



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**10.05.2017 Bulletin 2017/19**

(51) Int Cl.:  
**A47F 8/00 (2006.01)**

(21) Application number: **16196980.3**

(22) Date of filing: **03.11.2016**

(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**  
 Designated Validation States:  
**MA MD**

(71) Applicant: **Bonaveri S.r.l.**  
**44045 Cento (Ferrara) (IT)**

(72) Inventor: **BERTOCCHI, Manfredo**  
**44045 Renazzo (Ferrara) (IT)**

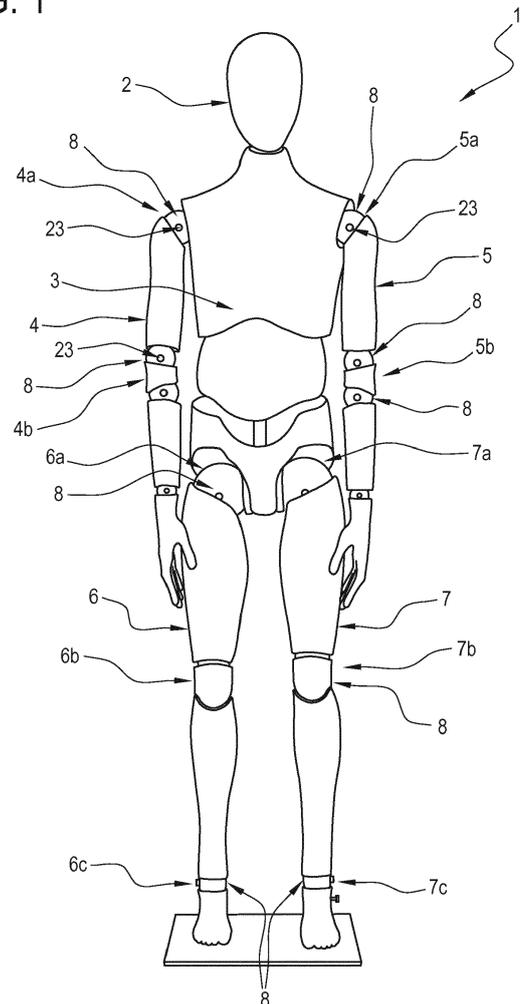
(74) Representative: **Firmati, Leonardo**  
**Bugnion S.p.A.**  
**Via di Corticella, 87**  
**40128 Bologna (IT)**

(30) Priority: **06.11.2015 IT UB20154962**

(54) **ARTICULATED MODEL**

(57) Described is an articulated model comprising a trunk (3), a plurality of limbs (4, 5, 6, 7) connected to the trunk (3) and having respective joints (4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c), the joints (4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c) comprising at least a first joint (8) having two portions (8a, 8b) which are rotatably connected to rotate relative to each other about a predetermined axis of rotation (A1).

FIG. 1



## Description

**[0001]** This invention relates to an articulated model for displaying apparel and garments.

**[0002]** More specifically, this invention relates to an articulated model, of the so-called display window type, that is, of the type which substantially reproduces an entire human body, at least with regard to the limbs. Display window models are universally used to display garments, in shops, fairs and other display areas.

**[0003]** Regardless of the fact that they reproduce the build of the human body in a realistic manner or a stylised manner, these models have movable and/or removable parts both to adopt different positions and so as to be able to easily put on the garments to be displayed.

**[0004]** The models of known type provided with parts which are only removable for dressing the model are clearly rigid in their position and unsuitable in those situations, which are increasingly frequent, wherein the designer wishes to personalise the position of the model according to circumstances related to the type of garments worn, display requirements or the like.

**[0005]** In order to increase the versatility, models have been developed which are provided with joints, that is movable in different configurations and even during the steps of putting on and taking off articles of clothing.

**[0006]** The models provided with joints of known type, although they improve the usability of the models compared with those which are rigid and/or can be dismantled, are not without drawbacks.

**[0007]** A first drawback is due to the difficulty of movement of these joints which, if too rigid, appear to be difficult to adjust and, if too mobile, do not give sufficient assurance in keeping the set position.

**[0008]** A further drawback which occurs in particular in models provided with joints with friction elements is due to the fact that the joints tend to lose the capacity to maintain the set position, especially in the presence of loads and/or unbalanced positions of the model.

**[0009]** The aim of this invention is to provide an articulated model which is able to overcome the drawbacks of the prior art and which is at the same time practical to use and simple to make.

**[0010]** A further aim of this invention is to provide an articulated model which is easy to adjust which can be easily modified in its configuration.

**[0011]** A further aim of this invention is to provide an articulated model which is stable in its configuration.

**[0012]** The technical features of the invention, with reference to the above aims, are clearly described in the claims below and its advantages are more apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a preferred, non-limiting embodiment of the invention by way of example and in which:

- Figure 1 is a schematic front perspective view of a preferred embodiment of the articulated model ac-

ording to this invention;

- Figure 2 is a schematic view with some parts in cross section of a detail of the model of Figure 1;
- Figures 3 and 4 are, respectively, schematic plan views of two components of the detail of Figure 2;
- Figure 5 is a schematic view with some parts in cross section of a further detail of the model of Figure 1.

**[0013]** As illustrated in Figure 1 the numeral 1 denotes in its entirety an articulated model made in accordance with this invention.

**[0014]** The articulated model 1 comprises a head 2, a trunk 3 and a plurality of limbs.

**[0015]** Advantageously, in order to imitate as best as possible the human figure, the above-mentioned limbs comprise two upper limbs 4 and 5, respectively right and left, and two lower limbs 6 and 7, respectively right and left. Each limb 4, 5, 6, 7 has a joint for connecting to the trunk, an intermediate joint and a distal joint.

**[0016]** More specifically, as illustrated in Figure 1, the upper limbs 4, 5 have respective joints 4a, 5a to the trunk at the shoulder, respective intermediate joints 4b, 5b at the elbows, and respective distal joints 4c, 5c at the wrists.

**[0017]** Again with reference to Figure 1, the lower limbs 6, 7 have respective joints 6a, 7a to the torso at the hips, respective intermediate joints 6b, 7b at the knee, and respective distal joints 6c, 7c at the ankles.

**[0018]** All the above-mentioned joints 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c, comprise a first rotatable joint 8, designed to allow the mutual rotation of the parts connected.

**[0019]** Advantageously, the joint 4b, 5b comprises two first joints 8, in order to allow a movement of the upper limbs 4, 5 which is more similar to a human movement.

**[0020]** As illustrated by way of example in Figure 2, which regards a joint 6c, 7c of the ankle of the model 1, the first joint 8 comprises two portions 8a, 8b which are rotatably connected to each other to rotate relative to each other about a predetermined axis of rotation A1.

**[0021]** A first 8a of the two portions has a substantially spherical shape and has a hollow central zone for receiving the second portion 8b.

**[0022]** The second portion 8b has the shape of a spherical segment with two bases, designed to be inserted into the above-mentioned central hollow zone of the first portion 8a.

**[0023]** The first joint 8 comprises a first disc 9, illustrated in Figure 3, rigidly connected to the first portion 8a and a second disc 10, shown in Figure 4, rotatably integral with the second portion 8b.

**[0024]** The first and the second disc 9, 10 are both coaxial with the above-mentioned axis of rotation A1 of the first joint 8.

**[0025]** The first disc 9 has a plurality of holes 11 distributed angularly equidistant from each other along a substantially peripheral circumferential line.

**[0026]** The first disc 9 is made of sheet metal.

**[0027]** As illustrated in Figures 2 and 3, the first disc 9 has two further countersunk holes 12 for the fixing, by screws 13, to the first portion 8a, and a circular central opening 14.

**[0028]** As illustrated in Figures 2 and 3, the second disc 10 comprises two pins 15 extending in an axial direction and positioned at respective positions diametrically opposite each other of the disc 10.

**[0029]** The second disc 10 also has two holes 16, corresponding to the countersunk holes 12 of the first disc 9 and designed to allow access to the screws 13, and a circular central opening 17.

**[0030]** As clearly shown in Figure 2, the second disc 10 is inserted into a cavity 18 with a cylindrical in shape, made between the two portions 8a, 8b.

**[0031]** The pins 15 have a cylindrical shape and are configured to insert at least partially inside any of the above-mentioned holes 11 of the first disc 9. The pins 15, together with the holes 11 in which they are inserted, define a shape impediment to the reciprocal rotation of the above-mentioned first and second portions 8a, 8b of the first joint 8.

**[0032]** The cavity 18 is configured to allow an axial movement of the second disc 10, away from the first disc 9, up to the complete disengagement of the pins 15 from the holes 11 of the first disc 9.

**[0033]** The pins 15 extend, in an axial direction, on both sides relative to the second disc 10, in such a way as to define respective guides for the above-mentioned axial movement of the second disc 10.

**[0034]** For this purpose, the pins 15, with their portion not designed to engage in the holes 11 of the first disc 9, engage slidably in respective holes 19 made in the second portion 8b of the first joint 8.

**[0035]** Between the first and the second portion 8a, 8b there is a pin 20, having an axis A1 and forming a fulcrum for the reciprocal rotation of the above-mentioned portions 8a, 8b.

**[0036]** The pin 20 is housed in a through cavity 21, extending through both the first 8a and the second 8b portion of the first joint 8.

**[0037]** The pin 20 has a first part 20a having a greater diameter, on which is fitted a helical spring 22, and a second part 20b, with a smaller diameter, which passes through the second portion 8b and has a threaded end hole.

**[0038]** A pushbutton 23, emerging from the spherical surface of the first joint 8, is made on the pin 20. The pushbutton 23 has a diameter greater than that of the first part 20a of the pin 20, to define an end stop, in abutment, for the helical spring 22.

**[0039]** A screw 24 engages in the above-mentioned threaded hole, which, by means of a washer 25 allows a fixing of the pin 20 relative to the first portion 8a of the first joint 8.

**[0040]** The above-mentioned central circular openings 14, 17 of the first disc 9 and of the second disc 10 are designed for the insertion of the pin 20.

**[0041]** In the passage between the above-mentioned first part 20a and second part 20b of the pin 20 there is a shoulder 26 on which the second disc 10 comes into contact.

**[0042]** By using a cylindrical spacer 27 and the above-mentioned washer 25, the screw 24 ensures the axial fixing of the second disc 10 relative to the pin 20, in contact with the above-mentioned shoulder 26.

**[0043]** In use, with reference to Figure 2, with the user exerting a force F on the pushbutton 23 and having overcome the opposing force exerted by the spring 22, the pin 20 slides axially pulling the second disc 10 away from the first disc 9, until disengaging the pins 15 from the respective holes 11. In this condition, that is, keeping pressed down the pushbutton 23, the shape impediment to the mutual rotation of the two portions 8a, 8b first and second of the first joint 8 is momentarily eliminated and their mutual angulation may therefore be modified as desired by the user.

**[0044]** After reaching the desired mutual angulations between the two portions 8a, 8b first and second of the first joint 8, the user releases the pushbutton 23 which, under the action of the elastic force exerted by the spring 22, returns the second discs 10 towards the first disc 9, with the pins 15 penetrating into corresponding holes 11, re-establishing a shape impediment to the mutual rotation of the above-mentioned portions 8a, 8b first and second.

**[0045]** In other words, the first disc 9 which is rigidly connected to the first portion 8a and second discs 10 which is rotatably integral with the second portion 8b can move axially relative to both these portions between a first position where it engages with the first disc 9, to define a condition for stopping the rotation, and a second position of disengagement from the first disc 9, to define a release condition of the rotation.

**[0046]** The first and second portions 8a, 8b of the first joint 8 are designed to be connected to respective parts of the model 1, as clearly illustrated in Figure 1.

**[0047]** By way of example, in Figure 2, which, as mentioned, relates to the joint 6c, 7c of the ankle, the second portion 8b of the first joint 8 is designed to be connected to a foot (shown in Figure 1) of the model 1, whilst the first portion 8a of the first joint 8 comprises a substantially cylindrical projection 28.

**[0048]** The cylindrical projection 28 is inserted in a portion shaped to match the limb 6, 7 of the model 1, to allow its rotation relative to an axis A2 perpendicular to the above-mentioned axis A1 of the first joint 8.

**[0049]** The possibility of the rotation of the projection 28 relative to the axis A2 defines a second joint 29 for the joint 6c, 7c of the ankle.

**[0050]** The second joint 29, in a similar fashion to the first joint 8 described above, comprises a first disc 9 and a second disc 10 equipped with holes 11 and a second disc 10 having two pins 15 (of which only one is shown in Figure 2).

**[0051]** The first disc 9 is integral with the leg 6, 7 of the

model 1.

**[0052]** The second disc 10 is integral with the projection 28.

**[0053]** The second joint 29 comprises a pin 20 and a helical spring 22 fitted around the pin 20.

**[0054]** In a similar fashion to the above-mentioned operation of the first joint 8, the operation of the second joint 29 comprises the application of a force F' to the projection 28 in such a way as to cause the disengagement of the pins 15 from the holes 11, the relative rotation of the first and second disc 9, 10 about the axis A2 and a new insertion of the pins 15 in different holes 11.

**[0055]** The joint 4a, 5a of the shoulder, not illustrated in detail, also comprises a second joint 29 which is identical to that just described, wherein the disengagement of the pins 15 from the respective holes 11 (and hence the temporary removal of the shape impediment) requires a pulling of the arm 4, 5 away from the torso 3.

**[0056]** As illustrated in Figure 5, which shows a view of the joint 4b, 5b of the elbow, there are two first joints 8 combined.

**[0057]** In this case, although there are analogies with the first joint 8 described above, to which reference should be made for clarity, the respective first portions 8a of the two first joints 8 are integral with each other. The second portions 8b of the two first joints 8 are, however, are designed to be stably connected one to the arm and the other to the forearm of the respective upper limb 4, 5.

**[0058]** The above-mentioned first disc 9, second disc 10, pin 20 spring 22, pushbutton 23 define, for the first joint 8 means 30 for locking the mutual rotation of the first and second portion 8a, 8b.

**[0059]** According to alternative embodiments, not illustrated, of the invention, the first and second disc 9, 10 have respective inner and outer teeth configured to mesh with each other; these teeth defining the above-mentioned shape impediment.

**[0060]** Similarly, in further embodiments, not illustrated, the first and second disc 9, 10 have respective front teeth, these teeth defining the above-mentioned shape impediment.

**[0061]** The invention brings important advantages.

**[0062]** The model 1 according to the invention allows the achievement of defined and stable positions, thanks to shape impediments present in the first and second joints 8, 29 of the respective joints 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c.

**[0063]** Moreover, the model 1 according to the invention is, advantageously adjustable, in its joints 4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c, even when covered by articles of clothing.

**[0064]** In effect, the pushbutton 23 protruding, even though only slightly, from the spherical surface of the first joints 8 allows the user to perceive the presence also through the articles of clothing worn by the model 1, to actuate it through the fabric and therefore be able to adjust the limb as required.

## Claims

1. An articulated model comprising

5 - a torso (3),  
 - a plurality of limbs (4, 5, 6, 7) connected to the torso (3) and having respective joints (4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c), the joints (4a, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c) comprising at least one first joint (8) comprising two portions (8a, 8b) rotatably connected to rotate relative to each other about a predetermined axis (A1) of rotation and means (30) for stopping the rotation, the stopping means (30) comprising a shape impediment designed to be inserted between the two portions (8a, 8b) to prevent the reciprocal rotation of them about the axis (A1), **characterised in that** the stopping means (30) comprise an elastic element (22) designed to keep the shape impediment in a condition of stopping the rotation and a pushbutton (23) designed to overcome the elastic action of the elastic element (22) to bring the shape impediment into a condition of releasing the rotation.

2. The model according to claim 1, **characterised in that** the first joint (8) comprises a first disc (9) rigidly connected to a first of the portions (8a, 8b) and a second disc (10) rotatably integral with a second of the portions (8a, 8b) and movable axially relative to both portions (8a, 8b) between a first position of engagement with the first disc (9) to define the condition of stopping the rotation, and a second position of disengagement from the first disc (9) to define the released position of the rotation, the first and second disc (9, 10) being coaxial with the axis (A1) of rotation.

3. The model according to claim 2, **characterised in that** the first disc (9) has a plurality of holes (11) distributed angularly equidistant from each other along a circumferential line and the second disc (10) has at least one pin (15) extending in axial direction and configured to be inserted into any one of the holes (11) of the first disc (9), the pin (15) and the holes (11) defining the shape impediment.

4. The model according to claim 3, **characterised in that** the second disc (10) has two pins (15) positioned diametrically opposite each other.

5. The model according to claim 2, **characterised in that** the first disc (9) and the second disc (10) have respective inner and outer teeth configured to mesh with each other, the teeth defining the shape impediment.

6. The model according to any one of the claims from

2 to 5, **characterised in that** the first joint (8) comprises a pin (20) for pivoting the rotation of the two portions (8a, 8b), the pin (20) being movable axially and configured to move the second disc (10) at least from its first position to its second position.

5

7. The model according to claim 6, **characterised in that** the pushbutton (23) designed to overcome the elastic action of the elastic element (22) is obtained at an end of the pin (20).

10

8. The model according to claim 7, **characterised in that** the pushbutton (23) protrudes from the spherical outer surface of one of the first and second portions (8a, 8b).

15

9. The model according to any one of the claims from 1 to 8, **characterised in that** the first portion (8a) has a spherical size and a central hollow zone and the second portion (8b) is shaped like a spherical segment designed to be inserted into the hollow zone.

20

25

30

35

40

45

50

55

FIG. 1

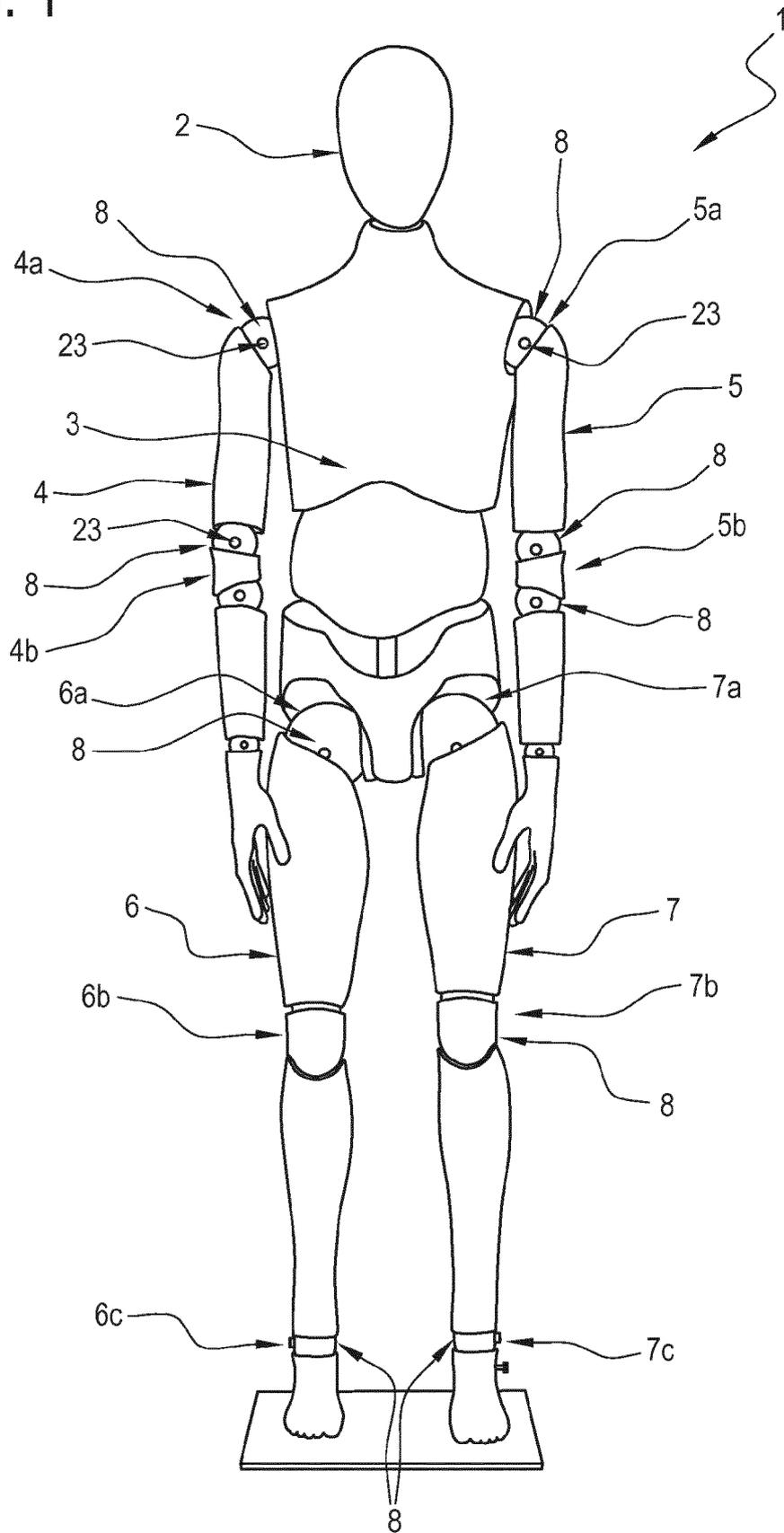




FIG. 3

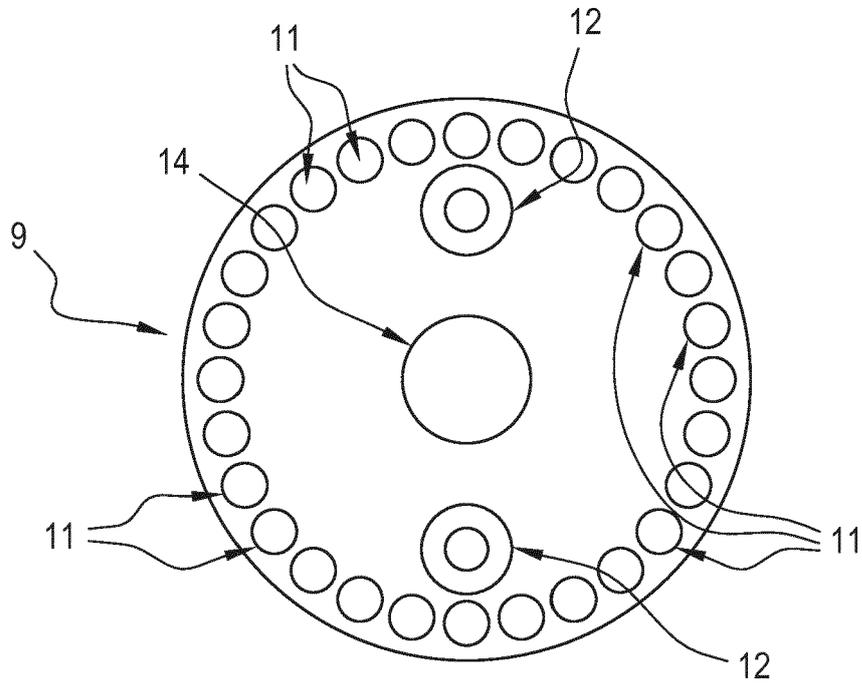


FIG. 4

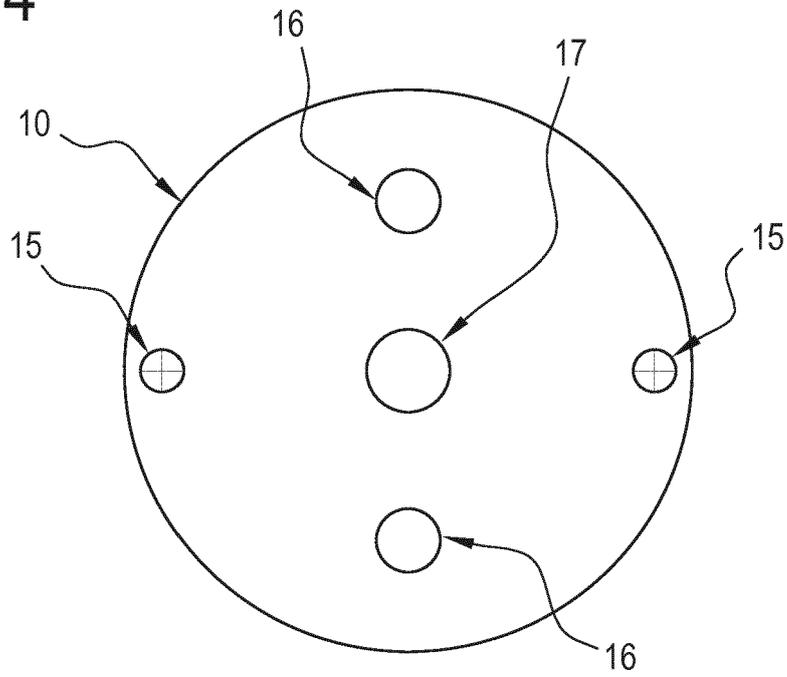
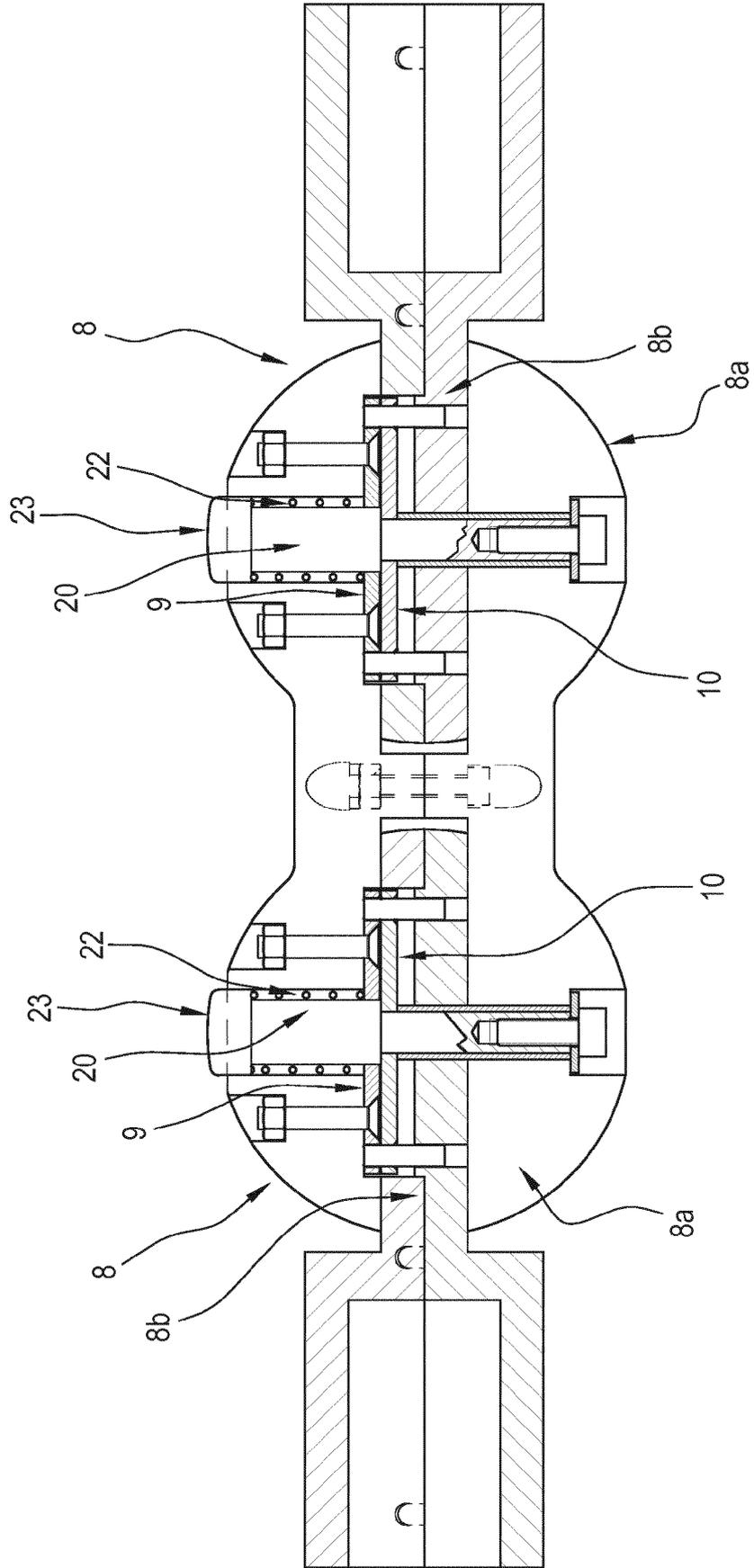


FIG. 5





EUROPEAN SEARCH REPORT

Application Number  
EP 16 19 6980

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 2 599 408 A2 (INNOVATIVE MOVING DISPLAYS S DE R L DE C V [MX]) 5 June 2013 (2013-06-05) * paragraphs [0030], [0048], [0056] - paragraph [0065]; figures 1-36 *	1-9	INV. A47F8/00
A	US 6 485 215 B1 (CHIANG JUNG-CHANG [TW]) 26 November 2002 (2002-11-26) * paragraph [0019] - paragraph [0032] *	1-9	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 December 2016	Examiner Vehrer, Zsolt
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	

EPO FORM 1503 03/02 (P04/C01)

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

EP 16 19 6980

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-12-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2599408 A2	05-06-2013	CN 103269621 A	28-08-2013
		EP 2599408 A2	05-06-2013
		JP 2013539993 A	31-10-2013
		KR 20130065692 A	19-06-2013
		US 2013186922 A1	25-07-2013
		WO 2012015290 A2	02-02-2012
-----			
US 6485215 B1	26-11-2002	NONE	
-----			

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82