



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.08.2012 Bulletin 2012/35

(51) Int Cl.:
A47B 57/56 (2006.01)

(21) Application number: **12156607.9**

(22) Date of filing: **22.02.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(71) Applicant: **Cean Company S.p.A.**
61032 Fano (PU) (IT)

(72) Inventor: **Patrignani, Patrizio**
I-61040 S. Ippolito (PU) (IT)

(74) Representative: **Negrini, Elena**
Agazzani & Associati S.r.l.
Via dell'Angelo Custode 11/6
40141 Bologna (IT)

(30) Priority: **22.02.2011 IT BO20110074**

(54) **Support device**

(57) A support device comprises at least one connection means (2) having a support means (4) and associable to a corresponding elongated prop means (5) and assigned, in an operative condition, to be vertical or nearly vertical.

The side outer surface (51) of the prop means (5) has straight lines generatrix and parallel in respect to the longitudinal axis of the same prop means (5).

The connection means (2) includes a cavity whose inner surface (21) is complementary shaped and almost equal to the shape of a portion of the outer surface (51) of the prop means (5) and has identical transverse dimensions or slightly bigger than those of this latter outer

surface (51).

This inner surface (21) has a lateral opening (22), inclined in respect to the straight lines generatrix of the inner surface (21), sufficient wide to allow the passage of the prop (5) and whose projection onto a plane perpendicular in respect to said straight lines generatrix of the inner surface (21) is smaller than the corresponding transverse section of the prop means (5).

The connection means (2) has also a coupling (23) for the support means (4) and approximately oriented parallel in respect to the lateral opening (22) and approximately perpendicularly to the straight lines generatrix of the inner surface (21).

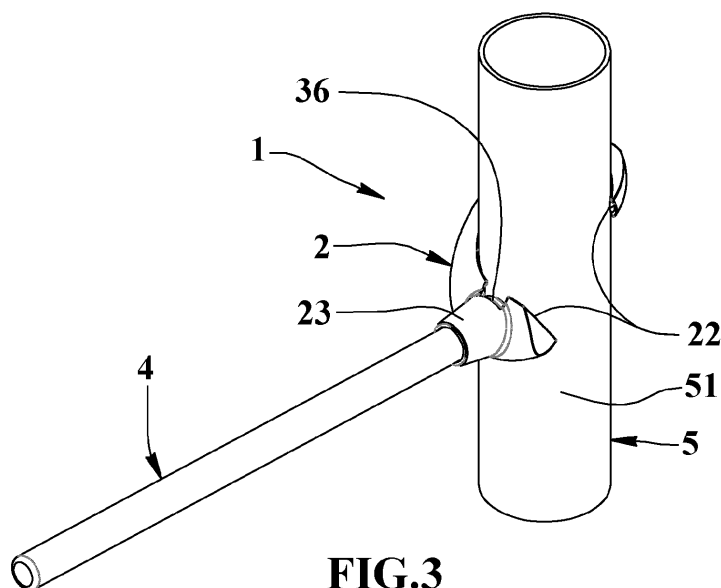


FIG.3

Description

[0001] The present invention relates to the technical field concerning the equipment, the furnishings and the furniture for shops and houses and it refers to a support device particularly suitable for the support and/or to the exhibition of clothing, objects and goods in general.

[0002] There are known supports, used in clothing shops, provided with a protruding arm, suitable to support hangers for dresses, blisters or to support shelves, fixed by means of hook ends to proper hollow seats carried out in support elements such as crossbar uprights or the like.

[0003] A drawback of these known supports consists in that the arms positioning cannot be achieved everywhere along the support but is obliged at the hooks slot seats positions obliging the support configuration and the space use.

[0004] Another drawback consists in that the it needs relatively a lot of time, attention, capability and sometimes assembly tools to hook, to unhook and to reposition the protruding arm on the support element which render complex and expensive the installation and adjustment of the known supports.

[0005] Another drawback consists in that the slot seats necessary for the hooks, besides to determine or condition the support general esthetics, get weak the support elements and are more expensive.

[0006] Further drawback consists in the fact that the zones of the support elements having the hollow seats are subjected to scratches and other damages due to the repeated hooks positioning.

[0007] Another drawback consists in that many known supports arms, when they are stressed from lower part upwards or anyway with forces having action direction opposite to the action direction of the normal working loads, can be unhooked and fall down.

[0008] An object of the present invention is to propose a support device to position as desired and without any limitations the arms along the respective supports.

[0009] Another object is to propose a device which allows anybody in easy and immediate manner, to fix an arm to a support and continuously to adjust the position of the arm.

[0010] Further object is to propose a device whose support uprights are continuous, in other words without cavity or openings, and therefore they are robust with solid and pleasant aspect.

[0011] Other object is to propose a device virtually free from scratches and damages due to the arms fixing and repositioning.

[0012] Further object is to propose a device whose arms don't break away when falling down even if they are subjected to loads in the opposite direction in respect to the working direction.

[0013] The characteristics of the invention are highlighted in the following with particular reference to the attached drawings in which:

- figure 1 shows a side-view of the support device object of the present invention wherein a connection means, having a support means, is connected to a prop means whose a partial portion is shown and placed in work vertically;
- figure 2 shows a back-view of the device of figure 1;
- figure 3 shows an axonometric view of the device of figure 1;
- figure 4 shows an enlarged and in plane view of the connection means of figure 1;
- figure 5 shows an enlarged and front view of the connection means of figure 1;
- figure 6 shows a sectional view according to the plane VI-VI of figure 5;
- figure 7 shows an enlarged side view of the connection means of figure 1;
- figures 8 and 9 show axonometric from various sides, enlarged and exploded of the device of figure 1;
- figures 10 and 11 show axonometric views of respective variants of the device of figure 1;
- figure 12 shows an enlarged and exploded view of the device of figure 11.

[0014] With reference to figures 1-9, number 1 indicates the support device, object of the present invention, comprising at least a connection means 2 having a support means 4, for instance cantilever shaped.

[0015] The connection means 2 is associable to a corresponding elongated prop means 5 and assigned, in an operative condition, to be fixed vertically or almost like a free upright or column.

[0016] The outer side surface 51 of the prop means 5 has straight lines generatrix and parallel in respect to the longitudinal axis of the same prop means 5, which therefore can be prismatic shaped, for example rectangular, square, polygonal in general or curved transverse section; preferably said prop means 5 has right cylinder shape as shown in the figures 1 - 3, 10 and 11.

[0017] The connection means 2 includes a cavity whose inner surface 21 is shaped complementary to a portion of the outer surface 51 of the prop means 5 and its transverse dimensions are equal to or slightly bigger than those of the outer surface 51.

[0018] Therefore said inner surface 21 of the connection means 2 reproduces the shape of a portion of the outer side surface 51 of the prop means 5 and so preferably consists of a cylindrical surface portion with the same diameter or better slightly bigger than that of the prop means 5.

[0019] Said connection means 2 and its inner surface 21 have a lateral opening 22 whose main dimension is inclined in respect to the straight lines generatrix of the inner surface 21.

[0020] The minimum width of the lateral opening 22 is sufficient to allow the passage of the prop means 5 for example having a clearance of few millimeters to facilitate the insertion.

[0021] The projection of the lateral opening 22 on a

plane perpendicular to said generatrix of the inner surface 21 has smaller sizes than the corresponding transverse section of the prop means 5 or smaller than the diameter of the cylindrical outer surface 51 of the connection means.

[0022] In particular, the inner surface 21 of the cavity of the connection means is preferably geometrically shaped similar to the portion of the cylindrical outer surface 51 of the prop means 5 included between two geometric planes mutually almost parallel and inclined at an angle ranging between 30° and 60°, preferably at about 45°, in respect to the straight lines generatrix of said inner surface 21.

[0023] The intermediate curved geometric line of said inner surface 21 has therefore an elliptic shape interrupted at the lateral opening 22.

[0024] When the main dimension of the lateral opening 22 is almost parallel in respect to the longitudinal axis of the prop means 5, it is possible to insert and engage this latter into the cavity of the connection means 2 while when the longitudinal geometric axes of the inner surface 21 of said cavity and of the prop means 5 are coinciding, the connection means 2 cannot be disengaged by the prop means 5 except by rotating this latter until the return in the parallelism condition between the lateral opening 22 and the prop means 5.

[0025] If the prop means 5 has a polygonal section, for example squared, the inner surface 21 of the connection means 2 will have four flat faces which form interposed square corners and, as seen, it is interested by the lateral opening 22.

[0026] In this case, the intermediate geometric line of said inner surface 21 assumes therefore a rectangular shape interrupted at the lateral opening 22.

[0027] The connection means 2 is further more equipped with a coupling 23 for the support means 4 and oriented approximately parallelly in respect to the projection of the lateral opening 22 onto a geometric plane perpendicular to the straight lines generatrix of the inner surface 21.

[0028] The intermediate portion of the lateral opening 22 of the inner surfaces 21 is approximately placed at the incidence point of the minor axis of the intersection between one of the geometric planes and the outer surface 51 with the same outer surface 51.

[0029] The coupling 23 is approximately placed at the incidence point of the main axis of the intersection between one of the geometric planes and the outer surface 51 with the same outer surface 51.

[0030] In other words and referring to the elliptic shape of the median line of the cylindrical inner surface 21, the coupling 23 is placed at an intersection point of the major axis of said median line with said line, while the central point of the lateral opening 22 is at an intersection point of the minor axis of said median line with said line.

[0031] The inner surface 21 of the cavity of the connection means 2 has a first hollow seat 25 and a second hollow seat 26 carried out near the coupling 23 and po-

sitioned opposed to it 23.

[0032] In each hollow seat 25, 26 a respective magnet means 27, 28 is locked inside, for example by means of glue, mortise or clamping, preferably of neodymium type and they are discoid or pad shaped. The prop means 5 is made of a magnetizable material. In this way, when the connection means 2 is engaged to the prop means, the magnets, acting on the magnetizable material of the prop means, maintain the connection means 2 in the engaged position in respect to the prop means 5 also in the presence of forces, having lower intensity than a certain threshold exceed the magnetic forces, turned towards disengaging direction.

[0033] Furthermore, the magnets prevent undesired sliding of the connection means 2 along the prop means 5.

[0034] Obviously, the invention provides the possibility to use only one magnet or a number of magnets bigger than two.

[0035] Each hollow seat 25, 26 of the connection means 2 has a peripheral extension 30, 31 assigned to house respective friction means 32, 33, for example of O-ring type or obtained by punching an elastomeric material sheet or by die-molding and equipped with an adhesive or glueable face in the hollow seat 25, 26.

[0036] The friction means 32, 33 are assigned to match the outer surface 51 of the prop means 5 to cooperate in preventing the undesired sliding of the connection means 2 along the prop means 5; furthermore, they preserve the prop means 5 from superficial scratches and damages.

[0037] The support means 4 has a mounting portion 41 for a first chamber 24 of the coupling 23 of the connection means 2.

[0038] Said mounting portion 41 and the first chamber 24 have complementary cylindrical or truncated conical shape or the like, with respective anti-rotation flat portions 42, 34.

[0039] The mounting portion 41 has furthermore a threaded hole for a fixing screw 43 whose head portion is housed in a pass-through opening 35 carried out through the connection means 2 and directing into the first chamber 24, preferably under the respective magnet.

[0040] The cross-sections of the connection means 2, not interfering with the coupling 23 or with the lateral opening 22, are approximately shaped as "D", circumference sector or ellipses sector.

[0041] The connection means 2 is preferably made of aluminum, aluminum alloys or other metal, in a single body with the portion having the first chamber 24.

[0042] The operation of the device 1 provides the vertical assembly of one or more prop means 5, for example in a shop, in an exposition area, in a wardrobe, in a wardrobe-room, etc. and the application at each of said prop means 5, for example of tubular type with cylindrical wall, of one or more connection means 2 with the respective support means 4 to support products, hangers for dresses, blisters, shelves, spot lights, etc....For this purpose

the support means 4 can be shaped and realized in the most various shapes and materials to adapt the device to the various needs

[0043] Preferably the support means 4 are metallic type and rod shaped.

[0044] The device characteristics allow at the same time an easy and prompt application and setting-up of the support means 4 and their stable and safe fixing also when they are unloaded.

[0045] The variant of the device in figure 10 differs from the previous embodiment only because of the presence of a terminal stop 44 fixed at the free end of the support means 4 to prevent the undesired falling-down of hangers or blisters.

[0046] The variant of the device in figures 11 and 12 differs from the first embodiment because of a set of cantilever means 45 fixed to the rod of the support means 4.

[0047] Each of said cantilever means 45 is equipped with one or more bearing means 46, for example consisting of rubber pads made of transparent silicon material, to support the shelves, for example made of glass. Furthermore, in said variant the coupling 23 is equipped with a second chamber 36 for an rotation preventing means 37 in "L" shaped for said shelves sustained by the cantilever means 45.

[0048] An end of the rotation preventing means 37 is equipped with a kind of small cap assigned to protect the edges of the respective shelf and the other end is equipped with a hole 38 engageable by the fastening screw 43 to block the rotation preventing means 37 to the coupling 23.

[0049] Each shelf is placed, after the fixing of the support means 4 to the prop means 5, inserting an edge of the shelf under to the protection cap and laying this shelf above the bearing means 46.

[0050] An advantage of the present invention is to provide a support device which permits to position as desired and without any limitations the arms along the respective supports

[0051] Other advantage is to provide a device which allows anyone, in an easy and immediate way, to fix an arm to a support and continuously adjusting its position.

[0052] Further advantage is to provide a device whose support uprights are continuous, or without cavity or openings, and so they are robust and have solid and elegant aspect.

[0053] Other advantage is to provide a device virtually free from scratches and damages due to the arms fixing and their repositioning.

[0054] Further advantage is to provide a device whose arms do not break away when fall down even when they are subjected to loads in direction opposite to that of the work direction.

Claims

1. Support device comprising at least a connection

means (2) having a support means (4), with a main dimension, and associable to a corresponding elongated prop means (5) and assigned, in an operative condition, to be vertical or nearly vertical; said device (1) is **characterized in that** the outer side surface (51) of the prop means (5) has straight lines generatrix parallel in respect to the longitudinal axis of the same prop means (5); the connection means (2) has a cavity whose inner surface (21) is complementary shaped and almost equal to the shape of a portion of the outer side surface (51) of the prop means (5) and said inner surface (21) has transverse dimensions equal to or slightly bigger than those of the outer side surface (51) portion; said inner surface (21) has a lateral opening (22), inclined in respect to the straight lines generatrix of the inner surface (21), sufficiently wide to allow the passage of the prop means (5) and whose projection onto a plane perpendicular in respect to those generatrix of the inner surface (21) is smaller than the corresponding transverse section of the prop means (5); the connection means (2) has furthermore a coupling (23) for connecting the support means (4) orientating the main dimension of the latter approximately parallel in respect to the lateral opening (22) and approximately perpendicular to the straight lines generatrix of the inner surface (21).

2. Device according to claim 1 **characterized in that** the shape of the inner surface (21) of the cavity of the connection means (2) is geometrically similar to a portion of the outer surface (51) of the prop means (5) comprised between two geometric planes inclined in respect to said straight lines generatrix and interrupted corresponding to the lateral opening (22).

3. Device according to claim 1 or claim 2 **characterized in that** the outer side surface (51) of the prop means (5) is cylindrical shaped.

4. Device according to claims 2 and 3 **characterized in that** the inner surface (21) of the cavity of the connection means (2) has the shape of a portion of cylindrical surface having a diameter equal to or slightly bigger than the diameter of the outer surface (51) of the prop means (5) and said portion is comprised between two geometric planes almost mutual parallel and inclined at an angle ranging between 30° and 60°, preferably about 45°, in respect to the straight lines generatrix of said cylindrical surface interrupted in corresponding to the lateral opening (22) which extends itself for a development slightly larger than the diameter of the outer surface (51) of the prop means (5).

5. Device according to claim 4 **characterized in that**, in an engaged condition of the connection means (2) to the corresponding prop means (5) and referring

to their geometric shapes, the median portion of the lateral opening (22) is approximately located at the intersection of the minor axis of the intersection between one of the geometric planes with the outer surface (51) and the same outer surface (51); the coupling (23) is located approximately at the intersection between the major axis of the intersection of one of the geometric planes with the outer surface (51) and said outer surface (51).

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sector or ellipses sector and said connection means (2) being preferably made of single piece of aluminum, aluminum alloys or other metal.

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6. Device according to any of the preceding claims **characterized in that** the inner surface (21) of the cavity of the connection means (2) has at least a hollow seat first (25) and/or second (26) carried out near the coupling (23) and/or positioned opposite to this latter, a respective magnet means (27, 28) is locked inside each hollow seat (25, 26) and the prop means (5) is made of magnetizable material.

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7. Device according to claim 6 **characterized in that** at least one of the hollow seats (25, 26) of the connection means (2) has a corresponding peripheral extension (30, 31) for respective friction means (32, 33) assigned to match with the outer surface (51) of the prop means (5) to prevent the unwanted sliding of the connection means (2) along the prop means (5).

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8. Device according to any of the preceding claims **characterized in that** the support means (4) has a mounting portion (41) for a first chamber (24) of the coupling (23) of the connection means (2) where said mounting portion (41) and the first chamber (24) are cylindrical or truncated cone or the like complementary shaped and they have respective anti-rotational flat portions (42, 34), the mounting portion (41) having furthermore a threaded hole for a fixing screw (43) whose head portion is housed in a pass-through opening (35) carried out by means of the connection means (2) and directing into the first chamber (24) of the coupling (23) which has the second chamber (36) for an optional "L" shaped rotation preventing means (37) for shelves, having an end with a hole (38) assigned to engaged by the fixing screw (43) to block said rotation preventing means (37) to the coupling (23).

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9. Device according to any of the preceding claims, **characterized in that** the support means (4) is rod shaped and is provided with a terminal stop (44) or a set of cantilever means (45) each with one or more bearing means (46) for supporting shelves.

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10. Device according to any one of the preceding claims **characterized in that** the transverse sections of the connection means (2) not interfering with the coupling (23) or with the lateral opening (22) connection means (2) are approximately "D" shaped, of circle

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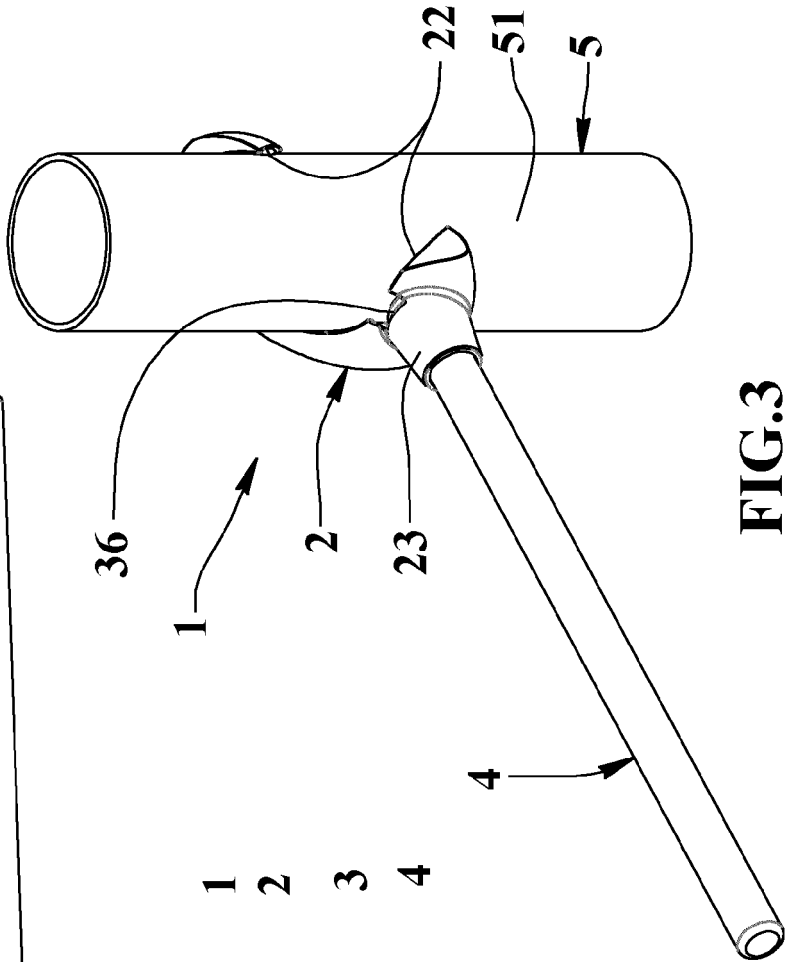
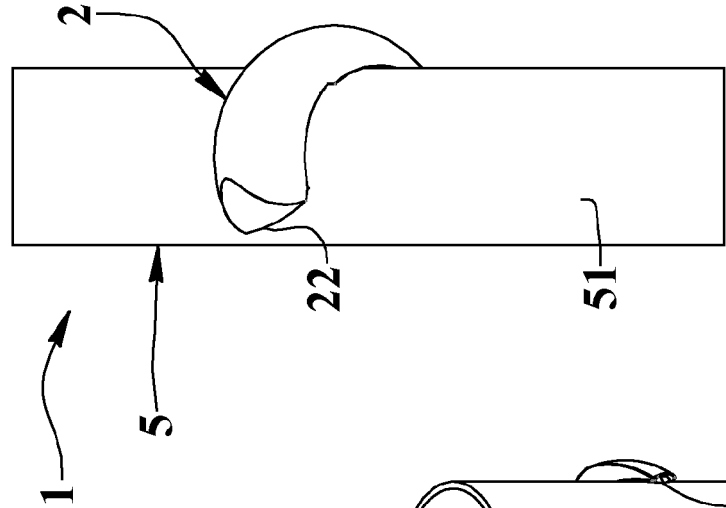
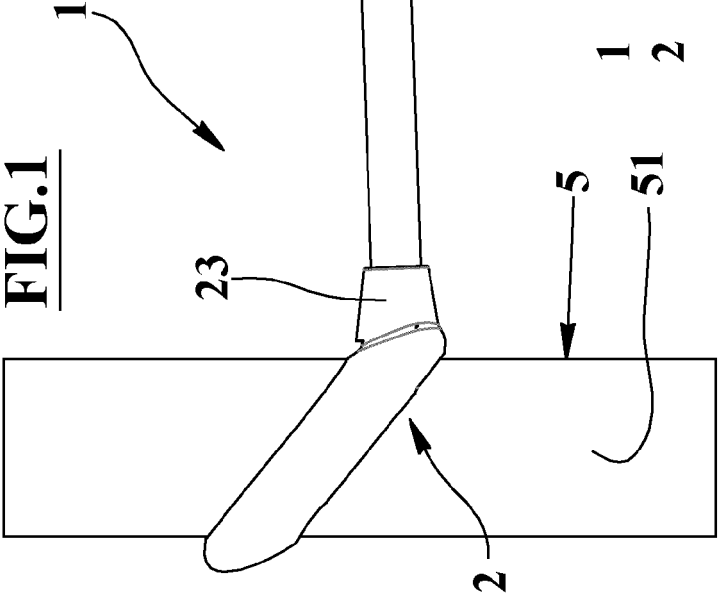


FIG.4

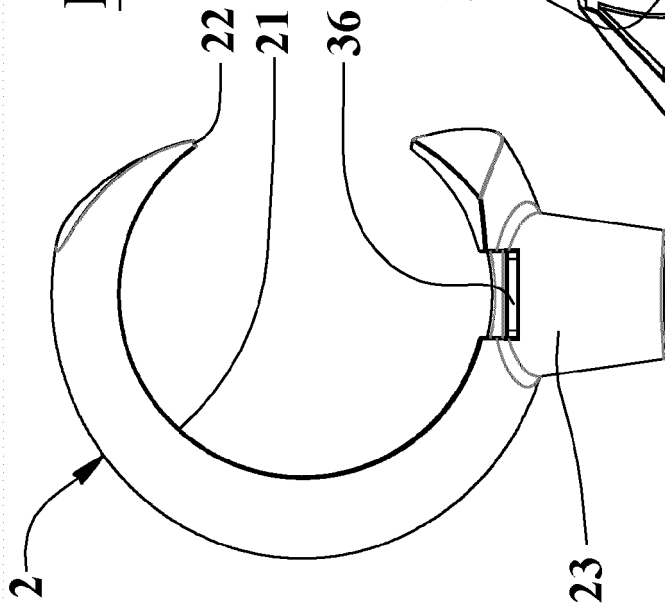


FIG.7

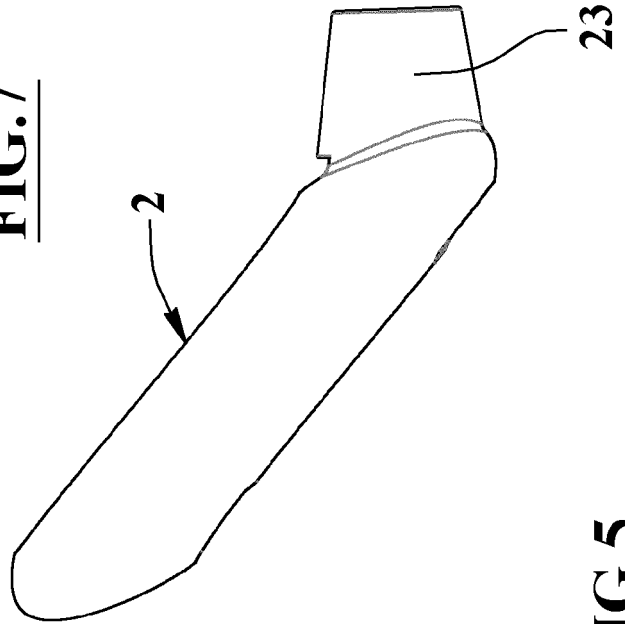


FIG.5

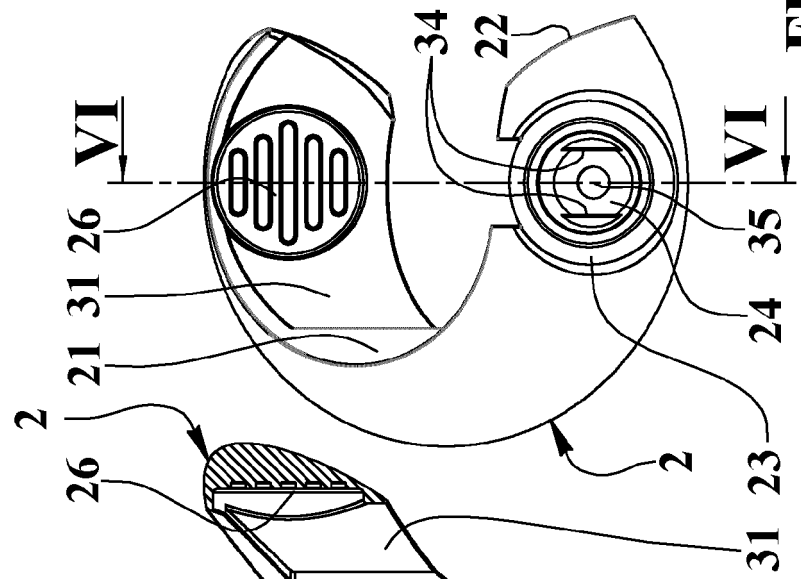
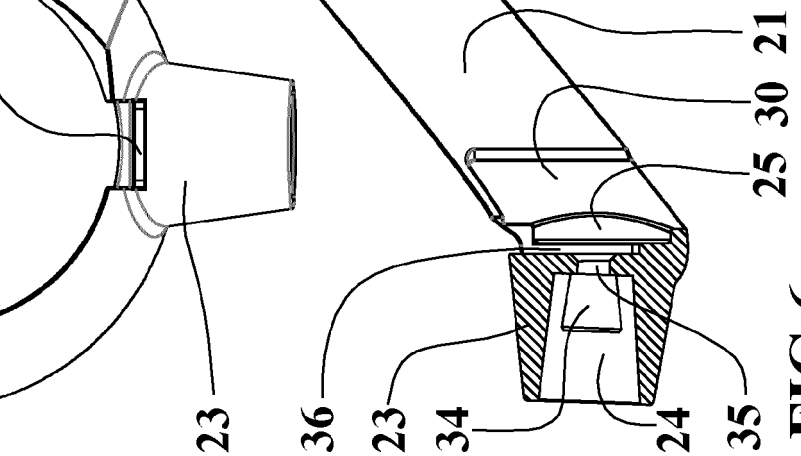
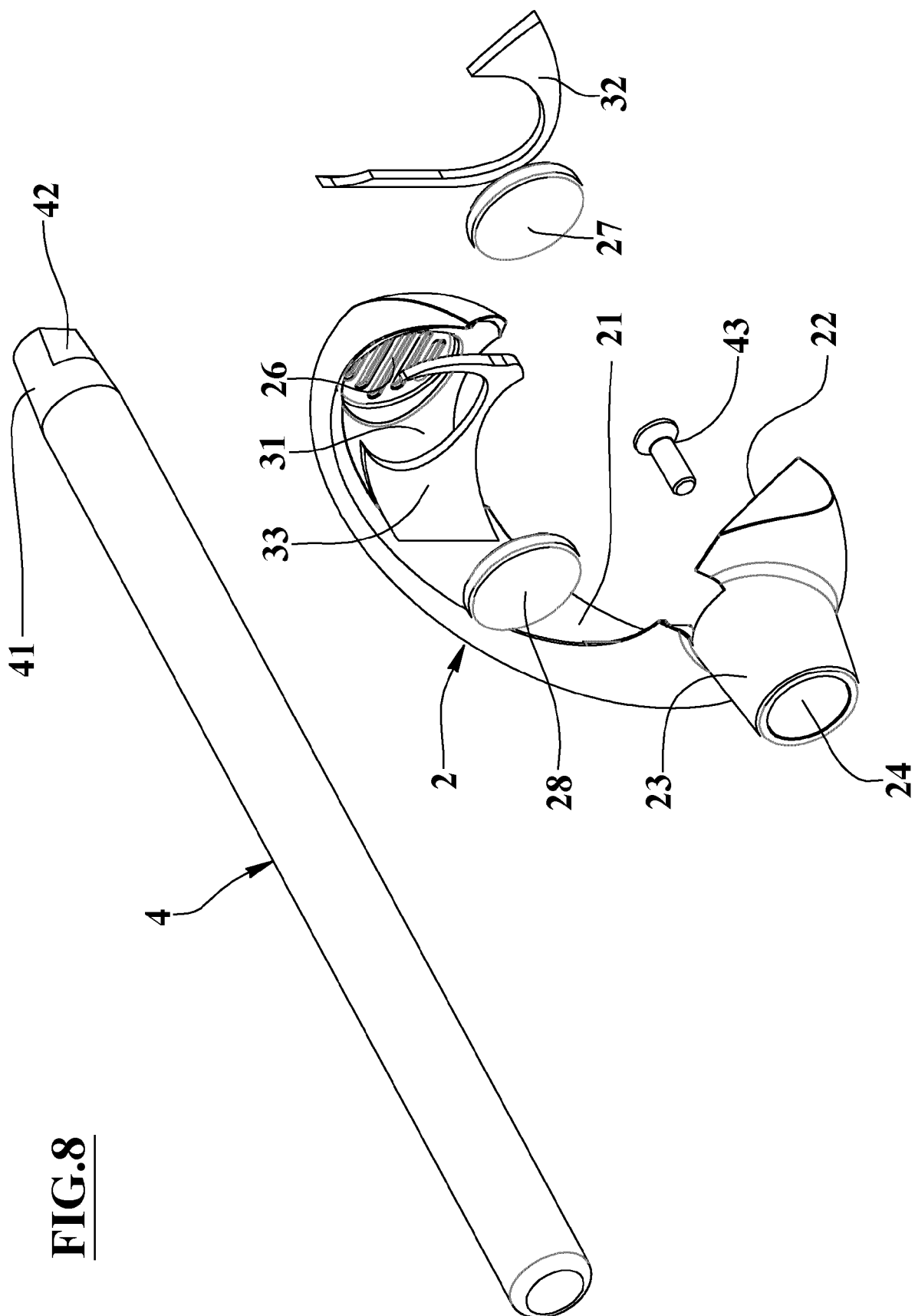


FIG.6





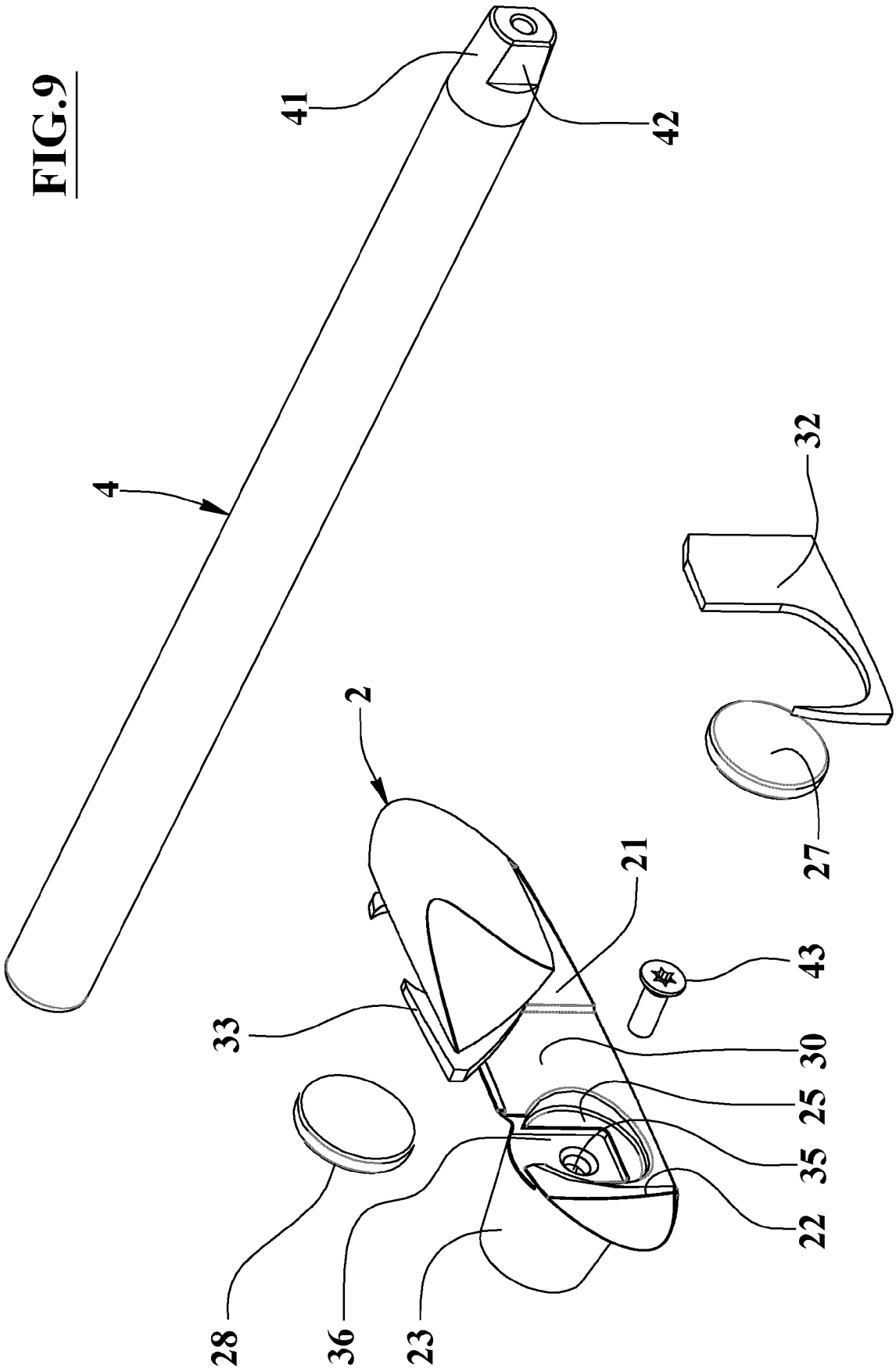


FIG.10

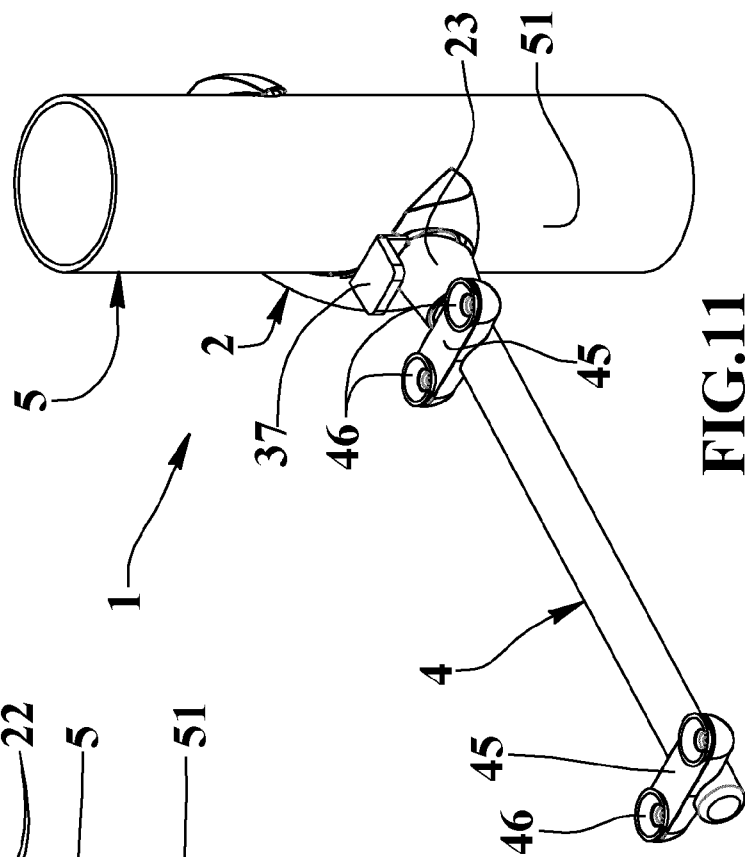
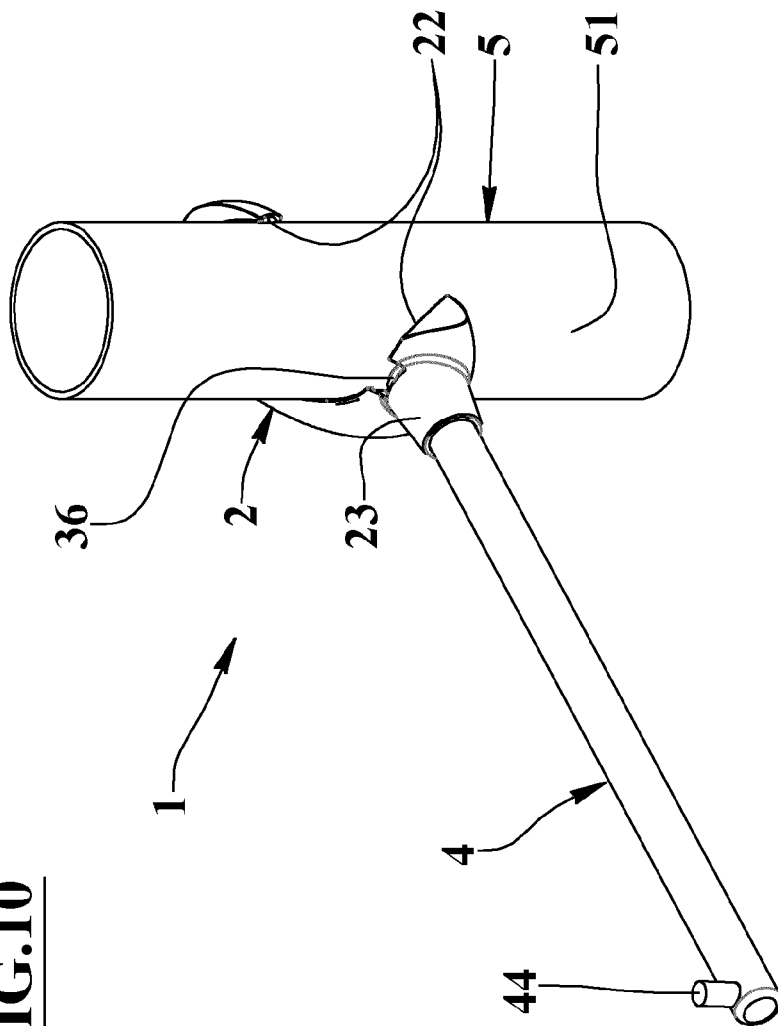


FIG.11

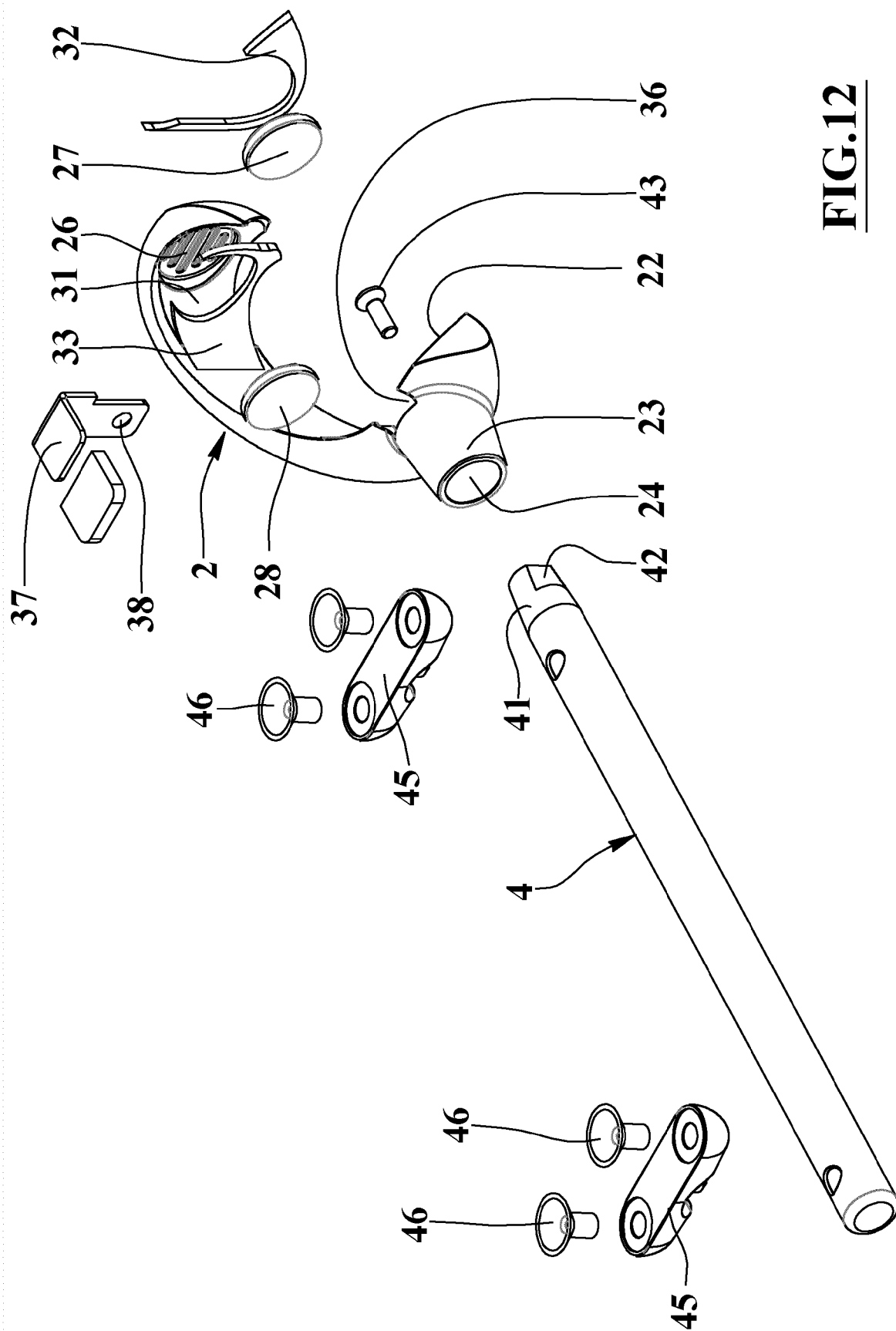


FIG.12



EUROPEAN SEARCH REPORT

Application Number
EP 12 15 6607

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2009/139944 A1 (DREW ERROL [GB] ET AL) 4 June 2009 (2009-06-04) * abstract; figures 10,11 * * paragraph [0034] - paragraph [0035] * -----	1-5,9,10	INV. A47B57/56
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X	FR 2 278 978 A1 (SAINTVILLE OLIVIER [FR]) 13 February 1976 (1976-02-13) * page 2, paragraph 3; figures 1-6 * * page 5, last paragraph - page 6, paragraph 2 * -----	1-3,6,7,9,10	A47B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 May 2012	Examiner Jones, Clive
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 15 6607

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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22-05-2012

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