, it is also possible to nonuniformly affix

1 the support layer to the pressure sensitive adhesive
layer. This would be particularly desirable for
the configuration described above where the support
5 layer is separated into horizontal and vertical
portions. For such a configuration the pressure
sensitive adhesive would be affixed only to the
horizontal portion of the support layer. Absence
of the adhesive composition from the vertical por-
10 tion of the support layer would avoid problems
during moving of the vertical portion at an angle
to the horizontal portion created by the tendency
of the adhesive to also adhere the vertical portion
to the bottom of the container to be suspended.
Such absence would also avoid problems created by
15 subsequent interference of the exposed adhesive
with objects with which it might later come in
contact.

An alternative embodiment of the suspension
device of the present invention provides for
20 inclusion of a layer of flexible material disposed
between the pressure sensitive adhesive layer and
the support layer. Such a layer of flexible
material permits the suspension device of the
present invention to readily conform to an irregular
25 surface of an article or container to which it is
to be attached. Suitable flexible materials would
include, for example, polyurethane foam and synthetic
rubber foam compositions. It is possible, of
course, to make the support layer itself from such
30 a flexible material, thus avoiding the necessity
of a third layer. However, in such a case the
flexible material must possess sufficient strength,
especially resistance to tearing, to serve as the
support layer material.

1 BRIEF DESCRIPTION OF THE DRAWING:

In the accompanying drawing, illustrating certain preferred embodiments of the present invention, the same reference numerals designate
5 the same parts of all of the views:

FIG. 1 is a perspective view of a suspension device of the present invention adhered to an inverted container and engaging the arm of a support device (not shown);

10 FIG. 2 is an enlarged cross-sectional view of a suspension device containing a layer of flexible material;

FIG. 3 is a crosssectional view of the suspension device containing a layer of flexible material adhered to a container;
15

FIG. 4 is a fragmentary perspective view of a suspension device containing two vertical portions;

FIG. 5 is a fragmentary perspective view of a suspension device in which the horizontal portion covers a limited portion of the bottom of a container to which it is applied;
20

FIG. 6 is a fragmentary perspective view of a suspension device where the horizontal portion has tabs adhered to the bottom sidewall of a container, in addition to covering the bottom of the container.
25

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring more particularly to the drawing, in FIG. 1 container 1, from which medication solutions or suspensions are to be dispensed, is suspended from the arm 2 of a support device (not shown) by means of suspension device 3. The arm 2 is engaged by passing through aperture 4 in
30

1 vertical portion 5 of support layer 6. Horizontal
portion 7 comprises the remainder of support layer
6. Suspension device 3 also comprises pressure
sensitive adhesive layer 8. It will be noted that
5 the suspension device is adhered to the entire
bottom surface of container 1.

FIG. 2 illustrates the inclusion of a
third layer of flexible material 9 disposed between
pressure sensitive adhesive layer 8 and support
10 layer 6. FIG. 3 is a crosssectional view of such
a suspension device adhered to the concave bottom
of a container for dispensing medicament solutions
or suspensions. It can be seen that the layer of
flexible material permits the suspension device to
15 more readily conform to the irregular surface of
the container.

FIG. 4 illustrates the use of two vertical
portions of the support layer disposed parallel to
each other with their apertures aligned so that
20 they both will engage the arm of a support device.
This configuration results in noticeably improved
stability with respect to resistance of the suspended
container and suspension device to swaying i.e.,
rotation about the arm of the support device.

25 FIG. 5 illustrates the use of a suspension
device of reduced size which covers only a limited
portion of the bottom of the container to which it
is adhered. Such a suspension device would be
useful where it was desired to suspend containers
and their contents having total weights that were
30 smaller than usual. By contrast, FIG. 6 illustrates
a suspension device that not only covers the
entire bottom area of the container to which it is
adhered, but which also comprises tabs or extensions

1 which are adhered as well to the bottom sidewall
of the container. This suspension device is
clearly able to support a greater total weight of
a container and its contents than the suspension
5 device illustrated in FIG. 5. It is clearly a
matter of ordinary skill and routine experimentation
to determine the size of suspension device required
to satisfactorily suspend a given total weight of
a container and its contents.

10 The suspension device of the present
invention may be manufactured by any suitable
means within the skill of the ordinary artisan
instructed by the description herein as to the
requirements for the finished article. For example,
15 a continuous strip or band of material suitable
for the support layer may first have applied
thereto in a uniform application, or in a non-
uniform pattern, a suitable pressure sensitive
adhesive composition. There may then be applied
20 to the adhesive composition a material having a
release coating or an adhesive material, i.e., a
material which will only lightly adhere to the
adhesive composition and which may be later removed
therefrom easily, thus permitting handling of the
25 composite laminate of materials. The continuous
composite laminate thus created may then be cut by
a stamping die into the desired configuration for
the suspension device, and the individual suspension
devices then separated and collected. These
30 suspension devices may then be distributed for
eventual use with articles or containers to be
suspended, on a one-by-one basis. The suspension
devices may also be immediately applied to articles

- 1 or containers which are to be distributed for
future use, in which case such articles or containers
will be capable of being suspended from a support
device without the necessity of installing the
5 suspension device. The suspension device may be
applied to an article or container simply by
removing the adhesive or release layer and pressing
the device firmly against the article or container
with its pressure sensitive adhesive side inward.

CLAIMS

1. A suspension device (3) suitable for adhering to an article (1) to be suspended, for the purpose of suspending the article (1) from a support (2), comprising in combination a pressure-sensitive adhesive layer (8) and, affixed to one side of the said adhesive layer (8), a unitary support layer (6) having a configuration that will engage the said support (2).
2. A suspension device (3) suitable for adhering to a container (2) used for dispensing solutions or suspensions, at the end of the container opposite to that from which the solutions or suspensions are dispensed, for the purpose of suspending the container (1) from a support (2), comprising in combination a pressure-sensitive adhesive layer (8) and, affixed to one side of the said adhesive layer (8), a unitary support layer (6) have a configuration that will engage the said support (2).
3. A suspension device (3) suitable for adhering to a container (1) used for parenteral and especially intravenous administration of medicament solutions or suspensions, at the end of the container opposite to that from which the medicament solutions or suspensions are dispensed, for the purpose of suspending the said container (3) from the arm of a support (2), comprising in combination a pressure-sensitive adhesive layer (8) and, affixed to one side of the said adhesive layer (8), a unitary support layer (6) having a configuration that will engage the said

arm of the support (2).

4. A suspension device as claimed in any one of Claims 1 to 3 in which the configuration of the support layer comprises a horizontal portion (7) affixed to the adhesive layer (8) and a vertical portion (5) cut from the said horizontal portion (7) except for one side by which it remains hingedly attached to the said horizontal portion, the vertical portion (5)(a) being coplanar with the horizontal portion but movable at an angle to it when it is desired to suspend a container (1) by the device, and (b) having an aperture (4) through it to engage the support (2).

5. A device as claimed in Claim 4 in which the aperture (4) is a circular opening.

6. A device as claimed in Claim 4 or 5 in which two vertical portions (5) are cut from the horizontal portion (7) and are disposed in parallel planes, and the apertures (4) through them are aligned to engage the support (2).

7. A device as claimed in any one of Claims 1 to 6 additionally including a layer of flexible material (9) disposed between the adhesive layer (8) and the support layer (6) whereby the device may be readily made to conform to an irregular surface of a container (1) to which it is to be attached.

8. A device as claimed in any one of Claims 1 to 7 in which the support layer (6) is composed of a material having a Strip Tensile strength, for a 1-inch (2.5-cm.) strip, of at least 45 lbs/ inch M.D. and 40 lbs/inch C.D., (20 kg per 2.5 cm M.D. and 18 kg per 2.5 cm C.D.) as measured by TAPPI Method T404M50.

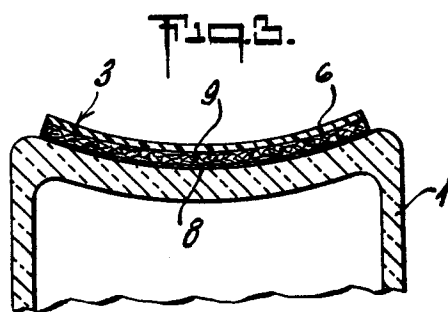
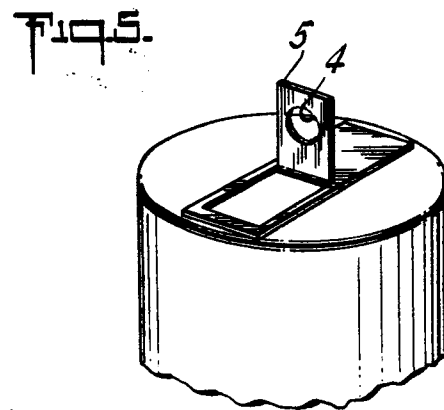
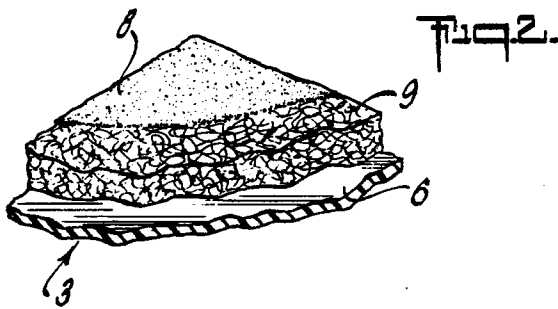
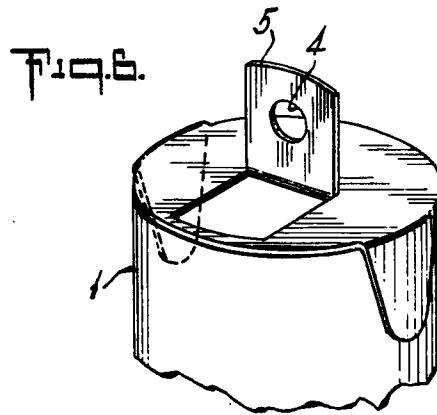
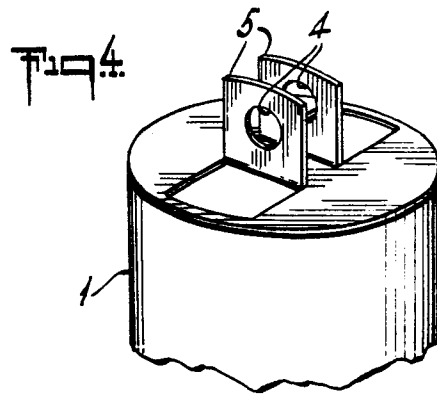
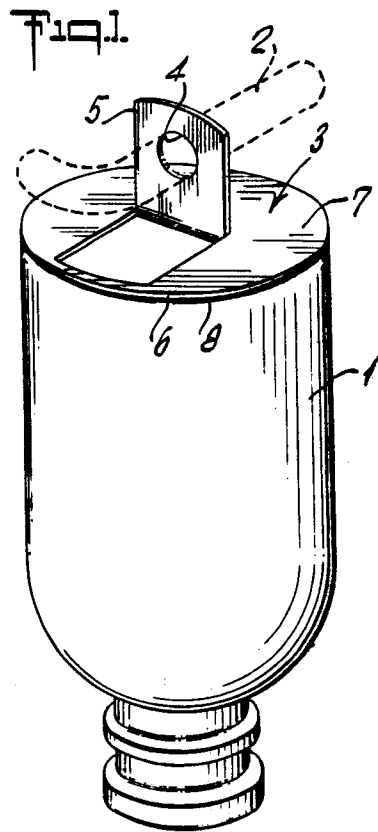
9. A device as claimed in any one of Claims 1 to 8 in which the support layer (6) is composed of a material made from high-density polyethylene fibers by an integrated spinning and bonding process.

10. Apparatus for dispensing solutions or suspensions comprising a container (1) for dispensing the solutions or suspensions and a suspension device (3) stuck to the container (1) at the end opposite to that from which the solutions or suspensions are dispensed, in which the suspension device (3) comprises a pressure-sensitive adhesive layer (8) by means of which the suspension device is stuck to the container, and, affixed to the opposite side of the adhesive layer (8), a unitary support layer (6) having a configuration that will engage a support device (2) from which the container (1) is to be suspended.

11. Apparatus as claimed in Claim 10 in which the container (1) is for parenteral, especially intravenous, administration of medicament solutions or suspensions from an inverted position.

12. Apparatus as claimed in Claim 11 in which the container is made of glass.

13. Apparatus as claimed in Claim 10, 11 or 12 in which the suspension device is as claimed in any one of Claims 2 to 9.





European Patent
Office

0000654
EUROPEAN SEARCH REPORT

Application number
EP 78 30 0182

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	<u>DE - A - 2 323 801</u> (FAENSEN KG) * Figure 12; pages 1-8; claims 1,2 *	1-5, 10-13	A 61 M 5/14
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			A 61 M 5/14
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family, corresponding document
☒ The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
The Hague	02-11-1978	NOESEN	