



(11) **EP 2 022 552 A1**

(12) **EUROPEAN PATENT APPLICATION**  
published in accordance with Art. 153(4) EPC

(43) Date of publication:  
**11.02.2009 Bulletin 2009/07**

(51) Int Cl.:  
**A63H 33/10 (2006.01)**

(21) Application number: **06747530.1**

(86) International application number:  
**PCT/MX2006/000030**

(22) Date of filing: **08.05.2006**

(87) International publication number:  
**WO 2007/129878 (15.11.2007 Gazette 2007/46)**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI  
SK TR**  
Designated Extension States:  
**AL BA HR MK YU**

(72) Inventor: **Monge Rodriguez, Ernesto**  
**C.P. 03020, México, D.F. (MX)**

(71) Applicant: **Monge Rodriguez, Ernesto**  
**C.P. 03020, México, D.F. (MX)**

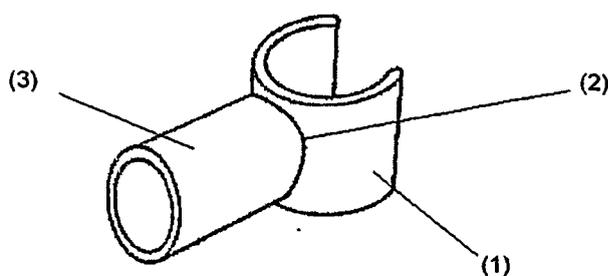
(74) Representative: **Grünecker, Kinkeldey,  
Stockmair & Schwanhäusser**  
**Anwaltssozietät**  
**Leopoldstrasse 4**  
**80802 München (DE)**

(54) **THREE-DIMENSIONAL ASSEMBLY PIECES FOR TOY CONSTRUCTION**

(57) This invention relates to a set of pieces-connectors to assembly toys in shapes of smooth or grooved cylindrical tubes, smooth or teeth semicircles and the combination of the same. Smooth or toothed tubular semicircles joined to a smooth or grooved cylindrical tube by one of its ends to the middle external portion; smooth or toothed semicircles joined to other smooth or toothed semicircles by its exterior middle portion; cylindrical tubes with a fixed "ring-butt" joined in its middle portion; smooth or toothed semicircles, joined at its two ends by a smooth or grooved cylindrical tube, in its cavity direction, leaving the cavity at sight; cylindrical tubes, joined by their ends forming wheel; smooth or toothed semicircles, joined

among them at their middle external portions of their curves perpendicular one to the other; cylindrical tubes folded 90 degrees and reduced in its ends respecting their circumferences. The pieces interact, engaging, fastening, dropping, sliding, grading, stabilizing, turning around and making sound "clicks" among them, constructing and creating an endless 3D shapes, the grooves and the edges-butts will stabilize and grade the development as well as the final result, the combination of smooth pieces with grooved and toothed pieces produce versatile results, having parts with stability and parts with more mobility, subjected to the needs of the different parts of the toy.

**Fig. 1**



**EP 2 022 552 A1**

Fig. 2

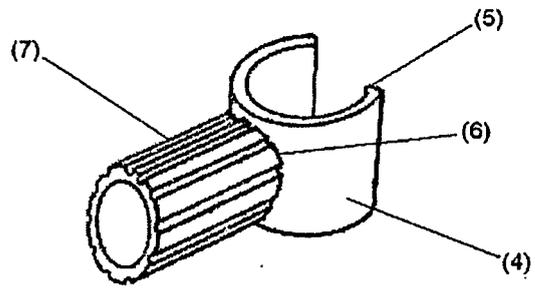
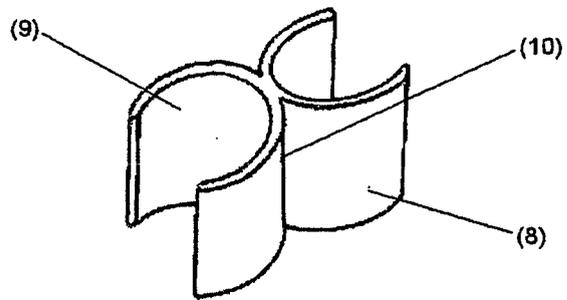


Fig. 3



## Description

### Object of the Invention

[0001] The present invention is related to a new model of construction pieces for 3D-assembly toys totally different from those known until now. This new model is characterized by its novel practical design and improvements which provide it with a peculiar and unique look.

### Background of the Invention

[0002] Presently, construction pieces for 3D assembly toys are characterized by its rigidity during the development, and, when the designs are finished, they have no mobility due to their own nature. Examples of them are Interlego, which has registered more than a hundred models including those with register numbers: 3572, 3571, 3570, 3568, 3583, 4335 2823 3877, 3870, 3804, 4250, 5324, 5325, or the German Anton Meyers' models of pieces for assembling toys with model register numbers 4104, 4103, 4102, 4093, 4092, 4091.

[0003] The pieces intended to be protected by the present invention have been conceived with movement and gradable stability provided by its own nature. Through a grooved-toothed system the final result can be transformable or it can have mobility. This transformable mobility is carried on by manipulation and not by the effects of instability and collapse of pieces. This characteristic is a different proposal from the previous art because, by having movement through manipulation when the toy is being constructed as well as at the final result, there are much more possibilities of creation and other options for toy constructions.

### Brief Description of the Drawings

[0004] To complement the description and to provide a better understanding of the characteristics of the invention, the following drawings with an illustrative non-limiting character are herein attached:

Figure 1 shows a perspective view of one connection-fastening, able to be connected-assembled on the internal diameter and the external diameter of its tubular end and on the internal diameter of its semicircular end.

Figure 2 shows a perspective view of a connection-fastening, able to be connected-assembled on the internal diameter and the external diameter of its tubular end, which has a grooved-channeled finishing to permit to grade its mobility and stabilize the development and completion of the figure created.

Figure 3 shows a perspective view of a connector-fastener, based on two semicircles, joined by their middle external portion in a parallel direction, able to be connected-assembled on the internal diameter of the two semicircles.

Figure 4 shows a perspective view of a connector-fastener based on two semicircles, joined by its middle external portion in a parallel direction, able to be connected-assembled on the internal diameter of the two semicircles.

Figure 5 shows a perspective view of a connection-fastening, able to be connected-engaged on the external diameter of the tubular end and connected on the internal diameter of its semicircular end.

Figure 6 shows a perspective view of a connection able to be connected-engaged on the external diameter of its tubular end and to be connected on the internal diameter of its semicircular end.

Figure 7 shows a perspective view of a connector-extensor with a circular butt in its middle external portion, able to be connected-assembled on its two external diameters.

Figure 8 shows a perspective view of a connector with a double capacity to be connected-assembled: on the external diameter of the smaller diameter end of its tubular portion, and the other portion on the larger diameter end of its tubular portion, on the external diameter in a perpendicular direction to the small tubular portion.

Figure 9 shows a perspective view of a connector with a double capacity to be connected-assembled, on the external diameter of its tubular portion of the smaller-diameter end, and the other, on the tubular portion of larger diameter, on the external diameter in a perpendicular direction to the small tubular portion and that has channeled grooves lengthwise.

Figure 10 shows a perspective view of a tube joined on their two ends forming a tubular wheel.

Figure 11 shows a perspective view of two semicircles joined on the external middle portion of their curves, in a perpendicular direction one to another, able to connect and fasten on the internal diameter of the two semicircles.

Figure 12 shows a perspective view of two semicircles joined on the external middle portion of their curves, in a perpendicular direction one to another, able to connect and fasten on the internal diameter of the two semicircles.

Figure 13 shows a perspective view of a circular tube with a 90 degree curve, able to be connected-engaged on its two external reduced diameters of its two ends.

Figure 14 shows a perspective view of a circular tube able to be connected-engaged on the internal diameters of its ends, and able to be connected and fastened all along its external diameter.

Figure 15 shows a perspective view of a circular tube, able to be connected-engaged on the internal diameters of its ends and able to be connected and fastened along its external diameter which will have channeled grooves in a parallel direction lengthwise. Figures 16 to 30 show perspective views of how the different construction pieces for 3D assembling toys

of the present invention can interact among them and interact with circular, smooth and grooved, tubes of different longitudinal sizes.

### Detailed Description of the Invention

**[0005]** As it can be appreciated in Figure 1, the first piece of the 3D assembly toy is constituted by a tubular semicircle (1) joined, on the middle of its external curve (2), to a circular tube with a large diameter (3) at one of its two ends. As it is depicted in Figure 2, the second piece of the 3D assembly toy is constituted by a tubular semicircle (4) with an edge-butt along the width of one of its two internal ends (5), joined, on the middle portion of its external curve (6), to a grooved circular tube (7). As it is observed in Figure 3, the third piece of the 3D assembly toy is constituted by a tubular semicircle (8) joined to another tubular semicircle (9) on the middle portions of their external curves (10).

**[0006]** As it is noticed in Figure 4, the fourth piece of the 3D assembly toy is constituted by a tubular semicircle (11), with an edge-butt all over the width of one of its two internal ends (12), joined to another tubular semicircle (13), with an edge-butt all over the width of one of its two internal ends (14) on the middle portion of their external curves (15). As it can be appreciated in Figure 5, the fifth piece of the 3D assembly toy is constituted by a tubular semicircle (16) joined at the middle portion of its external curve (17) to a cylindrical tube of small diameter (18) which will engage, interiorly, perfectly well to the tubular portion of the pieces depicted on Figures 1, 2, 14 and 15. As it is illustrated in Figure 6, the sixth piece of the 3D assembly toy is constituted by a tubular semicircle (19), with an edge-butt all over the width of one of its two internal ends (20), joined, in the middle portion of its external curve (21), to a cylindrical tube of small diameter (22), which will engage, interiorly, perfectly well, to the tubular portion of the pieces illustrated in Figures 1, 2, 14 and 15.

**[0007]** As it is observed in Figure 7, the seventh piece of the 3D assembly toy is constituted by a cylindrical tube (23) which has a fixed "ring-butt" (24) in the middle. As it can be noticed in Figure 8, the eighth piece of the 3D assembly toy is constituted by a semicircle (25) which in its two internal ends a cylindrical tube (26) is joined, leaving at sight, from one side to another, the cavity of the circular tube (27) in a perpendicular direction to a circular tube (28) which is in the middle external portion of its curve (29), where the tubular ends of the pieces illustrated in Figure 1, 2, 14 and 15 will be able to be engaged. As it can be appreciated in Figure 9, the ninth piece of 3D assembly toy is constituted by a semicircle (30) which at its two internal ends a cylindrical tube (31) is joined with lengthwise parallel grooves (32) leaving at sight, from one side to another, the cavity of the circular tube (33) in a perpendicular direction to a circular tube (34), which is in the external middle portion of its curve (35), where the tubular ends of the pieces illustrated in Figure

1, 2, 14 and 15 can be engaged.

**[0008]** As it can be illustrated in Figure 10, the tenth piece of the 3D-assembly toy is constituted by a cylindrical tube joined at its two ends, forming a wheel (36). As it is observed in Figure 11, the eleventh piece of the 3D assembly toy is constituted by a tubular semicircle (37), joined, at the middle part of its external curve (38) to another tubular semicircle (38), in a perpendicular direction one to another. As it can be noticed in Figure 12, the twelfth piece of the 3D assembly toy is constituted by a tubular semicircle (40), with an edge-butt all over the width of one of its two internal ends (41), joined, on the middle portion of its external curve (42), to another tubular semicircle (43) with an edge-butt all over the width of one of its two internal ends (44) in a perpendicular direction one to another.

**[0009]** As it can be appreciated in Figure 13, the thirteenth piece of the 3D assembly toy is constituted by a tube with a 90 degree curve (45), with its two reduced ends (46), this reduction allowing the connection-engagement to the pieces illustrated in Figures 1, 2, 14 and 15. As it is illustrated in Figure 14, the fourteenth piece of the 3D assembly toy is constituted by a circular tube (47) where the pieces illustrated in Figure 5, 6, 7, 8, 9 and 13 are engaged with on their internal diameter and the pieces illustrated in Figures 1, 2, 3, 4, 5, 6, 11 and 12 on their external diameter. The fifteenth piece of the 3D-assembly toy is constituted by a cylindrical tube, grooved in a parallel direction lengthwise (48) where the internal diameter is connected-engaged with the pieces illustrated in Figures 5, 6, 7, 8, 9 and 13 on the internal diameter, and with the pieces illustrated in Figures 1, 2, 3, 4, 5, 6, 11 and 12 on the external diameter.

**[0010]** The connecting pieces for cylindrical tubes are constituted by 13 distinct pieces, as it has been illustrated in Figures 1 to 13, to connect cylindrical tubes, which will constitute in different lengths the pieces illustrated in Figures 14 and 15; connecting them among themselves inducing couples, turns, slides, fastenings, grading, stabilizations and sound "clicks".

**[0011]** As it can be observed in Figures 16 to 30, the 13 illustrated pieces in Figures 1 to 13 interact among them and with circular, smooth and grooved, tubes of different lengths or with the pieces illustrated in Figures 14 and 15. The 13 pieces illustrated in Figures 1 to 13 serve as connections-connectors-fasteners, engaging the smaller diameter ends (49) into the larger diameter ends (50). The tubular semicircles (51) fasten the pieces and the circular, smooth or grooved, tubes of different lengths (52). All semicircles, smooth or toothed, can be opened and then closed because they are manufactured with flexible material which also allows the free displacement all over the length of the circular tubes, smooth or grooved, and provides a 360 degree free rotation over all the external circumference of the pieces and circular tubes, on their external diameter; the grooved pieces (53), in conjunction with the toothed pieces (54) will bring gradation to stabilize the development and final results

in creating figures. The rotation movement also is present when a smaller diameter (49) engages - gets into another of larger diameter (50). In the case of the wheel, the central circumference of the wheel (55) allows the pieces illustrated in Figures 1, 2, 14 and 15 to engage - get inside.

### Claims

1. A set of pieces-connectors for cylindrical tubes for 3D assembly toys, comprising:

a first piece constituted by a joint tubular semicircle, on the middle portion of its exterior circumference to a circular tube on one of its two ends;

a second piece constituted by a tubular semicircle, with an edge-butt all over the width of one of its two internal ends, joined, on the middle portion of its external curve, to a grooved circular tube; and

a third piece constituted by a tubular semicircle, joined to another tubular semicircle on the middle portions of their external circumferences in a parallel direction.

2. A set of pieces-connectors for cylindrical tubes for 3D assembly toys according to claim 1, further comprising:

a fourth piece constituted by two tubular semicircles, with an edge-butt all over the width of one of its two internal ends, joined one to another on the middle portion of their external curves in a parallel direction;

a fifth piece constituted by a tubular semicircle joined, on the middle portion of its external circumference to a circular tube with a small external diameter; and

a sixth piece constituted by a tubular semicircle, with an edge-butt all over the width of one of its two internal ends, joined, on the middle portion of its external curve, to a cylindrical tube with small external diameter.

3. A set of pieces-connectors for cylindrical tubes for 3D assembly toys according to claim 1 or 2, further comprising:

a seventh piece constituted by a circular tube which has a fixed "ring-butt" on its middle portion;

an eighth piece constituted by a semicircle which on its two internal ends a circular tube with large external diameter is joined, with grooves in a parallel direction lengthwise, leaving at sight, from one side to another, the cavity of the tube, in a perpendicular direction to a circular tube with

small diameter, which is on the middle portion of its external curve..

4. A set of pieces-connectors for cylindrical tubes for 3D assembly toys according to claim 1, 2 or 3, further comprising:

a tenth piece constituted by a cylindrical tube joined on its two ends, forming a wheel with a central cavity;

an eleventh piece constituted by two semicircles joined one to another at the middle part of their external curve in a perpendicular direction one to another; and

a twelfth piece constituted by a tubular semicircle with an edge-butt all over the width of one of its two internal ends, joined, on the middle portion of its external curve, to another tubular semicircle with an edge-butt all over the width of one of its two internal ends in a perpendicular direction one to another.

5. A set of pieces-connectors for cylindrical tubes for 3D assembly toys according to claims 1, 2, 3 or 4, further comprising:

a thirteenth piece constituted by a tube with a 90 degree fold with its two ends reduced to allow the engagement to connectors as well as tubes; a fourteenth piece constituted by a circular tube wherein its internal diameter allows the engagement of connections on its tubular portions and its external diameter allows the engagement with connections on semicircular ends; and

a fifteenth piece constituted by a cylindrical tube, grooved in a parallel direction lengthwise, wherein the internal diameter allows engagement with connections on its tubular portions and its external diameter allows to fasten the connections on the semicircular ends, and the engagement and gradation on toothed semicircular ends.

6. A set of pieces-connectors for cylindrical tubes for 3D assembly toys according to claim 1, 2, 3, 4 or 5, wherein the pieces-connectors, smooth or grooved, for cylindrical tubes, smooth or grooved, interact among them and or smooth or grooved cylindrical tubes of different lengths by engaging, fastening, folding, sliding, grading, stabilizing, rotating and making "click" sounds, in a way that the grooves and edges-butts will stabilize and grade the development as well as the final result, the combination of smooth pieces with grooved or toothed pieces, bringing versatile results and providing parts with stability and parts with more mobility, as necessary in the different parts of the toy.

7. A set of pieces-connectors for cylindrical tubes for 3D assembly toys according to claim 5, wherein the fourteenth and fifteenth pieces can be of any length.

5

10

15

20

25

30

35

40

45

50

55

6

Fig. 1

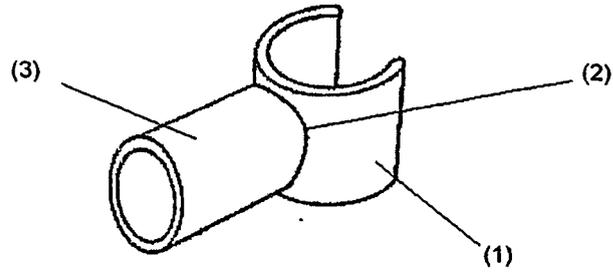


Fig. 2

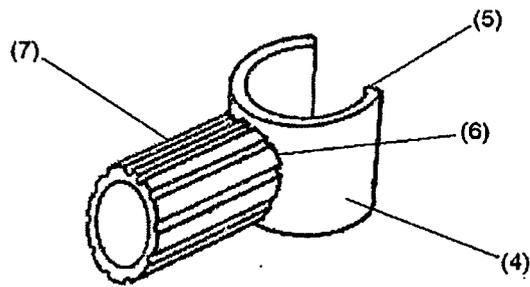


Fig. 3

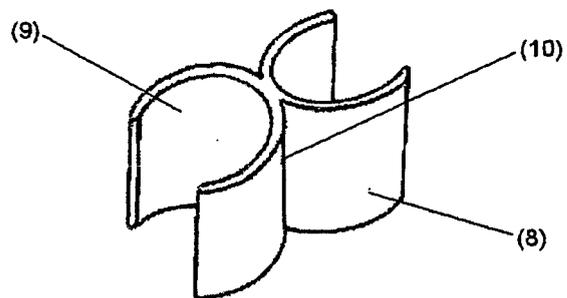


Fig. 4

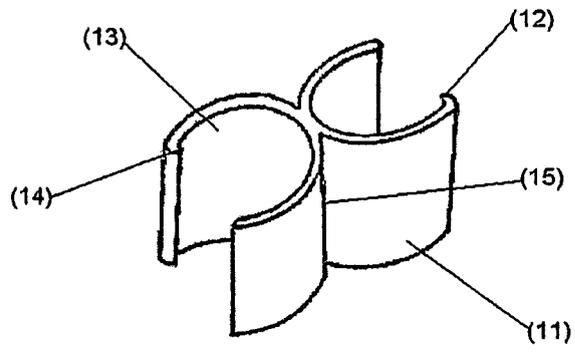


Fig. 5

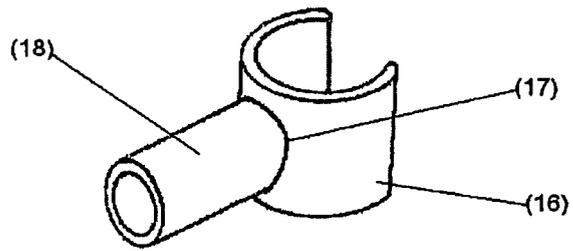


Fig. 6

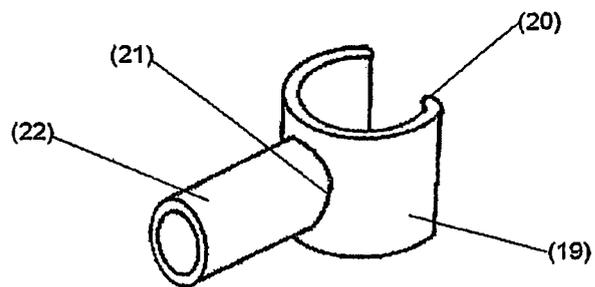


Fig. 7

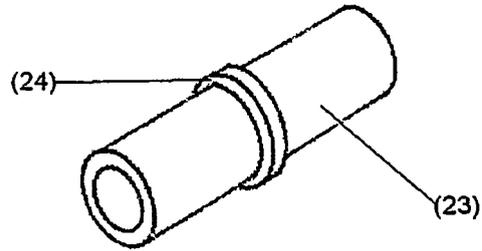


Fig. 8

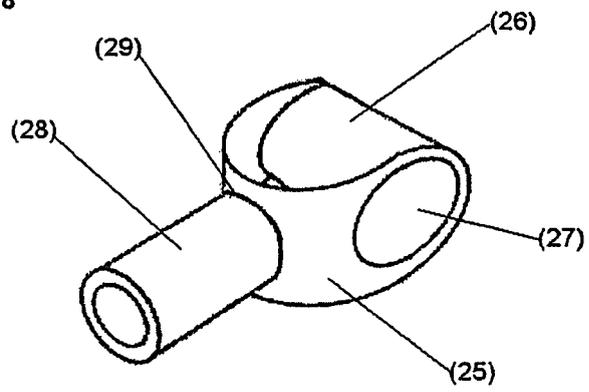


Fig. 9

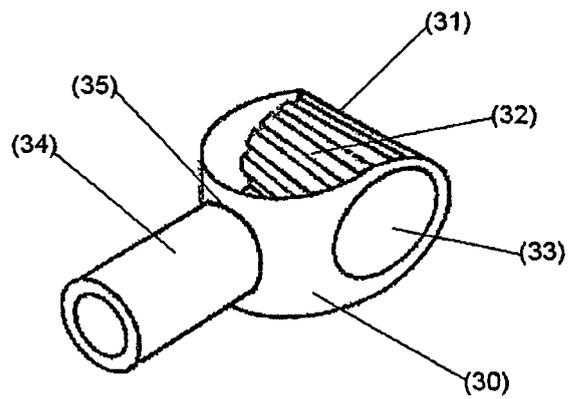


Fig. 10

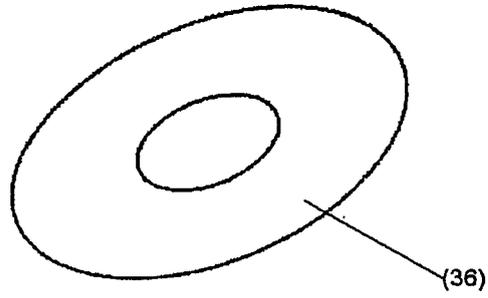


Fig. 11

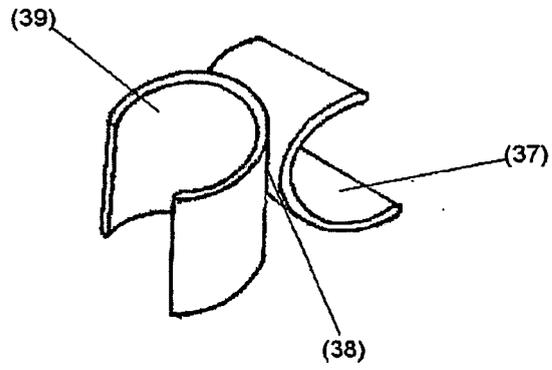


Fig. 12

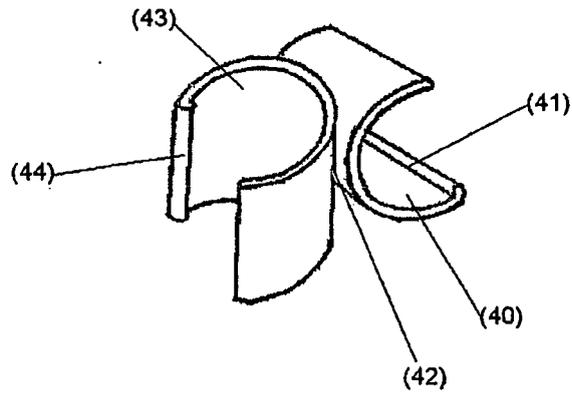


Fig. 13

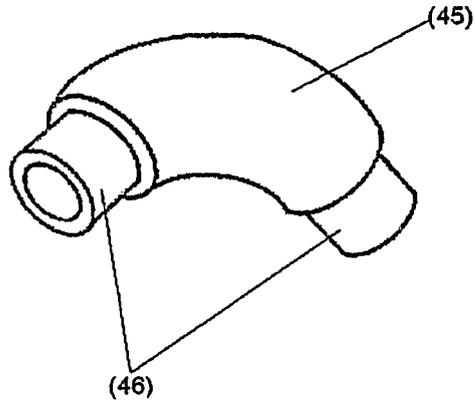


Fig. 14

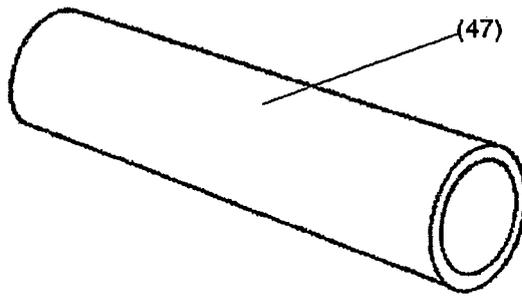
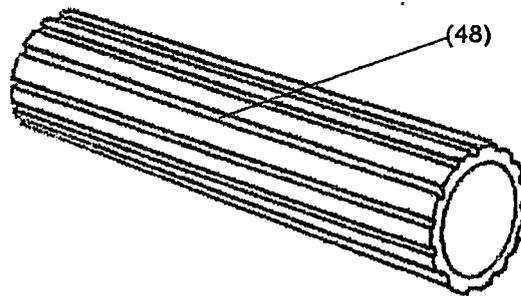


Fig. 15



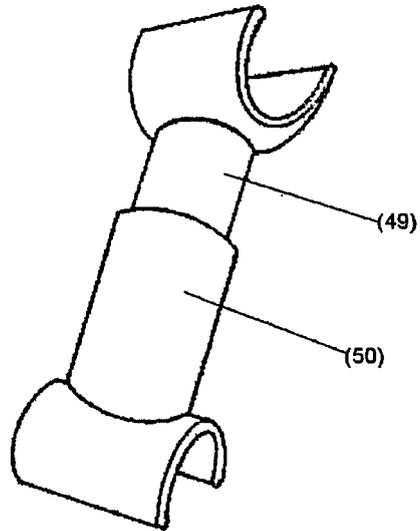


Fig. 16

Fig. 17

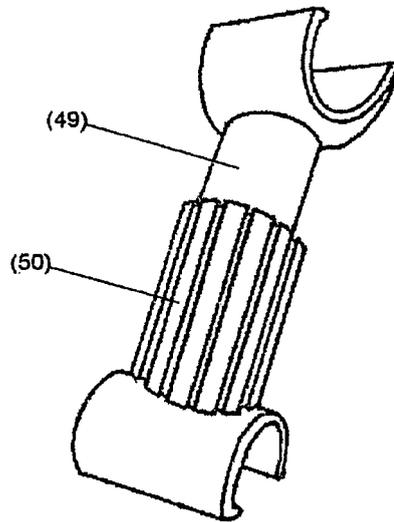
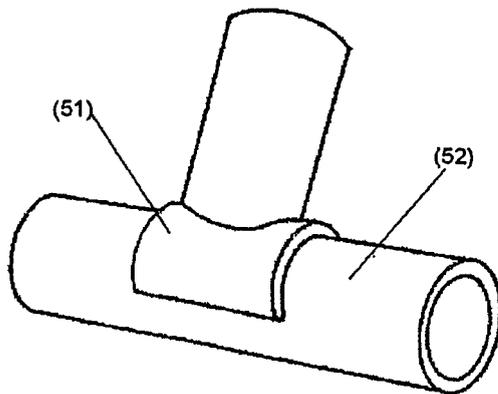


Fig. 18



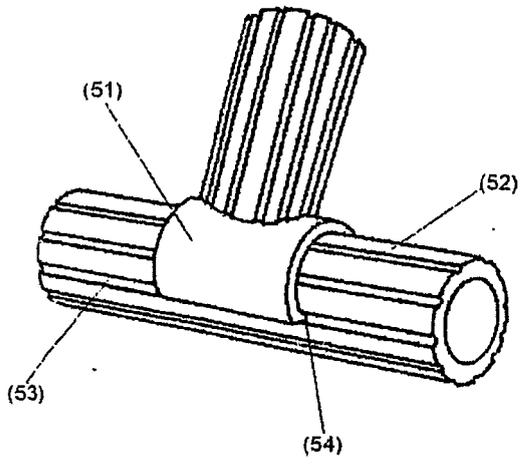


Fig. 19

Fig. 20

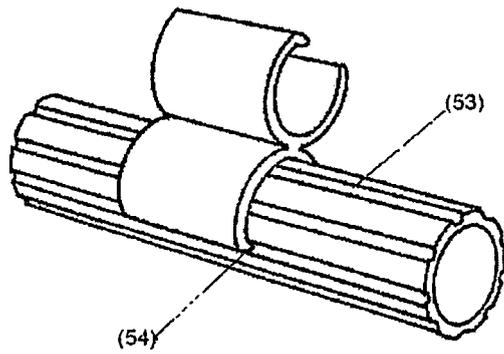
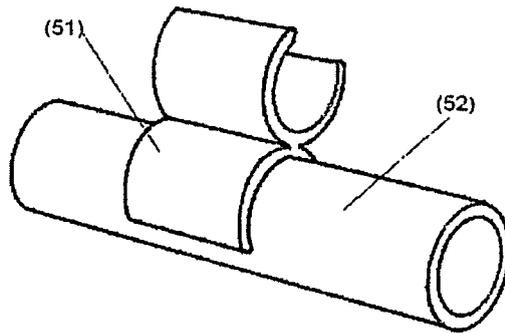


Fig. 21

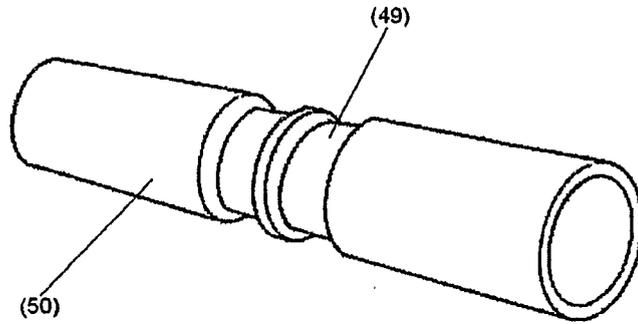


Fig. 22

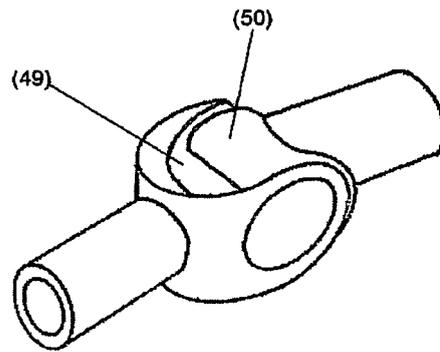


Fig. 23

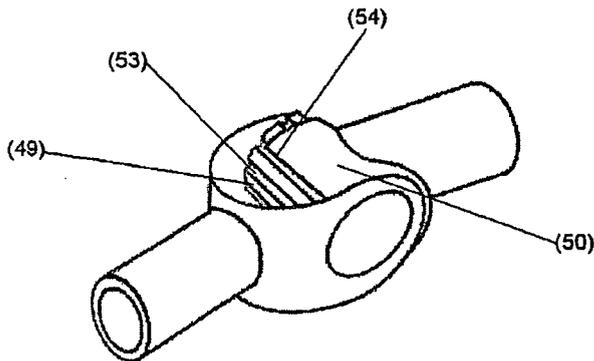


Fig. 24

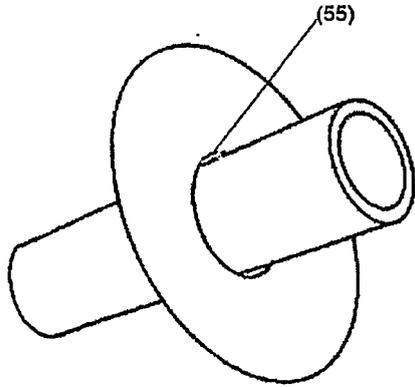


Fig. 25

Fig. 26

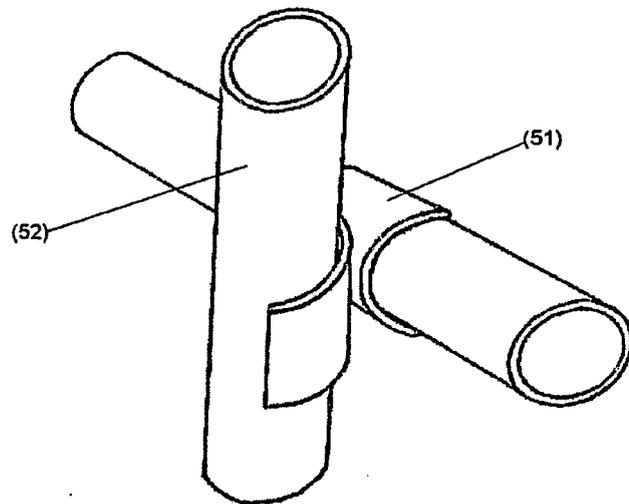
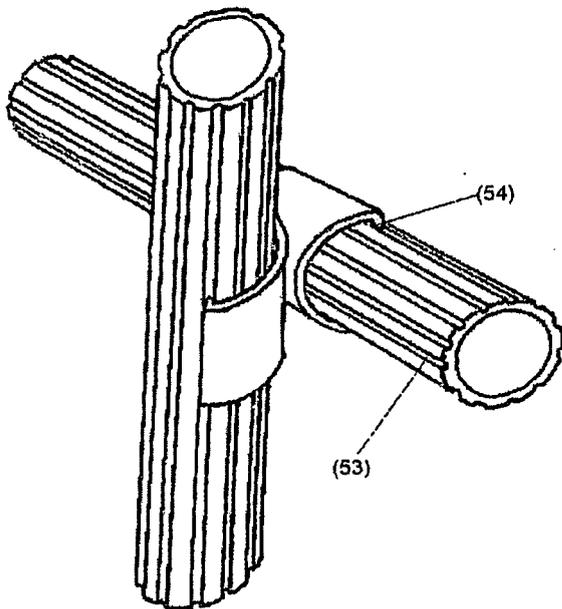


Fig. 27

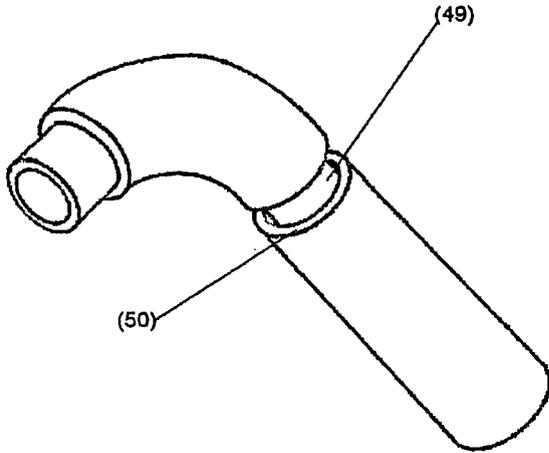


Fig. 28

Fig. 29

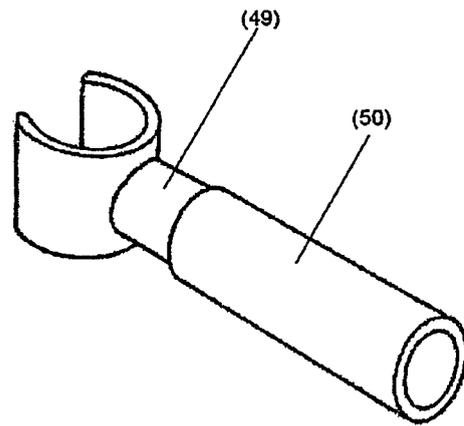
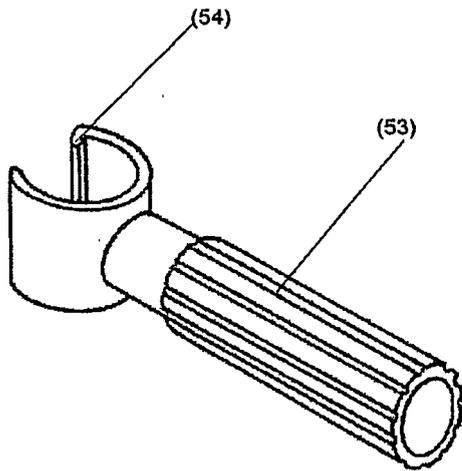


Fig. 30

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ MX 2006/000030

A. CLASSIFICATION OF SUBJECT MATTER <i>A63H 33/10</i> (2006.01) 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) <i>A63H33/</i>		
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)  <u>CIBEPAT, EPODOC, PAJ, WPI</u>		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03037471 A1 (MONGE RODRIGUEZ) 08.05.2003, <b>The whole document</b>	1,2,6
Y		3-5,7
Y	US 5704186 A (TILTAN 3 DIMENSIONAL TECHNOLOG) 06.01.1998, column 5, line 46 - column 6, line 9; column 7, line 60 - column 8, line 20; figures 1,2,10,11.	3,5,7
Y	GB 1585825 A (MURPHY C) 11.03.1981, <b>page 1</b> , lines 55-80; figures 1,2.	4
A	US 5372450 A (BLODGETT) 13.12.1994, <b>abstract</b> column 4, lines 26-31; figure 4.	4
A	NL 1016054 C2 (VERGINA HOLDING B V) 01.03.2002, figure 5.	5
A	US 4352255 A (WAREHIME) 05.10.1982, column 3, line 18 - column 5, line 23; figures 1-8.	1-3
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search <b>06 JUL 2006 (03.07.2006)</b>	Date of mailing of the international search report <b>18 SEP 2006 (18.09.2006)</b>	
Name and mailing address of the ISA/ <b>S.P.T.O.</b>	Authorized officer	
Facsimile No.	Telephone No.	

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

**EP 2 022 552 A1**

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No. PCT/MX 2006/000030
---

WO03037471A A	08.05.2003	<b>NONE</b>	-----
-----	-----	-----	-----
US 5704186 A	06.01.1998	IL 112421 A	20.11.1997
-----	-----	-----	-----
GB 1585825 A	11.03.1981	ZA 7604179 A	30.11.1977
-----	-----	-----	-----
US5372450A A	13.12.1994	<b>NONE</b>	-----
-----	-----	-----	-----
NL1016054CC C	01.03.2002	<b>NONE</b>	-----
-----	-----	-----	-----
US4352255A A	05.10.1982	<b>NONE</b>	-----
-----	-----	-----	-----

Form PCT/ISA/210 (patent family annex) (April 2005)