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(54) **MOTORIZED HOSE REEL DRUM**

(57) The present invention relates to a motorized hose reel drum system (1), comprising a drum (2), a throughgoing axle (3) having a first axle end (3a) and a second axle end (3b), a motor (4), a frame (5), drive means configured to rotate the drum around an axis defined by the axle, by a force of the motor, said motorized

hose reel drum further comprising a motor bracket (6) having a first fitting end (6a) and an opposing second fitting end (6b), said motor bracket (6) is fixed to the frame (5) by the first fitting end (6a) and attached to the motor (4) at the second fitting end (6b), wherein the motor (4) and motor bracket (6) are arranged inside the drum (2).

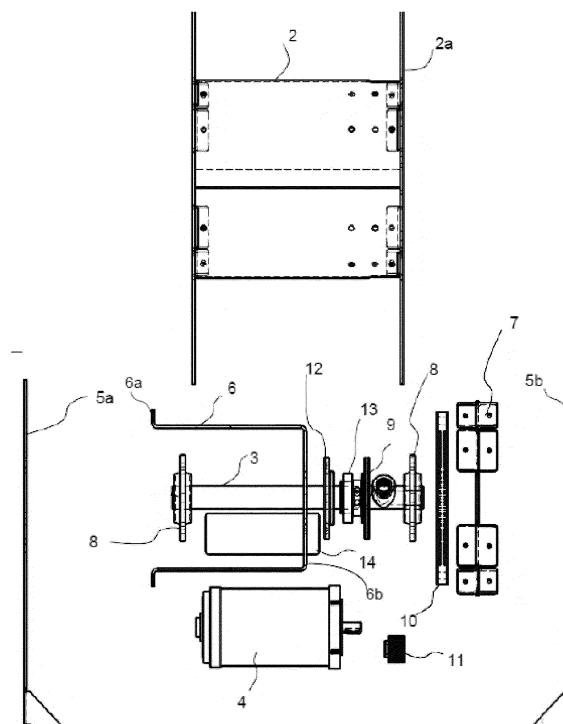


Fig 2

Description

Field of the Invention

[0001] The present invention relates to a motorized hose reel drum system for private and/or industrial use.

Background of the Invention

[0002] Several motorized hose reels in the industry have a visible/exposed electric motor placed on the side or in front of the hose reel, often with gearing, or other driving forces, such as belts, chains or the like.

[0003] In addition, they often require manual operation when disengaging the gearing for the hose to be pulled out of the wheel by manual force.

[0004] This is not an option in industries where it is necessary to quickly roll out hoses up to 100 m, which must take place both frequently and effortlessly.

[0005] Another challenge with motorized wheels driven by a belt, outer sprockets or visible chains is that moving parts are easily accessible.

[0006] This can result in broken and defective hoses, and in the worst-case cause personal injury due to inattention to moving parts.

[0007] External gear rings also cause greater wear and tear due to dust, sand and other sediment as well as external circumstances such as wind and other weather conditions.

[0008] Other challenges that are often seen on motorized hose reels are that they move by a fraction with each turn of the drum thus taking on a crooked shape over time. This is especially a problem with external sprockets or with drive power via chain/belt traction, which means that they often have to be adjusted to run fairly smoothly, and this at the expense of wear on the sprockets and any belts/chains as they are not fully tensioned/adjusted as required by the standards for chain, belt or sprocket.

[0009] Last is the challenge to fit the hose-reels and other equipment's close together causing difficulties in fitting one or more hose reels in space restricted places due to its size. It was necessary to find a solution to make more effective use of the space.

[0010] Examples of known systems suitable for winding up a hose, comprising a drum, a drive motor arranged inside the drum, and an outer frame to which the motor is mounted are seen in:

WO 03/026995 A2 that additionally discloses a fitting, one end of which is mounted to a frame and the opposite end is mounted to a drive motor. However, the majority of said fitting is arranged outside the drum.

[0011] CN 111453556 A that additionally discloses a hollow cylindrical bracket arranged essentially inside a drum, one end of which bracket is fixed to a frame, and a partition wall near an opposite second end of the bracket is fixed to a drive motor.

[0012] DE 19840831 A1 that additionally discloses a through-going axle (22) around which the drum (2) is ar-

ranged to rotate, and a drive motor (3) which somehow must be mounted to said axle (22).

[0013] Though, none of the above disclose a combination a through-going axle, a frame, and a motor bracket, one end of which is mounted to the frame while an opposite end of which is mounted to the motor, and wherein all of the motor bracket except its frame-fitting end is arranged inside a drum.

[0014] All the above challenges caused the development of a new type of hose reel to meet all the above challenges.

Object of the Invention

[0015] It is an object of the invention to provide a hose drum which is safe for users and related equipment such as hoses.

[0016] It is another object of the invention to provide a hose drum with reduced wear and environmental tear on essential parts.

[0017] It is also an object of the invention to provide a hose reel with more efficient use of space, without extra space next to the hose reel drum for gears and belt.

Description of the Invention

[0018] These and other advantages are achieved by a motorized hose reel drum, comprising a drum, a throughgoing axle having a first axle end and a second axle end, a motor, a frame, drive means configured to rotate the drum around an axis defined by the axle, by a force of the motor, said motorized hose reel drum further comprising a motor bracket wherein the motor, drive means, and motor bracket are arranged inside the drum whereby both motor and drive means are protected inside the drum. When the motor is attached to the motor bracket which again is fixed to the frame, the motor is kept steady inside the drum even when the drum is rotating by the force of the motor in order to reel in a hose attached to the drum.

[0019] The frame may comprise a first and second stand connected by the axle, via outer bushings whereby a steady frame allowing the rotation of the drum around the axis of the axle is achieved. In some embodiments the frame is formed by the first and second stand which only are connected by the axle. In other embodiments the frame has a different layout for example when the first and second stand or corresponding features are connected by secondary means together with the axle.

[0020] When the motorized hose reel drum comprises a drum fitting inside the drum an effective and simple way of fastening the drum relative to one or more of the inner parts of the drum is achieved.

[0021] Preferably the drum fitting is arranged concentric to the axle at the second axle end and fastened to the drum.

[0022] The drum fitting may be kept in place by an axle bushing around the axle ensuring desired stability and

rotatability of the drum fitting. The axle bushing may be fixated relative to the axle by e.g., a split.

[0023] In various embodiments the drive means are a cogwheel arranged in or on the drum fitting and a drive wheel rotated by the motor. The motor may pull the drive wheel, which again rotates the cogwheel which eventually rotates the drum as the drum fitting connects cogwheel and drum. The setup composing the drive wheel and the cogwheel ensures an even rotation of the drum compared to known solutions based on e.g. an external drives. When the drive means are a cogwheel and a drive wheel it is an even greater advantage that the drive means are inside the drum where dust and humidity may be limited compared to outside the drum.

[0024] The drum fitting is attached to the axle bushing which again is fixed relative to the axle.

[0025] In order to ensure the right position of the motor and especially the right relative position of the parts of the drive means, such as cogwheel and drive wheel, the motor bracket may be supported by an inner bushing and a ball bearing at the second fitting end.

[0026] The applicant has shown that a setup where the motor bracket is attached to the inner bushing having the ball bearing inserted which again rests against the axle bushing allows a very stable setup with a tight fit and optimal low tolerance between drive wheel and cogwheel.

[0027] The axle bearing may be arranged to hold the entire weight of the drum and may be fixed relatively to the axle via fastening means such as a screw, bolt or preferably a split.

[0028] The present arrangement, wherein the motor bracket at a first end is fastened to the static frame and an opposing second end is supported by the the bushing arrangement (comprising inner bushing, ball bearing and axle bushing), results in the motorized hose reel drum to have a stable and uniform motion and rotation.

[0029] The motor bracket may have two parallel bent end-points and an opposing straight part, said motor bracket having its two end-points which may be fixed to the frame and the opposite straight part kept steady by the inner bushing including a ball bearing, said motor bracket having the motor attached to the straight part.

[0030] The axle may be at least partially hollow in which case it may be arranged to transfer water from the water source to the hose on the drum.

[0031] The size of the inner drum reel may for example have an outer diameter set to 214 mm +/- 50 mm depending on size of motor, the need of a motor controller and the type of hose. The hose bearing side flanks likewise vary in size depending on type and length of the hose, as well as the width of the drum wheel to be able to keep the full volume on the desired hose-set. The width of the drum wheel is in some embodiments designed to be about 225 mm +/- 50 mm depending on motor size and desired hose-set.

[0032] Different motors may be required depending on the desired hose type as some hoses are lighter, simply

carrying pure water, while other hose types are much heavier with layers for high-pressure and temperature isolation. For lighter hoses motors are for example desired to be about 180 W +/- 30 W and for high-pressure hoses stronger motors are required such as to be in the range of 250 W +/- 50.

[0033] The full width of the motorized hose reel drum may be restricted by the length of the axle. It is often desired to keep the full width as small as possible and by the present invention the full width can be kept to a minimum of a total of 50 mm +/- 10 mm added to the width of the drum wheel. By a drum wheel of 225 mm the full width of the motorized hose reel drum is then about 275 mm.

[0034] In various embodiments the hose drum further comprises a motor control arranged inside the drum.

[0035] Thus, by the present invention a motorized hose reel drum is provided wherein all moveable parts are inside the drum in an arrangement which allows the tolerances in relation to the drive means to be kept small and which further significantly reduces any risks of limbs or cloths of personnel using the motorized hose reel drum and/or the hose to be caught in drive means etc.

[0036] Furthermore, the special arrangement wherein the motor is mounted by the motor bracket which again is mounted to the non-moving frame provides a motorized hose reel drum wherein the motor is inside the drum but doesn't rotate with the drum when the motorized hose reel drum is activated. Hereby it is possible to arrange the motor and/or control in a specific and desired part of the drum such as in an upper part (e.g. in line with or above the axle in use) and thereby ensure that the motor and/or control is kept dry even if water for some reason is present in the lower parts of the drum.

[0037] By the combination of the motor bracket, the through going axle and the bushing arrangement comprising inner bushing, ball bearing and axle bushing a motorized hose reel drum is provided which ensures an even motion and rotation of the drum when the motor is activated.

[0038] The arrangement further enables the use of various standard motors such as electrical motors to be used as there is no need for a specially designed motor making it possible to lower construction price as well as ensure a larger availability of spare parts.

Description of the Drawing

[0039]

Fig. 1 semi transparent view of a motorized hose reel drum

Fig. 2 partly exploded view of a motorized hose reel drum

Fig. 3 Inner parts of the motorized hose reel drum

Fig. 4 End view of inner parts of motorized hose reel drum

Fig. 5 Perspective view of the inner parts of motorized hose reel drum

Fig. 6 Perspective view of the axle, inner bushing, ball bearing, axle bushing and motor bracket

Fig. 7 Side view of the axle, inner bushing, ball bearing and axle bushing

Fig. 8 Perspective view of the axle, inner bushing, ball bearing and axle bushing

Fig. 9 Side view of the inner bushing, ball bearing and axle bushing side by side

Detailed Description of the Invention

[0040] Fig. 1 shows a see through view of a motorized hose reel drum 1 with a centre axle 3 driven by the action of a motor 4 inside the drum 2. The drum is connected via a drum fitting 7 to the axle which at each end is connected to a frame 5 via outer bushings 8 allowing the drum to rotate relative to the frame which is fixed.

[0041] In fig. 2 a semi exploded view of a motorized hose reel drum is shown.

[0042] The motorized hose reel drum 1 comprises a drum 2 having two side flanks 2a at opposite ends of the drum.

[0043] Here the inner parts i.e., the parts arranged inside the drum are clearly seen. At the centre along the rotational axis of the drum in use is the through going axle 3. On the axle 3 an axle bushing 9 is mounted whereon a ball bearing 13 is arranged to engage in an inner bushing 12 (here seen as not fully assembled with the inner bushing next to the ball bearing 13).

[0044] Also arranged around the axle 3 is a U-shaped motor bracket 6 with two parallel end-points arranged to be attached to the frame 5a and by its opposing flat mid-part to be fitted with the motor 4 and control 14.

[0045] The flat mid-part of the motor bracket is also attached to the inner bushing thereby allowing it to be supported by the axle. The motor 4 is arranged to pull a drive wheel 11 which engages with and rotates a cogwheel 10, which in turn, via the drum fitting 7 rotates the drum around the axis defined by axle 3. In the present view the frame comprises two separate frame sections arranged at each opposing end of axle 3.

[0046] Fig. 3a shows a perspective view of the axle 3 which at a first end is fitted with the outer bushing 8. Also fitted in relation to the axle is the motor bracket 6, the motor 4, the control 14 and the drum fitting 7.

[0047] Fig. 3b shows the inner parts of the motorized hose reel drum shown in fig. 3a without the outer bushing 8 and motor bracket 6 whereby the inner bushing 12 around the ball bearing 13 around part of the axle bushing

9 resting against the axle 3 is seen.

[0048] Furthermore, this view allows a clear view of the cogwheel arranged around the axle to be driven by the motor 4 via the drive wheel (not shown).

[0049] Fig. 4 shows a view of the inner part of fig. 3a without the drum fitting, seen from the second end of the axle 3. Here the interaction between drive wheel 11 and cogwheel 10 concentric around the axle 3 is clearly seen. In this view it is seen that the axle has an end opening 15 for attaching a water source to the hose reel drum. The axle also has a nozzle 16 extending from the axle by which the hose (not seen) is to be attached.

[0050] Fig. 5 is a perspective view of the inner parts seen in fig. 4. In this view it is also seen that the axle has an end opening 15 for attaching a water source to the hose reel drum. The axle also has a nozzle 16 extending from the axle by which the hose is to be attached. This setup means that the axle is at least partially hollow as it used to transfer water from the water source to the hose. Preferably the nozzle 15 is inside the drum, for example between the axle bushing and end bushing (not shown). When the nozzle is inside the drum, the drum may comprise an opening (not shown) in order for the hose to pass from inside the drum to outside the drum.

[0051] Fig. 6 shows the inner parts of fig. 5 where the motor, drive wheel and cogwheel are removed to allow a view of the details of the motor bracket 6.

[0052] Fig. 7 and 8 shows a side view and a perspective view respectively of the axle 3 mounted with the axle bushing 9 around which the ball bearing 13 is arranged inside the inner bushing 12.

[0053] Fig. 9 shows the axle bushing 9 with seat 9a for the ball bearing, ball bearing 13 and the inner bushing 12.

Claims

1. A motorized hose reel drum system (1), comprising:

- a drum (2),
- a throughgoing axle (3) having:
 - a first axle end (3a), and
 - a second axle end (3b),
- a motor (4),
- a frame (5),
- drive means configured to rotate the drum around an axis defined by the axle, by a force of the motor,
- a motor bracket (6) having:
 - a first fitting end (6a), and
 - an opposing second fitting end (6b),

wherein said motor bracket (6) is fixed to the frame (5) by the first fitting end (6a) and attached to the motor (4) at the second fitting end (6b), and

wherein the motor (4) and motor bracket (6) are arranged inside the drum (2), preferably except the fitting end (6a) of the bracket.

2. The motorized hose reel drum system according to claim 1, comprising a drum fitting (7) inside the drum. 5
3. The motorized hose reel drum system according to any of the preceding claims, wherein the frame comprises a first (5a) and second (5b) stand connected by the axle, via outer bushings (8). 10
4. The motorized hose reel drum system according to claim 2, wherein said drum fitting (7) is arranged concentric to the axle (3) at the second axle end (3b) and fastened to the drum (2). 15
5. The motorized hose reel drum system according to claim 2, wherein the drum fitting (7) is kept by an axle bushing (9) arranged around the axle. 20
6. The motorized hose reel drum system according to claim 2, wherein the drive means are a cogwheel (10) arranged in or on the drum fitting (7) and a drive wheel (11) rotated by the motor. 25
7. The motorized hose reel drum system according to any of the preceding claims, wherein the motor bracket (6) is supported by an inner bushing (12) and a ball bearing (13) at the second fitting end (6b). 30
8. The motorized hose reel drum system according to any of the preceding claims, comprising a motor control (14) arranged inside the drum (2). 35
9. The motorized hose reel drum system according to any of the preceding claims, wherein the frame (5) comprises a first (5a) and a second stand (5b) connected by the axle (3). 40

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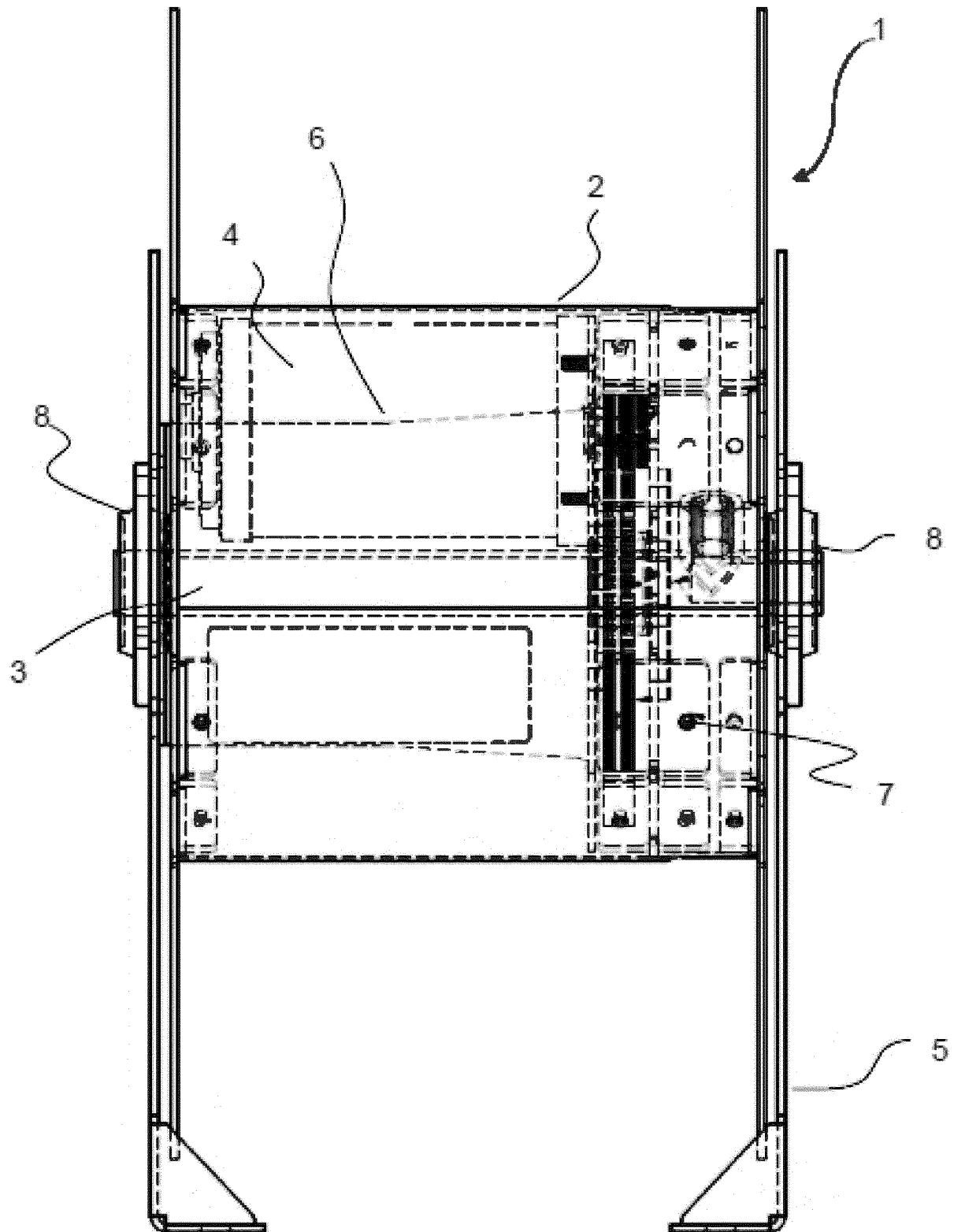


Fig 1

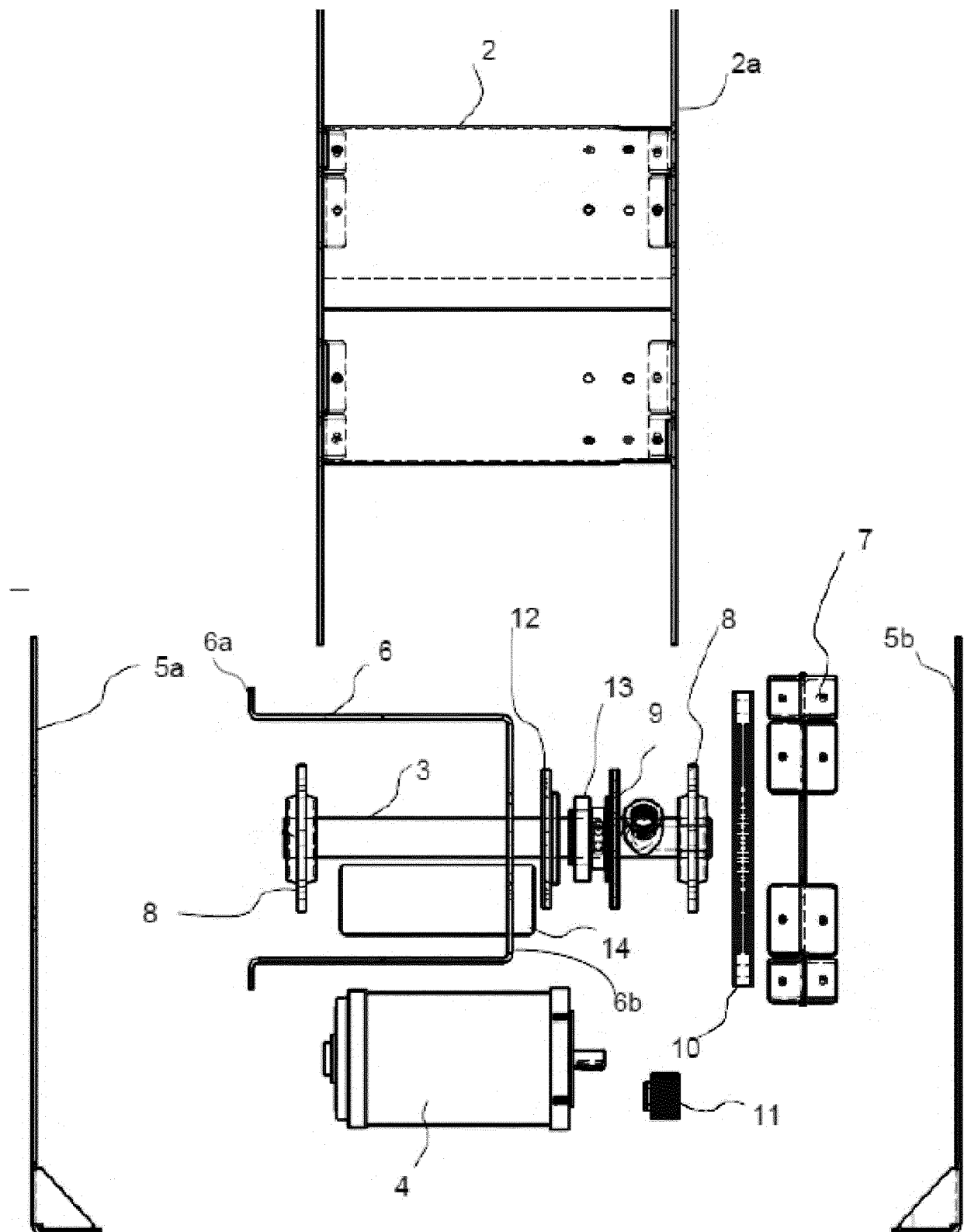
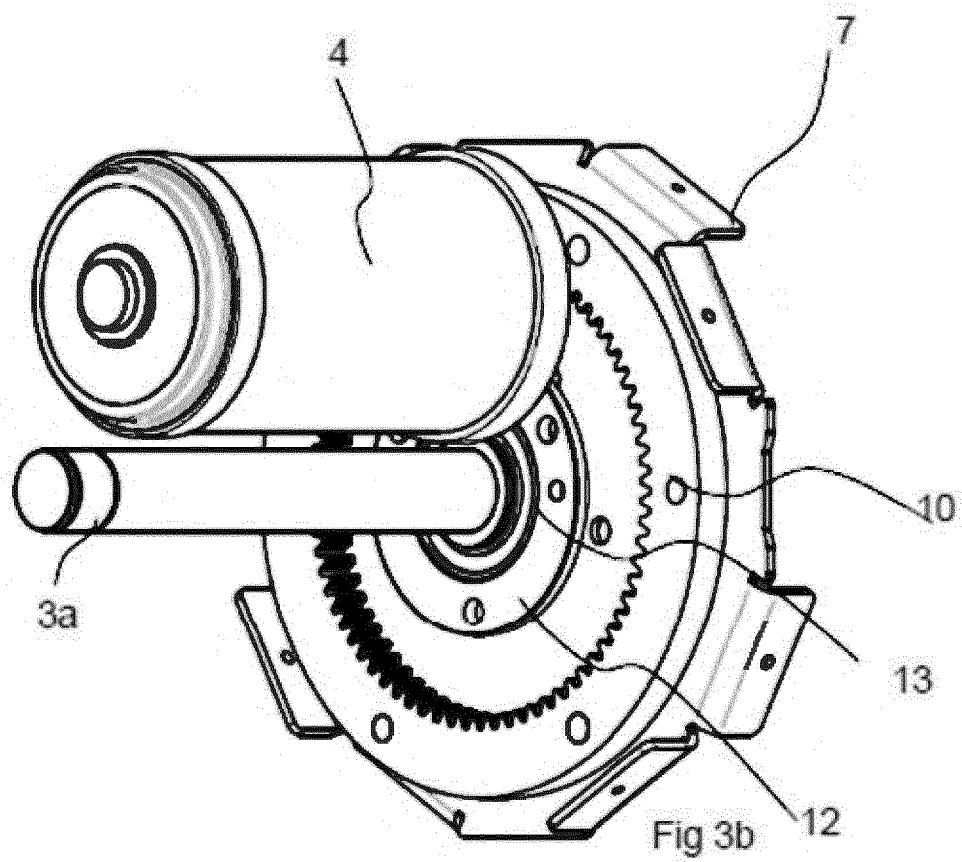
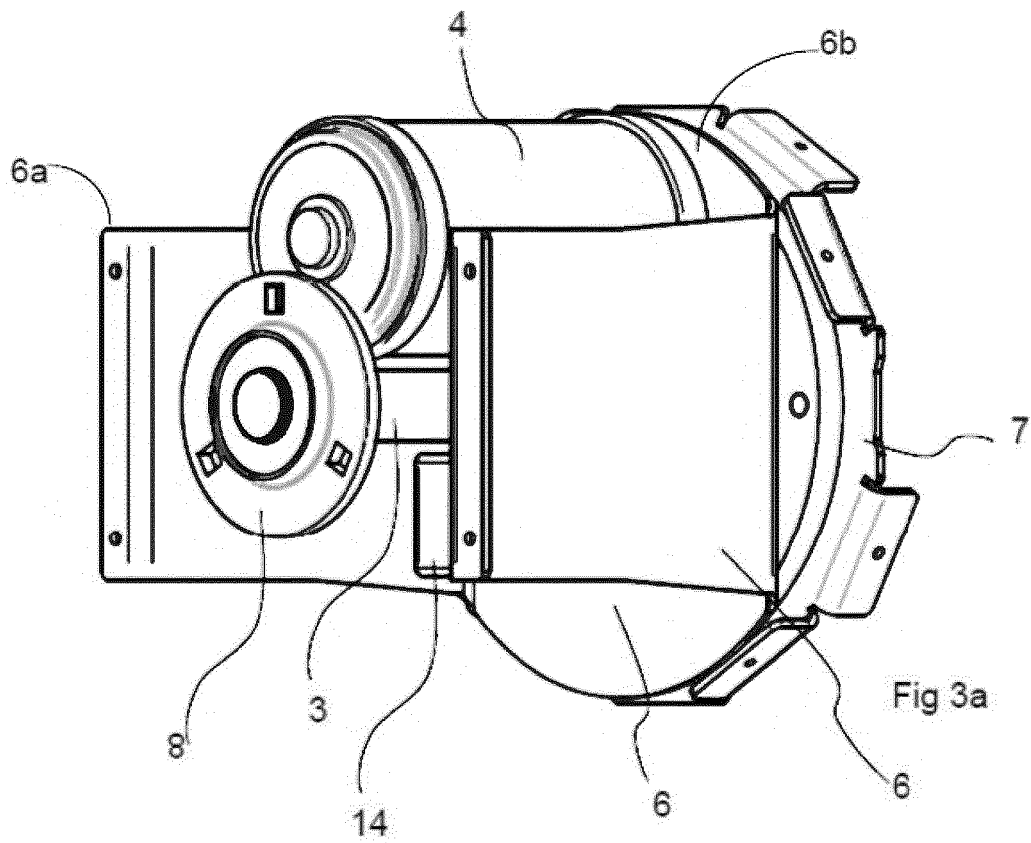


Fig 2



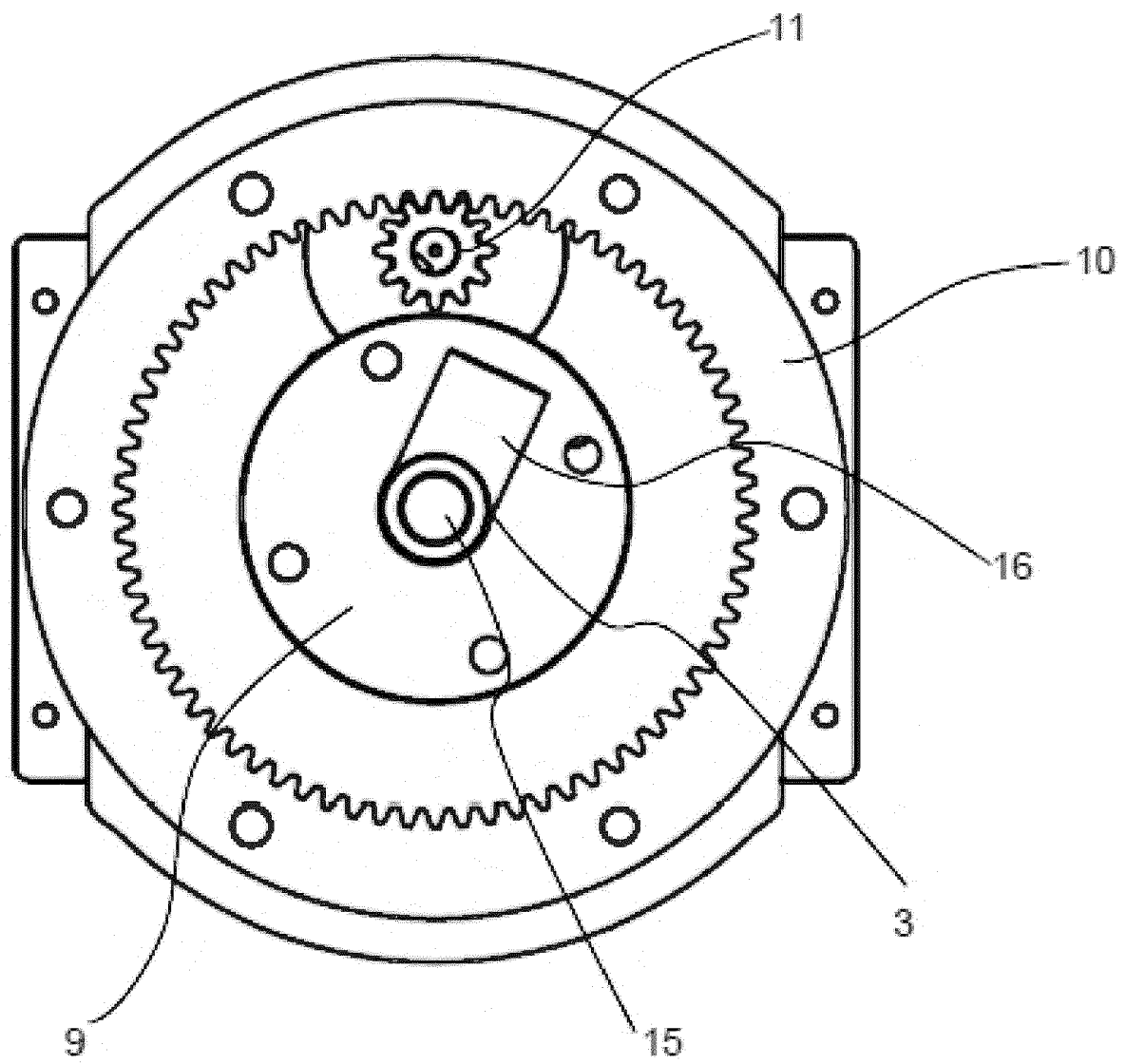
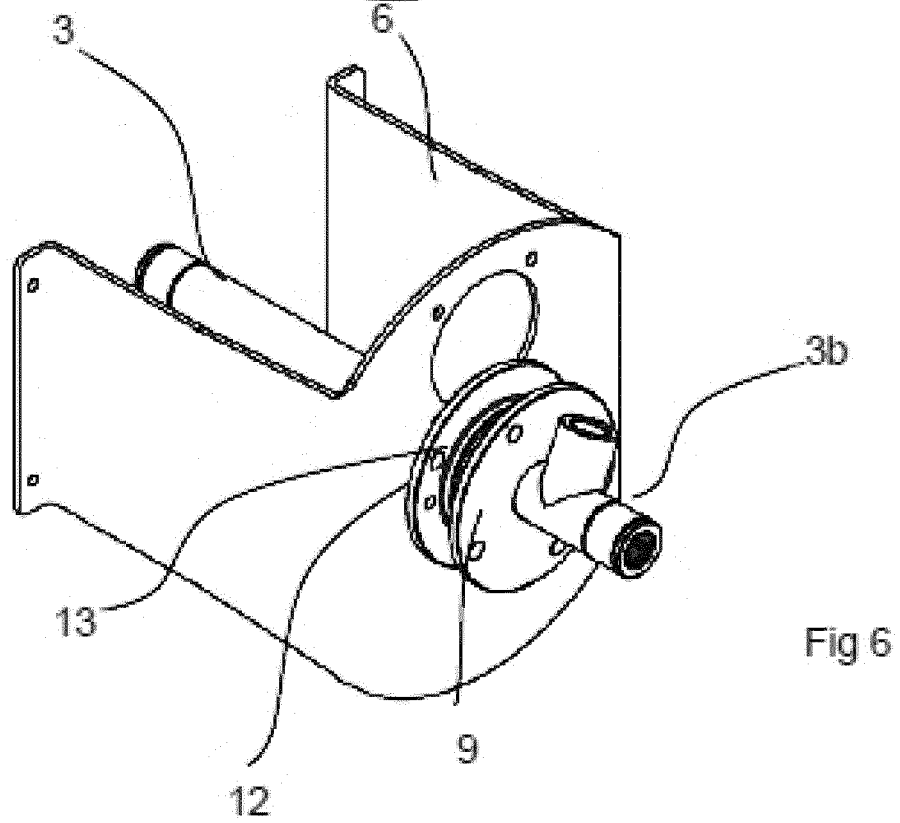
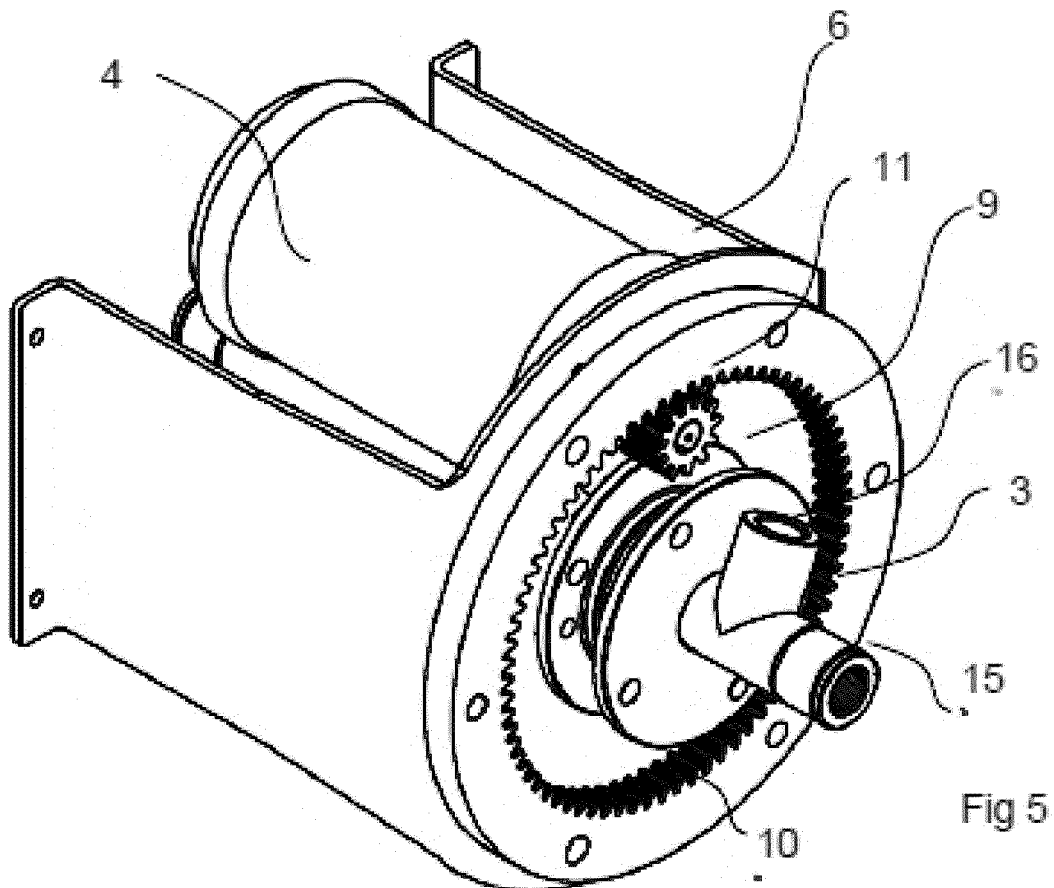
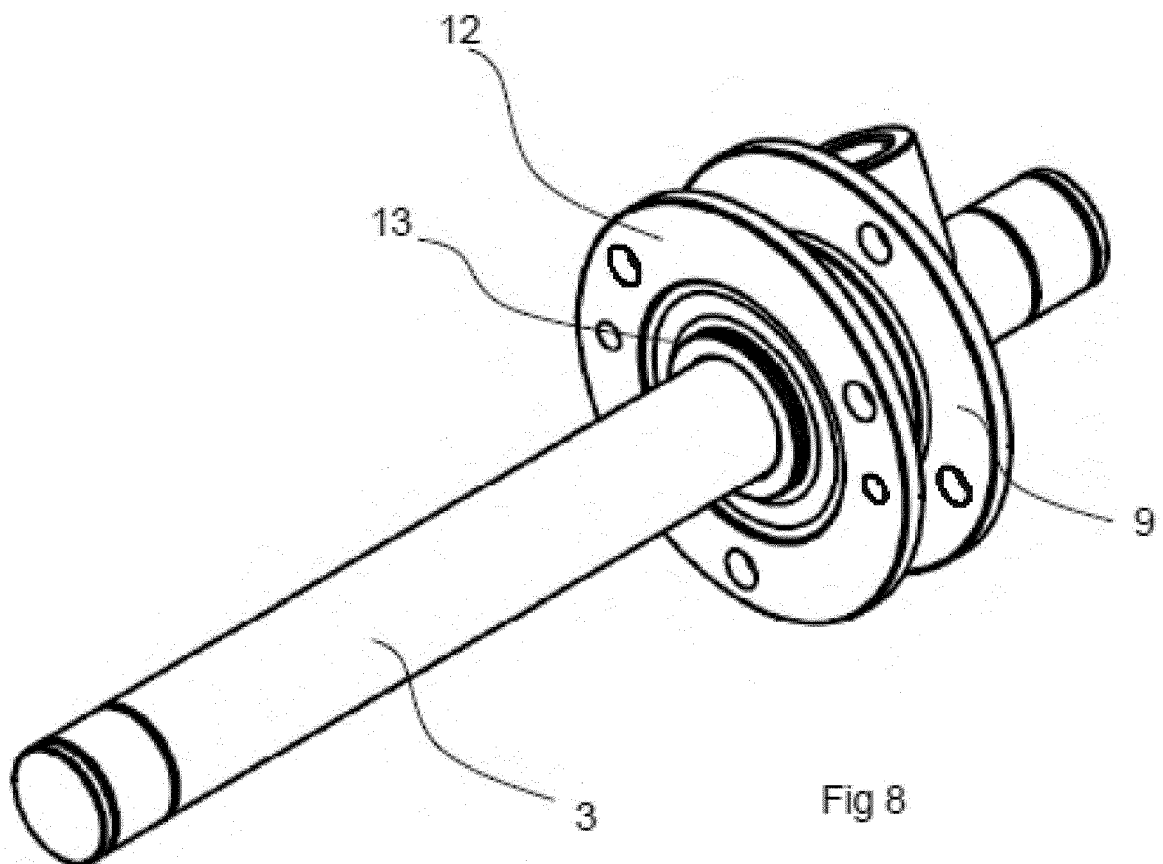
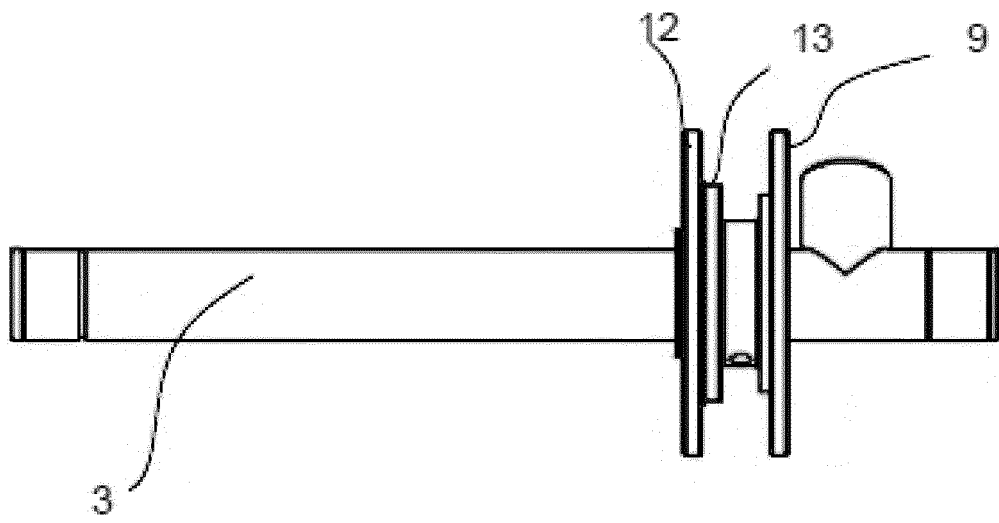


Fig 4





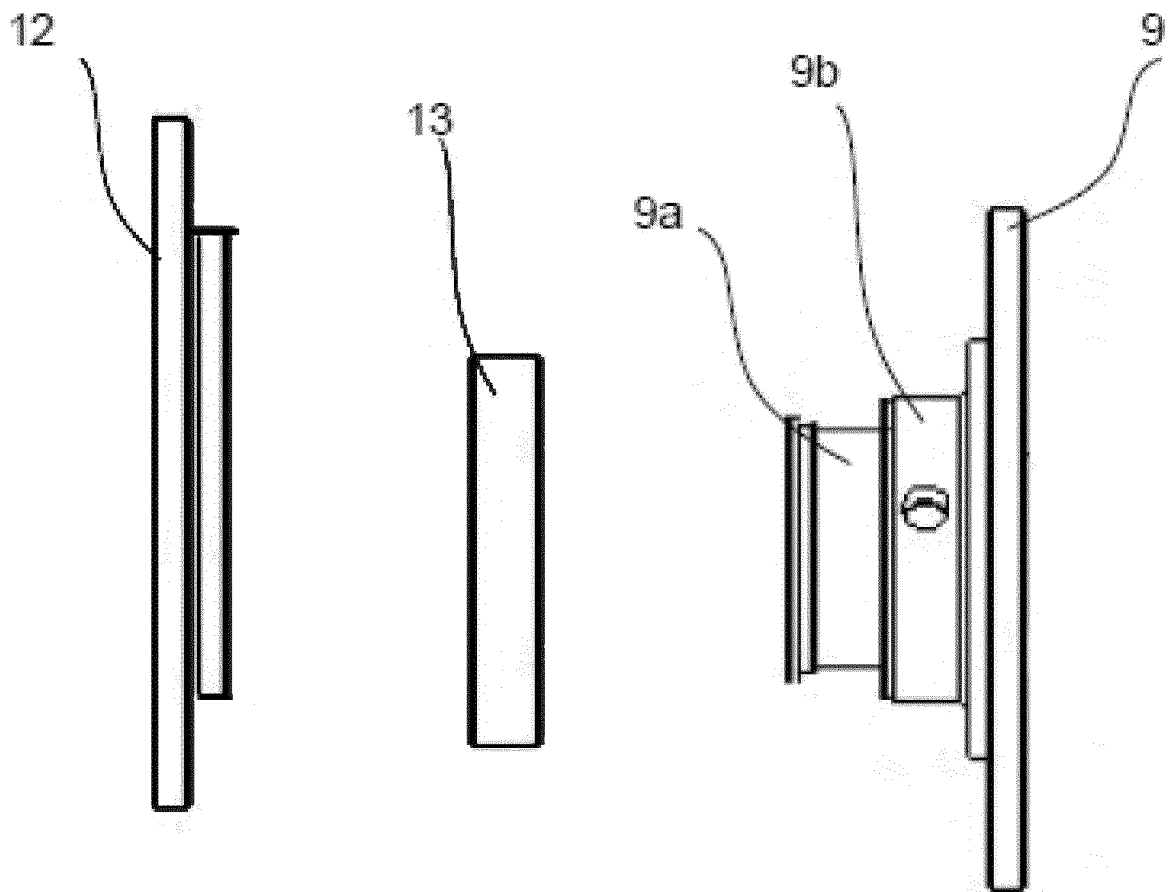


Fig 9



EUROPEAN SEARCH REPORT

Application Number

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EPO FORM 1503 03.82 (P04C01)

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	JP S57 137273 A (SHIN MEIWA IND CO LTD) 24 August 1982 (1982-08-24)	1-4,6,9	INV. B65H75/44
Y	* the whole document *	8	
A	-----	5	
Y	EP 1 445 228 B1 (MURA METALLTECHNIK GMBH [DE]) 5 September 2007 (2007-09-05) * paragraph [0025]; figures *	8	
X	FR 1 459 193 A (TH PERNIN & FILS) 29 April 1966 (1966-04-29)	1,2,4,7	
A	* figures *	5	
A	----- US 5 289 845 A (SIPOS DAVID L [US] ET AL) 1 March 1994 (1994-03-01) * column 3, line 64 - column 4, line 14; figures *	1-9	
A	----- US 2 963 227 A (LAMBERT ROBERT D) 6 December 1960 (1960-12-06) * column 2, lines 18-37; figures *	1-9	
	-----		TECHNICAL FIELDS SEARCHED (IPC)
			B65H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 May 2024	Examiner Lemmen, René
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EP 24 15 2042

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28-05-2024

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
	JP S57137273 A	24-08-1982	NONE	

15	EP 1445228 B1	05-09-2007	AT E372291 T1	15-09-2007
			DE 20300805 U1	27-03-2003
			EP 1445228 A2	11-08-2004

	FR 1459193 A	29-04-1966	NONE	

20	US 5289845 A	01-03-1994	NONE	

	US 2963227 A	06-12-1960	NONE	

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EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 03026995 A2 [0010]
- CN 111453556 A [0011]
- DE 19840831 A1 [0012]