

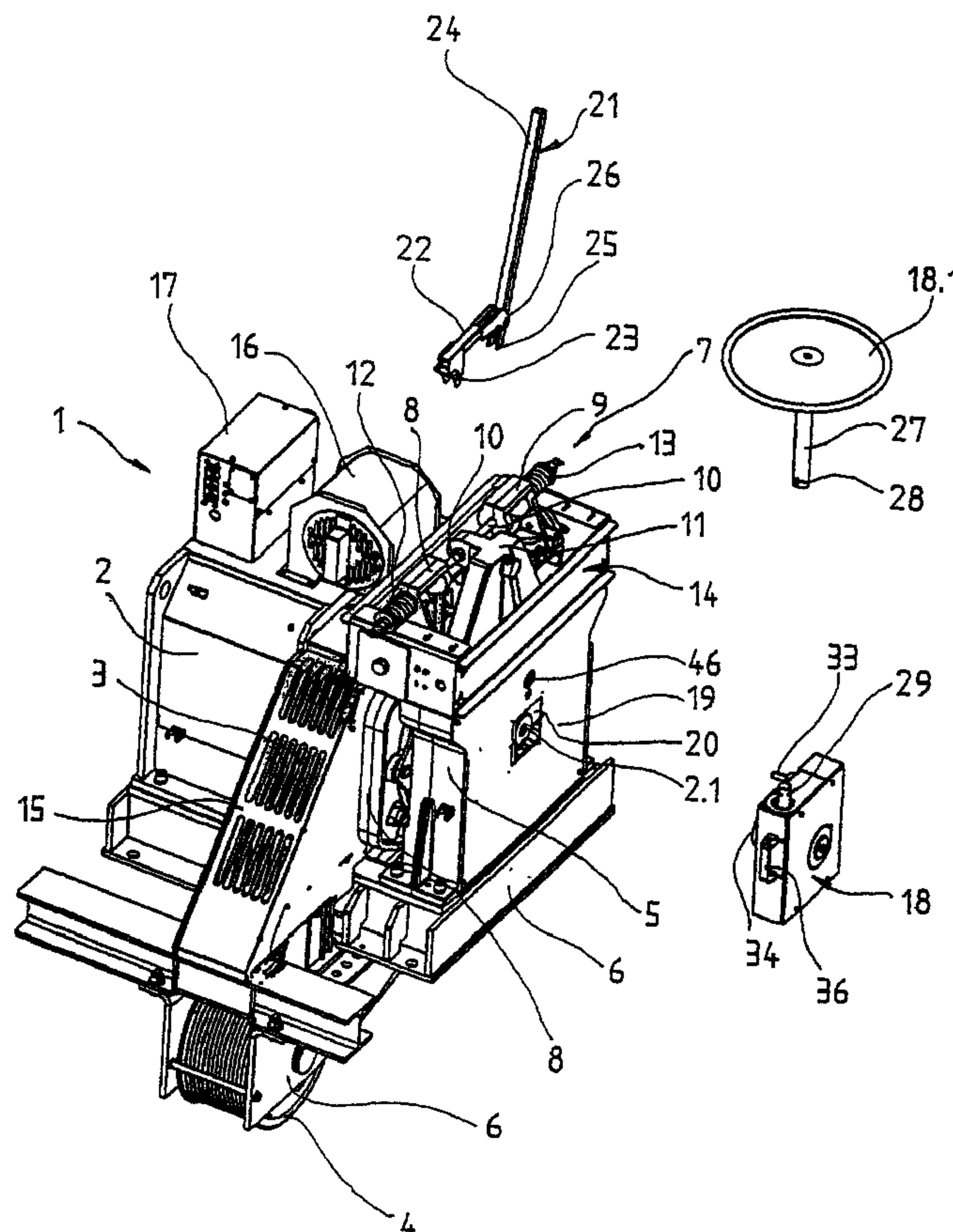


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(54) Titre : DISPOSITIF D'ACTIONNEMENT POUR LE FONCTIONNEMENT DE SECOURS D'UNE MACHINE
D'ENTRAINEMENT SANS ENGRENAGE D'ASCENSEUR

(54) Title: ACTUATOR FOR THE EMERGENCY OPERATION OF A GEARLESS DRIVING MACHINE OF AN ELEVATOR



(57) Abrégé/Abstract:

The invention relates to a gearless driving machine (1) with a motor (2) that drives a drive sheave (3). Ropes that are not shown in the drawing are guided via the drive sheave (3) and a deflecting roller (4) and carry an elevator car, not shown in the drawing, and a



(57) **Abrégé(suite)/Abstract(continued):**

counterweight, also not shown in the drawing. The drive sheave (3) is supported by a motor shaft (2.1) that is received on the one end by an end shield, not shown in the drawing, and on the other end by a bearing block (5). The motor (2), end shield, bearing block (5) and deflecting roller (4) are mounted on a machine console (6). For an emergency operation of the elevator, a manual drive (18) is provided that can be coupled with the motor shaft (2.1) without using tools. When the elevator is operated manually, a brake lifting lever (21) and the handwheel (18.1) are actuated until the elevator car reaches the next stop.

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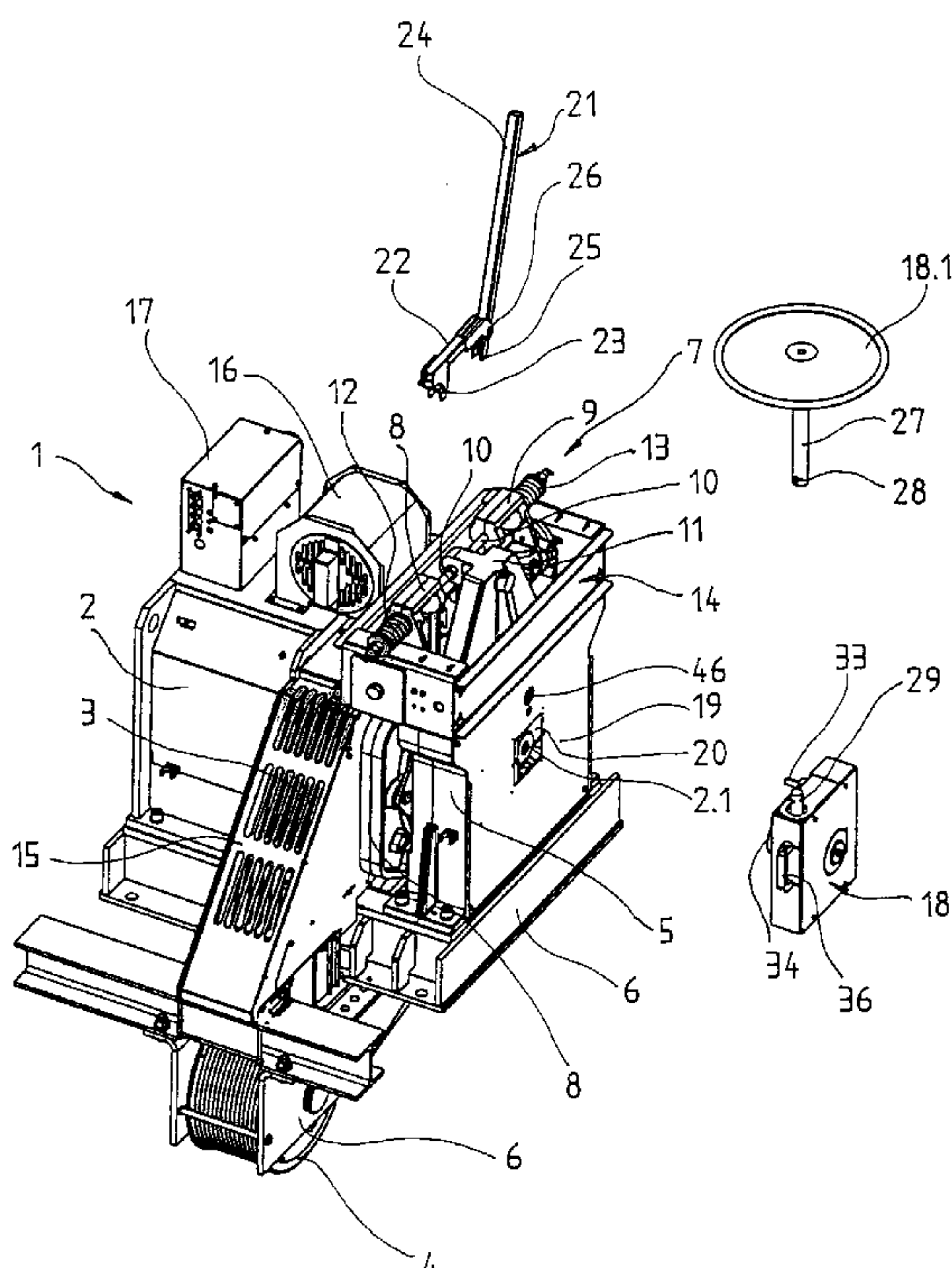
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[Fortsetzung auf der nächsten Seite]

(54) Title: ACTUATOR FOR THE EMERGENCY OPERATION OF A GEARLESS DRIVING MACHINE OF AN ELEVATOR

(54) Bezeichnung: BETÄTIGUNGSEINRICHTUNG FÜR DEN NOTBETRIEB EINER GETRIEBLOSEN ANTRIEBSMASCHINE EINES AUFZUGES



(57) Abstract: The invention relates to a gearless driving machine (1) with a motor (2) that drives a drive sheave (3). Ropes that are not shown in the drawing are guided via the drive sheave (3) and a deflecting roller (4) and carry an elevator car, not shown in the drawing, and a counterweight, also not shown in the drawing. The drive sheave (3) is supported by a motor shaft (2.1) that is received on the one end by an end shield, not shown in the drawing, and on the other end by a bearing block (5). The motor (2), end shield, bearing block (5) and deflecting roller (4) are mounted on a machine console (6). For an emergency operation of the elevator, a manual drive (18) is provided that can be coupled with the motor shaft (2.1) without using tools. When the elevator is operated manually, a brake lifting lever (21) and the handwheel (18.1) are actuated until the elevator car reaches the next stop.

(57) Zusammenfassung: Bei dieser getriebelosen Antriebsmaschine (1) treibt ein Motor (2) eine Treibscheibe (3) an. Über die Treibscheibe (3) und eine Umlenkrolle (4) sind nicht dargestellte Seile geführt, die eine nicht dargestellte Aufzugskabine und ein nicht dargestelltes Gegengewicht tragen und antreiben. Die Treibscheibe (3) wird von einer Motorwelle (2.1) getragen, die einenends an einem nicht dargestellten Lagerschild und anderenends an einem Lagerbock (5) gelagert ist. Motor (2), Lagerschild, Lagerbock (5) und Umlenkrolle (4) werden von einer Maschinenkonsole (6) getragen. Für den Notbetrieb des Aufzuges ist ein Handantrieb (18) vorgesehen, der mit der Motorwelle (2.1) werkzeuglos kuppelbar ist. Bei manuellem Betrieb wird ein

Bremslufthebel (21) und das Handrad (18.1) betätigt bis die Aufzugskabine die nächstliegende Haltestelle erreicht.

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— *mit internationalem Recherchenbericht*

Description**Actuator for the Emergency Operation of a Gearless Driving Machine of an Elevator**

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The invention relates to a gearless drive machine of an elevator, comprising a motor, a traction sheave which is borne on a motor shaft and over which the ropes for supporting and moving an elevator car and a counterweight are passed, a braking device which is arranged on a bearing pedestal and serves to bring the motor to a standstill, and an actuating device for emergency operation by means of which the motor can be manually actuated.

15 From patent specification EP 0 706 968 A2 a drive unit for an elevator has become known. The drive unit has passing through it a shaft which serves both as the shaft for the motor and the shaft for the gear. Arranged at one end of the shaft is a gear with a traction sheave for the elevator rope. Attached to the free, motor end of the shaft is a handwheel for emergency operation of the drive unit. Fastened by pivoted joints to a baseplate are arms which carry brake shoes. By means of a cylinder, the brake shoes are pressed against the external circumference of a braking body.

A disadvantage of the known device is that the handwheel is situated close to the motor. When the handwheel is turned, fingers can easily be caught and trapped by the rotating handwheel. For emergency operation, the brake must be released at the same time as the handwheel is turned. Releasing the brake is made difficult by the brake being situated at one end of the motor and the handwheel at the other end.

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In the case of gearless machines, the forces which must be overcome for emergency operation are substantially greater. To overcome them, it is common to use a gearbox with handwheel, the gearbox being connected to the main shaft by means of a coupling device. Such equipment is expensive, awkward, and not without danger in operation.

It is this that the invention sets out to remedy. The invention as characterized in Claim 1 provides a solution to avoiding the disadvantages of the known device and creating a handwheel by means of which emergency operation of the elevator is trouble-free and safe.

The advantages achieved by the invention are essentially to be seen in that the hand drive can be mounted easily and without tools. When needed, the hand drive can be mounted on the drive machine. A coupling such as required with a permanently installed hand drive is no longer necessary. The safety of the persons performing the emergency operation is assured in all cases, since the electric drive is switched off automatically when the hand drive is mounted. Furthermore, in the case of an elevator installation with several elevators, it is sufficient for there to be one hand drive which can be used on whichever elevator requires emergency operation.

The invention is described in greater detail below by reference to drawings illustrating an exemplary embodiment.

The drawings show:

Fig. 1 a drive machine with the hand drive and brake-release lever needed for emergency operation;

Fig. 2 hand drive with handwheel;

Fig. 3 details of the hand drive; and

Fig. 4 a cover of a bearing pedestal associated with the
5 hand drive.

Fig 1 shows a gearless drive machine 1 with a motor 2, comprising a stator and rotor, which drives a traction sheave 3. Passing over the traction sheave 3 and a deflector
10 sheave 4 are ropes (not shown) which support and drive an elevator car (not shown) and a counterweight (not shown). The traction sheave 3 is borne by a motor shaft 2.1 which is held in bearings, at one end in a bearing endplate (not shown) and at the other end in a bearing pedestal (not
15 shown). Motor 2, endplate, bearing pedestal 5, and deflector sheave 4 are borne by a machine bracket 6.

The drive machine includes a braking device 7 with a first brake arm 8 and a second brake arm 9, on each of which arms
20 a brake shoe is arranged. At their lower ends, the brake arms 8, 9 are pivoted on the bearing pedestal 5 and at their upper ends they are guided by a rod 10. The rod 10 is arranged with its mid-point in a support 11 which is connected to the bearing pedestal 5. To actuate the brake
25 shoes, each brake arm 8, 9 is provided with a compression spring 12, 13. To release the brake shoes each brake arm 8, 9 is provided with a magnet which acts against the compression spring. The magnets are arranged on a frame 14 which is connected to the bearing pedestal 5. A guard 15
30 covers the ropes between the traction sheave 3 and the deflector sheave 4. At the back of the drive machine 1, a further guard (not shown) covers the ropes between the traction sheave 3 and the machine bracket 6. To cool the drive unit 1, a ventilating fan 16 is provided. A terminal

box 17 serves as interface for power supply cables and as interface for control cables.

For emergency operation of the elevator, a hand drive 18 is provided which can be coupled with the motor shaft 2.1 without tools. A cover 19 of the bearing pedestal 5 has an opening 20 through which the hand drive 18 can be coupled to the motor shaft 2.1. The hand drive 18 can be driven by means of a handwheel 18.1. In case of emergency, depending on how the elevator car is loaded it is moved manually in upward or downward direction to the next stop and the passengers are evacuated. By turning the handwheel 18.1 and simultaneously releasing the brake shoes by means of a brake release lever 21, the motor shaft 2.1 is moved manually and the elevator car thereby lowered or raised. The brake release lever 21 consists of a yoke 22 with a first claw 23, and of a handle 24 with a second claw 25, the yoke 22 being pivoted on a pivot point 26 of the handle 24. To release the brake shoes, more precisely the brake arms 8, 9, the brake release lever 21 is placed on the rod 10 and the handle 24 is moved forward, a force thereby acting through the claws 23, 25 on the brake arms 8, 9 against the spring force of the compression springs 12, 13, and releasing the brake shoes.

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Fig. 2 shows the hand drive 18 with handwheel 18.1 as viewed from the drive machine side. At the end of a hollow axle 27 of the handwheel 18.1 there is a slot 28. The hollow axle 27 can be pushed over an extension 29 of a worm shaft 30, a pin 31 of the extension 29 engaging in the slot 28 and thereby transmitting the rotational motion of the handwheel 18.1 to the worm shaft 30. A dowel 33 arranged on a housing 32 serves as a torque anchor. A hub 34 with a groove 35 can be pushed onto the motor shaft 2.1. Handgrips 36 facilitate

mounting the hand drive 18 on the drive machine 1 and
dismounting the hand drive 18 from the drive machine 1.

Fig. 3 shows details of the handwheel 18. The worm shaft 30
5 drives a worm wheel 37, into which an extension 38 of the
hub 34 is inserted. The extension 38 of the hub 34, and the
worm shaft 30, are both held at both ends in bearings in the
housing 32. A first wall 39 with the handgrips 36, and a
second wall 40, enclose the housing 32. When the hand drive
10 19 is mounted on the drive machine 1, the hub 34 is pushed
through the opening 20 and onto the shaft end of the motor
shaft 2.1. The groove 35 of the hub 34 fits over a key (not
shown) on the motor shaft 2.1. By means of the groove/key
connection, the rotational motion of the hub 34 is
15 transmitted to the motor shaft 2.1. Worm shaft 30 and worm
wheel 37 form a gear with handwheel 18.1 on the drive input
side and with hub 34 serving as coupling on the drive output
side.

20 Fig. 4 shows an internal view of the cover 19 which encloses
the bearing pedestal 5. The cover 19 serves as guard for the
shaft end of the motor shaft 2.1, and also allows simple
mounting of the hand drive 19. The opening 20 of the cover
19 through which the hub 34 passes can be closed by means of
25 a sliding panel 41 and a closing element 42. The sliding
panel 41 is guided by guide rails 43. Arranged on the cover
19 to monitor the position of the sliding panel 41 there is
a sensor 44, for example a microswitch, which can be
actuated by means of a cam 45 arranged on the sliding panel
30 41. The sensor 44 prevents electrical operation of the drive
machine 1 when the sliding panel 41 is open. With the
handwheel 1 mounted, a hole 46 in the cover 19 receives the
dowel 33. Dowel 33 and hole 46 form the torque anchor for
the hand drive 18.

Patent Claims

1. Gearless drive machine of an elevator comprising a motor, a traction sheave which is borne on a motor shaft
5 and over which the ropes for supporting and moving an elevator car and a counterweight are passed, a braking device which is arranged on a bearing pedestal and serves to bring the motor to a standstill, and an actuating device for emergency operation by means of
10 which the motor can be manually actuated, characterized in that the actuating device is a hand drive (18) which without tools can be pushed onto the motor shaft (2.1), there being provided for actuation of the motor shaft (2.1) a
15 handwheel (18.1).
2. Gearless drive machine according to Claim 1, characterized in that the hand drive (18) has a gear (30, 37) with on the
20 drive input side a handwheel (18.1) and on the drive output side a coupling for the motor shaft (2.1).
3. Gearless drive machine according to Claim 2, characterized in that
25 the coupling is a hub (34) with a groove (35) via which the rotational motion of the handwheel (18.1) can be transmitted to the motor shaft (2.1).
4. Gearless drive machine according to claim 3
30 characterized in that the bearing pedestal (5) is enclosed by a cover (19) which has an opening (20) through which when the hand drive (18) is mounted the hub (34) passes.

5. Gearless drive machine according to Claim 4,
characterized in that
arranged on the cover (19) is a sliding panel (41) which
during electrical operation of the motor (2) closes the
5 opening (20), the position of the sliding cover (41)
being monitored by means of a sensor (44).
6. Gearless drive machine according to Claim 4 or 5,
characterized in that
10 provided in the cover (19) is a hole (46) which when the
hand drive (18) is mounted forms together with a dowel
(33) of the hand drive (18) a torque anchor for the hand
drive (18).

Fig. 1

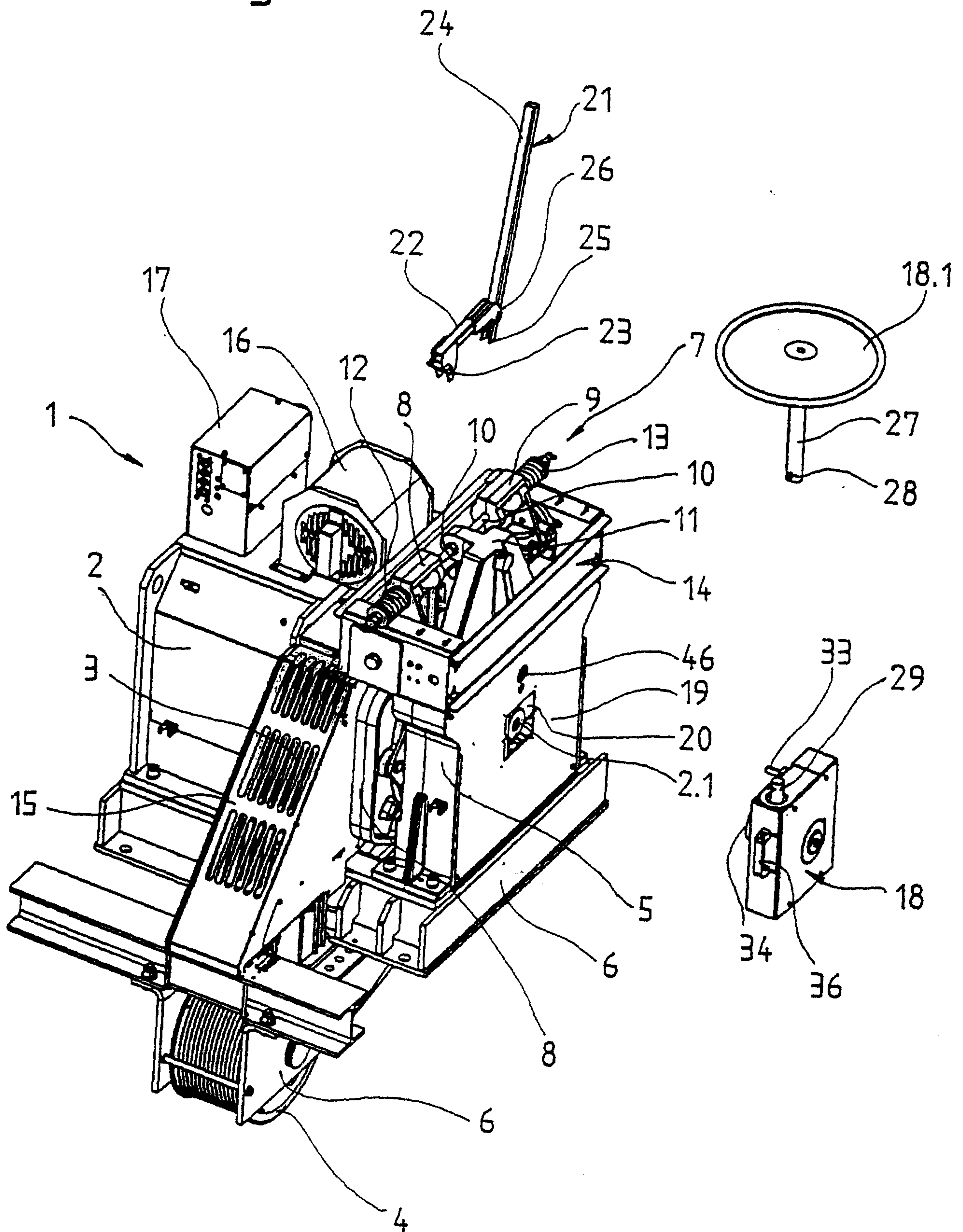


Fig. 2

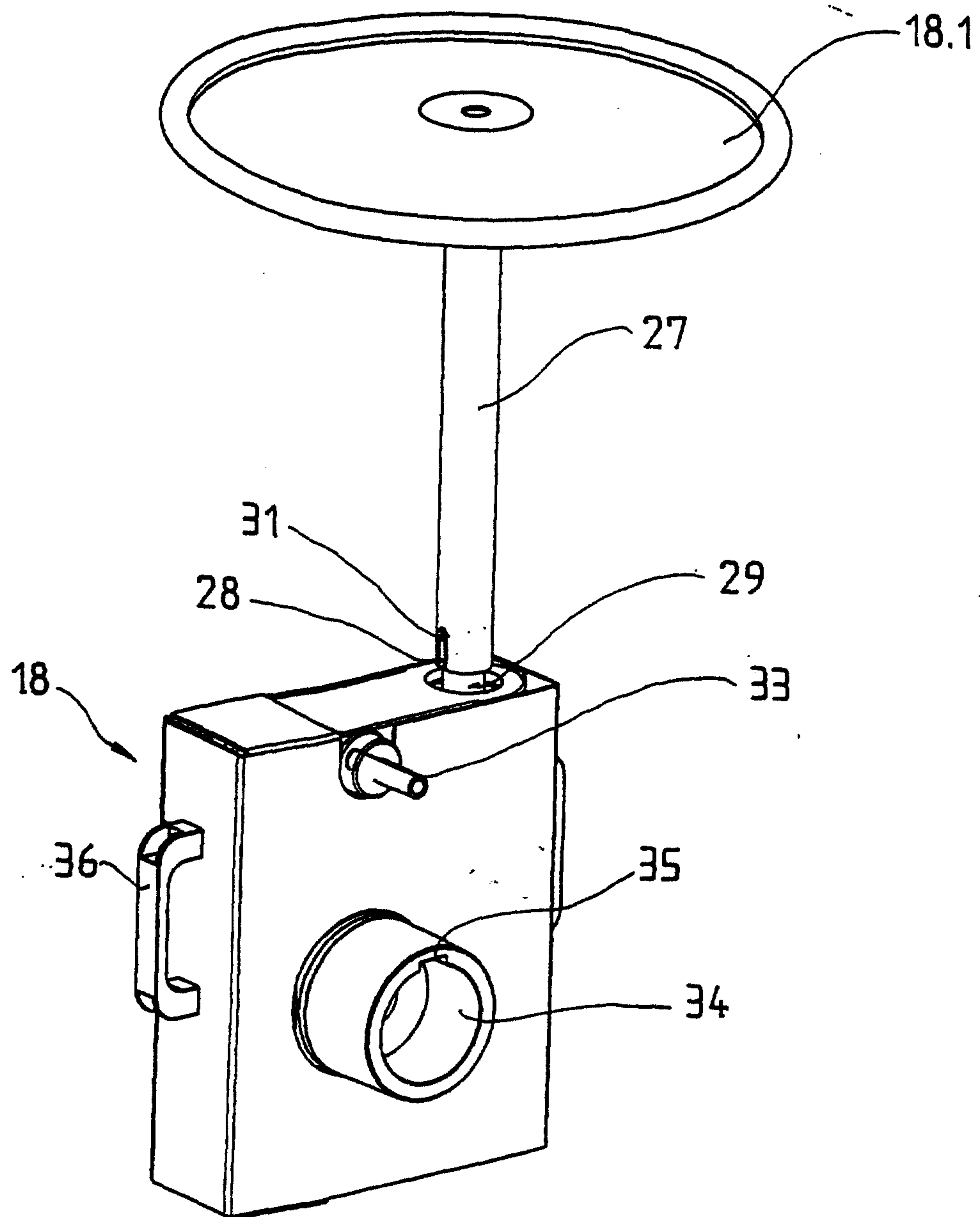


Fig. 3

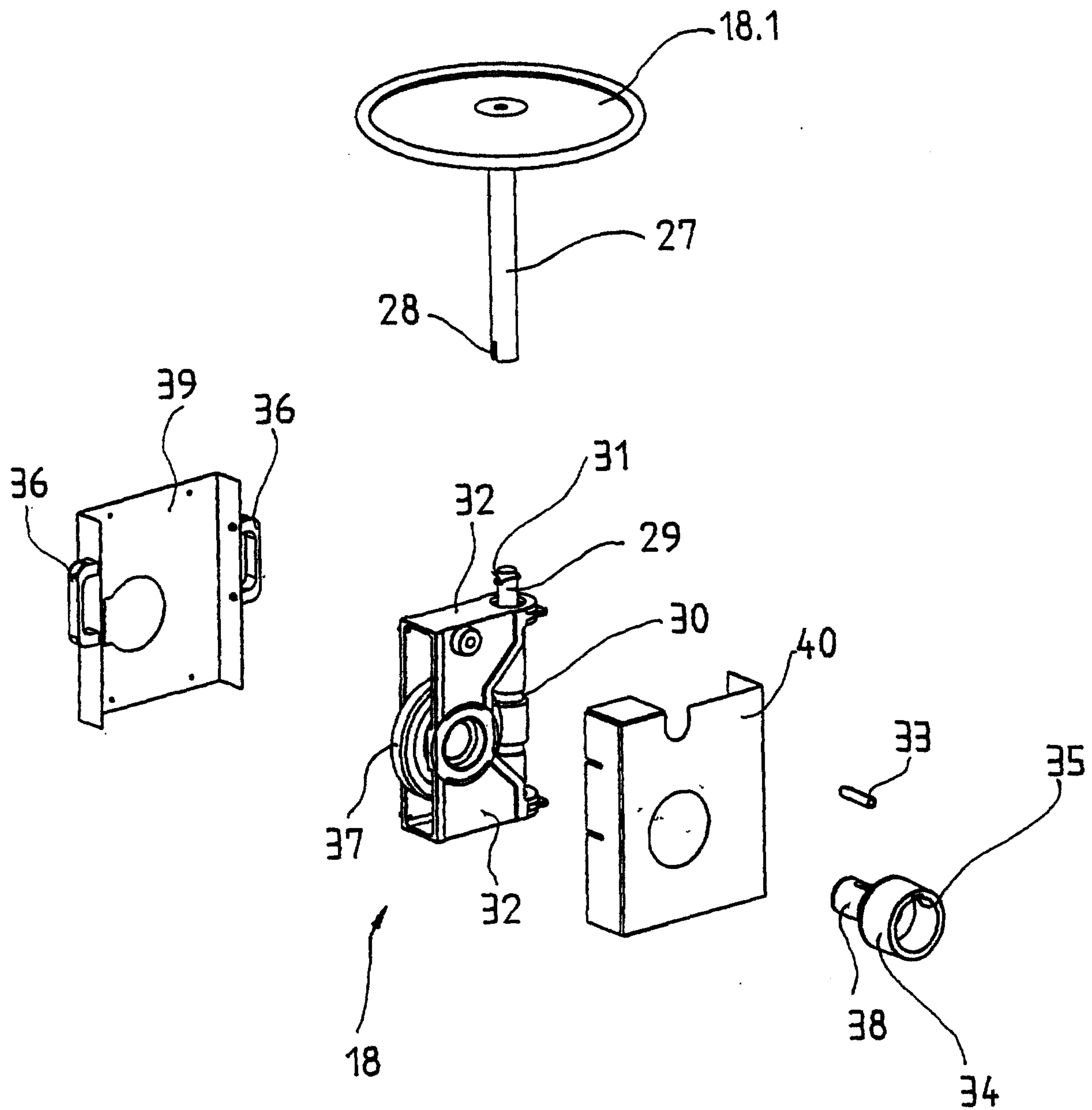


Fig. 4

