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(71) Applicant
Le Prototype Mecanique Industrie société anonyme

(Incorporated in France)

8 Rue Cugnot, Z.A. des Hautes Garennes,
78570 Chanteloup-Les-Vignes, France

(72) Inventor
Gilles Coty

(74) Agent and/or Address for Service
F J Cleveland & Co
40-43 Chancery Lane, London, WC2A 1JQ,
United Kingdom

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(56) Documents cited
GB 2167512 A **GB 2161234 A** **GB 1285803 A**
GB 1032691 A **GB 0410600 A**

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UK CL (Edition K) **F2G G1 G37 G6C2, F2P PF1**
INT CL[5] **F16L 3/00 5/00**

(54) Adjustable cable or tube guide

(57) A device for varying the angle of a cable (6) or tube as it emerges from an appliance comprises two cylindrical parts (1) and (2) each having a free end (3, 10) and an end (4, 11) bevelled at the same angle α, the bevelled ends (4, 11) comprising means leaving room for the cable (6) or tube through the device and also of use for securing one of the parts (1, 2) to the other (1, 2) and rotating one of the parts (1, 2) with respect to the other (1, 2) around a common axis perpendicular to the cross-section of the bevelled ends (4, 11) and extending through their centre as shown in Fig 6. The device may be provided with an O-ring 17 if it is to convey a liquid.

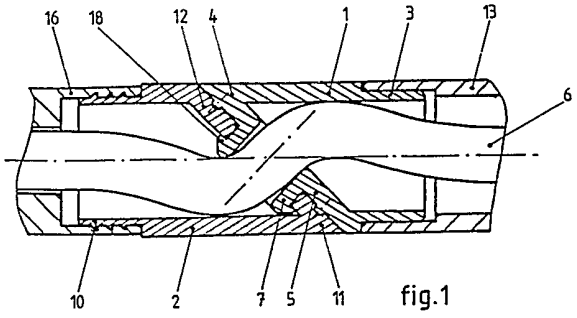

fig.1

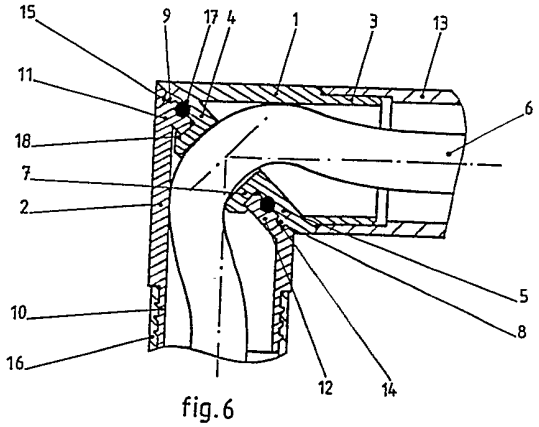

fig.6

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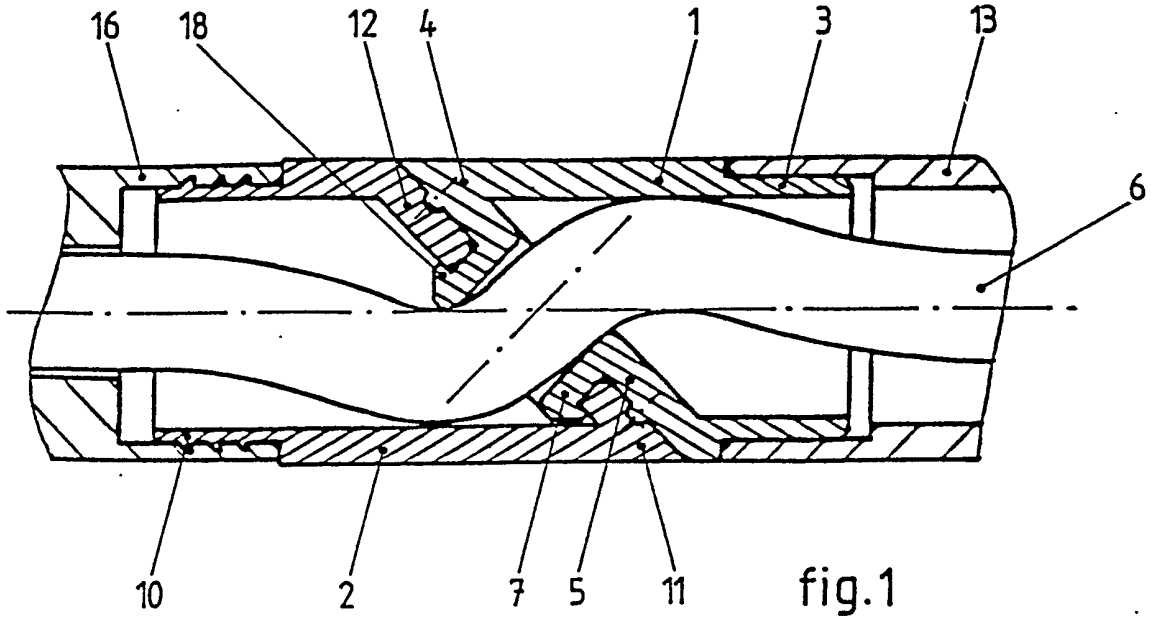


fig.1

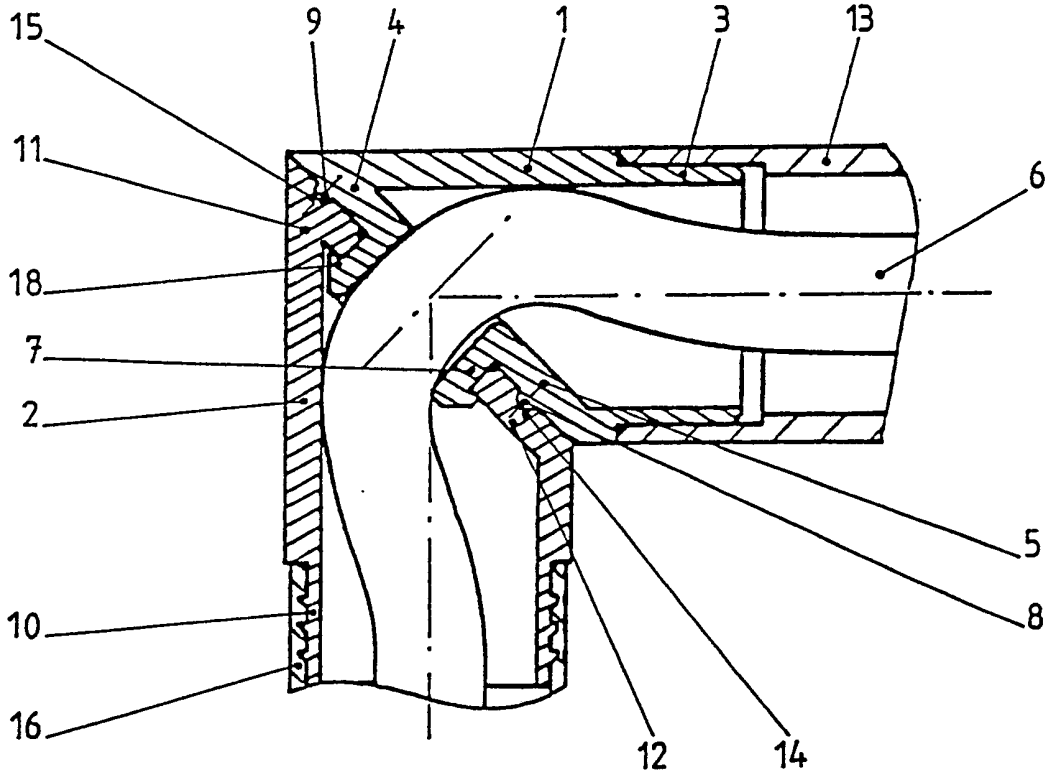
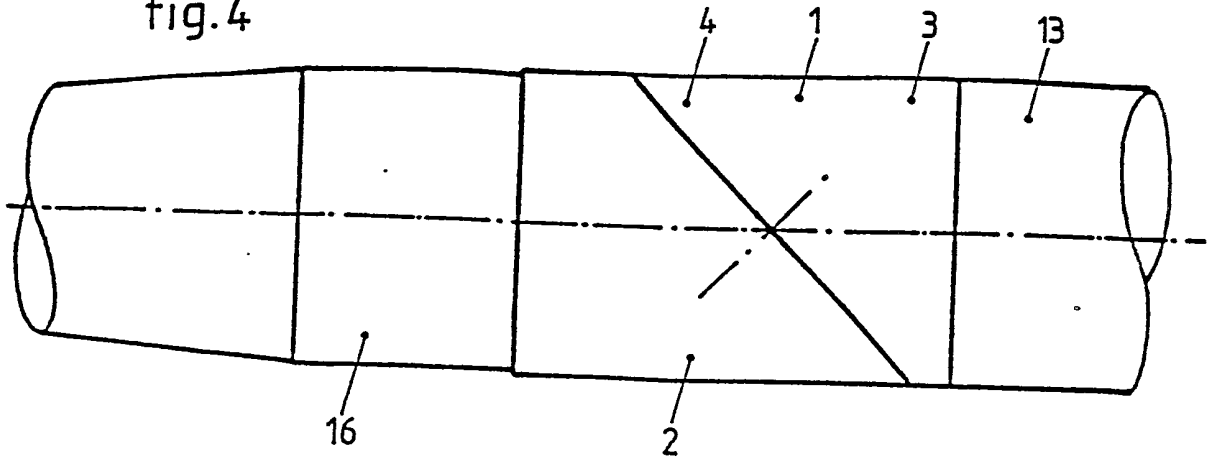


fig.2

fig.4



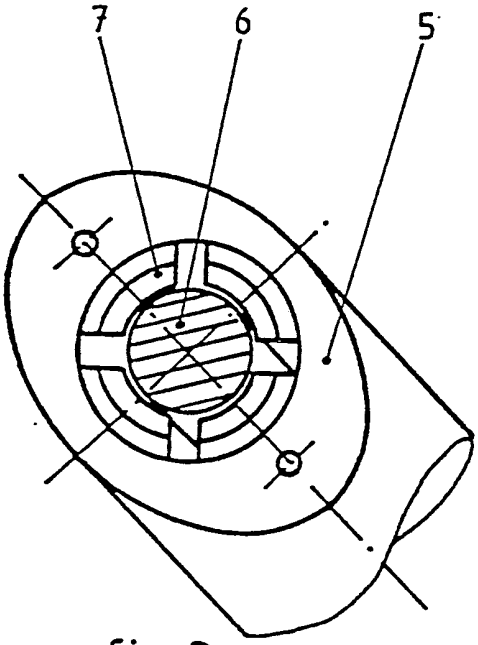


fig.3

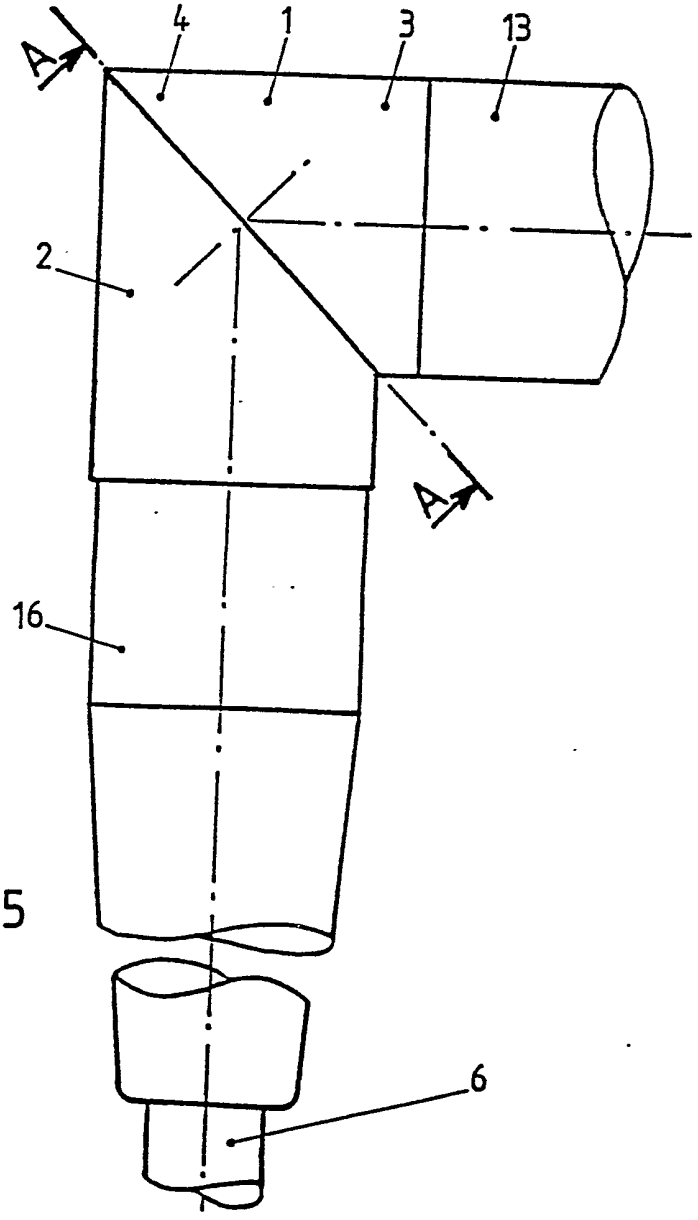


fig.5

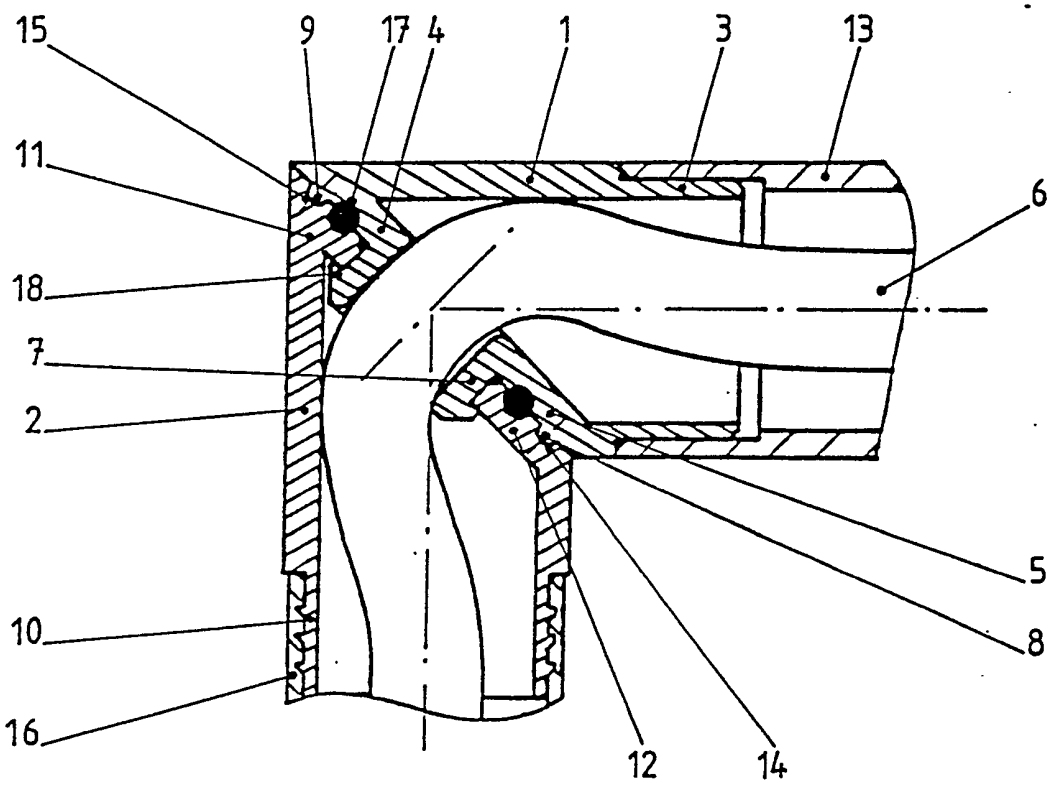


fig.6

A DEVICE FOR GUIDING AN ELONGATE BENDABLE MEMBER

DESCRIPTION

The invention relates to a device for guiding an elongate flexible member and more particularly to a device for varying the angle of a cable or tube as it comes out of an appliance, and to appliances equipped with such a device.

Numerous appliances are made up of various components enclosed in a chamber constituting the body of the appliance. The components can be connected to the exterior by cables for electricity or by pipes for transfer of liquids. Usually the cables or pipes come out of one surface of the chamber in a given direction, usually perpendicular to the surface. This shape may pose some problems when the appliance is adapted to be mounted in a more complex assembly. Appliances comprising a cable or pipe projecting perpendicularly to the outlet surface are suitable in some cases, but in other cases a bent outlet is preferable.

An attempt to solve these problems has been made in some prior-art devices. For example, to obtain a cable outlet bent at right angles, it has been proposed to insert an additional component at the place where the cable extends out of the appliance, when the cable has to be guided. This system admittedly solves the posed problem, but it requires two parts, one permanently installed on the cable to be guided and the other

positioned when the cable has to be guided. This solution, therefore, poses problems as regards looking after the moving part when not in use.

The invention proposes a simple, efficient and inexpensive solution and obviates the problems of storage.

To this end the invention relates to a device which is to be permanently installed on an appliance comprising an outlet for an elongate, bendable member, such as a cable or a tube, the device being adapted to alter the outlet angle of the elongate member by simple rotation. Hereinafter, the term "cable" will denote either a cable or a tube.

The invention also relates to appliances, more particularly motion pick-ups, equipped with the guide device.

The device according to the invention is characterised in that it comprises two cylindrical parts each having a free end and an end bevelled at the same angle α, the bevelled ends comprising means leaving room for the elongate member through the device and also of use for securing one of the parts to the other and rotating one of the parts with respect to the other end rotating one of the parts with respect to the other around a common axis perpendicular to the cross-section of the bevelled ends and extending through their centre.

The cylindrical parts can have any cross-section. In a preferred variant of the device according to the

invention, however, portions of a cylinder of circular cross-section are used.

Preferably the acute bevel angle is 45°.

In one embodiment, the bevelled end of each part is partly blocked by a partition comprising a circular opening centred relative to the outer surface of the partition. The opening in the partition in one part is provided with a securing component which is inserted into the opening in the partition in the other part. The securing component can be a tube having an outer diameter equal to the inner diameter of the opening in the other part, and formed with longitudinal notches giving it sufficient flexibility for insertion into the co-operating aperture, the free end being provided with a retaining bead.

One cylindrical part of the device is secured to the appliance and surrounds the elongate member to be guided, whereas the other part is secured to the first part and movable in rotation relative thereto.

When it is desired that the elongate member should extend perpendicular to the surface of the appliance, the movable cylindrical part of the device is positioned so that the two parts are coaxial.

When the cable outlet has to be bent, the movable part of the device is positioned so that its axis is at an angle 2α to the axis of the part fixed on the appliance. To change from one position to the other, it is only necessary to bring about a rotation through 180°, relative to one another, of the outer

surfaces of the partitions blocking the bevelled ends.

When the two cylindrical parts forming a device in which the invention is embodied are connected to one another in sealing-tight manner, the device can itself serve as a tube for a liquid. In that case it is only necessary to fit one end of the device to the appliance in sealing-tight manner, whereas the other end is fitted to the outer circuit.

This variant can also be used for simultaneously guiding an electric output and an outlet for liquid, using a single device, an electric cable extending into the device and the space between the cable and the inner surfaces of the device serving as a pipe for a liquid.

The device according to the invention is of use for any appliances connected to an external environment by cables or tubes which can be bent, when the direction of the cables or tubes cannot be determined before the appliance is fitted into the surrounding system. When an appliance is equipped with a device according to the invention, it is only necessary, during assembly, to pivot the moving part of the device relative to the part fixed on the appliance, so as to guide the cable or tube in the desired manner.

The device is particularly well adapted to appliances having a cylindrical shape and an axial cable outlet. Motion pick-ups are a characteristic example of such appliances. The fixed part of the device can then be mounted on the pick-up by a rigid sleeve. The device

and the sleeve will preferably be dimensioned so that the assembly is continuous.

The invention is explained in greater detail in embodiments described hereinafter with reference to Figures 1 and 6 hereinafter. In the drawings:

Fig. 1 shows a device in which the invention is embodied in the straight position, seen in section;

Fig. 2 shows a device in which the invention is embodied in a bent position, seen in section;

Fig. 3 is a view along A-A in Fig. 5;

Fig. 4 is a side view of the device in the straight position;

Fig. 5 is a side view of the device in the bent position, and

Fig. 6 shows a sealing-tight device in which the invention is embodied in the bent position, seen in section.

Figures 1 to 6 show a device in which the invention is embodied installed on an appliance having a generally cylindrical shape, e.g. a cylindrical pick-up, and comprising a coaxial outlet for a cable 6.

The device has two tubular parts 1 and 2. Part 1 is a cylinder having a circular cross-section and cut at a right angle at its end 3 connected to the pick-up and cut at a 45° bevel at its other end 4. The end 4 is partly blocked by a partition 5 comprising a

circular opening centred on the outer surface of the partition 5. The aperture has a securing means 7 extending towards the exterior. The part 2 is a cylinder having a circular cross-section and cut at a right angle at its end 10 and cut at a 45° bevel at its other end 11. The end 11 is partly blocked by a partition 12 formed with a circular opening centred on the outer surface of the partition 12. The diameter of the opening is equal to the outer diameter of the securing element 7.

Parts 1 and 2 are held in contact by the outer surfaces of partitions 5 and 12, via the securing element 7, which is inserted into the opening in the partition 12.

When parts 1 and 2 are coaxial, the cable outlet is straight (Fig. 1). Cable 6 however, follows a slightly curved trajectory, in view of the angle of the axis of the openings in the partitions 5 and 12.

In the embodiment shown in Figures 1 to 6, the part 1 provided with securing elements 7 is secured to the pick-up. In this manner the cable does not undergo torsion when the movable part 2 pivots with respect to the part 1 secured to the pick-up.

When the securing element 7 is borne by the movable part 2, the cable is held by the retaining beads 18 on the element 7, giving good protection against the cable being torn out when subjected to tension. In that case, however, it is advisable to provide means, such as an abutment, on the device to prevent rotation through more than 180°, in order to avoid

excessive torsion on the cable and possible damage thereto.

Parts 1 and 2 are held in relative position by simple friction of partitions 5 and 12. However, to maintain the position more efficiently, the outer surface of one partition can be provided with two diametrically opposite barbs 8,9 and the outer surface of the other partition can have two recesses 14,15 corresponding in size and position to the barbs. Barbs 1 and 2 are made of materials which are sufficiently resilient to enable the barbs to be disengaged from the recesses in order to rotate the part 2, relative to the part 1.

Part 1 can be secured to the pick-up by a rigid sleeve 13 incorporated in the pick-up. Preferably the end 3 of part 1 is shaped so as to compensate the thickness of the sleeve 13.

A flexible sleeve 16 is inserted at the end 10 of the part 2 so as to centre the cable 6 at the outlet. Preferably, end 10 is also designed so as to compensate the excess thickness due to the sleeve 16.

Fig. 6 shows a device in which the invention is embodied adapted to serve as a tube for conveying a liquid. To this end it has an 0-ring 17 for maintaining sealing-tightness.

A device of this kind can be mounted in sealing-tight manner on the appliance to be equipped, at the end 3 of part 1 and on the outer circuit at the end 10 of part 2.

CLAIMS

1. A device for guiding an elongate bendable member, the device comprising two cylindrical parts each having a free end and an end bevelled at the same angle α, the bevelled ends comprising means leaving room for the elongate member through the device and also of use for securing one of the parts to the other and rotating one of the parts with respect to the other around a common axis perpendicular to the cross-section of the bevelled ends and extending through their centre.

2. A device according to claim 1, wherein the cylindrical parts have a circular cross-section.

3. A device according to claim 1 or claim 2, wherein the bevel angle α is 45°.

4. A device according to any one of claims 1 to 3, wherein the bevelled end of each of the parts is partially blocked by a partition having a circular opening centred with respect to the outer surface of each partition, the opening in the partition in one of the parts being provided with a securing means for fitting into the opening in the partition in the other part.

5. A device according to claim 4, wherein the securing element is a tube having longitudinal notches and an outer diameter equal to the inner diameter of

the opening in the other part, the free edge being formed with a retaining bead.

6. A device according to any one of claims 1 to 5, wherein one of the cylindrical parts of the device is secured to the appliance and surrounds the elongate member to be guided, and the other cylindrical part is secured to the first part and movable in rotation with respect thereto.

7. A device according to any one of claims 1 to 6, wherein the two cylindrical parts are secured to one another in sealing-tight manner.

8. A device according to claim 7, wherein sealing-tightness is obtained by means of an O-ring.

9. A device according to claim 6, wherein the securing element is borne by the part of the device secured to the appliance.

10. A device according to claim 6, wherein the securing element is borne by the movable part of the device.

11. A device according to claim 10, wherein the device has means for limiting to 180° the rotation of the moving part relative to the part fixed to the appliance.

12. A device according to any of claims 1 to 11, wherein the outer surface of one of the partitions has two diammetrically opposite barbs, and the outer surface of the other partition has two recesses which correspond in dimensions and position to the barbs.

13. A device for guiding a cable or a tube substantially as described hereinbefore with reference to the accompanying drawings and as shown in Figures 1 and 4, or in Figures 2,3 and 5, or in Figure 6 of those drawings.

14. An appliance comprising a cable or tube outlet, wherein the cable or tube is provided with a device according to any of claims 1 to 13.

15. A motion pick-up comprising a cable outlet, wherein the cable is provided with a device according to any of claims 1 to 13.

Patents Act 1977

Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number

9204938.6

Relevant Technical fields

(i) UK Cl (Edition K) F2P (PF1); F2G (G1,G6C2,G37)

(ii) Int CL (Edition 5) F16L 5/00, 3/00

Search Examiner

B J PROCTOR

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

7 MAY 1992

Documents considered relevant following a search in respect of claims 1 AT LEAST

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2167512 A (CAMP) eg. Figures 1, 2 and page 3 lines 9-25	1-3, 4, 7 8 at least
X	GB 2161234 A (PARAGON PLASTICS) eg. Figure 1	1-3, 7, 8 at least
X	GB 1285803 A (HYDROTECH) eg. Figures 1-3	1-3, 7, 8 at least
X	GB 1032691 A (TAGA) eg. Figures 8, 9 and projections 7	1-3 at least
X	GB 410600 A (LENZE) eg. Figure 1	1-3 at least

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Category	Identity of document and relevant passages	Relevant to claim(s)

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E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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