



(11) **EP 2 118 420 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
16.02.2011 Bulletin 2011/07

(51) Int Cl.:
E05F 15/14^(2006.01) E05F 15/00^(2006.01)

(21) Application number: **07728061.8**

(86) International application number:
PCT/EP2007/053594

(22) Date of filing: **12.04.2007**

(87) International publication number:
WO 2008/098623 (21.08.2008 Gazette 2008/34)

(54) **DEVICE FOR OPERATING SLIDING PANELS OF GATES AND THE LIKE**

VORRICHTUNG ZUR BETÄTIGUNG VON GLEITPLATTEN VON TOREN UND DERGLEICHEN

DISPOSITIF POUR ACTIONNER DES PANNEAUX COULISSANTS DE PORTES ET SIMILAIRES

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE
SI SK TR**

(30) Priority: **14.02.2007 IT VE20070011**

(43) Date of publication of application:
18.11.2009 Bulletin 2009/47

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Description

[0001] The present invention relates to a device for operating sliding panels of gates and the like (see e.g. US-A-5170585).

[0002] Gates with sliding panels are known, provided with an electrically operated drive mechanism. The panel of these gates is generally provided with idle wheels slidable along a rail fixed to the ground, and is also provided with a rack parallel to said rail and engaged by a pinion keyed to the output shaft of a gearmotor fixed to the ground.

[0003] The electric cable for powering the gearmotor, the control unit and the accessory members such as the safety sensors, the flashing light indicating that the panel is in movement and a possible electrically operated lock must be brought to the base on which the gearmotor is mounted, and to the uprights defining the passageway closable by the sliding panel.

[0004] A drawback of these known operating devices is the fact that in the absence of mains power the panel is locked, unless the pinion of the gearmotor is provided with a clutch device for its release from the outside, however manual operation is then laborious.

[0005] Another drawback is the complexity of the installation operations, requiring the arrangement and cementing of suitable ducts for the electric cables and the time required for cement hardening for their stabilization.

[0006] Another drawback is the fact that correct panel movement requires perfect parallelism between the rack and ground rail and can be compromised by deformation or rectilinearity loss thereof.

[0007] Another drawback is that accidental interposing of a foreign body between the sliding panel and one of its uprights can result in damage.

[0008] An object of the invention is to provide an operating device which does not present the aforestated drawbacks.

[0009] A particular object of the invention is to provide an operating device which can be installed very quickly.

[0010] Another object of the invention is to provide an operating device totally insensitive to any deformation of the ground guide rail.

[0011] Another object of the invention is to provide an operating device of very low power consumption and even able to be powered by a photovoltaic panel.

[0012] Another object of the invention is to provide an operating device of high reliability in panel closing.

[0013] Another object of the invention is to provide an operating device which can be easily operated manually in an emergency.

[0014] These and other objects which will be apparent from the ensuing description are attained according to the invention by an operating device for sliding panels of gates and the like, as described in claim 1.

[0015] A preferred embodiment of the present invention is further clarified hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a schematic side view of the sliding panel of a gate provided with an operating device of the invention,

Figure 2 is a block diagram thereof.

[0016] As can be seen from the figures, the operating device of the invention comprises a panel 2, consisting of a robust tubular metal frame and a plurality of columns welded between its upper longitudinal member 4 and lower longitudinal member 6.

[0017] A longitudinal member 8, applied or fixed by screws to the longitudinal member 6, houses internally:

- a low voltage electric motor 10 (12 V),
- two wheels 12 of grooved profile for guidedly supporting the panel along a rail 14 positioned on the ground transversely to the passageway closable by the panel,
- a clutch 16 interposed between the motor and one of the two wheels, said clutch being protected by a belt cover,
- a power supply battery 18,
- an electrically operated lock 20 which when the gate is closed cooperates with a striker plate applied to one 24 of the fixed uprights bounding the passageway closable by the panel,
- a control unit 26 provided with a radiocontrol card.

[0018] The following are connected to the control unit:

- a flashing light 28 mounted on the upper longitudinal member 4 of the panel for indicating when the panel is moving,
- a photoelectric cell receiver 30 mounted on a panel upright 34 and interacting with a transmitter 36 provided on the upright 24.
- a sensitive rib 38 mounted on that upright on which the photoelectric cell receiver is mounted.

[0019] The upper longitudinal member 4 of the panel is provided with several isolated supports 40 for a conductive longitudinal collector 42 on which a sliding contact 44 rests, connected electrically to the positive terminal of a mains-powered battery charger 46 which is fixed relative to the movable structure of the gate, and could be positioned within the dwelling.

[0020] The negative terminal of the battery charger 46 is connected electrically to the rail 14 on which the wheels 12 run, these being electrically isolated from the panel.

[0021] A buffer battery 48 to which the contents of the photoelectric cell transmitter 36 are connected is associated with the battery charger 46.

[0022] The device of the invention operates in the following manner:

When the gate is closed the battery charger 46, which is connected to the mains supply is able, via the sliding contact 44 and the rail 14, to charge the

battery 18 which hence always remains in its maximum charge condition.

[0023] While the gate is closed its upright 34 adheres to the upright 24 and the electrically operated lock engages in the striker plate 22 applied to it.

[0024] If the user gives the command to open the gate under these conditions, the control unit which receives the opening command then operates the flashing light 28, releases the electrically operated lock 20 and powers the electric motor 16, which operates the wheels 12.

[0025] It should be noted that the battery remains fed by the battery charger because of the presence of the sliding contact along the collector.

[0026] On termination of its opening movement a traditional limit switch operates to halt the gate in its total open condition and arranges it for closure when a corresponding command arrives.

[0027] The closure command is generally timed, so that after a predetermined time period the control unit 26 automatically feeds a command to the electric motor 10 for operation in the reverse direction, in order to return the gate to its closed state. This command need not however be automatic, but could be expressly fed by the user.

[0028] If during closure of the gate a movement stop command reaches the control unit 26, for example from the photoelectric cell 30 due to interruption of the light beam, or from the sensitive rib 38, said control unit determines such stoppage as in any motorized gate, without this requiring further explanation.

[0029] From it foregoing it is apparent that the operating device of the invention is considerably more advantageous than traditional devices, and in particular:

- it allows very rapid installation as the complete panel and the uprights can be preassembled at the production stage, limiting site activity to merely applying the longitudinal member 8 to the panel,
- it is operative even if mains voltage fails,
- it offers a high guarantee of security by virtue of the presence of the electrically operated lock 20,
- the gate can be very easily operated by pushing if necessary,
- it is insensitive to deformation of the guide rail 14 and to lack of parallelism between this and the rack provided in traditional sliding gates,
- it uses a low power electric motor, which on the one hand is of very low power consumption and on the other hand can be opposed by simple hand pressure,
- it can form the subject of an assembly kit for use virtually for operating any sliding panel,
- by eliminating the rack and pinion operating mechanism, it results in smoother panel movement insensitive to external factors.

[0030] In a variant, the battery can be charged by the external battery charger by using the rail in the following manner:

the rail is divided into mutually isolated portions along which the two wheels slide, these being isolated from the panel and being connected to the battery via a rectifier, to act as a sliding contact.

Claims

1. A device for operating sliding panels of gates and the like, comprising:

- a panel (2) provided with wheels (12) slidable along a guide (14) fixed to the ground,
- at least one upright (24) bounding the passageway closable by said panel,
- electromechanical means for driving said panel (2) along said guide,
- a control unit (26),
- a low voltage direct current electric motor (10) which can be mechanically coupled to at least one of said wheels (12),
- a power supply battery (18), wherein

the control unit (26), the electric motor (10) and the power supply battery (18) are housed inside a longitudinal member (8) fixable to the panel, and further comprising:

- a first connector (42) mounted on said panel and connected to said control unit, **characterised by**
- a second connector (44) powered by external power and coupled to said first connector (42) for any position of the panel (2).

2. A device as claimed in claim 1, **characterised in that** that panel edge (34) facing the closure upright (24) is provided with a sensitive rib (38) and with a photoelectric cell (30) the light beam of which is directed towards said upright, said sensitive rib (38) and said photoelectric cell (30) being connected to the control unit (26).

3. A device as claimed in claim 2, **characterised in that** a torque limiter consisting of a clutch (16) protected by a belt cover is interposed between the electric motor (10) and the wheel (12) mechanically coupled to it.

4. A device as claimed in claim 1, **characterised in that** the second connector (44) is connected to a battery charger (46) feeding said battery (18).

5. A device as claimed in claim 4, **characterised in that** the battery charger (46) is provided with a buffer battery (48) for powering the photoelectric cell transmitter (36).

6. A device as claimed in claim 1, **characterised in that** the control unit (26) is provided with a radiocontrol card.
7. A device as claimed in claim 1, **characterised in that** the panel (2) is provided with an electrically operated lock (20) cooperating with a striker plate (22) mounted on the upright (24) which with the other upright defines the passageway closable by the panel (2).
8. A device as claimed in claim 1, **characterised in that** the upper longitudinal member (4) of the panel is provided with several isolated supports (40) for a conductive longitudinal collector (42) on which there rests a sliding contact (44) connected electrically to the positive terminal of the battery charger (46).
9. A device as claimed in claim 1, **characterised in that** the rail is divided into mutually isolated portions along which the two wheels slide, these being isolated from the panel and being connected to the battery via a rectifier.

Patentansprüche

1. Vorrichtung zur Betätigung von Gleitplatten von Türen und dergleichen, umfassend:
 - eine Platte (2), ausgestattet mit Rädern (12), die entlang einer Führung (14), die am Boden befestigt ist, gleitbar sind,
 - zumindest einen Pfosten (24), der den Durchgang, der von der Platte verschließbar ist, begrenzt,
 - elektromechanische Mittel, um die Platte (2) entlang der Führung anzutreiben,
 - eine Steuereinheit (26),
 - einen elektrischen Niederspannungs-Gleichstrom-Motor (10), der mechanisch zumindest an eines der Räder (12) gekoppelt werden kann,
 - eine Stromversorgungsbatterie (18), wobei die zweite Steuereinheit (26), der elektrische Motor (10) und die Stromversorgungsbatterie (18) innerhalb eines Längsträgers (8) untergebracht sind, das an die Platte befestigt werden kann, und weiter umfassend:
 - ein erstes Verbindungselement (42), das auf der Platte montiert ist und mit der Steuereinheit verbunden ist, **gekennzeichnet, durch**
 - ein zweites Verbindungselement (44), das von einer externen Leistung versorgt wird und mit dem ersten Verbindungsglied (42) für jede Position der Platte (2) verbunden ist.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Plattenkante (34), die dem Verschlusspfosten (24) gegenüberliegt, mit einer empfindlichen Rippe (38) und mit einer photoelektrischen Zelle (30) ausgestattet ist, deren Lichtstrahl auf den Pfosten gerichtet ist, wobei die empfindliche Rippe (38) und die photoelektrische Zelle (30) mit der Steuereinheit (26) verbunden sind.
3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** ein Drehmomentbegrenzer, umfassend eine Kupplung (16), geschützt von einer Riemenabdeckung, zwischen den elektrischen Motor (10) und das Rad (12), das mechanisch daran gekoppelt ist, gestellt ist.
4. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das zweite Verbindungselement (44) mit einem Batterieladegerät (46) verbunden ist, das die Batterie (18) versorgt.
5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** das Batterieladegerät (46) mit einer Pufferbatterie (48) ausgestattet ist, um den photoelektrischen Zellsender (36) zu versorgen.
6. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Steuereinheit (26) mit einer Funksteuerkarte ausgestattet ist.
7. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Platte (2) mit einer elektrisch betriebenen Sperre (20) ausgestattet ist, die mit einer Schließplatte (22) zusammenarbeitet, die auf den Pfosten (24) montiert ist, der zusammen mit dem anderen Pfosten den Durchgang definiert, der von der Platte (2) geschlossen werden kann.
8. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der obere Längsträger (4) der Platte mit mehreren isolierten Auflagen (40) für einen leitenden Längskollektor (42) bereitgestellt ist, auf dem ein Gleitkontakt (44) ruht, der elektrisch mit dem positiven Kontakt des Batterieladegeräts (46) verbunden ist.
9. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Schiene in zwei gegeneinander isolierte Abschnitte unterteilt ist, entlang derer die zwei Räder gleiten, wobei diese von der Platte isoliert sind und über einen Gleichrichter mit der Batterie verbunden sind.

Revendications

1. Dispositif pour actionner des panneaux coulissants de barrières et analogues, comprenant :

- un panneau (2) pourvu de roues (12) pouvant coulisser le long d'un guidage (14) fixé au sol,
- au moins un montant (24) bornant la voie de passage pouvant être fermée par ledit panneau,
- des moyens électromécaniques pour entraîner ledit panneau (2) le long dudit guidage,
- une unité de commande (26),
- un moteur électrique à courant continu à basse tension (10) qui peut être couplé mécaniquement à au moins une desdites roues (12),
- une batterie d'alimentation électrique (18),

dans lequel l'unité de commande (26), le moteur électrique (10) et la batterie d'alimentation électrique (18) sont logés à l'intérieur d'un élément longitudinal (8) fixable au panneau, et comprenant en outre :

- un premier connecteur (42) monté sur ledit panneau et connecté à ladite unité de commande,

caractérisé par

- un second connecteur (44) alimenté par une alimentation externe et couplé audit premier connecteur (42) pour une quelconque position du panneau (2).

2. Dispositif selon la revendication 1, **caractérisé en ce que** le bord de panneau (34) faisant face au montant de fermeture (24) est pourvu d'une nervure sensible (38) et d'une cellule photoélectrique (30) dont le faisceau lumineux est dirigé vers ledit montant, ladite nervure sensible (38) et ladite cellule photoélectrique (30) étant connectées à l'unité de commande (26).
3. Dispositif selon la revendication 2, **caractérisé en ce qu'un** limiteur de couple constitué d'un embrayage (16) protégé par un couvercle de courroie est interposé entre le moteur électrique (10) et la roue (12) couplée mécaniquement à celui-ci.
4. Dispositif selon la revendication 1, **caractérisé en ce que** le second connecteur (44) est connecté à un chargeur de batterie (46) alimentant ladite batterie (18).
5. Dispositif selon la revendication 4, **caractérisé en ce que** le chargeur de batterie (46) est pourvu d'une batterie tampon (48) pour alimenter un transmetteur (36) de la cellule photoélectrique.
6. Dispositif selon la revendication 1, **caractérisé en ce que** l'unité de commande (26) est pourvue d'une carte de radiocommande.
7. Dispositif selon la revendication 1, **caractérisé en**

ce que le panneau (2) est pourvu d'un verrou actionné électriquement (20) coopérant avec une gâche (22) montée sur le montant (24) qui, avec l'autre montant, définit la voie de passage pouvant être fermée par le panneau (2).

8. Dispositif selon la revendication 1, **caractérisé en ce que** l'élément longitudinal supérieur (4) du panneau est pourvu de plusieurs supports isolés (40) pour un collecteur longitudinal conducteur (42) sur lequel repose un contact coulissant (44) connecté électriquement à la borne positive du chargeur de batterie (46).

9. Dispositif selon la revendication 1, **caractérisé en ce que** le rail est divisé en parties isolées mutuellement le long desquelles les deux roues coulisent, celles-ci étant isolées du panneau et étant connectées à la batterie par l'intermédiaire d'un redresseur.

FIG. 1

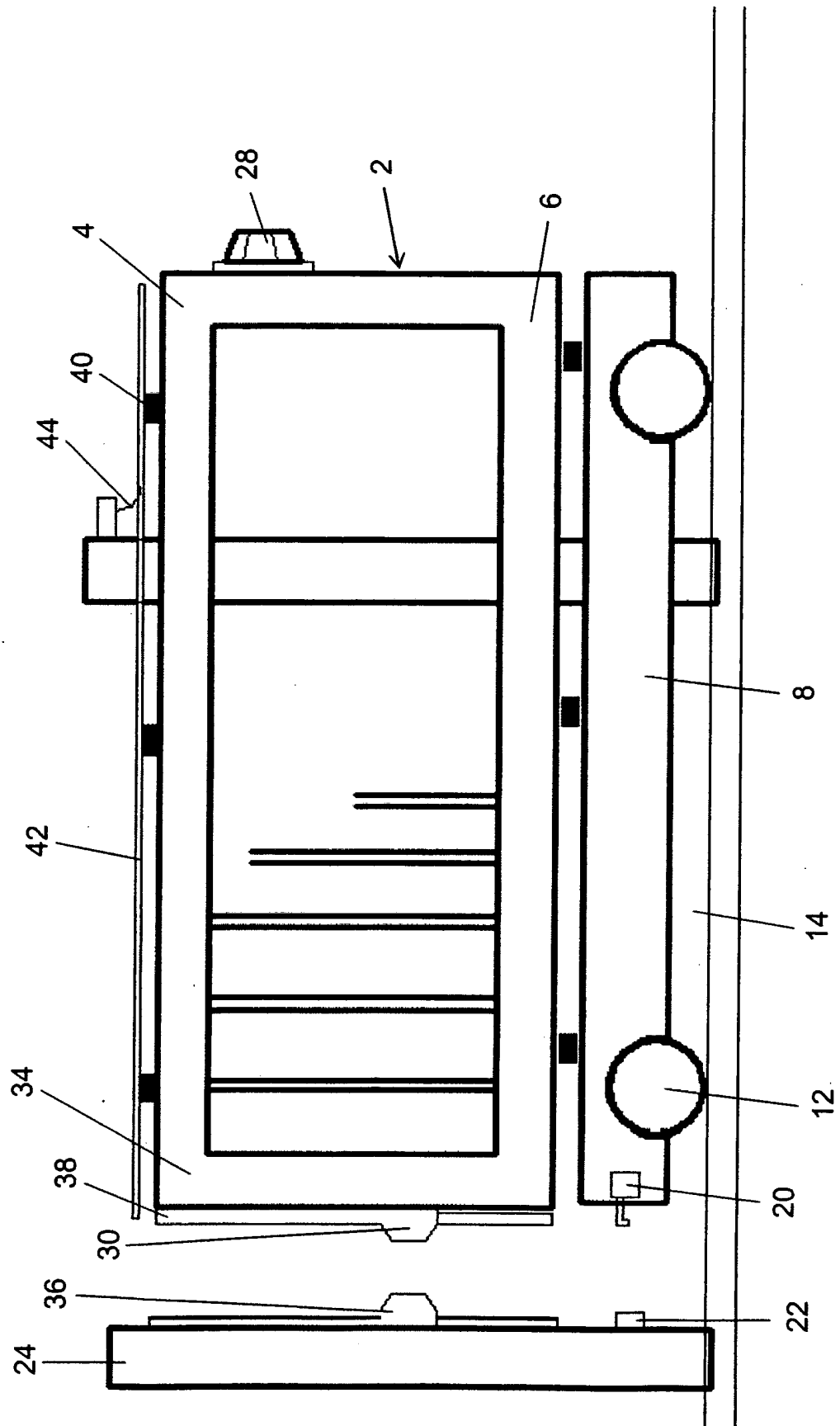
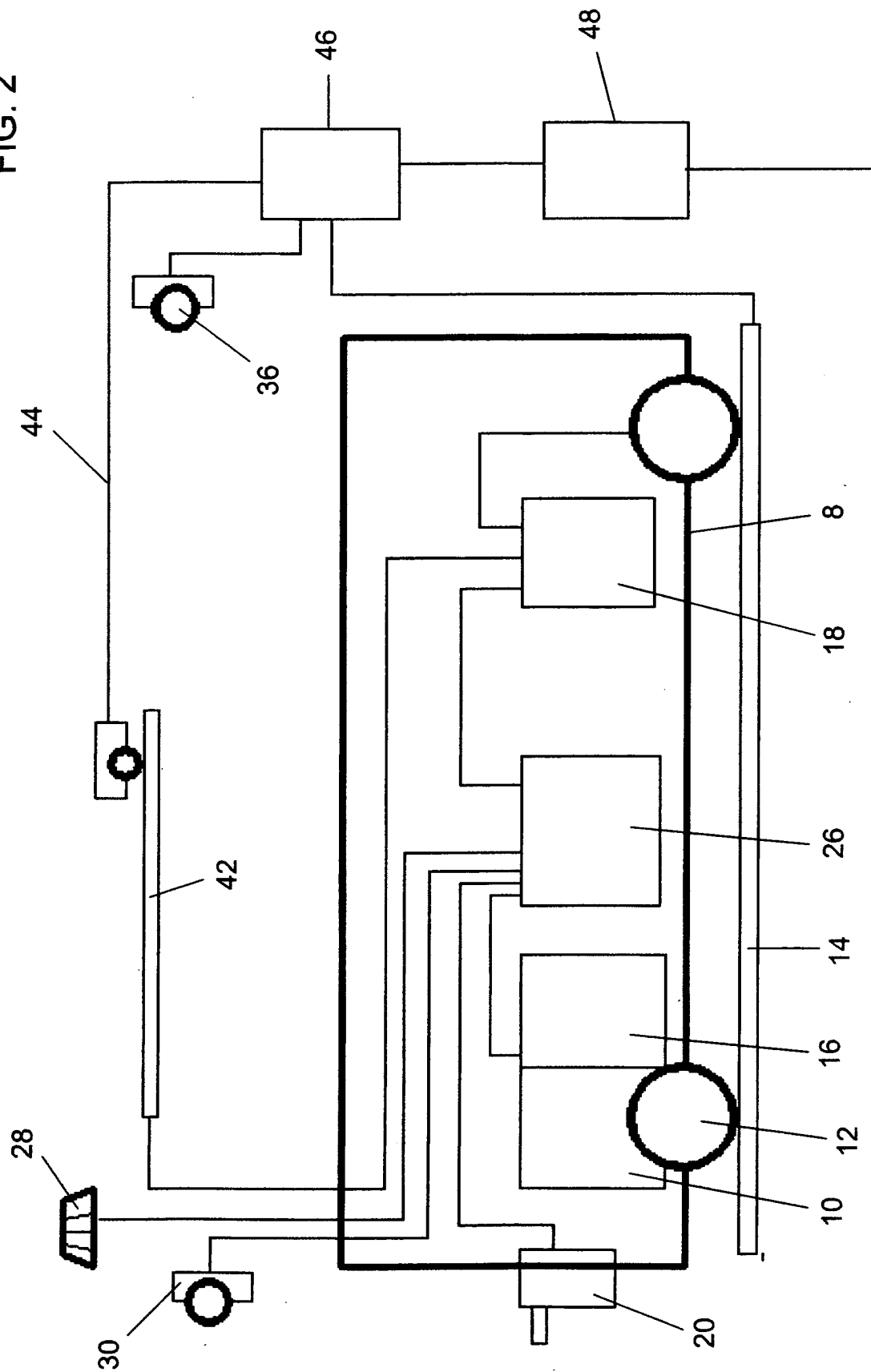


FIG. 2



REFERENCES CITED IN THE DESCRIPTION

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