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(71) Applicant: **KEYMED (MEDICAL & INDUSTRIAL EQUIPMENT) LIMITED** [GB/GB]; KeyMed House, Stock Road, Southend-on-Sea Essex SS2 5QH (GB).

(72) Inventor: **HYNES, John**; c/o KeyMed (Medical & Industrial Equipment) Limited, KeyMed House, Stock Road, Southend-on-Sea Essex SS2 5QH (GB).

(74) Agent: **BOULT WADE TENNANT**; Verulam Gardens, 70 Gray's Inn Road, London, Greater London WC1X 8BT (GB).

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(54) Title: TRANSPORTATION CONTAINER FOR A MEDICAL DEVICE

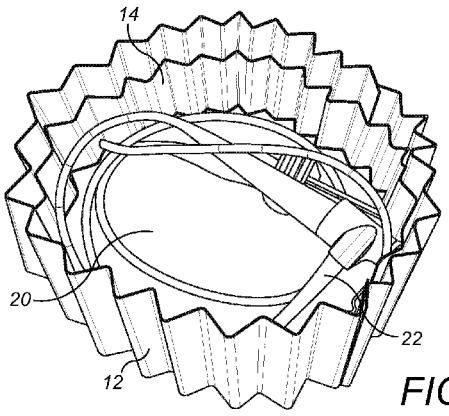

FIG. 4

(57) Abstract: A container (10) for carrying a medical instrument such as an endoscope after use and before cleaning, comprises a perimeter wall (12) having a height h and defining an enclosure with a diameter d. The perimeter wall (12) is substantially rigid in the height dimension. A flexible base (14) and a flexible cover (16) are attached to the wall (14). The wall (14) is compressible to a reduced diameter configuration for storage and expandable to an increased diameter configuration for use. The wall (14) may comprise a series of adjacent panels foldable concertina-style to reduce the diameter.

Transportation Container for a Medical Device

The present invention relates to a transportation container for a medical device such as an endoscope. The container can be stored in a compressed state and expanded when needed to provide an enclosure large enough to fit the medical device.

After carrying out a medical procedure with a device such as an endoscope, the device is contaminated with body fluids and must be thoroughly cleaned and sterilised before it is used again. The cleaning process is normally carried out at a different location and so the endoscope must be transported safely, in a manner which protects it from damage and prevents it contaminating anything else. Typically, the endoscope may be placed in a flexible bag which is sealed for transport and later disposed of when the endoscope is cleaned. Alternatively, endoscopes may be placed in a rigid plastic tray for transport and cleaning. A plastic sheet may then be sealed over the cleaned tray and endoscope so they are ready for a subsequent re-use.

The present invention provides a container for carrying a medical instrument, comprising a perimeter wall having a height and defining an enclosure with a diameter, wherein the perimeter wall is substantially rigid in its height dimension, a flexible base attached to the outer wall on which a medical device can be received, and an openable and a closable flexible cover attached to the outer wall, wherein the wall is compressible into a reduced diameter configuration for storage and expandable to an increased diameter configuration for receiving a medical device.

In this way, a container is provided which can be stored in a compressed form for space efficiency and expanded easily when desired. It provides improved protection for the medical instrument during transport but can be disposed of after use.

The perimeter wall may comprise a plurality of adjacent panels with fold lines therebetween. There may be multiple panels which are folded concertina-style. Alternatively, the wall may comprise two panels joined at their ends by fold lines.

The flexible base, or the flexible cover, or both may comprise a thin flexible sheet material. The cover is preferably in the form of a substantially tubular sheet with first and

second circular edges, wherein the first circular edge is secured to the perimeter wall and the second circular edge is free and provided with a closure means, which may comprise a drawstring.

The perimeter wall may define two or more apertures for receiving a user's fingers to facilitate to carrying the container. Conveniently, the perimeter wall may be formed of corrugated cardboard.

A fluid absorbent sheet may be located within the container to increase the ability to carry any fluid present on a medical instrument.

Preferably, the flexible base does not protrude below a lowermost edge of the perimeter wall when the container is in its expanded configuration.

The invention will now be described in detail, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a schematic perspective view of a container in accordance with a first embodiment of the present invention;

Figure 2 is a cross-section of the device shown in Figure 1;

Figures 3a, 3b and 3c show the device in its compressed state, folded in alternative configurations;

Figure 4 shows the container expanded, with the cover removed for clarity, and a medical device placed within the container;

Figure 5 shows the container in its expanded configuration, with the cover present and open and a medical device placed within the container; and

Figures 6a, 6b and 6c show an alternative embodiment of a compressible wall for the container of the present invention.

With reference to Figures 1 and 2, a container 10 in accordance with the present invention comprises a continuous perimeter wall 12, a flexible base 14 and an openable and closable flexible cover 16. Together these define an enclosure for receiving a medical device 22. The cover 16 may be closed by means of a drawstring 18. An absorbent cloth

20 may be placed within the container 10 on the flexible base 14 to absorb any fluids present on a medical device 22 placed in the container 10.

The perimeter wall 12 has a height h and defines the diameter d of the enclosure. The wall 12 is substantially rigid in the height dimension but can be contracted and expanded to provide an enclosure of different diameters. In the embodiment illustrated, the wall 12 is formed as a series of adjacent panels 24 with fold lines 25 between them. The panels 24 may be folded in a zig-zag or concertina-style manner. The wall 12 can be contracted when the panels 24 are folded so as to lie close to each other and expanded when the panels 24 are allowed to separate out.

The wall 12 can be folded in different ways in order to contract it, as illustrated in Figures 3a-3c. In Figure 3a, one pair of adjacent panels 24a is expanded out so that the pair is substantially flat. A corresponding pair of adjacent panels 24b on the opposite side is similarly expanded and lies flat. The remaining panels 24 are folded in two concertina rows between the flattened pairs 24a, 24b. In Figure 3b, pairs of the panels 24 are folded flat and the flattened pairs concertinaed together, with six adjacent panels 24c folded out to join the two ends of the concertina row.

In Figure 3c, all the panels 24 are contracted towards the centre.

In any of the contracted forms, the container 10 may be held by a fastener 26 such as an elastic band. The configurations shown in Figures 3a and 3b both produce a substantially rectangular package which is particularly space efficient. The configuration of Figure 3c produces a substantially cylindrical package which is somewhat larger.

The wall 12 is dimensioned and sufficiently expandable that it can accommodate a desired medical instrument. In the case of an endoscope, it must provide an enclosure with a large enough diameter in which the endoscope can be placed without coiling it too tightly so that the internal channels and optical fibres within the endoscope are not subjected to unduly small bending radii. For example, the wall 12 can be dimensioned to produce an enclosure with an overall diameter in the order of 45cm to 55cm.

The wall 12 may be formed of any suitable material such as cardboard or plastic which provides a strong perimeter for the container 10, to protect a medical device 22 from side impact damage. In this example, it is formed of corrugated cardboard. The corrugations can be aligned vertically to provide the substantially rigid height dimension h and to allow formation of the fold lines 25 between corrugations. Corrugated cardboard is also a cheap, readily available and easily disposable material.

The base 14 of the container 10 is formed by a flexible sheet which is secured to the interior surface of the wall 12, for example by a line of adhesive 15 (shown schematically in Figure 2). The flexible base 14 is thus suspended from the wall 12 in the form of a hammock. It is dimensioned such that it does not protrude below the bottom edge of the wall 12, even when a medical device 22 is placed upon it. This protects the medical device 22 from damage when the container 10 is placed on a surface. It is sufficiently strong to support the weight of a medical device 22 but is thin and flexible so that it can be folded up as the wall 12 is contracted. It is preferably formed of material such as plastic which is fluid impervious so that no leakage of fluid from the medical instrument 22 can occur.

In use, it may be desirable to place an absorbent cloth 20 within the container 10 on top of the base wall 14 for increased capacity to hold fluid.

The container 10 also includes a flexible cover 16 as shown in Figure 5. This is of generally tubular form, with one circular edge secured to the wall 12, for example by the same line of adhesive 15 as the base 14, or a separate line. The other circular edge is free and provided with a drawstring 18. The cover 16 is dimensioned so that it can be opened out, with the free edge folded over to the exterior side of the perimeter wall 12, to allow easy access into the container 10. Once a medical instrument 22 is placed within the container 10, the drawstring 18 can be pulled to cause the cover 16 to close over the top of the container 10 as shown in Figure 1. The drawstring 18 and flexible cover 16 may be configured to leave some central open area in the closed configuration, as illustrated in the schematic view of Figure 1. Alternatively, it may be possible to pull in the drawstring 18 sufficiently tightly that there is no significant opening in the closed configuration.

The flexible cover 16 may be separate from the flexible base 14 or they may be integral with one another. In this case, they are effectively formed as a bag of thin flexible material which is joined to the wall 12, for example by the adhesive line 15. A lower part of the bag below the adhesive 15 then forms the flexible base 14 and an upper portion of the bag above the adhesive forms the flexible cover. The base 14 and cover 16 are formed of thin flexible material such as plastic. At least the cover 16 may be transparent so that the contents of the container 10 can be easily seen.

In use, the container 10 is initially held in its compressed state for storage. When required, any fastener 26 present is removed, the wall 12 is expanded and the cover 16 opened in order to expose the base wall 14. If desired, an absorbent cloth 20 can be laid inside the container 10 on the base 14. A medical instrument 22 can then be placed on top of the cloth 20. The cover 16 is then pulled in by the drawstring 18 in order to close it over the top of the medical device 22. In this state, the container 10 can be taken to a suitable location for cleaning and sterilisation. The cover 16 is opened by loosening the drawstring 18. The medical device 22 can be removed and the container 10 can then be disposed of.

Finger slots may be formed in the wall 12 to make it easier to carry the container 10 when a medical device is placed therein.

It will be appreciated that different forms of compressable and expandable container can be provided within the scope of the present invention. In particular, the perimeter wall 12 may have different configurations. One example is shown in Figures 6a, 6b and 6c. In this case, the wall 12 is formed of two panels 24 joined by fold lines 25. In the expanded configuration, each panel 24 thus forms a substantially semi-circular portion of the wall 12. These can be pressed together as shown in Figure 6b to form a substantially flat item which can then be rolled up as shown in Figure 6c, or folded, into a smaller package. In these diagrams, the flexible base wall and cover have been omitted for the sake of clarity.

Claims:-

1. A container for carrying a medical instrument, comprising a perimeter wall having a height and defining an enclosure with a diameter, wherein the perimeter wall is substantially rigid in its height dimension, a flexible base attached to the wall for receiving a medical device, and an openable and closable flexible cover attached to the wall, wherein the wall is compressible into a reduced diameter configuration for storage and expandable into an increased diameter configuration for receiving a medical device.

2. A container as claimed in claim 1, wherein the perimeter wall comprises a plurality of adjacent panels with fold lines therebetween.

3. A container as claimed in claim 2, wherein the panels are folded concertina-style.

4. A container as claimed in claim 2, wherein the perimeter wall comprises two panels joined at their ends by fold lines.

5. A container as claimed in any preceding claim, wherein the base, or the cover, or both, comprise a thin flexible sheet.

6. A container as claimed in claim 5, wherein the cover comprises a substantially annular sheet with first and second circular edges, wherein the first circular edge is secured to the perimeter wall and the second circular edge is free and provided with closure means.

7. A container as claimed in claim 6, wherein the closure means comprises a drawstring arranged in the free edge of the cover.

8. A container as claimed in any preceding claim, wherein the perimeter wall defines two or more apertures for receiving a user's fingers to facilitate carrying the container.

9. A container as claimed in any preceding claim, wherein the perimeter wall is formed of corrugated cardboard.

10. A container as claimed in any preceding claim, further comprising a fluid absorbent sheet located within the container.

11. A container as claimed in any preceding claim, wherein the base does not protrude below a lowermost edge of the perimeter wall in the expanded configuration.

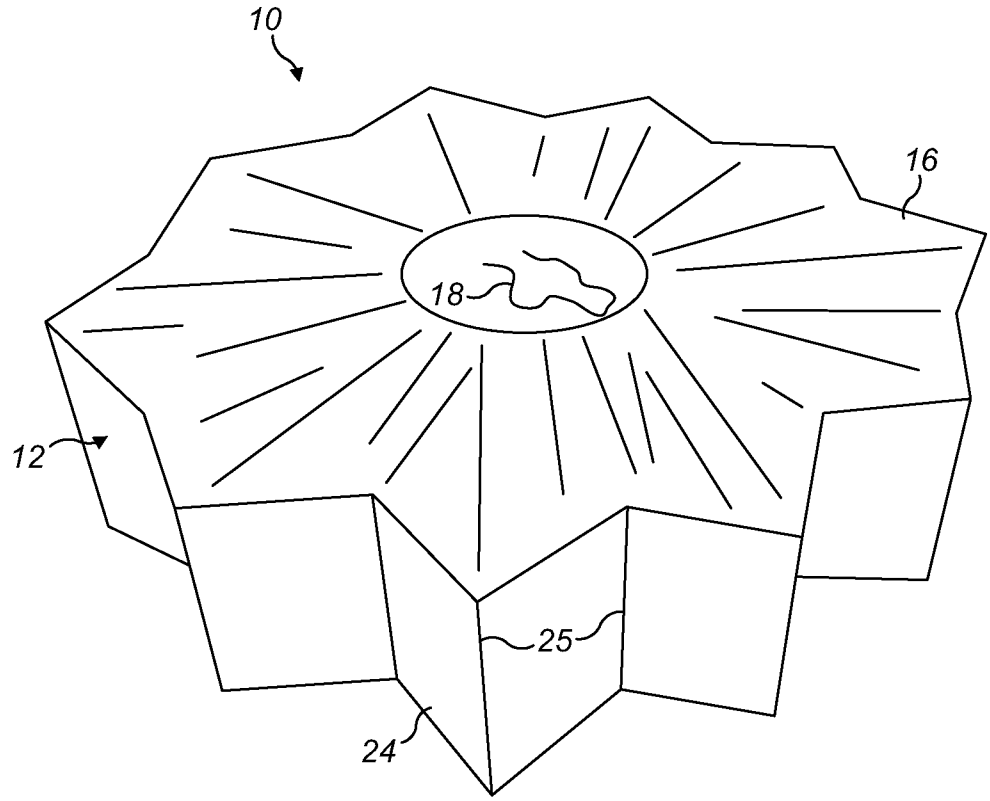

FIG. 1

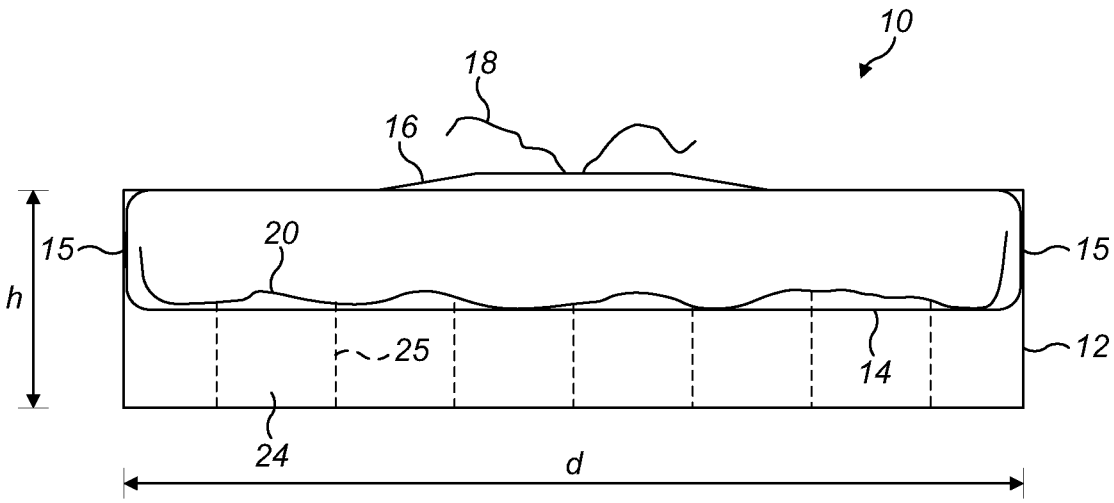

FIG. 2

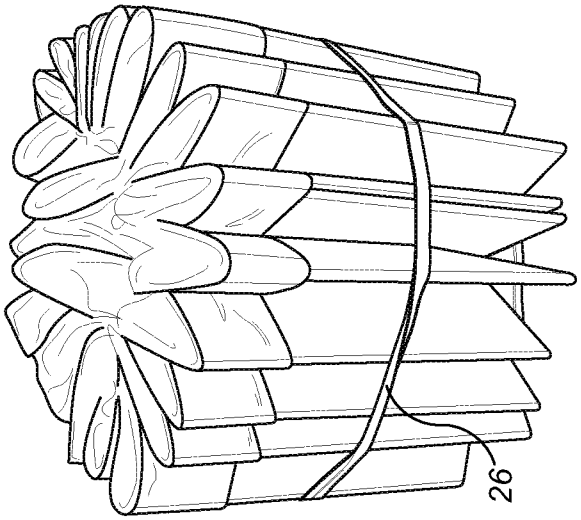

FIG. 3c

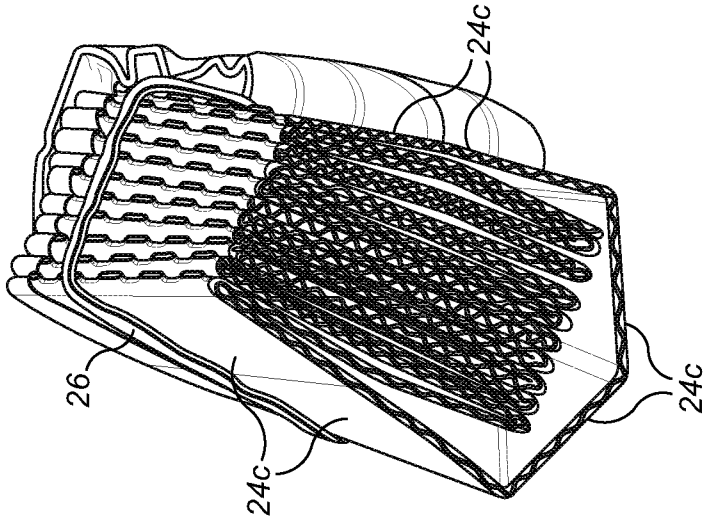

FIG. 3b

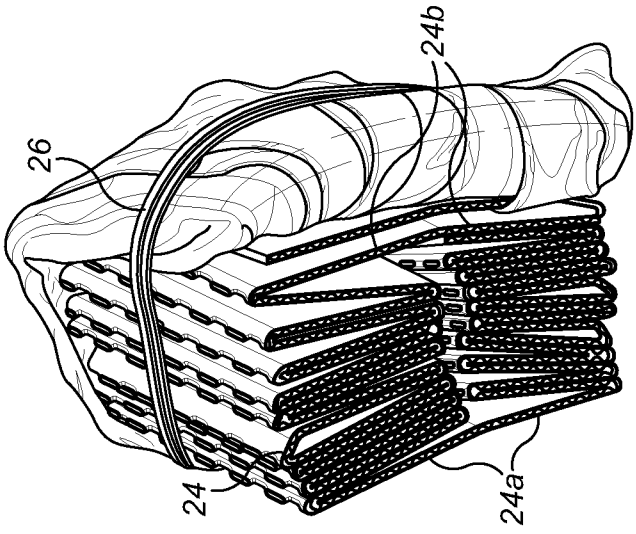

FIG. 3a

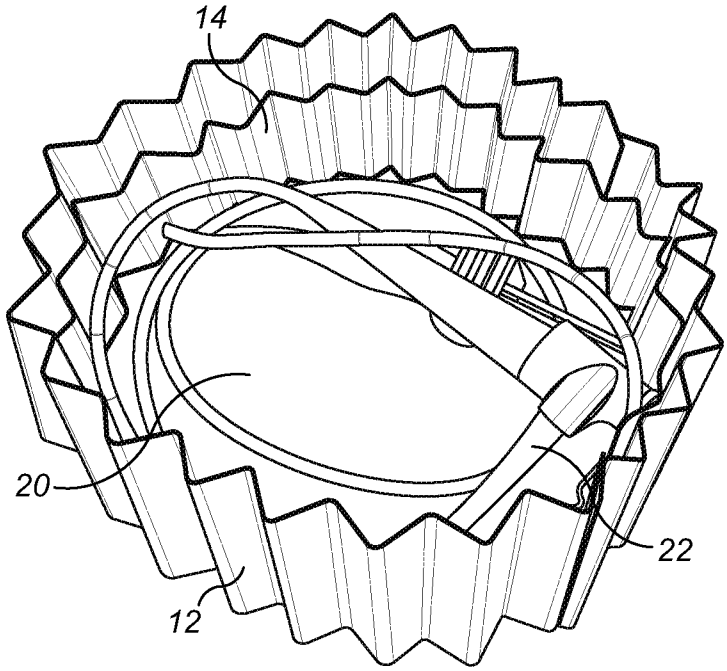

FIG. 4

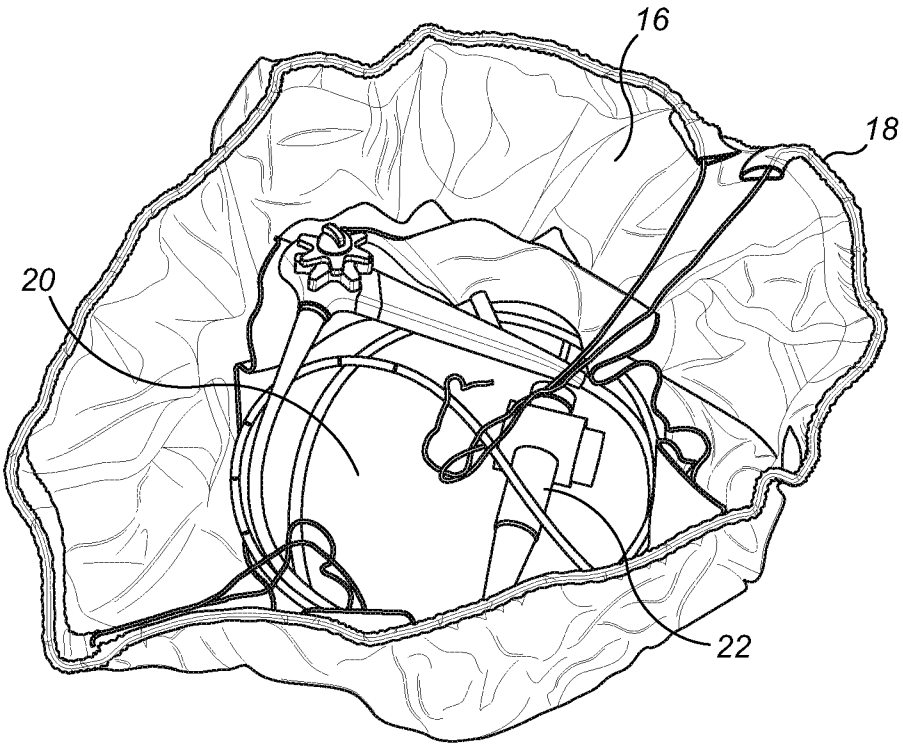

FIG. 5

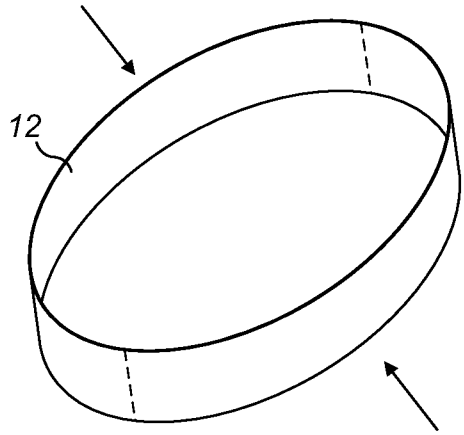

FIG. 6a

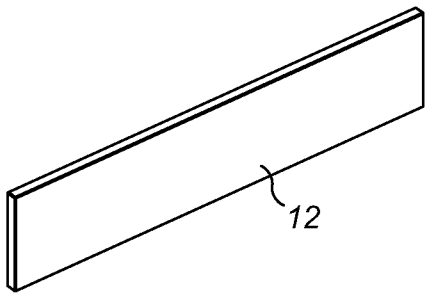

FIG. 6b

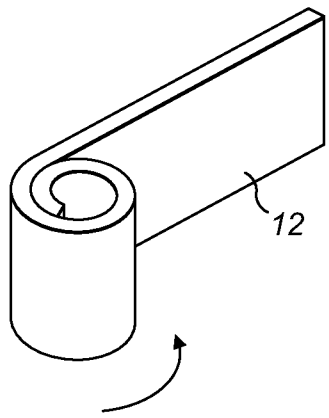

FIG. 6c

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2016/051201

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B1/00 B65D5/36 A61M25/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B B65D A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 July 2016	27/07/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Schindler, Martin

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2016/051201

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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