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[0001] The invention relates to a distributor for spreading material according to the preamble of Patent Claim 1.

[0002] Distributors for spreading material, such as fertilizers, utilize centrifugal discs which are drivable in rotation in order to accelerate throwing the spreading material over a surface.

[0003] In the region of field borders, field edges and field sections tapering in wedge fashion it is normally necessary to adapt the throwing pattern in order that the spreading material can be applied with the best possible precision. In particular, throwing the spreading material beyond the field borders is especially to be avoided.

[0004] Distributors for spreading material are already known from the prior art and have adjustable guide elements which are configured to guide the spreading material discharged onto the centrifugal disc. Adapting the throwing pattern can be achieved by adjusting the guide elements.

[0005] The printed specification DE 10 2010 037 935 A1 discloses by way of example a centrifugal fertilizer spreader whose throwing blades are attached to the centrifugal discs in a pivotable manner by means of a pivotal bolt. The printed specification EP 1 618 775 A1 proposes a centrifugal fertilizer spreader in which the throwing blades are adjustable as regards their effective length.

[0006] Furthermore the printed specification DE 10 2007 021 442 B4 discloses a centrifugal fertilizer spreader in which parts of the throwing blades are movable in the vertical direction perpendicular to the plane of the discs. The printed specification DE 10 2010 060 155A1 furthermore proposes a centrifugal fertilizer spreader in which the angular position of the throwing blades in the plane of the centrifugal disc can be adjusted.

[0007] These and other known solutions however require a complicated adjusting device which is susceptible to error but with which the guide elements can be

adjusted to adapt the throwing pattern. The adjustable throwing patterns of the spreading material are further extremely limited in part with the known solutions so that a precise delivery of the spreading material is not readily possible in the case of complex field geometries.

[0008] The object of the invention is thus to provide a distributor for the spreading material wherein the throwing pattern can be adjusted precisely within wide limits wherein the design structure is comparatively simple and strong as regards damage and faulty functioning.

[0009] This is achieved by a distributor of the type mentioned at the beginning wherein the adjusting device comprises an actuating member which is movable at least partially in the axial direction within the clearance in the drive shaft and via which the one or more guide elements are adjustable.

[0010] The invention utilizes the knowledge that by using a drive shaft which has a clearance extending in the axial direction through the drive shaft, and the arrangement of a movable actuating member inside this clearance, an extremely sturdy durable design structure is provided since the actuating member is not readily accessible from outside for adjusting the one or more guide elements and is protected by the clearance in the drive shaft against external influences and stresses, in particular also impact shocks. It is thus possible to adapt the throwing pattern without increasing the susceptibility of the distributor to faults and/or damage.

[0011] Preferably fixed throwing blades are arranged on the centrifugal disc in addition to the one or more adjustable guide elements. The one or more guide elements can direct the spreading material either to the throwing blades of the centrifugal disc or can throw the spreading material out directly so that it does not come into contact with the fixed throwing blades arranged on the centrifugal disc. By adjusting the one or more guide elements it is possible to produce different throwing patterns. Through the different throwing patterns the distributor can be used for border, edge or wedge-shaped spreading. The throwing characteristic is

moreover dependent on the delivery point of the spreading material onto the centrifugal disc and the rotational speed of the centrifugal disc. The spreader can be a centrifugal fertilizer spreader.

[0012] In a particularly preferred embodiment of the distributor according to the invention the clearance extends in the drive shaft over the entire length of the drive shaft. The drive shaft is thus configured as a hollow shaft. The clearance preferably has a circular cross section wherein the cross section of the clearance is preferably the same over the entire length of the drive shaft. Since the drive shaft is designed as a hollow shaft, on the one hand weight is saved and on the other a pressure-charged fluid, by way of example a liquid, a gas or a gas mixture can be guided through the drive shaft so that the fluid when charged with pressure can be used to adjust the one or more guide elements.

[0013] In an advantageous further development of the distributor according to the invention, the actuating member is coupled for rotation with the drive shaft. Since the actuating member is coupled for rotation with the drive shaft it leads to a rotational movement of the actuating member when the drive shaft rotates. The rotational coupling can be produced so that the actuating member and the drive shaft always rotate at the same rotational speed. In this case, the actuating member can be connected to the drive shaft by way of example through a coupling element, such as by way of example a pin or a bolt. Alternatively, the rotational coupling can be configured so that differences in speed between the actuating member and the drive shaft are possible. In this case, fluids or rotatable coupling elements by way of example can be used for coupling the actuating member and the drive shaft in rotation.

[0014] According to the invention the clearance in the drive shaft is coupled to a hydraulic connection wherein the actuating member is designed as a piston which is movable in the axial direction inside the clearance of the drive shaft when charged with hydraulic pressure. The hydraulic connection is preferably arranged on a non-rotatable connection element of the distributor. The hydraulic connection is preferably designed as a connecting pipe which is designed for

coupling with a hydraulic line.

[0015] In another embodiment of the distributor according to the invention the actuating member is designed as a component part of a hydraulic actuating device wherein the actuating member is movable in the axial direction within the clearance in the drive shaft. If the actuating member is designed as a component part of a hydraulic actuating device, the actuating member can be moved in the axial direction within the clearance in the drive shaft by a hydraulic fluid. If the actuating member is configured as a component part of a pneumatic actuating device, not according to the invention, the actuating member can be moved in the axial direction within the clearance in the drive shaft by a gas or gas mixture. If the actuating member is configured as a component part of an electric actuating device, not according to the invention, the actuating member can be moved in the axial direction within the clearance in the drive shaft via an electric motor, by way of example a linear motor.

[0016] Furthermore a distributor according to the invention is advantageous in which the actuating member projects at least in one state of the adjusting device, out of that side of the drive shaft that faces away from the centrifugal disc. By way of example the clearance in the drive shaft is filled on that side facing away from the centrifugal disc, in this case with a hydraulic fluid, a gas or a gas mixture wherein the actuating member can be moved out from the drive shaft and/or into the drive shaft by controlling the pressure of the hydraulic fluid, gas or gas mixture.

[0017] In a particularly preferred embdo8iment of the distributor according to the invention, the actuating member is rotationally decoupled from the drive shaft. By way of example the actuating member can be designed non-rotatable or can have a rotational characteristic which is independent of the drive shaft. Furthermore, a distributor according to the invention is preferred in which the actuating member is arranged inside an actuating cylinder on that side of the drive shaft facing away from the centrifugal disc. The actuating member is preferably configured as a piston of the actuating cylinder. The actuating cylinder is a hydraulically

controllable cylinder. The actuating cylinder can be configured as a double-acting cylinder so that the one or more guide elements can be moved by means of the actuating cylinder after moving into the discharging region of the centrifugal disc also out again from the discharging region of the centrifugal disc. Alternatively, or additionally one or more resetting springs can be used for moving the one or more guide elements out from the discharging region of the centrifugal disc.

[0018] In another preferred embodiment of the distributor according to the invention the actuating member is rotationally decoupled from the drive shaft so that the actuating member does not carry out any rotational movement during the rotation of the drive shaft. Through a decoupling of the actuating member from the drive shaft in this way it is possible to dispense with using a dynamic seal which has to take up rotational movements to seal the actuating member. Furthermore, since a rotational movement of the actuating member does not take place, the moment load of the actuating member is considerably reduced whereby the susceptibility to damage is reduced.

[0019] A further development of the distributor according to the invention has a transmission member which is arranged at least partially within the clearance in the drive shaft and is configured to transfer an axial movement of the actuating member to the one or more guide elements or to a movement converter connected to the one or more guide elements. In order to transfer the axial movement of the actuating member the transmission member preferably is in contact with the actuating member, in particular within the clearance in the drive shaft. The movement converter can change the axial movement of the actuating member and the transmission member into another form of movement, such as by way of example a pivotal movement or a radial movement. In this way, an axial movement of the actuating member can produce a pivotal movement of the one or more guide elements and/or a radial movement of the one or more guide elements on the centrifugal disc.

[0020] Furthermore, a distributor according to the invention is preferred in which an axial bearing is arranged between the actuating member and the transmission

member. The transmission member is preferably coupled rotationally to the drive shaft. Since the actuating member is rotationally decoupled form the drive shaft, the actuating member and the transmission member have different rotational speeds during operation of the distributor. So that the speed differential between the actuating member and the transmission member can be compensated, an axial bearing is used. Alternatively, the actuating member and the transmission member can also have a different suitable coupling which allows the transmission of axial force and can at the same time take up differences in speed. By way of example the actuating member and the transmission member have strengthened ends which are in contact wherein one end is configured as a ball and the other end is configured as a socket. This design results in an additional space-saving design and is particularly suitable for use in distributors with optimized structural space.

[0021] A distributor according to the invention is moreover preferred in which the actuating member and/or the transmission member projects at least in one state of the adjusting device, out of the side of the drive shaft that faces away from the centrifugal disc. The actuating member and/or transmission member preferably project in the at least one state of the adjusting device out from the drive shaft into a transmission housing wherein a bevel gear pair connected to the drive shaft is arranged inside the transmission housing for driving the drive shaft.

[0022] In a further preferred embodiment of the distributor according to the invention an axial movement of the actuating member causes a movement of the one or more guide elements into a discharging region of the centrifugal disc and/or out from the discharging region of the centrifugal disc. The discharged spreading material is accelerated, and ultimately discharged in the discharging region of the centrifugal disc by the one or more guide elements and/or by the fixed throwing blades. The axial movement of the actuating member preferably causes a movement of the one or more actuating elements into the discharging region of the centrifugal disc, wherein the movement of the one or more guide elements out from the discharging region of the centrifugal disc is caused by one or more resetting springs. The one or more resetting springs then cause a movement of the one or more guide elements out from the discharging region of

the centrifugal disc, when the resetting force of the one or more resetting springs exceeds the actuating force acting on the actuating member.,

[0023] Moreover a distributor according to the invention is preferred in which the movement of the one or more guide elements comprises a linear movement, preferably parallel to the axis of rotation of the centrifugal disc, and/or a pivoting movement of the one or more guide elements. With a linear movement of the one or more guide elements, the axial movement of the actuating member is preferably transferred to the one or more guide elements without a previous movement conversion. With a pivotal movement of the one or more guide elements, the axial movement of the actuating member is preferably transferred to the one or more guide elements with a previous movement conversion. According to this, the one guide element or the several guide elements can be driven by a lifting movement into the discharging region of the centrifugal disc and/or can be tilted and/or turned by a pivotal movement into the discharging region of the centrifugal disc.

[0024] In another preferred embodiment of the distributor according to the invention the one or more guide elements is/are pushed or drawn upwards into the discharging region of the centrifugal disc in the event of a linear movement of the actuating member. If the one or more guide elements during a linear movement of the actuating member are pushed upwards into the discharging region of the centrifugal disc, a coupling element, such as a pin or a bolt is arranged in the transmission member and transfers the movement of the transmission member underneath the centrifugal disc to the one or more guide elements, or to a support part supporting the one or more guide elements. If the one or more guide elements during a linear movement of the actuating member is or are pulled upwards into the discharging region of the centrifugal disc, a coupling element transfers the movement of the transmission member above the centrifugal disc to the one or more guide elements or a structural group comprising the one or more guide elements.

[0025] In another preferred embodiment of the distributor according to the invention the one guide element is or the several guide elements are formed with one or more bends. The guide elements preferably have a U shape or an L shape. The one or more guide elements preferably extend through a clearance in the centrifugal disc. Through a bent formation of the one or more guide elements thus on the one hand a vertical guide of the discharged spreading material can be achieved and on the other hand the clearance or the clearances through which the one or more guide elements extend, are closed when the one or more guide elements do not project into the discharging region of the centrifugal disc.

[0026] The distributor according to the invention furthermore is formed advantageously by a control device which is configured to control the hydraulic pressure acting on the actuating member. The control of the hydraulic pressure can take place by way of example automatically in dependence on a detected field geometry or a detected field shape. Alternatively, or additionally, the control of the hydraulic pressure can follow a selected discharging routine.

[0027] Furthermore a distributor according to the invention is preferred whose control device is configured to control the hydraulic actuating device. In this case the control device is preferably configured to control the hydraulic pressure of a hydraulic fluid. Away from the subject of the invention, the control device is alternatively configured to control the pneumatic pressure of a gas or a gas mixture or an electric motor of the actuating device.

[0028] Further details of the invention can be drawn from the description of the figures and from the drawings. In the drawings:

Fig. 1 shows a perspective view of a distributor according to the invention in a first state;

Fig. 2 shows a perspective view of the distributor, illustrated in Fig. 1, in a second state;

Fig. 3 shows a sectional view of the distributor, illustrated in Fig. 1, in the first state

Fig. 4 shows a sectional view of the adjusting device of the distributor, illustrated in Fig. 1, in a first state;

Fig. 5 shows a sectional view of the distributor, illustrated in Fig. 1, in the second state;

Fig. 6 shows a sectional view of a distributor according to the invention in a first state;

Fig. 7 shows a sectional view of the distributor, illustrated in Fig. 6, in a second state;

Fig. 8 shows a sectional view of a distributor according to the invention in a first state; and

Fig. 9 shows a sectional view of the distributor, illustrated in Fig. 8, in a second state.

[0029] Figs. 1 and 2 show a distributor 10 configured as a fertilizer spreader. The distributor 10 comprises a rotatably driven centrifugal disc 12 to which the spreading material, configured as fertilizer, is dispensed.

[0030] Two pairs of fixed throwing blades 14a, 14b, 16a, 16b are arranged on the centrifugal disc. The throwing blades 14a, 14b extend substantially radially outwards from a cover 24 which is arranged in the middle on the centrifugal disc 12, and each have an overhang which projects beyond the centrifugal disc 12. The throwing blades 16a, 16b are arranged in the outer region of the centrifugal disc 12 and each adjoin clearances 17a, 17b radially on the inside in the centrifugal disc 12.

[0031] Furthermore the distributor 10 has two guide elements 18a, 18b which are movable into the discharging region of the centrifugal disc 12 so that the spreading material discharged onto the centrifugal disc 12 is guided by the guide elements 18a, 18b. The guide elements 18a, 18b of the illustrated distributor 10 are in this case configured to prevent the spreading material which is discharged onto the centrifugal disc 12 being seized by the throwing blades 14a, 14b. Rather the guide elements 18a, 18b serve to direct the spreading material, discharged onto the centrifugal disc 12, to the throwing blades 16a, 16b. Different throwing patterns, by way of example for spreading the border, edge or wedge area can hereby be achieved.

[0032] The two guide elements 18a, 18b are connected to an adjusting device 20 which is configured to adjust the guide elements 18a, 18b correspondingly between a retracted state and an extended state.

[0033] The distributor 10 comprises in addition a housing 22 which is arrange underneath the centrifugal disc 12 wherein an input shaft 28 is arranged in section in the housing 22. The input shaft 28 serves to drive the centrifugal disc 12 in rotation. Furthermore, a hydraulic connection 26 designed as a connecting pipe, is connected to the housing 22. A hydraulic fluid, such as hydraulic oil, can be introduced via the hydraulic connection 26 into a drive shaft (covered) arranged inside the housing 22 and configured as a hollow shaft, wherein the guide elements 18a, 18b are ultimately adjustable via the hydraulic pressure of the hydraulic fluid.

[0034] In the state illustrated in Fig. 1 the guide elements 18a, 18b are situated in the retracted position. An upper surface of the guide elements 18a, 18b has substantially the same shape as the clearances 17a, 17b in the centrifugal disc 12. In the retracted state these upper surfaces of the guide elements 18a, 18b close the clearances 17a, 17b in the centrifugal disc 12 so that the spreading material is substantially prevented from falling through the clearances 17a, 17b in the centrifugal disc 12.

[0035] Since the guide elements 18a, 18b are situated in the retracted state, the spreading material discharged onto the centrifugal disc 12 is seized, accelerated and thrown out by the throwing blades 14a, 14b.

[0036] In the state illustrated in Fig. 2 the guide elements 18a, 18b are situated in the extended position. A lower surface of the guide elements 18a, 18b has essentially the same shape as the clearances 17a, 17b in the centrifugal disc 12. In the extended position these lower surfaces of the guide elements 18a, 18b close the clearances 17a, 17b in the centrifugal disc 12 so that the spreading material is substantially prevented from falling through the clearances 17a, 17b in the centrifugal disc 12.

[0037] Since the guide elements 18a, 18b are located in the extended position, the spreading material discharged onto the centrifugal disc 12 is seized by the guide elements 18a, 18b which prevent the spreading material discharged onto the centrifugal disc 12 from being seized by the throwing blades 14a, 14b. The guide elements 18a, 18b deflect the spreading material discharged onto the centrifugal disc 12 to the throwing blades 16a, 16b wherein the throwing blades 16a, 16b throw out the spreading material.

[0038] The throwing pattern of the spreading material is changed by the deviating position and orientation as well as by the differing overhang beyond the centrifugal disc 12 of the throwing blades 16a, 16b compared with the throwing blades 14a, 14b.

[0039] The guide elements 18a, 18b have a substantially U-shaped cross section so that the guide elements 18a, 18b are formed with a double bend. Through the U-shape of the guide elements 18a, 18b, the clearances 17a, 17b in the centrifugal disc 12 are closed in suitable manner both in the retracted state of the guide elements 18a, 18b and also in the extended state of the guide elements 18a, 18b so that spreading material discharged onto the centrifugal disc does not fall through the clearances 17a, 17b through the centrifugal disc 12. Furthermore, the U-shape

of the guide elements 18a, 18b in the retracted state of the guide elements 18a, 18b enables a guidance and deflection of the spreading material discharged onto the centrifugal disc 12 towards the throwing blades 16a, 16b.

[0040] Fig. 3 shows that the input shaft 28 is connected to the drive shaft 30 via a pair of bevel gears 52a, 52b. The drive shaft 30 is configured to drive the centrifugal disc 12 in rotation via the shaft-hub connection 68 and has a clearance 32 which extends in the axial direction over the entire length of the drive shaft 30. The drive shaft 30 is thus configured as a hollow shaft. The radial bearing of the drive shaft is provided by the bearing 38 and the bearing 54. The bearing 38 is arranged inside a socket 36 wherein the hydraulic connection 26 is likewise fastened in the socket 36.

[0041] The adjusting device 20 comprises an actuating member 34 which is movable in sections in the axial direction inside the clearance 32 of the drive shaft 30 and via which the guide elements 18a, 18b are adjustable. The actuating member 34 projects on the side facing the centrifugal disc 12 out from the drive shaft 30. The clearance 32 in the drive shaft 30 is coupled to the hydraulic connection 26 wherein the actuating member 34 is configured as a piston which when charged with hydraulic pressure is movable in the axial direction inside the clearance 32 of the drive shaft 30.

[0042] The actuating member 34 is coupled in rotation with the drive shaft 30 via the projection 40 so that the actuating member 34 always rotates at the same speed as the drive shaft 30. Furthermore, the actuating member 34 is connected to a blade element 42 by way of a fastening element 58 which is configured as a screw, wherein the blade element 42 is connected by retaining bars 44 to a vertically movable support 46 which is arranged underneath the centrifugal disc 12. The guide elements 18a, 18b are fastened on the support 46 by means of the fastening elements 48 which are configured as screws, so that an axial movement of the actuating member 34 can ultimately cause a movement of the one or more guide elements 18a, 18b in a discharging region of the centrifugal disc 12 and/or out from the discharging region of the centrifugal disc 12. The movement of the

guide elements 18a, 18b caused by the actuating member 34 is a linear movement in the vertical direction and thus parallel to the axis of rotation of the centrifugal disc 12 wherein the axial movement of the actuating member 34 is transferred to the guide elements 18a, 18b without prior movement conversion. Guide pins 50 which prevent a lateral deflection or a lateral tilting of the support 46 are used to guide the support 46 and the guide elements 18a, 18b fastened on the support 46.

[0043] The distributor 10 furthermore comprises a control device (not shown) which is configured to control the hydraulic pressure acting on the actuating member 34.

[0044] Fig. 4 shows the adjusting device 20 of the distributor 10 when the guide elements (not shown) are retracted. Starting from the state illustrated in Fig. 4, the hydraulic pressure can be increased inside the clearance 32 of the drive shaft 30. The actuating member 34 is deflected upwards by the increased hydraulic pressure. Since the guide elements are connected to the actuating member 34 via the support 46, the retaining bars 44, the guide element 42 and the fastening element 58, the increase in pressure thus also causes an upward movement of the guide elements into the discharging region of the centrifugal disc 12.

[0045] Fig. 5 shows the adjusting device 20 of the distributor 10 when the guide elements (not shown) are extended and located in the discharging region of the centrifugal disc 12. This state can be maintained by maintaining a constant pressure level. If the hydraulic pressure drops again inside the clearance 32 of the drive shaft 30 one or more resetting springs cause a downward movement of the support 46 whereby the guide elements are moved out from the discharging region of the centrifugal disc 12.

[0046] Figs. 6 and 7 show a further embodiment of the distributor 10. Unlike the distributor 10 shown in Figs. 1 to 5, the actuating member 34 is now rotationally decoupled from the drive shaft 30, namely so that the actuating member 34 does not perform any rotational movement during rotation of the drive shaft 30.

[0047] The actuating member 34 is arranged inside an actuating cylinder 66 on the side of the drive shaft 30 facing away from the centrifugal disc 12 wherein the actuating member 34 is movable by an axial movement into the clearance 32 of the drive shaft 30 so that the actuating member 34 projects out from the drive shaft 30 from the side facing away from the centrifugal disc 12.

[0048] Furthermore a transmission member 60 is mounted in displaceable manner inside the clearance 32 of the drive shaft 30 and is configured to transfer an axial movement of the actuating member 34 to the guide elements 18b (guide element 18a is not shown). Between the actuating member 34 and the transmission member 60 there is an axial bearing 62 arranged based on the speed difference during operation of the distributor 10. The transfer of the axial movement to the guide elements 18b takes place via a blade element 42 connected to the transmission member 60, via retaining bars 44 and a support 46 on which the guide elements 18b are arranged.

[0049] With the illustrated embodiment the guide elements 18b during a linear movement of the actuating member 34 are pulled up into the discharging region of the centrifugal disc 12.

[0050] In the state illustrated in Fig. 6 the guide elements 18b are situated in the retracted position and thus do not affect the throwing of the spreading material discharged onto the centrifugal disc 12. The actuating member 34 can be axially deflected by raising the pressure inside the actuating cylinder 66 whereby the guide elements 18b are moved into the extended position.

[0051] In the state illustrated in Fig. 7 the guide elements 18b are situated in the extended position and thus do not affect the throwing of the spreading material discharged onto the centrifugal disc 12. Through the movement of the support 46 in the direction of the centrifugal disc 12 the resetting springs 64 were compressed which cause the guide elements 18b to move out from the discharging region of the centrifugal disc 12 as soon as the hydraulic pressure inside the actuating cylinder 66 falls short of a boundary pressure.

[0052] Figs. 8 and 9 show a further embodiment of the distributor 10. Unlike the distributor 10 illustrated in Figs. 6 and 7, the guide elements 18a, 18b are pushed upwards during linear movement into the discharging region of the centrifugal disc 12. This is achieved by a deviating coupling of the transmission member 60 with the support 46. A pin 56 ensures a direct force transmission between the transmission member 60 and the support 46. Vertically aligned slots are arranged inside the drive shaft 30 and the pin 56 extends through the slots. The slots enable a vertical movement of the pin 56 relative to the drive shaft 30.

[0053] In the state illustrated in Fig. 8, the guide elements 18b are situated in the retracted position. In the state illustrated in Fig. 9 the guide elements 18b are situated in the extend position.

Reference numeral list

	10	Distributor
	12	Centrifugal disc
	14a,14b	Throwing blades
	16a,16b	Throwing blades
	17a,17b	Clearances
	18a,18b	Guide elements
	20	Adjusting device
	22	Housing
	24	Cover
	26	Hydraulic connection
	28	Input shaft
	30	Drive shaft
	32	Clearance
	34	Actuating member
	36	Socket
	38	Bearing
	40	Projection
	42	Blade element
	44	Retaining bars
	46	Support
	48	Fastening elements
	50	Guide pin
	52a,52b	Bevel gear pair
	54	Bearing
	56	Pin
	58	Fastening element
	60	Transmission member
	62	Axial bearing
	64	Resetting spring
	66	Actuating cylinder
	68	Shaft-hub connection

PATENTKRAV

1. Fordelingsapparat (10) for spredemateriale, navnlig gødningsspreder, med

- mindst en i rotation drivbar centrifugalskive (12),
- et eller flere indstillelige føringselementer (18a, 18b), der er indrettet til at føre det til centrifugalskiven (12) leverede spredemateriale;
- en drivaksel (30), som omfatter en udsparing (32), der strækker sig i aksial retning gennem drivakslen (30) og derved er indrettet til at drive centrifugalskiven (12) i rotation; og
- en justeringsindretning (20), som er indrettet til at justere det ene eller flerheden af føringselementerne (18a, 18b),

hvorved justeringsindretningen (20) omfatter et aktiveringselement (34), som i det mindste afsnitsvist kan bevæges i aksial retning inden for udsparingen (32) i drivakslen (30), og ved hjælp af hvilket det ene eller flerheden af føringselementer (18a, 18b) kan justeres,

kendetegnet ved, at udsparingen (32) i drivakslen (30) er koblet til en hydrauliktilslutning (26), hvorved aktiveringselementet (34) er udformet som stempel, der kan bevæges i aksial retning i udsparingen (32) i drivakslen (30) ved påvirkning med hydraulisk tryk.

2. Fordelingsapparat (10) ifølge krav 1,
kendetegnet ved, at udsparingen (32) i drivakslen (30) strækker sig over hele længden af drivakslen (30).

3. Fordelingsapparat (10) ifølge krav 1 eller 2,
kendetegnet ved, at aktiveringselementet (34) rotatorisk er koblet til drivakslen (30).

4. Fordelingsapparat (10) ifølge et af de foregående krav,
kendetegnet ved, at aktiveringselementet (34) er dannet som bestanddel af en hydraulisk aktiveringsindretning, hvorved aktiveringselementet (34) hydraulisk kan bevæges i aksial retning inden i udsparingen (32) i drivakslen (30).

5. Fordelingsapparat (10) ifølge et af de foregående krav,
kendetegnet ved, at aktiveringselementet (34) i det mindste i en tilstand for justeringsindretningen (20) rager ud fra den mod centrifugalskiven (12) vendende side af drivakslen (30).

6. Fordelingsapparat (10) ifølge krav 1 eller 2,
kendetegnet ved, at aktiveringselementet (34) rotatorisk er afkoblet fra drivakslen (30).

7. Fordelingsapparat (10) ifølge krav 6,
kendetegnet ved, at aktiveringselementet (34) er anbragt inden i aktiveringscylinderen (66) på den bort fra centrifugalskiven (12) vendende side af drivakslen (30).

8. Fordelingsapparat (10) ifølge krav 6 eller 7,
kendetegnet ved, at aktiveringselementet (34) rotatorisk er afkoblet således fra drivakslen (30), at aktiveringselementet (34) under drivakslens (30) rotation ikke udfører nogen rotationsbevægelse.

9. Fordelingsapparat (10) ifølge et af de foregående krav,
kendetegnet ved et transmissionselement (60), som i det mindste afsnitsvist er anbragt inden i udsparingen (32) i drivakslen (30) og er indrettet til at overføre en aksial bevægelse af aktiveringselementet (34) til det ene eller flerheden af føringselementer (18a, 18b) eller til en bevægelseskonverter, som er forbundet til det ene eller flerheden af føringselementer (18a, 18b).

10. Fordelingsapparat (10) ifølge krav 9,
kendetegnet ved, at et aksialleje (62) er arrangeret mellem aktiveringselementet (34) og transmissionselementet (60).

11. Fordelingsapparat (10) ifølge krav 9 eller 10,

kendetegnet ved, at aktive- ringselementet (34) og/eller transmissionselementet (60), i det mindste i en tilstand for justeringsindretningen (20), rager ud fra den side af drivakslen (30), som vender bort fra centrifugalskiven (12).

12. Fordelingsapparat (10) ifølge et af de foregående krav,
kendetegnet ved, at en aksial bevægelse af aktiveringselementet (34) bevirker en bevægelse af det ene eller flerheden af føringselementer (18a, 18b) ind i et afgivningsområde af centrifugalskiven (12) og/eller ud fra afgivningsområdet på centrifugalskiven (12).

13. Fordelingsapparat (10) ifølge krav 12,
kendetegnet ved, at bevægelsen af det ene eller flerheden af føringselementer (18a, 18b) omfatter en lineær bevægelse, fortrinsvis parallel med centrifugalskivens (12) rotationsakse, og/eller en svingbevægelse af det ene eller flerheden af føringselementer (18a, 18b).

14. Fordelingsapparat (10) ifølge krav12 eller 13,
kendetegnet ved, at det ene eller flerheden af føringselementer (18a, 18b) skubbes opad eller trækkes opad ind i centrifugalskivens (12) afgivningsområde ved en lineær bevægelse.

15. Fordelingsapparat (10) ifølge et af de foregående krav,
kendetegnet ved, at det ene eller flerheden af føringselementer (18a, 18b) er udformet med en eller flere bøjninger.

16. Fordelingsapparat (10) ifølge et af de foregående krav,
kendetegnet ved en styringsindretning, som er konfigureret til at styre det hydrauliske tryk, der virker på aktiveringselementet (34).

17. Fordelingsapparat (10) ifølge mindst krav 4,
kendetegnet ved en styringsindretning, som er konfigureret til at styre den hydrauliske aktiveringsindretning.

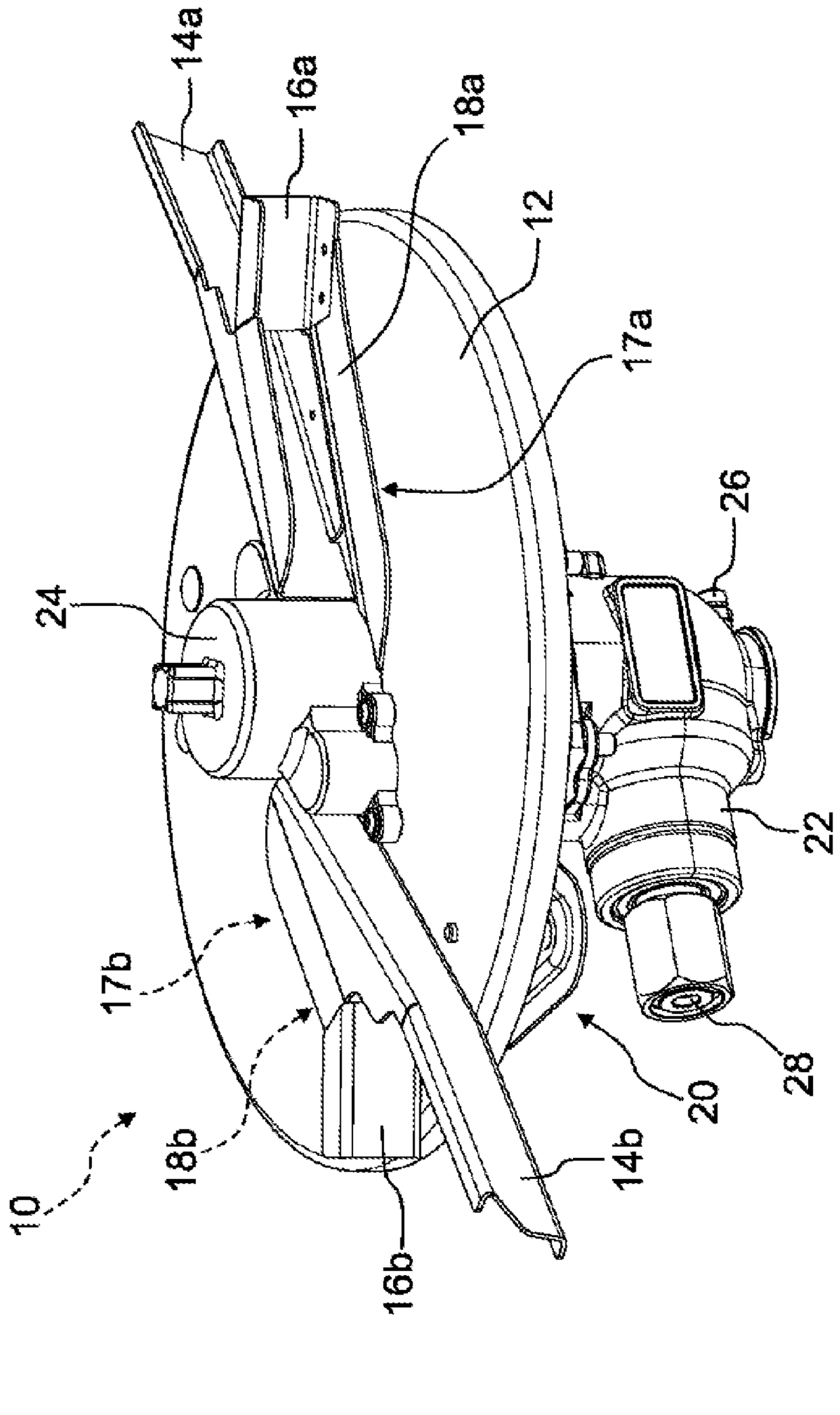


Fig.1

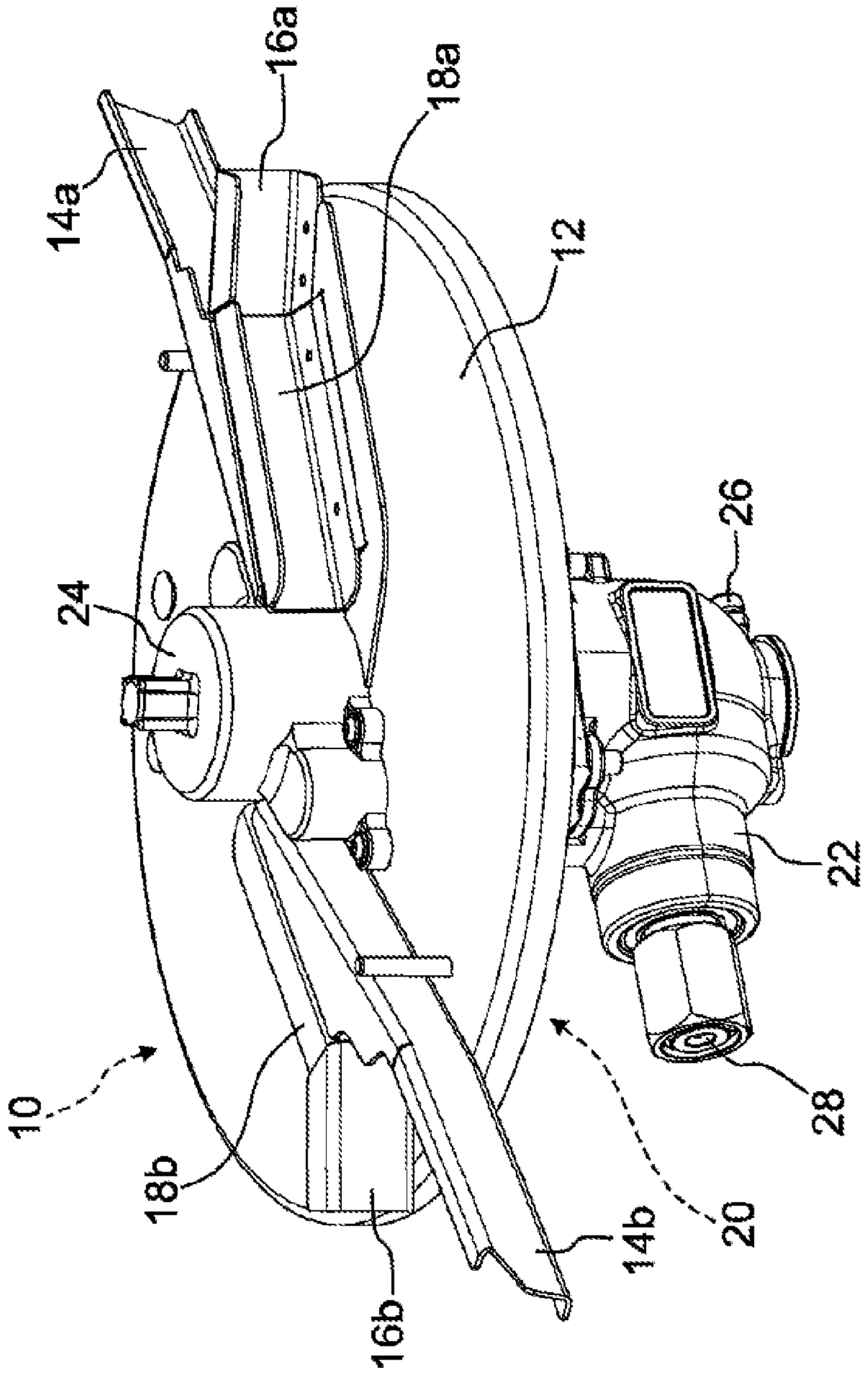


Fig.2

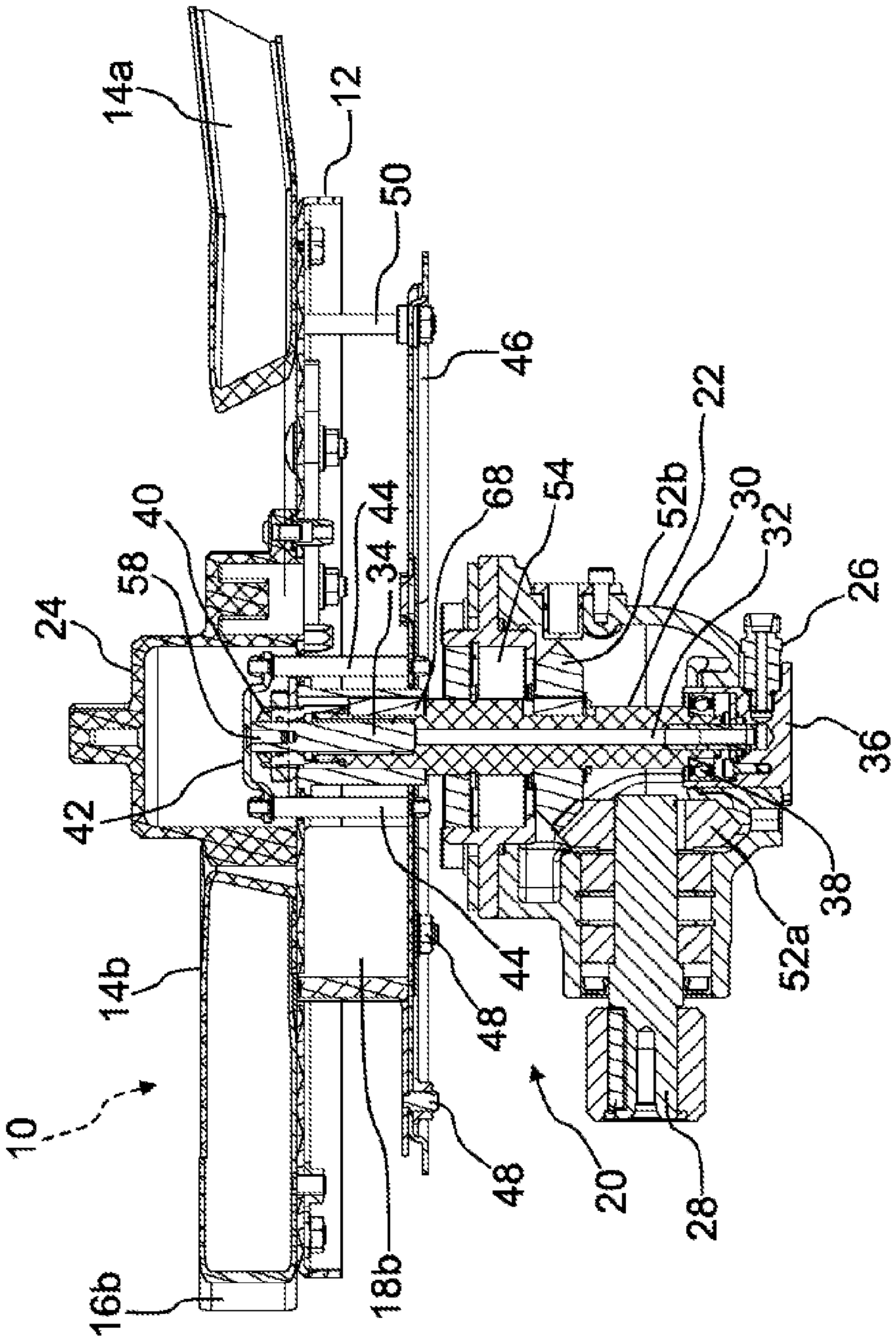
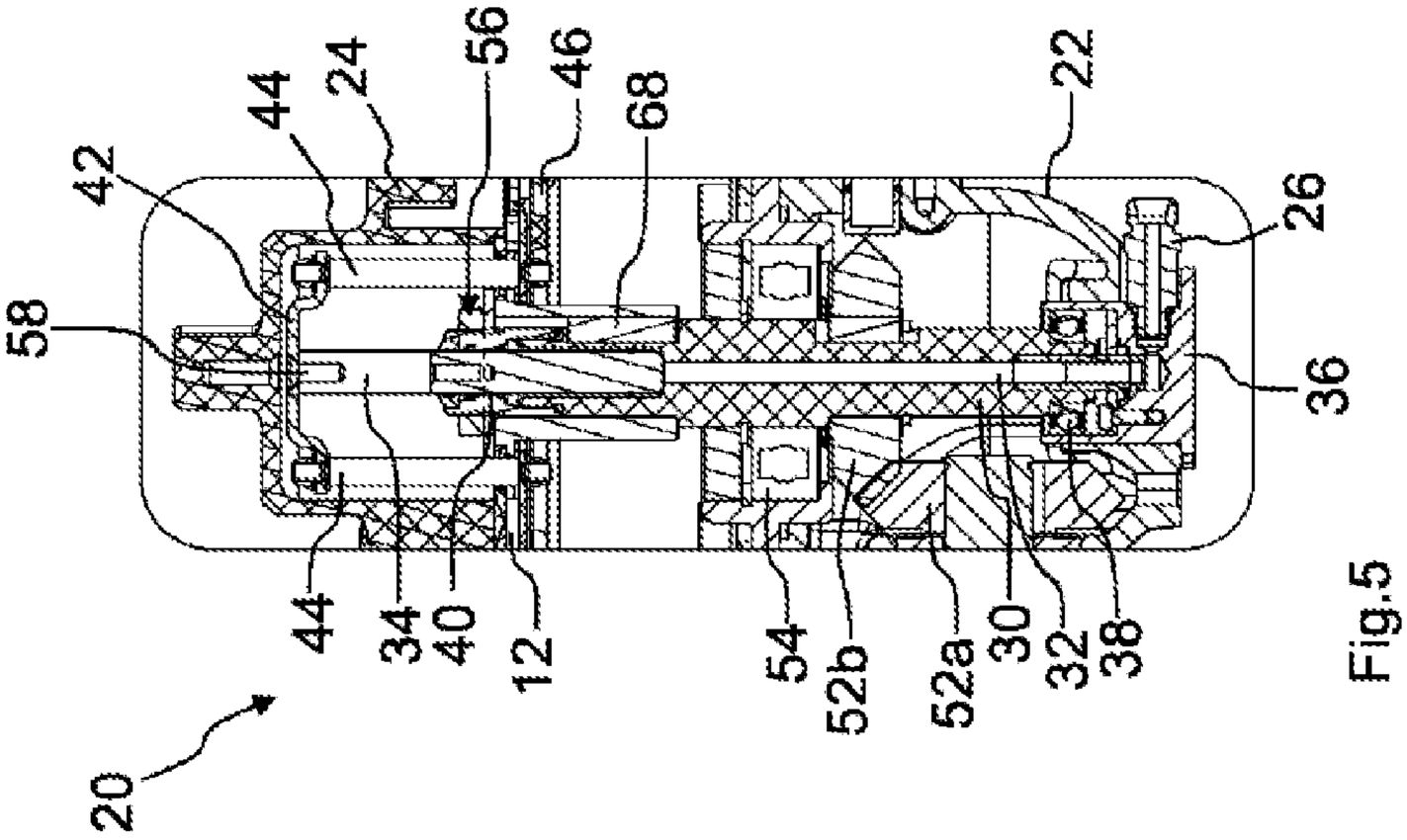

14a
12
50
46
22
68
54
52b
30
32
40
44
34
58
24
26
36
42
38
52a
14b
48
44
10
48
20
28
18b
16b

Fig.3


20
58
42
44
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36
44
34
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54
52b
52a
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38

Fig.5

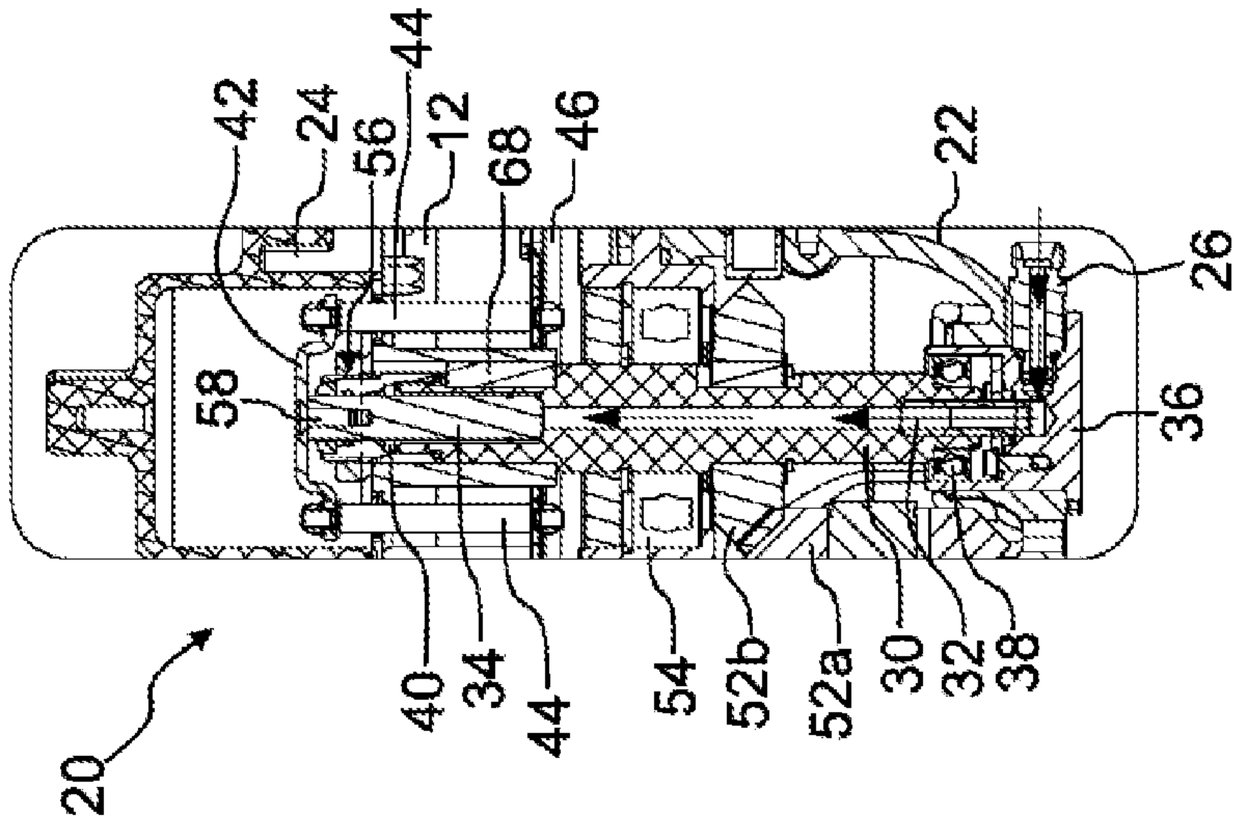
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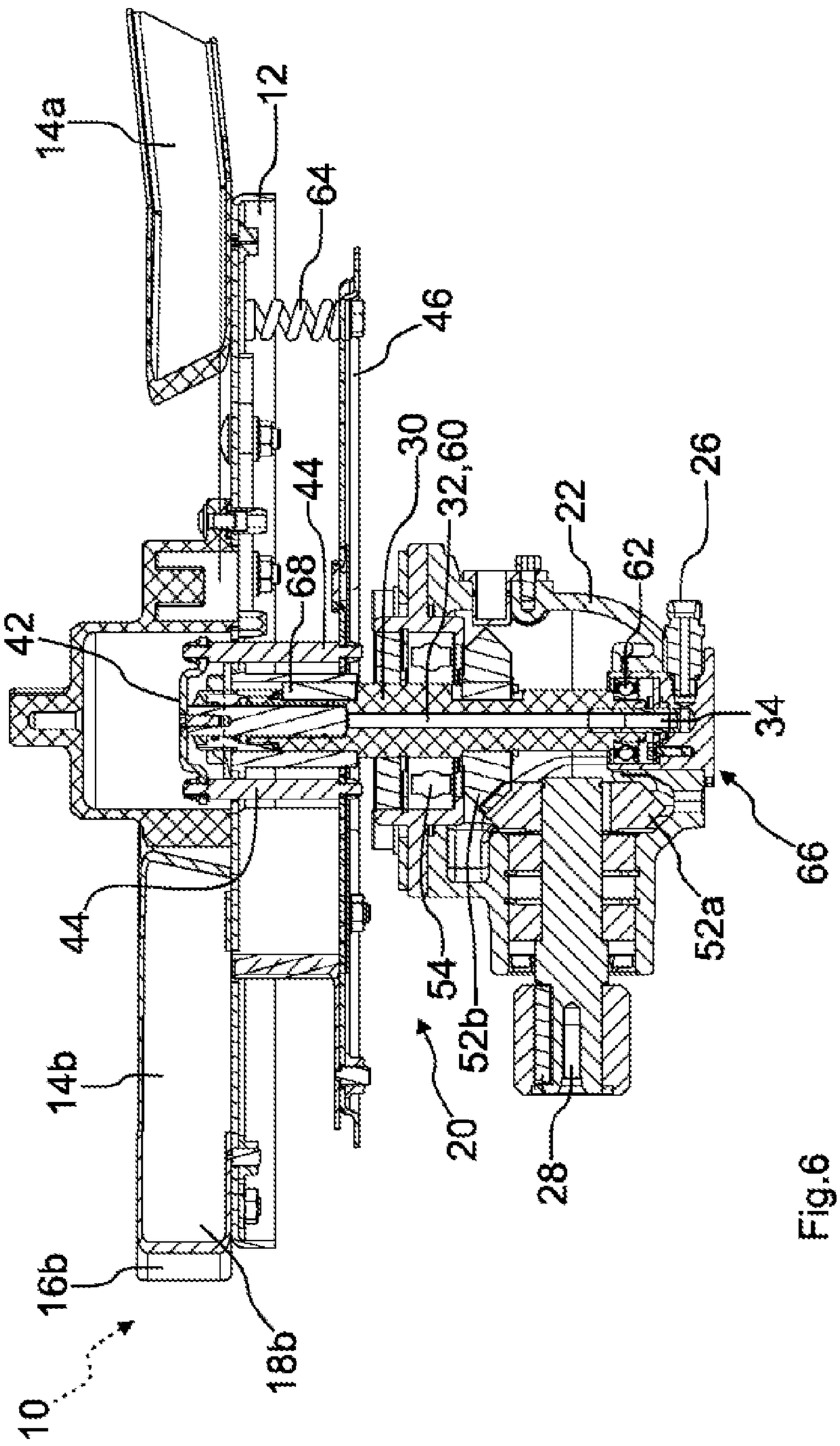
Fig.4


14a
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52a
54
52b
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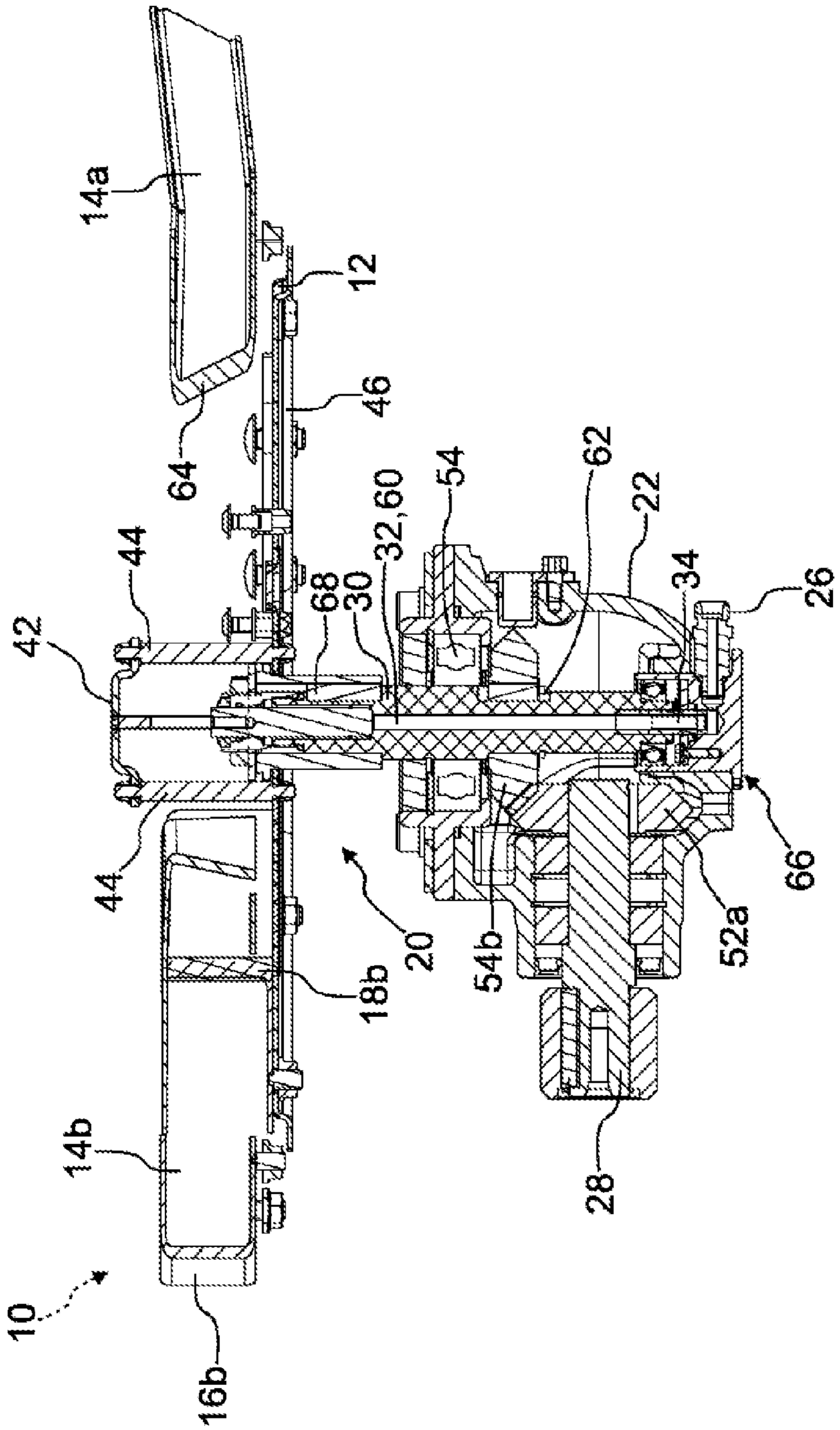
44
14b
16b
10
18

Fig.6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52a
54b
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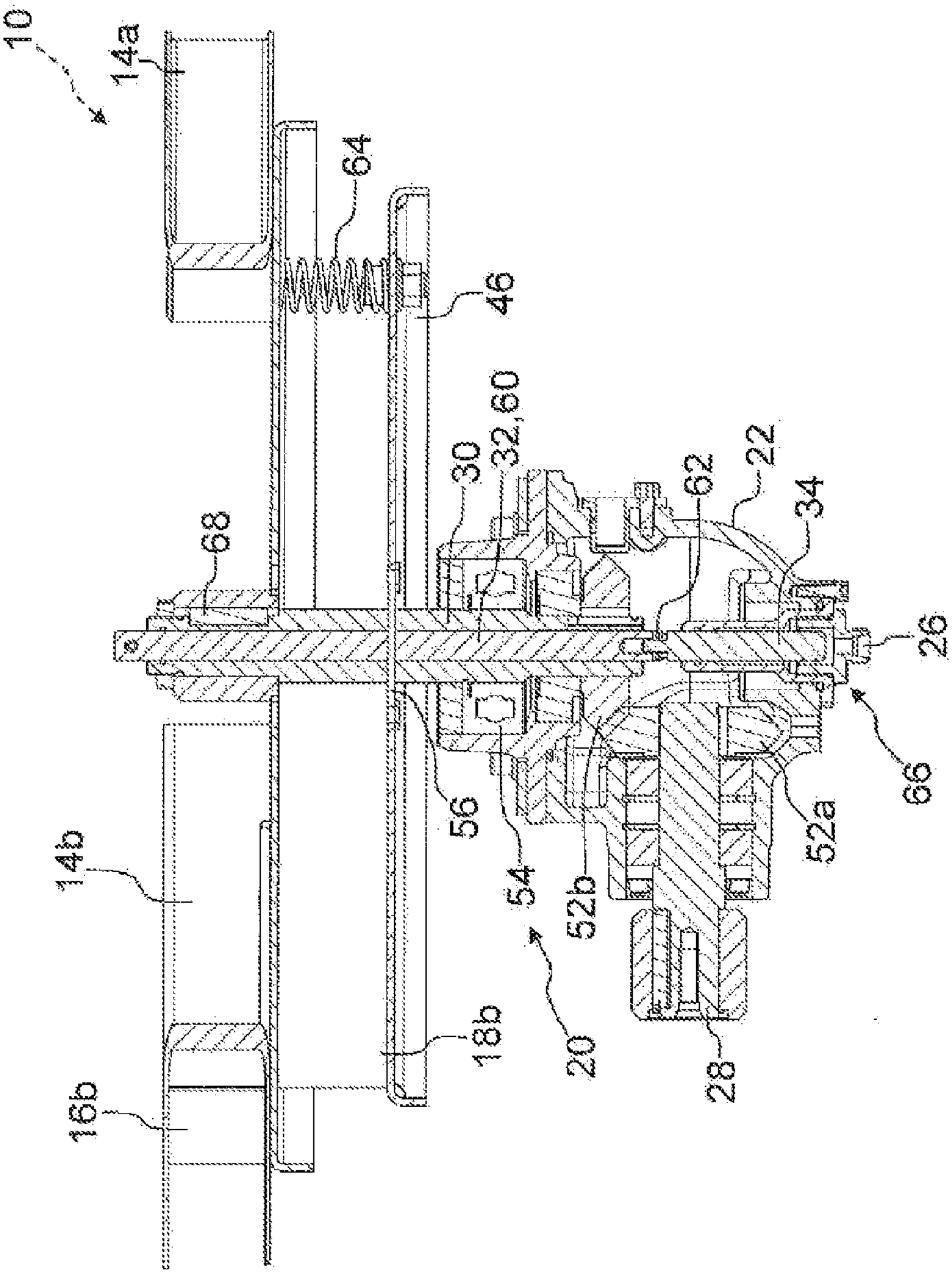
18b
14b
10
16b
28

Fig.7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52a
52b
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18b
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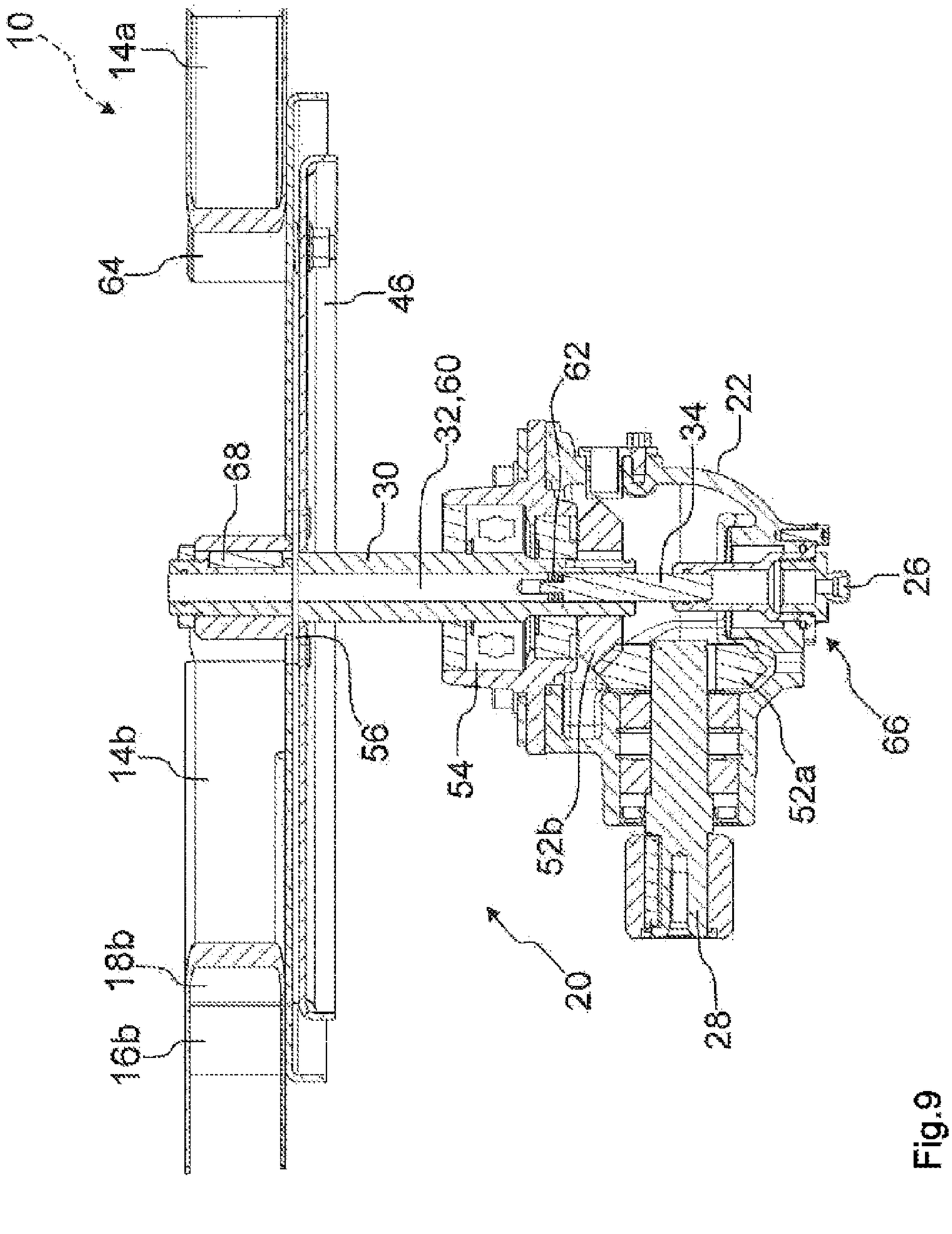
28
16b

Fig.8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52b
52a
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14b
18b
16b
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28

Fig.9