

(19)



(11)

EP 2 891 760 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
08.07.2015 Bulletin 2015/28

(51) Int Cl.:
E06B 9/322 ^(2006.01)
E06B 9/324 ^(2006.01)
E06B 9/58 ^(2006.01)

(21) Application number: **14461501.0**

(22) Date of filing: **06.01.2014**

(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

(72) Inventor: **Wójkiewicz, Marek**
61-612 Pozna (PL)

(74) Representative: **Lisiecki, Wojciech**
Sciegienego 118
60-304 Poznan (PL)

(71) Applicant: **Decora Spolka Akcyjna**
63-000 Sroda Wielkopolska (PL)

(54) **Brakes for window blinds**

(57) The invention solves the issue of shifting pleated blinds on string lines and a blind brake stabilising the blind's bars in an assumed position.

The brake is characterised in that the labyrinth duct

of the brake is parallel to the longitudinal axis of the bar, and moreover, there are two rounded elements, preferably wheels, before and behind the labyrinth duct.

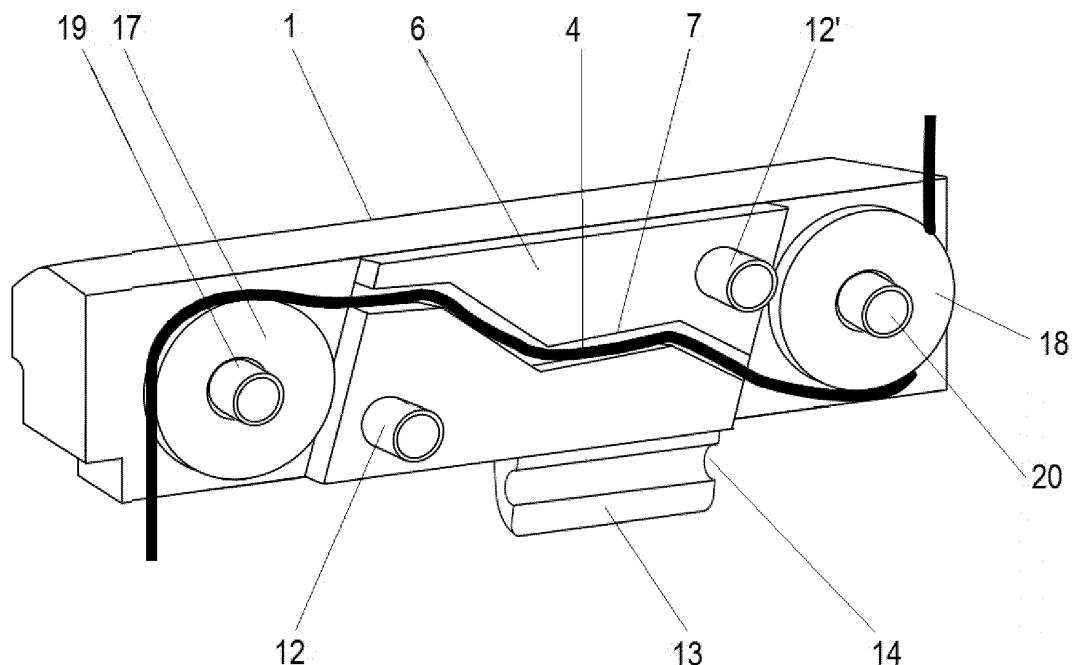


Fig. 9

EP 2 891 760 A1

Description

[0001] The invention solves the issue of shifting pleated blinds on string lines and a blind brake stabilising the blind's bars in an assumed position.

[0002] Pleated blinds are known and commonly used. One of the types of these blinds are ones with bars moving on string lines, while usually both blinds are movable. Thanks to such a solution, the blind may be positioned in any place of the element being shaded, usually a window or a door, and the span of the blind may be changed freely. Thanks to its special design, a pleated blind may be positioned in any place in the window. It may shade the bottom, the middle or the upper part of the window, depending on the needs and predilections.

[0003] Correct functioning of such type of blinds depends on stability of location of the bars, while it is necessary for the forces preventing self-displacement of the bars not to hinder their motion while displaced by a user.

[0004] In order to stabilise the location of the blind's bars on the string line, various types of brakes are used. The brakes, apart from preventing self-displacement of the blind's bars on the string lines, act also as bar guides on the string lines.

[0005] In known designs of pleated blinds, a system of double string lines is used. For correct operation of such blinds, high tension of the string lines is necessary, as otherwise the string lines bend during displacement of the blind's bars, preventing the displacement of the blind. High tension of the string lines is particularly important in case when pleated blinds are used in slant roof windows, where during normal operation, drooping of the blinds in relation to the window plane is observed.

[0006] From utility model No. W. 122018, a solution enabling a very strong tensioning of the string lines is known, useful for blinds installed on slant roof windows.

[0007] From utility model application No. W. 122019, a brake is known with principle of operation consisting in shifting a cube on the string line, the cube having a labyrinth duct, through which the string line is passed. Bends in the labyrinth duct effectively brake self-displacement of the string line. The braking force of such a brake depends on the weight of the blind's bars, the tension of the string line, and the number and shape of the labyrinth ducts. On one hand, the brake must brake self-displacement of the blind's bars on the string line, and on the other hand, it may not pose too strong a resistance during purposeful shifting of the blind's bars on the string lines.

[0008] Combination of high tension of the string lines with a labyrinth brake having a design as described in the utility model No. W. 122019 is not effective in some cases. Particularly in the case of wide windows, shifting of the blind's bars with brake of this utility model is very hard, and in extreme cases impossible.

[0009] The braking force may be regulated by the number of the bends in the labyrinth duct and by bending angles between the individual sections of the duct. The higher the number of bends in the labyrinth duct, the higher

er the braking force, but it results in elongation of the brake, constituting an important obstacle in construction of the blinds and leads to a deterioration of their aesthetic qualities. The smaller the angles between individual sections of the labyrinth duct, the lower the braking force, but it results in an increase of resistances during purposeful shifting of the blind's bars and increases the rate of wear and tear of the string lines.

[0010] The goal of the invention was to build a brake with a high braking force, which would not pose excessive resistance during displacement of the blind's bars, while maintaining high aesthetic qualities, especially in case when the blinds are used in wide slant windows, for instance roof windows.

[0011] The brake for blinds, particularly for pleated blinds, according to the invention, is connected with the blind by a bar and functions as a guide at the same time. The brake is characterised in that the labyrinth duct of the brake is parallel to the longitudinal axis of the bar, and moreover, there are two rounded elements, preferably wheels, before and behind the labyrinth duct. The rounded elements enable a change in direction of the course of the string line, while the labyrinth duct is shaped so that one inlet of the duct is located below the axle of the rounded element, and the other, opposite one is located above the axle of the rounded element. The string line, from the internal side of the blind on the rounded element, changes its course from vertical to horizontal, and then, behind the labyrinth ducts, changes its course back to vertical on the second rounded element.

[0012] The rounded element is a circular segment not smaller than 180° , preferably a circular segment of 190° . In a preferred version of the invention, the rounded elements are wheels mounted on axles. The diameter of the wheels or the rounded element is not smaller than 1.5 of the diameter of the string line, and in case when the string lines of the blind are made of metal, the ratio of the wheel diameter to the string line diameter is not smaller than 2.0.

[0013] Application of wheels eliminates sharp bending of the string line and facilitates shifting of the string line in the brake while shifting the blind's bars. No sharp bending especially favourably influences the durability of the string lines, particularly metal string lines covered in plastic.

[0014] The labyrinth duct has at least two bends, while preferably the angles between the individual sections of the duct range from 100 to 175° .

[0015] The brake according to the invention consists of two connected parts. In the first part, the labyrinth duct and the rounded elements are located, while these elements have protrusions perpendicular to their plane, intended for connection with the other part of the brake. In case when the rounded elements are wheels, the axles they are mounted on are longer than the thickness of the wheels and they form two protrusions for connection with the other part of the brake. Moreover, this part of the brake has additionally at least two protrusions intended for connection and stabilisation of this connection with

the other part of the brake. The other part of the brake has openings corresponding to the protrusions of the first part of the brake, and after assembly, the protrusions of the first part of the brake enter the openings in the other part and stabilise the connection.

[0016] Additionally, the brake may have properly shaped holders enabling shifting of the blind's bars, or sockets for installation of such holders. A brake according to the invention may have properly shaped sockets for connection with the bar of the blind or it may be concealed inside the bar.

[0017] The subject of the invention is presented by the way of embodiments that illustrate but do not limit the scope of the invention.

[0018] In the drawings, the individual Figures show:

- Figure 1 - a general view of the brake as assembled,
- Figure 2 - a general side view of the brake as assembled,
- Figures 3 and 5 - a view of the labyrinth part of the brake in two projections,
- Figure 4 - a magnification of detail A from Figure 3,
- Figure 6 - course of the string line through the labyrinth part of the brake according to Figures 3 and 5,
- Figures 7, 8, 9 and 5 - a view of the labyrinth part of the brake in a version with wheels,
- Figure 10 - a view of the labyrinth part of the brake in a version with a semicircular element,
- Figure 13 - a blind with four brakes according to the invention installed,
- Figure 14 - a connection of the blind's bars with the brake in a view along the axle of the blind's bar,
- Figures 15-18 - other combinations for connection of the labyrinth part with a connector.

[0019] In Figure 1, a general view of the brake as assembled ready for installation in the bar is shown, in a view along the axle of the bar. The brake consists of two parts (1, 2), one (2) of which has a socket (3) for installation of a blind's bar. Both parts differ in their internal design, as shown in the following Figures, but they complete one another and together constitute the whole brake. The main part of the brake is the labyrinth part (1), containing the basic operating elements of the brake. The basic function of the second part consists in completion of the internal design of the brake and connection with the blind's bar (hereinafter called "a connector" in the embodiment description). A string line (4) is passed through the brake. A holder (5) intended for operating

the blind is connected to the brake.

[0020] As shown in Figure 2, the string line (4) enters the brake from its internal end, while watching from the side of the blind's cloth, and exits at the external end.

[0021] In the labyrinth part (1), shown in Figure 3, there is a protrusion (6) on the internal surface, the protrusion having a labyrinth duct (7) furrowed, and at both ends of the labyrinth duct (7), there are two rounded elements (8, 9) with a thickness equal to the thickness of the protrusion (6). From the rounded elements (8, 9), cylindrical pins (10, 11) protrude that are intended for connection of the labyrinth part (1) with the connector (2). On the protrusion (6), there are two cylindrical pins (12, 12'), also intended for connection of the labyrinth part (1) with the connector (2). The pins (10, 11, 12, 12') stabilise the connection of both parts of the brake. The labyrinth part has a protrusion (13), containing a socket (14) for the holder (5). The socket (14) constitutes a half of the complete socket for the holder (5), and the other half of the socket is located on the connector (2).

[0022] In Figure 4, a section of the labyrinth duct (7) marked as "A" in Figure 3 is shown. The individual sections of the duct (7', 7'') form angle α , which preferably should be in the range of 110-175°.

[0023] In Figure 5, the labyrinth part (1) is shown in a view perpendicular to that of Figure 3. The casing (15) of the labyrinth part (1) has a shape corresponding to the internal shape of the blind's bar. Depending on the profile of the blind's bar, the casing (15) may assume any shape. Preferably, there is a longitudinal groove (16) in the casing (15), the groove additionally stabilising the connection with the blind's bar, which should have a corresponding protrusion in this case.

[0024] In Figure 6, the course of the string line is shown. The string line (4) enters the brake from the top and changes its direction by about 90° on the rounded element (9), next it passes through the labyrinth duct (7), and then changes its direction again by about 90° on the rounded element (8) and exits the brake.

[0025] In Figure 7, the labyrinth part (1) is shown in a version where two wheels (17, 18) mounted on axles (19, 20) are located at both ends of the labyrinth duct (7). The wheels (17, 18) have a thickness smaller than the protrusion (6), in order to enable their free rotation on axles (19, 20) during the brake's operation. At the same time, the axles (19, 20) perform functions of cylindrical pins for connection of the labyrinth part (1) with the connector (2). On the protrusion (6), there are two cylindrical pins (12, 12'), also intended for connection of the labyrinth part (1) with the connector (2). The axles (19, 20) and pins (10, 11) stabilise the connection of both parts of the brake. The labyrinth part has a protrusion (13), containing a socket (14) for the holder (5). The socket (14) constitutes a half of the complete socket for the holder (5), and the other half of the socket is located on the connector (2).

[0026] In Figure 8, the labyrinth part is shown in a view perpendicular to that of Figure 7. The casing (21) of the labyrinth part (1) has the axle (19), on which the wheel

(17) is placed.

[0027] In Figure 9, the course of the string line is shown. The string line (4) enters the brake from the top and changes its direction by about 90° on the wheel (18), next it passes through the labyrinth duct (7), and then changes its direction again by about 90° on the wheel (17) and exits the brake.

[0028] In Figure 10 the labyrinth part (1) is shown in a version where two rounded elements (22, 23) are located at both ends of the labyrinth duct (7), the rounded elements being a circular section, and their thickness is equal to the thickness of the protrusion (6). From the rounded elements (22, 23), cylindrical pins (24, 25) protrude that are intended for connection of the labyrinth part (1) with the connector (2). On the protrusion (6), there are two cylindrical pins (12, 12'), also intended for connection of the labyrinth part (1) with the connector (2). The pins (12, 12', 24, 25) stabilise the connection of both parts of the brake. The labyrinth part has a protrusion (13), containing a socket (14) for the holder (5). The socket (14) constitutes a half of the complete socket for the holder (5), and the other half of the socket is located on the connector (2).

[0029] The connector (2) shown in Figure 11 has a casing (26), having openings (27, 28, 29, 29') drilled in it. After connecting with the labyrinth part (1) shown in Figure 3, pins (10, 11, 12, 12') corresponding to these openings enter them. The connector has a socket (3), into which the end of the blind's bar enters. At the same time, the external surface of the socket (3) constitutes a decorative tailpiece of the blind's bar. The connector has a protrusion (30), containing a socket (31) for the holder (5). After connecting with the labyrinth part (1), the socket (31) forms with the socket (14) a complete socket for the holder (5).

[0030] In Figure 12, the connector (2) is shown in a view perpendicular to that of Figure 11. The casing (21) of the connector (2) has a shape corresponding to the internal shape of the blind's bar. Depending on the profile of the blind's bar, the casing (21) may assume any shape. Preferably, there is a longitudinal groove (16') in the casing (21), the groove additionally stabilising the connection with the blind's bar, which should have a corresponding protrusion in this case.

[0031] In Figure 13, a blind with four brakes according to the invention installed is shown. The bottom bar (32) has two brakes (34, 35), and the upper bar (33) has also two brakes (36, 37). In Figure 13, one brake (34) with exposed labyrinth part (1) is shown. Two the string lines (38, 38') are passed through the brakes and through the pleats of the blind.

[0032] In Figure 14, a connection of the blind's bars with the brake is shown in a view along the axle of the blind's bar. The bar of the blind (40) enters the socket (3) of the connector (2).

[0033] Figures 15-18 show several from among many variants of solutions for the connection of both parts of the brake according to the invention. These variants are

only examples and they do not limit the scope of the invention. In Figure 15, a version of the labyrinth part (1) with pins (41, 41') having square cross-section is shown, and in Figure 16 - a connector (2) compatible with this version, containing openings (42, 42') corresponding to the pins (41, 41').

[0034] In Figure 17, a version of the labyrinth part (1) is shown, containing only axles (10, 11) of the wheels (8, 9) for connection with the connector (2).

[0035] In Figure 18, the connector (2) of the brake is shown in a version without the socket for the connecting bar.

15 Claims

1. A brake for a blind, particularly for pleated blinds, having a labyrinth duct **characterised in that** the labyrinth duct (7) of the brake is parallel to the longitudinal axis of the bar, and moreover, there are two rounded elements (8, 9), preferably wheels, before and behind the labyrinth duct (7).
2. A brake according to claim 1 **characterised in that** at least one rounded element is a wheel (17, 18) mounted on axles (19, 20).
3. A brake according to claim 2 **characterised in that** the wheels (17, 18) have a diameter not smaller than 1.5 of diameter of the string line (4) of the blind.
4. A brake according to claim 1 **characterised in that** the rounded element (8, 9) is a circular segment not smaller than 180°.
5. A brake according to claim 4 **characterised in that** the rounded element (8, 9) is a circular segment not smaller than 190°.
6. A brake according to claim 1 or 2 or 3 or 4 or 5 **characterised in that** it has additionally at least one pin (12, 12') for connection of the labyrinth part (1) with the connector (2).

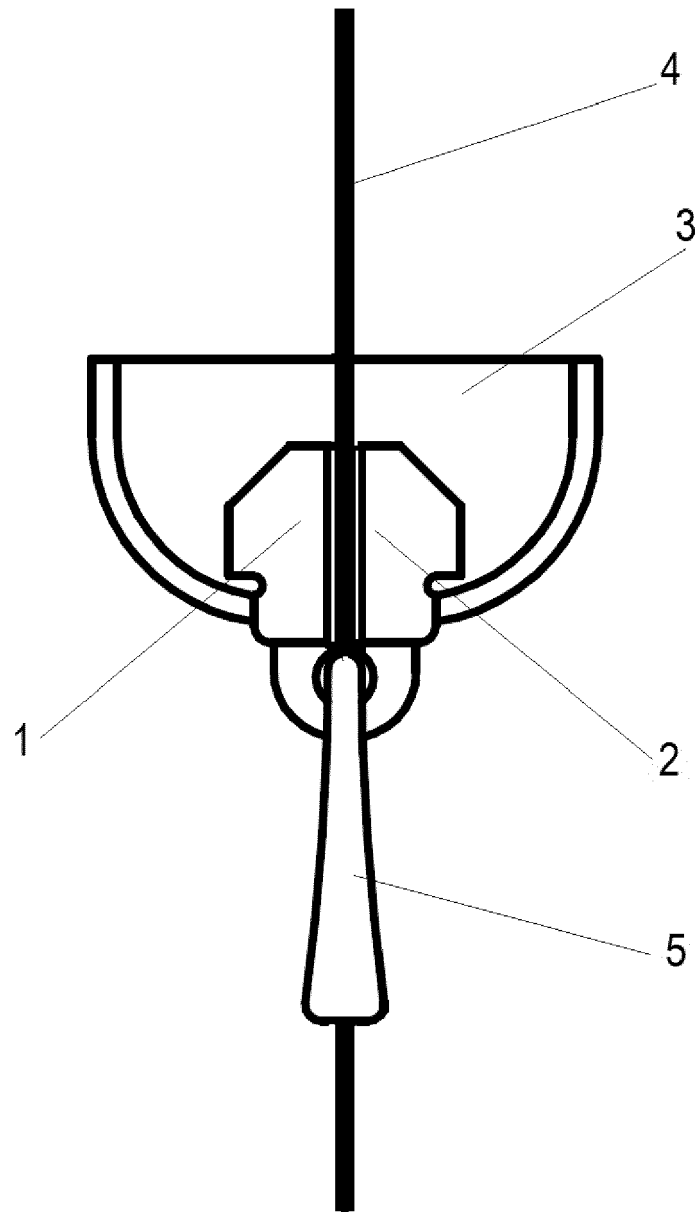


Fig.1

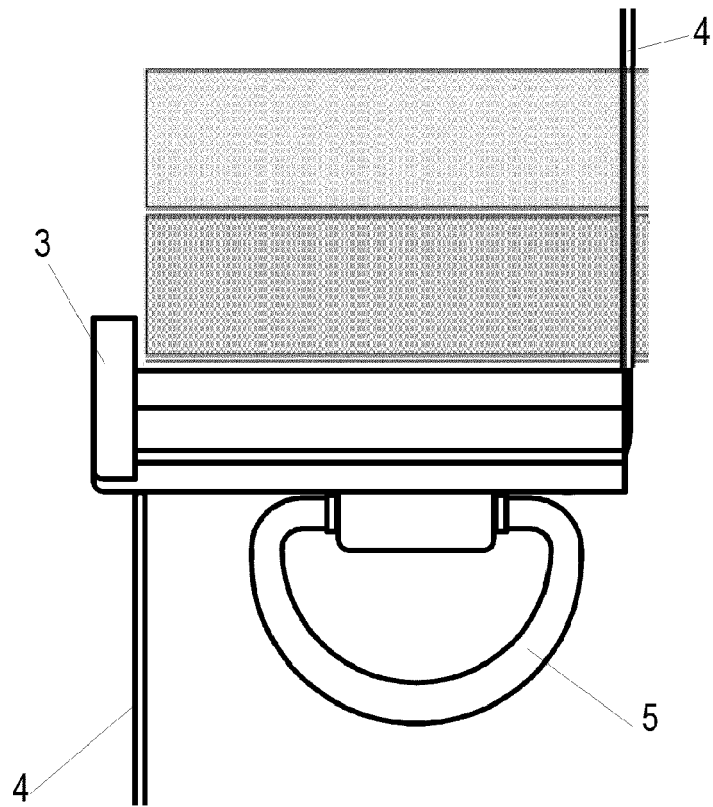


Fig. 2

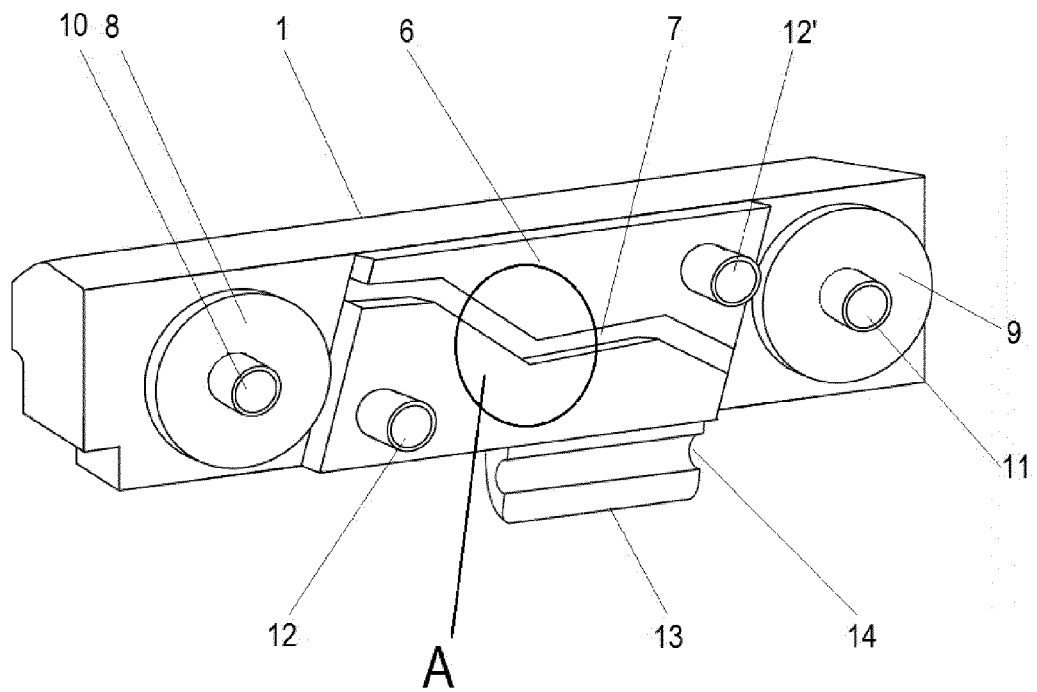


Fig. 3

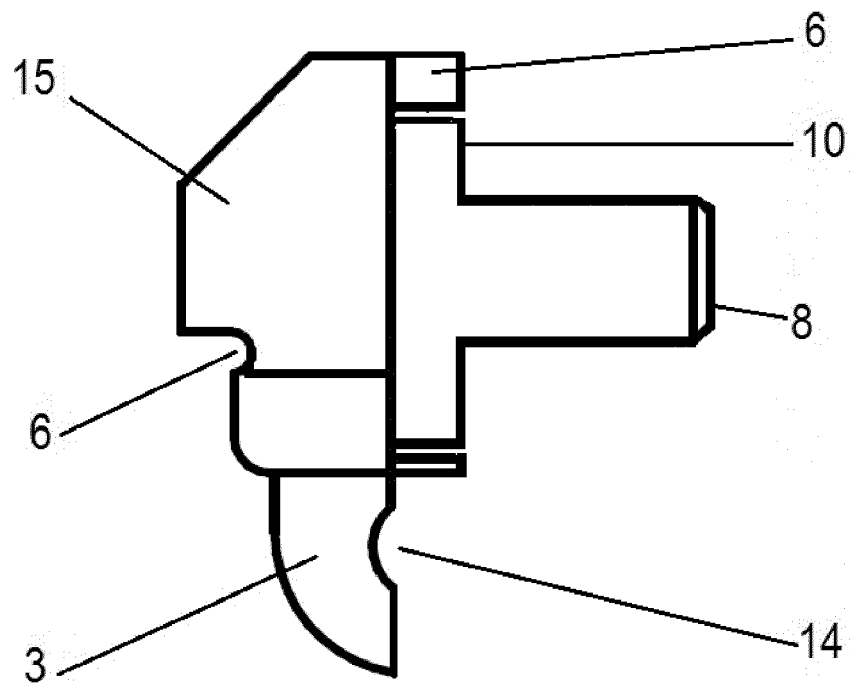


Fig. 4

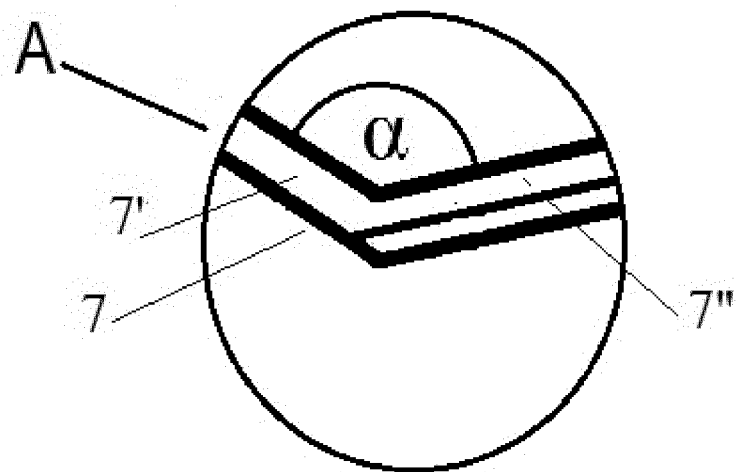


Fig. 5

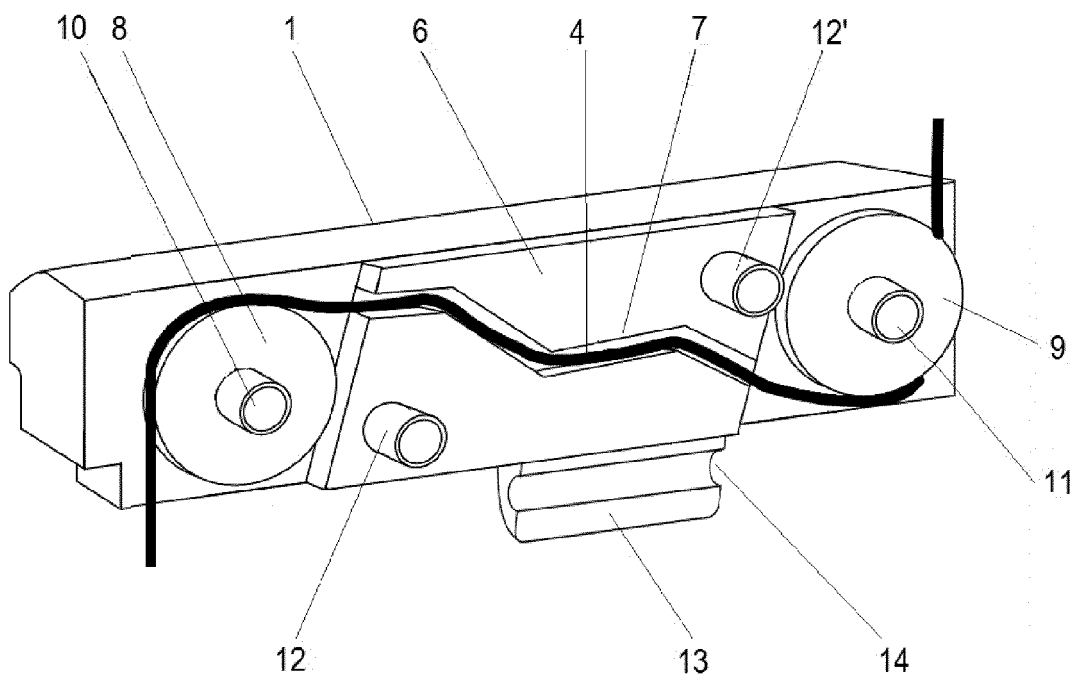


Fig. 6

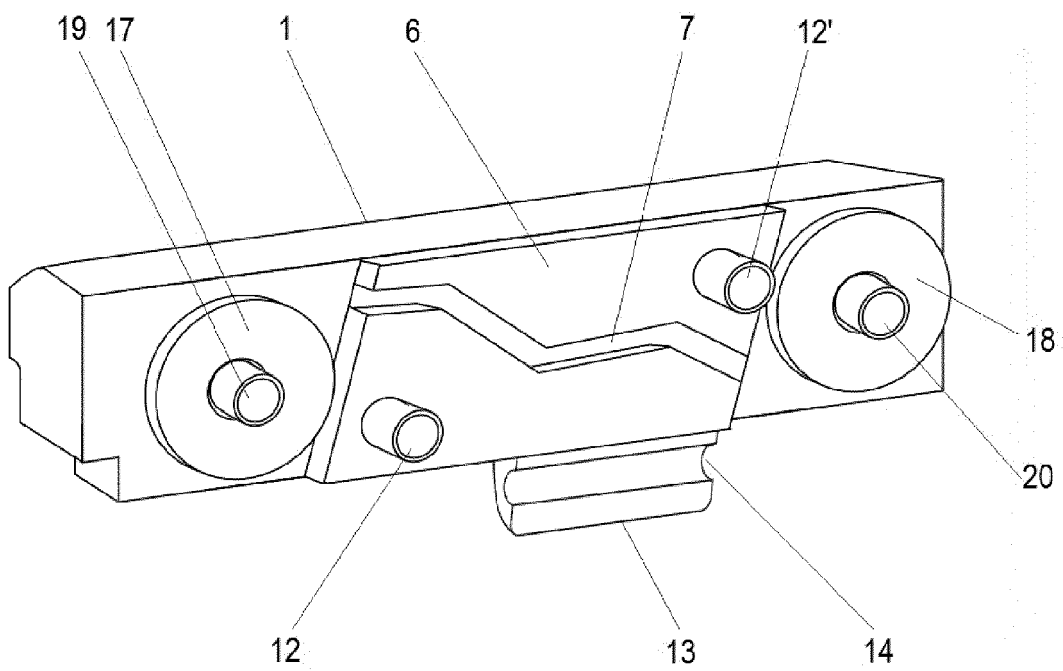


Fig. 7

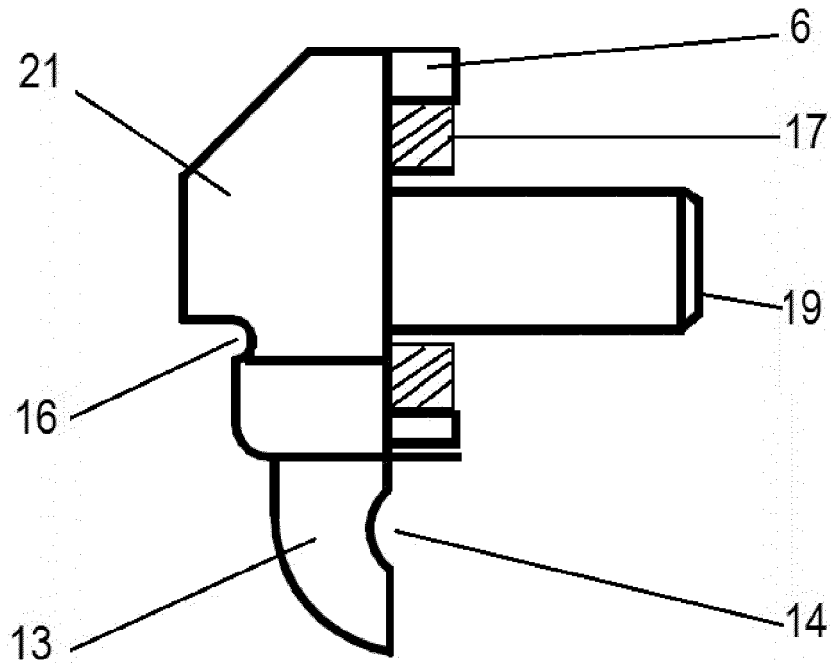


Fig. 8

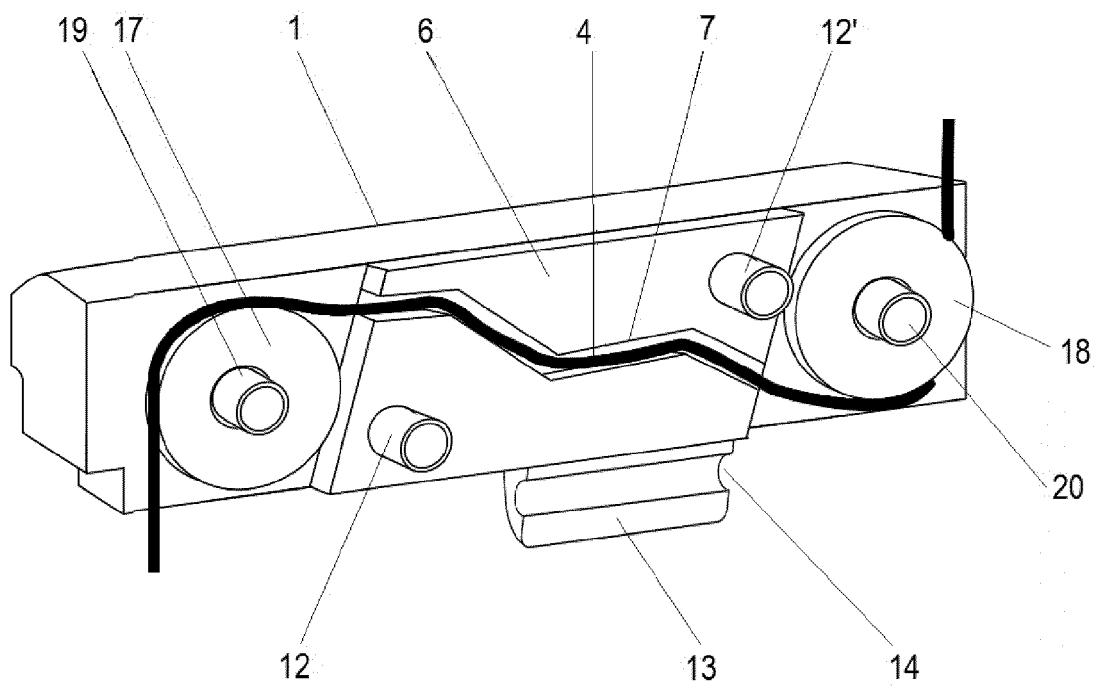


Fig. 9

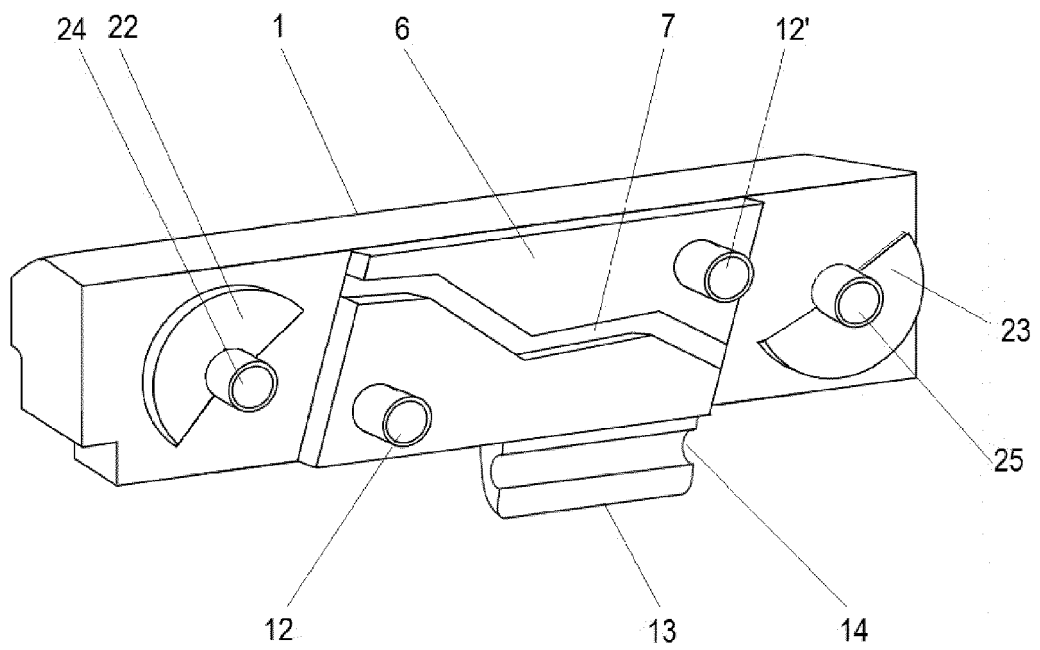


Fig. 10

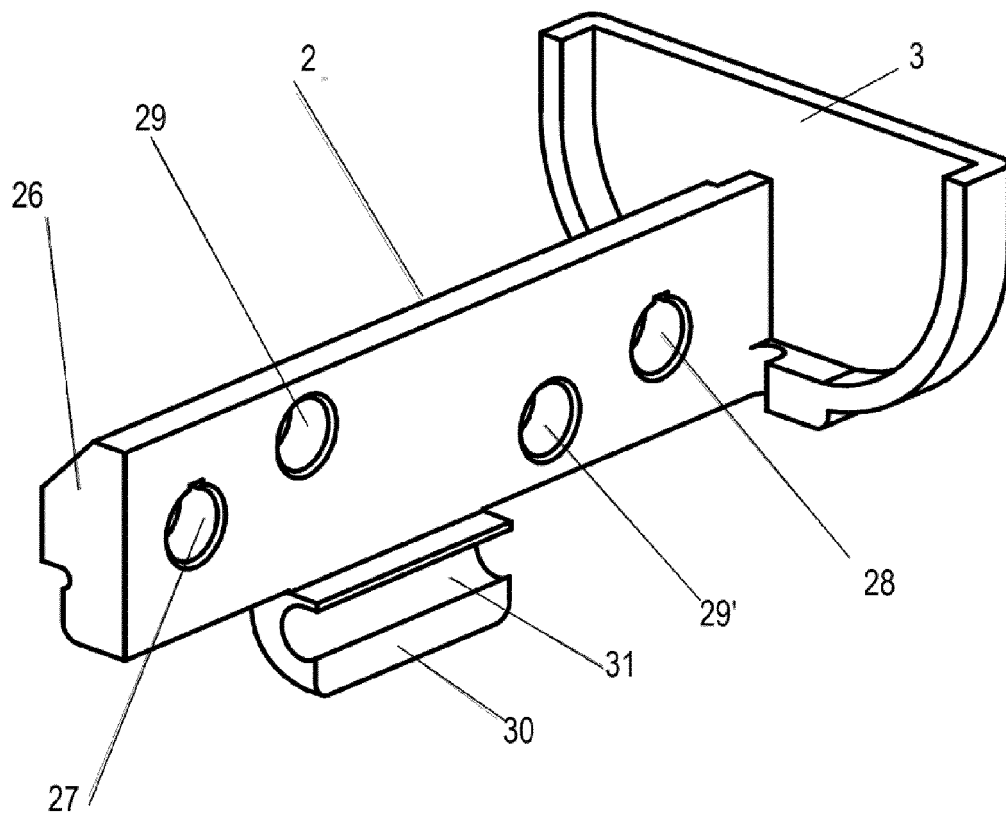


Fig. 11

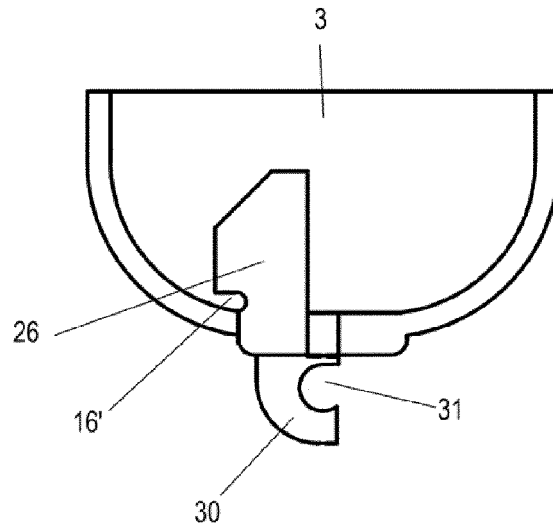


Fig. 12

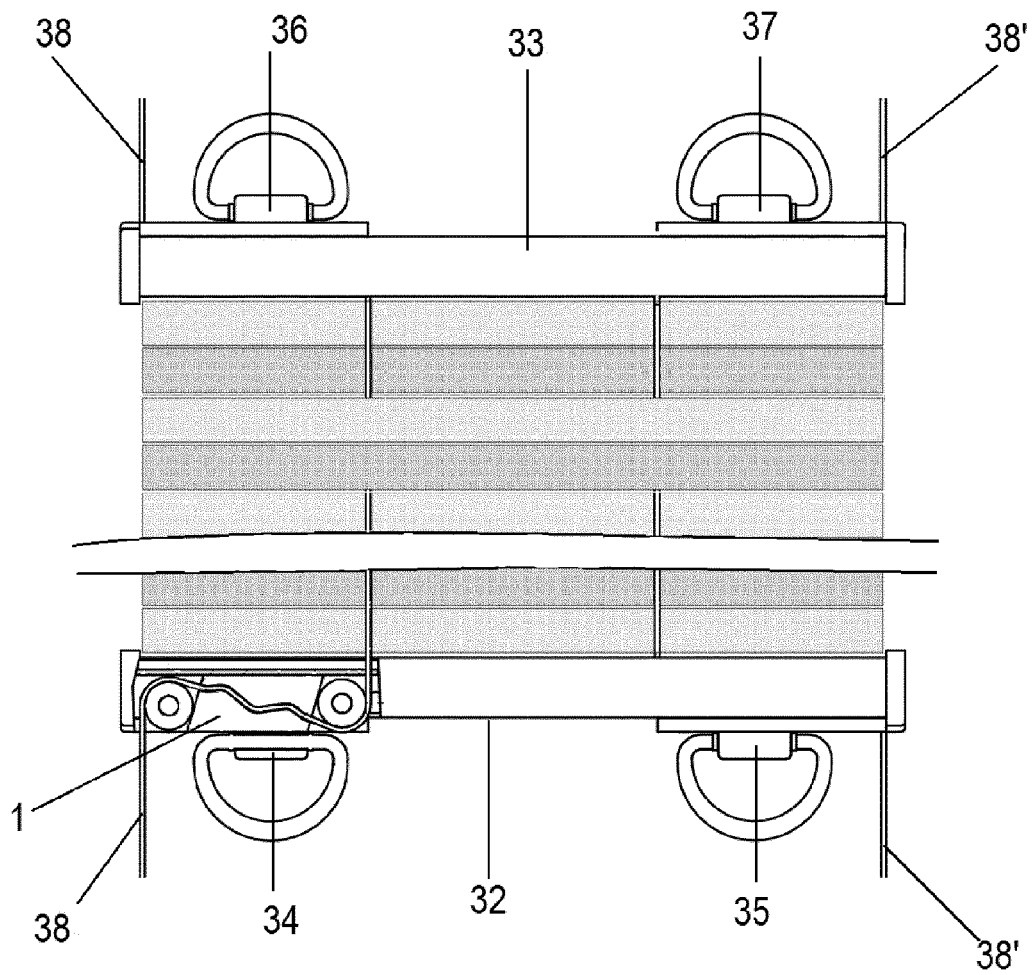


Fig. 13

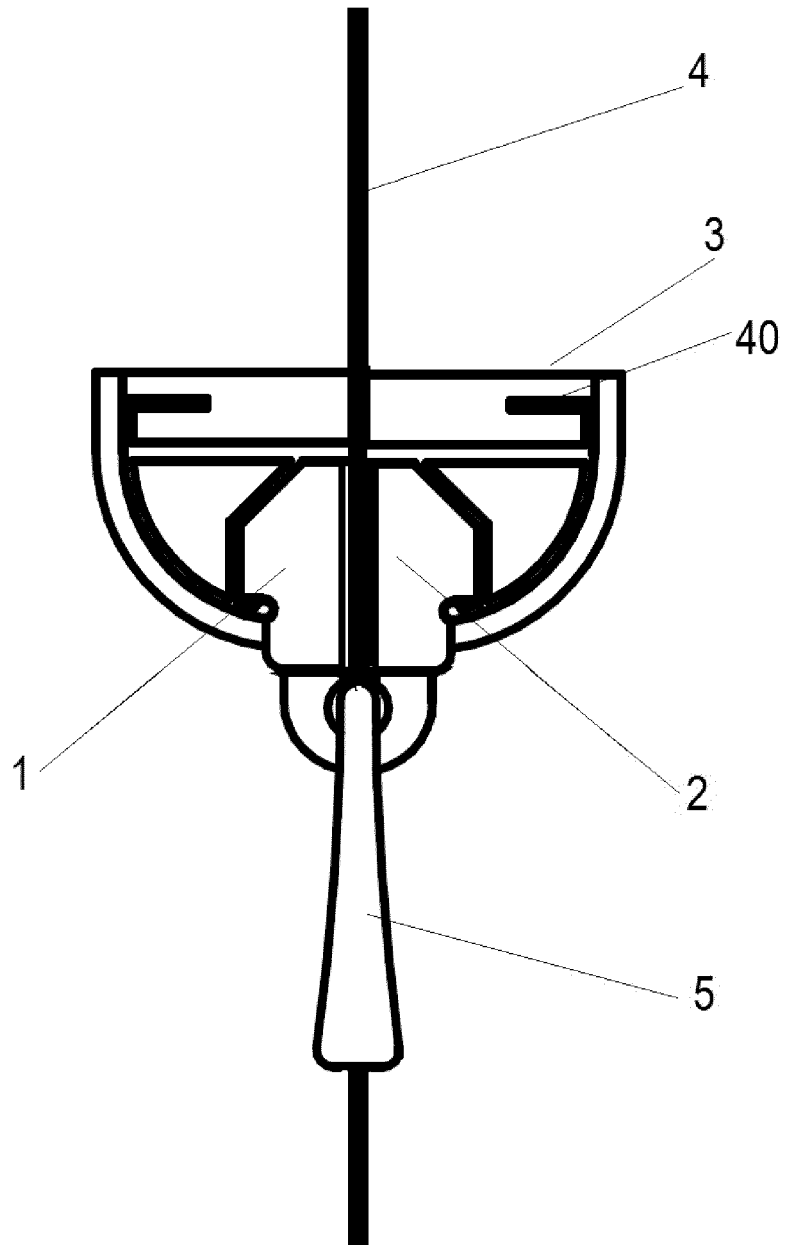


Fig. 14

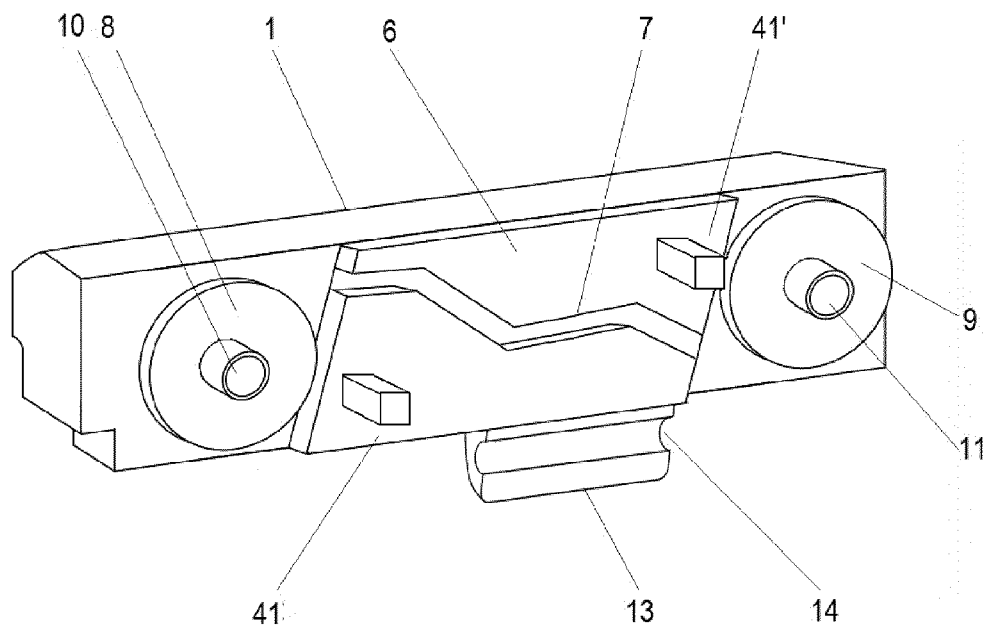


Fig. 15

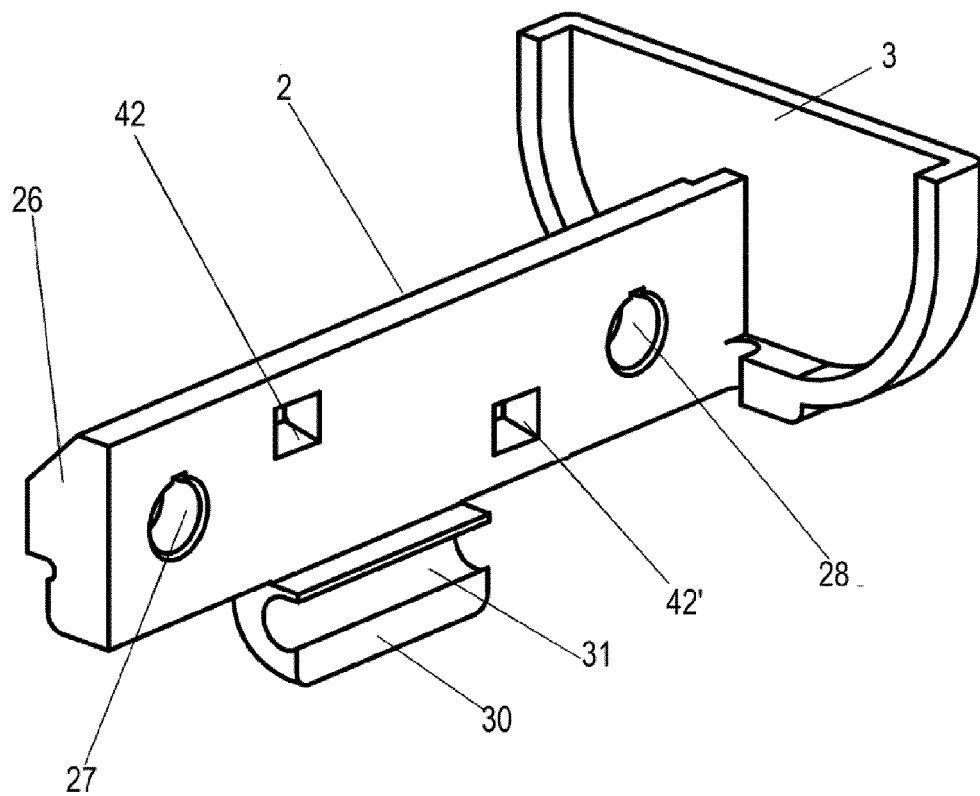


Fig. 16

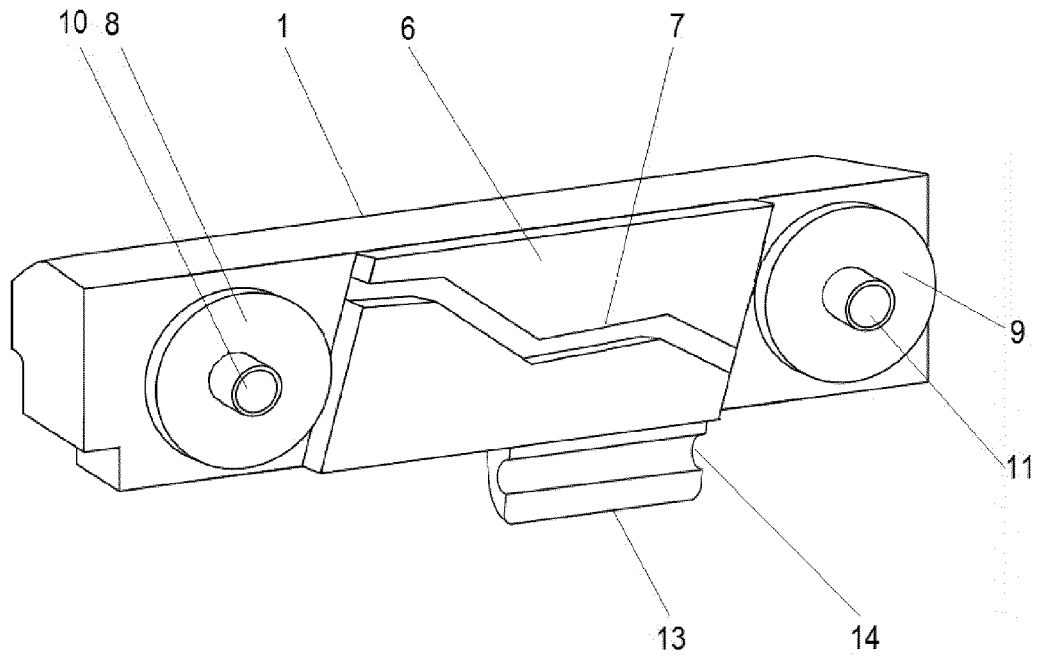


Fig. 17

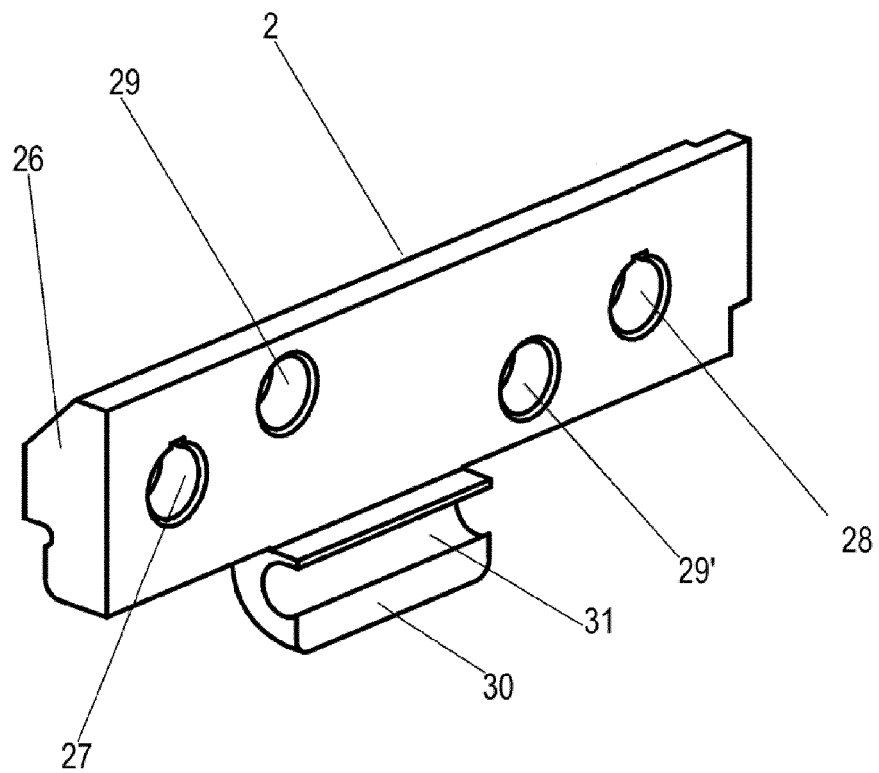


Fig. 18



EUROPEAN SEARCH REPORT

Application Number
EP 14 46 1501

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)
X	WO 2012/154871 A1 (HUNTER DOUGLAS [US]; ANTHONY JAMES M [US]; DANN KEVIN M [US]; KOVACH J) 15 November 2012 (2012-11-15) * paragraph [0047] - paragraph [0058]; figures 6, 12-18, 22, 23 *	1-6	INV. E06B9/322 E06B9/58 E06B9/324
E	EP 2 735 692 A2 (COULISSE BV [NL]) 28 May 2014 (2014-05-28) * paragraphs [0017], [0028] - [0031]; figures 1, 4, 6A, 6B *	1,2,4,5	
A	US 2007/272363 A1 (HUANG TAI-LONG [TW]) 29 November 2007 (2007-11-29) * abstract; figures 4, 5 *	1-6	
A	US 4 202 395 A (DEKKER DAVID J [US] ET AL) 13 May 1980 (1980-05-13) * abstract; figures 2, 5, 6, 8, 12 *	1-6	
A	US 2008/202705 A1 (CHENG LI-MING [TW] ET AL) 28 August 2008 (2008-08-28) * abstract; figures 6, 7 *	1-6	
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 September 2014	Examiner Weißbach, Mark
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 (P04C01)

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

EP 14 46 1501

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.

08-09-2014

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012154871 A1	15-11-2012	CA 2834943 A1	15-11-2012
		US 2014076504 A1	20-03-2014
		WO 2012154871 A1	15-11-2012

EP 2735692 A2	28-05-2014	EP 2735692 A2	28-05-2014
		US 2014138036 A1	22-05-2014

US 2007272363 A1	29-11-2007	NONE	

US 4202395 A	13-05-1980	NONE	

US 2008202705 A1	28-08-2008	NONE	

EPO FORM P0459

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