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(54) **Container with lid that can be operated electrically**

Behälter mit einem elektrisch betätigbaren Deckel

Réceptier avec couvercle actionné par électricité

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Description

[0001] The invention relates to a container, comprising a container body with a deposit opening, a lid for closing off and, alternatively, exposing said opening as well as an electric control for moving the lid between a closed position and an open position, which electric control comprises an electric motor, transmission, power source and control means.

[0002] Such a container is disclosed in EP-A 903 305. This known container has a lid that is mounted in a cap that is placed on the container body. An electric motor, which has a motor shaft with pinion, is mounted in the cap. The pinion engages in the toothing that is on the periphery of a quadrant that is fixed to the lid. By activating the electric motor the quadrant, and thus the lid, is moved between the open position and the closed position.

[0003] The disadvantage of such a construction is that it is relatively complex and that the motor and the transmission are split between both the cap and the lid. Should, for example, play arise between these components, the correct functioning of the lid can be adversely affected.

[0004] The aim of the invention is, therefore, to provide a container that has reliable operation and compact construction with regard to the movable lid. Said aim is achieved in that the electric motor and the transmission are mounted on the lid.

[0005] Installation of the electric motor and the transmission in the lid has the advantage that other components of the container are hardly involved or are not involved when operating the motor in connection with opening the lid. Furthermore, the power source can also be mounted on the lid. The lid with motor, transmission, power source and, optionally, also the control means for starting the motor form a compact unit that is easy to fit and, if necessary, to replace. It is clear that the transmission must have a point of reaction on the container body, which point of reaction can optionally also be on a cap in which the lid is mounted such that it can turn.

[0006] In this context the transmission preferably interacts with a shaft that cannot be turned with respect to the container body, on which shaft the lid is mounted such that it can turn. The transmission can have a number of gears that produce a reduction, such that the gear with the greatest reduction interacts with the shaft. Furthermore, the transmission can have two pulleys as well as a flexible member running over the pulleys, which pulleys produce a reduction such that the pulley with the greatest speed interacts with the motor shaft.

[0007] With the aim of improving the efficiency of the transmission and preventing peak loads for the motor that are too high, pretensioning means are provided for exerting a pretensioning force on the lid, which pretensioning force acts to force the lid into the open position. The pretensioning means can comprise an arm that is connected to the shaft, as well as a pretensioning spring that at one end is connected to the arm and at the other

end to the lid. Furthermore, a telescopic guide can be provided, around which the pretensioning spring is fitted.

[0008] The electric control can comprise a sensor for activating the electric motor, which sensor is provided on the lid. There can be a sensor both on the inside and on the outside of the lid. The sensor on the outside detects whether there is a moving object in the vicinity, in response to which the control means open the lid. As long as the sensor on the inside still detects the movement of an object, the control means keep the lid in the open position. As soon as no further movement is detected, the control means can then emit a signal to close the lid.

[0009] The invention will be explained in more detail below with reference to an illustrative embodiment shown in the figures.

Figures 1 and 2 show the container with lid in the open and closed position, respectively.

Figures 3 - 6 show details of the mounting of the lid and the associated cap.

Figure 7 shows the lid in the dismantled state.

Figures 8a - c show various positions of a control member in plan view.

Figure 9 shows the control member in side view.

[0010] The container shown in Figures 1 and 2 comprises a container body 1 on which a cap 2 is placed in which the lid 3 is mounted such that it can pivot. In the edge of the cap 2 there is a recess 4, such that the lid 3 can also be grasped and opened by hand.

[0011] As shown in Figure 3, the lid 3 is mounted such that it can turn about a shaft to be described in more detail, one flattened end 5 of which protrudes with respect to the rear edge 6 of the lid 3. A recess 7 is provided at the other end of the rear edge 6, as shown in Figure 4. The lid 3 can be fitted in the cap 2 in a simple manner by first of all placing the flattened projection 5 in the correspondingly shaped flattened recess 8 in the cap, shown in Figure 5. The lid 3 is then tilted into the final position in which a pin 9 clicks into the recess 7 (Figure 4) thereof, which pin 9 is permanently pushed under spring pretension into the position in which it is pushed outwards, as shown in Figure 6. As a consequence of the flattened shape of the projection 5 and the recess 8, the shaft to be described in more detail cannot be turned with respect to the cap 2. Such an inability to turn is needed in order to be able to open the lid 3.

[0012] Figure 7 shows the lid 3 in the dismantled state with two lid halves 10, 11. The shaft 12, the flattened projection 5 of which can also be seen, is fitted in the one lid half 11 such that it can turn. The recess 7 that has been discussed above is on the other side of the lid half 11.

[0013] A transmission indicated in its entirety by 13, which is driven by the motor 14, engages on the shaft. A set of batteries 15 is accommodated in lid half 11.

[0014] Furthermore, the control means 16, as well as the sensors 17, 18, are located in the lid half 11. As shown

in more detail in Figure 8, the shaft 12 is mounted in the frame 21 such that it can turn. The gear 19 is fixed to the shaft 12, which is also shown in Figure 9. This gear 19 interacts with the further gear 20, which is mounted such that it can turn in the frame 21 that is fixed to the lid half. The gear 21 is coaxially connected to the gear 22, which meshes with the pinion 30. This pinion 30 is coaxially connected to the gear 31, which meshes with pinion 32, which is fixed coaxially to the pulley 24. This pulley 24 is connected by means of a flexible member or cord 25 to the pulley 33 of small diameter on the shaft of motor 14.

[0015] The cord transmission 24, 25, 33 together with the gear transmission 19-22, 30-32 provides a reduction such that the lid can be opened gradually even with a motor 14 running at a high speed of revolution. During this operation the lid rotates about the shaft 12 that cannot be turned and which, after all, as a result of its flattened projection 5, is fixed with respect to the likewise flattened recess 8 in the cap 2.

[0016] In order to prevent peak loads on the motor 14, a pretensioning spring 26 is provided that interacts with the arm 27 on the shaft 12. Telescopic components 28, 29, form a telescopic guide inside the pretensioning spring 26 to provide stability.

[0017] As a consequence of the pretensioning of the spring, the drive provided by the motor 14 when initially lifting the lid from the approximately horizontal position is complemented by the drive of the pretensioned spring 26. When the lid is closed the spring is pretensioned again and made ready for the next action.

[0018] Sensor 17 (covered by the semi-transparent cover plate 42 as shown in Figure 1), which activates the control means 16 as soon as the movement and/or presence of an object, hand and the like is detected is on the outside of the lid. Sensor 18 (covered by the semi-transparent cover plate 43 as shown in Figure 2), which ensures that the lid remains in the open position as soon as a movement and/or presence of an object, hand and the like is detected, is on the inside of the lid. If no further detection signal is emitted after some time, the control means 16 emit a signal for closure of the lid.

[0019] The sensors 17, 18 are preferably infrared sensors. As a result the lid can be opened without touching it. The sensors 17, 18 are not active at the same time. After the lid has been opened, the sensor 17 on the outside is switched off and the sensor 18 on the inside is switched on. Switching takes place in the opposite direction on closure.

[0020] With the aim of being able to leave the lid permanently open, the sensors can be switched off by manually exerting a limited turning movement on the lid when the lid is in the open position. If the lid is then closed manually, the control means return to the normal status and the lid is ready for automatic operation again.

[0021] The shaft 12 has a slipping clutch 44. As a result the transmission cannot be forced if the lid is opened manually or if an excessively high load is exerted thereon.

[0022] The movements of the lid are furthermore con-

trolled by the switches 34, 35 and 36, as shown in Figures 7 - 8. These switches are operated by the striker 37, which is mounted on the arm 38. This arm 38 is connected via a pivot joint 41 to a drive arm 39, which, in turn, is connected by means of a pivot joint 42 to the lever 40 on the shaft 12. When the shaft is turned, the arm 38, and thus the striker 37, executes the stroke shown in Figure 9.

[0023] In the part of this stroke that is at the bottom in the figures the striker 37 is in contact with the first limit switch 34, which stops the drive when the lid is closed. The second limit switch 35 stops the driving movement when the lid is opened.

[0024] The switch 36 located opposite the two limit switches 34, 35 ensures the lid is in the open position when it is operated manually. This switch 36 is activated during this operation such that the control device is switched off and the lid no longer closes automatically. The lid can then be closed again by moving it manually in the closing direction.

[0025] A significant advantage of installing all components, including the electronic components, in the lid results in it being possible to remove the lid from the container easily. Consequently the container can be cleaned well and there are no places that are difficult to reach.

Claims

1. Container, comprising a container body (1) with a deposit opening, a lid (3) for closing off and, alternatively, exposing said opening as well as an electric control (16) for moving the lid (3) between a closed position and an open position, which electric control (16) comprises an electric motor (14), transmission (13), power source (15) and control means (16), **characterised in that** the electric motor (14) and the transmission (13) are mounted on the lid (3).
2. Container according to Claim 1, wherein the power source (15) is mounted on the lid (3).
3. Container according to Claim 1 or 2, wherein the transmission (13) interacts with a shaft (12) that cannot be turned with respect to the container body (1), on which shaft (12) the lid (3) is mounted such that it can turn.
4. Container according to Claim 3, wherein the transmission (13) has a number of gears (19-22, 30-32) that produce a reduction, such that the gear (19) with the greatest reduction interacts with the shaft (12).
5. Container according to Claim 3 or 4, wherein the transmission (13) has two pulleys (24, 33) as well as a flexible member (25) running over the pulleys (24, 33), which pulleys (24, 33) produce a reduction such that the pulley (33) with the greatest speed interacts with the motor shaft.

6. Container according to one of the preceding claims, wherein pretensioning means (26-29) are provided for exerting a pretensioning force on the lid (3), which pretensioning force acts to force the lid (3) into the open position. 5
7. Container according to Claim 6 in combination with one of Claims 3-5, wherein the pretensioning means (26-29) comprise an arm (27) that is connected to the shaft (12), as well as a pretensioning spring (26) that at one end is connected to the arm (27) and at the other end to the lid (3). 10
8. Container according to Claim 7, wherein a telescopic guide (28, 29) is provided, around which the pretensioning spring (26) is fitted, said telescopic guide (28,29) providing stability to said pretensioning spring (26). 15
9. Container according to one of the preceding claims, wherein the control means (16) comprises a sensor (17) for activating the electric motor (14), which sensor (17) is provided on the outside of the lid (3). 20
10. Container according to Claim 9, wherein said sensor (17) is provided for detecting the movement and/or presence of an object, hand and the like on the outside in connection with opening the lid (3). 25
11. Container according to Claim 9 or 10, wherein a sensor (18) is provided on the inside of the lid (3) for detecting the movement and/or presence of an object, hand and the like on the inside of the lid (3), to prevent the closing movement of the lid (3) when such an object, hand and the like is detected. 30
12. Container according to one of the preceding claims, wherein the lid (3) is accommodated in a cap (2), which cap (2) can be placed on the container body (1). 35
3. Behälter nach Anspruch 1 oder 2, wobei das Getriebe (13) mit einer Welle (12) zusammenwirkt, die im Hinblick auf den Behälterkörper (1) nicht gedreht werden kann, wobei der Deckel (3) auf der Welle (12) so angeordnet ist, daß er drehen kann. 5
4. Behälter nach Anspruch 3, wobei das Getriebe (13) eine Anzahl von Zahnrädern (19-22, 30-32) hat, die eine Untersetzung so erzeugen, daß das Zahnrad (19) mit der größten Untersetzung mit der Welle (12) zusammenwirkt. 10
5. Behälter nach Anspruch 3 oder 4, wobei das Getriebe (13) zwei Scheiben (24, 33) sowie ein flexibles Teil (25) hat, das über die Scheiben (24, 33) läuft, wobei die Scheiben (24, 33) eine Untersetzung so erzeugen, daß die Scheibe (33) mit der größten Drehzahl mit der Motorwelle zusammenwirkt. 15
6. Behälter nach einem der vorstehenden Ansprüche, wobei eine Vorspanneinrichtung (26-29) zum Ausüben einer Vorspannkraft auf den Deckel (3) vorgesehen ist, wobei die Vorspannkraft so wirkt, daß sie den Deckel (3) in die offene Position drückt. 20
7. Behälter nach Anspruch 6 in Kombination mit einem der Ansprüche 3 bis 5, wobei die Vorspanneinrichtung (26-29) einen Arm (27), der mit der Welle (12) verbunden ist, sowie eine Vorspannfeder (26) aufweist, die an einem Ende mit dem Arm (27) und am anderen Ende mit dem Deckel (3) verbunden ist. 25
8. Behälter nach Anspruch 7, wobei eine Teleskopführung (28, 29) vorgesehen ist, um die die Vorspannfeder (26) aufgesetzt ist, wobei die Teleskopführung (28, 29) der Vorspannfeder (26) Stabilität verleiht. 30
9. Behälter nach einem der vorstehenden Ansprüche, wobei die Steuereinrichtung (16) einen Sensor (17) zum Aktivieren des Elektromotors (14) aufweist, wobei der Sensor (17) auf der Außenseite des Deckels (3) vorgesehen ist. 35
10. Behälter nach Anspruch 9, wobei der Sensor (17) zum Detektieren der Bewegung und/oder des Vorhandenseins eines Objekts, einer Hand u. ä. auf der Außenseite in Verbindung mit dem Öffnen des Deckels (3) vorgesehen ist. 40
11. Behälter nach Anspruch 9 oder 10, wobei ein Sensor (18) auf der Innenseite des Deckels (3) zum Detektieren der Bewegung und/oder des Vorhandenseins eines Objekts, einer Hand u. ä. auf der Innenseite des Deckels (3) vorgesehen ist, um die Schließbewegung des Deckels (3) zu verhindern, wenn ein solches Objekt, eine solche Hand u. ä. detektiert wird. 45

Patentansprüche

1. Behälter, der aufweist: einen Behälterkörper (1) mit einer Einlageöffnung, einen Deckel (3) zum Verschießen und alternativen Freilegen der Öffnung sowie eine elektrische Steuerung (16) zum Bewegen des Deckels (3) zwischen einer geschlossenen Position und einer offenen Position, wobei die elektrische Steuerung (16) einen Elektromotor (14), ein Getriebe (13), eine Stromquelle (15) und eine Steuereinrichtung (16) aufweist, **dadurch gekennzeichnet, daß** der Elektromotor (14) und das Getriebe (13) am Deckel (3) angeordnet sind. 50
2. Behälter nach Anspruch 1, wobei die Stromquelle (15) am Deckel (3) angeordnet ist. 55

12. Behälter nach einem der vorstehenden Ansprüche, wobei der Deckel (3) in einer Kappe (2) untergebracht ist, wobei die Kappe (2) auf dem Behälterkörper (1) plaziert sein kann.

Revendications

1. Récipient, comprenant un corps de récipient (1) avec une ouverture de dépôt, un couvercle (3) destiné à fermer et, en alternance, à exposer ladite ouverture, ainsi qu'une commande électrique (16) pour déplacer le couvercle (3) entre une position fermée et une position ouverte, laquelle commande électrique (16) comprend un moteur électrique (14), une transmission (13), une source électrique (15) et des moyens de commande (16), **caractérisé en ce que** le moteur électrique (14) et la transmission sont montés sur le couvercle (3). 10
2. Récipient selon la revendication 1, dans lequel la source électrique (15) est montée sur le couvercle (3). 15
3. Récipient selon la revendication 1 ou 2, dans lequel la transmission (13) interagit avec un arbre (12) qui ne peut pas être tourné par rapport au corps de récipient (1), sur lequel arbre (12) le couvercle (3) est monté de sorte qu'il puisse tourner. 20
4. Récipient selon la revendication 3, dans lequel la transmission (13) comporte un nombre de pignons (19 à 22, 30 à 32) qui produisent une réduction, de sorte que le pignon (19) qui produit la réduction la plus importante interagit avec l'arbre (12). 25
5. Récipient selon la revendication 3 ou 4, dans lequel la transmission (13) comporte deux poulies (24, 33) ainsi qu'un élément flexible (25) passant par-dessus les poulies (24, 33), lesquelles poulies (24, 33) produisent une réduction de sorte que la poulie (33) avec la vitesse la plus importante interagit avec l'arbre de moteur. 30
6. Récipient selon une des revendications précédentes, dans lequel des moyens de pré-tension (26 à 29) sont prévus pour exercer une force de pré-tension sur le couvercle (3), laquelle force de pré-tension agit pour forcer le couvercle (3) dans la position ouverte. 35
7. Récipient selon la revendication 6, en association avec une des revendications 3 à 5, dans lequel les moyens de pré-tension (26 à 29) comprennent un bras (27) qui est relié à l'arbre (12), ainsi qu'un ressort de pré-tension (26) qui, à une extrémité, est relié au bras (27) et, à l'autre extrémité, au couvercle (3). 40

8. Récipient selon la revendication 7, dans lequel un guide télescopique (28, 29) est prévu, autour duquel le ressort de pré-tension (26) est installé, ledit guide télescopique (28, 29) fournissant une stabilité audit ressort de pré-tension (26). 45

9. Récipient selon l'une des revendications précédentes, dans lequel les moyens de commande (16) comprennent un capteur (17) pour activer le moteur électrique (14), lequel capteur (17) est prévu sur l'extérieur du couvercle (3). 50
10. Récipient selon la revendication 9, dans lequel ledit capteur (17) est prévu pour détecter le mouvement et/ou la présence d'un objet, d'une main et analogue sur l'extérieur en association avec l'ouverture le couvercle (3). 55
11. Récipient selon la revendication 9 ou 10, dans lequel un capteur (18) est prévu sur l'intérieur du couvercle (3) pour détecter le mouvement et/ou la présence d'un objet, d'une main et analogue sur l'intérieur du couvercle (3), pour empêcher le mouvement de fermeture du couvercle (3) lorsqu'un tel objet, une telle main et analogue est détecté.
12. Récipient selon l'une des revendications précédentes, dans lequel le couvercle (3) est logé dans un chapeau (2), lequel chapeau (2) peut être placé sur le corps de récipient (1).

Fig 1

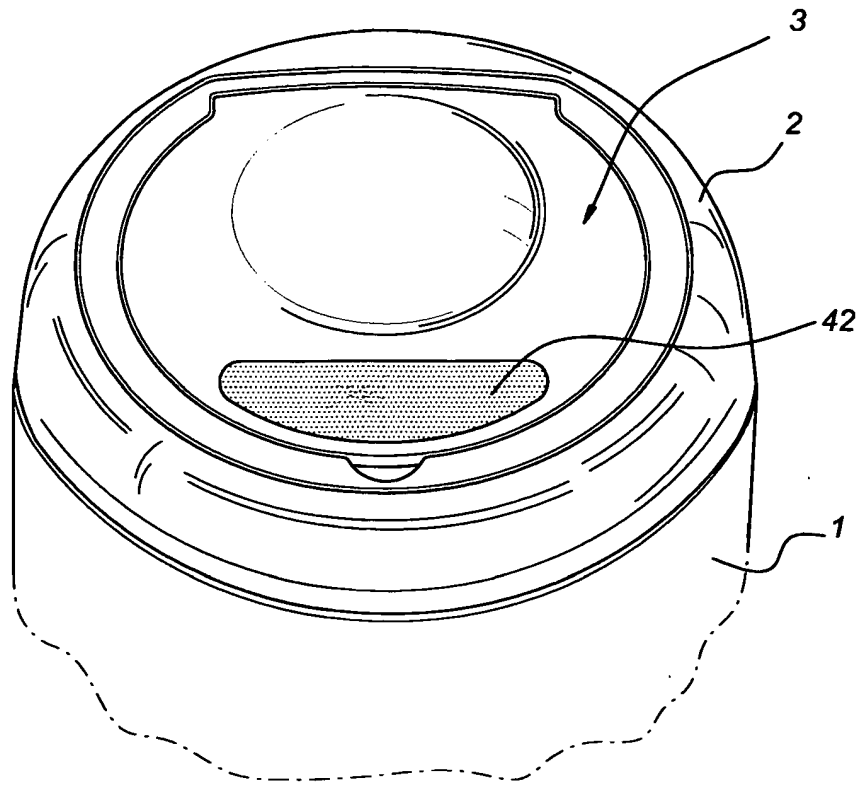


Fig 2

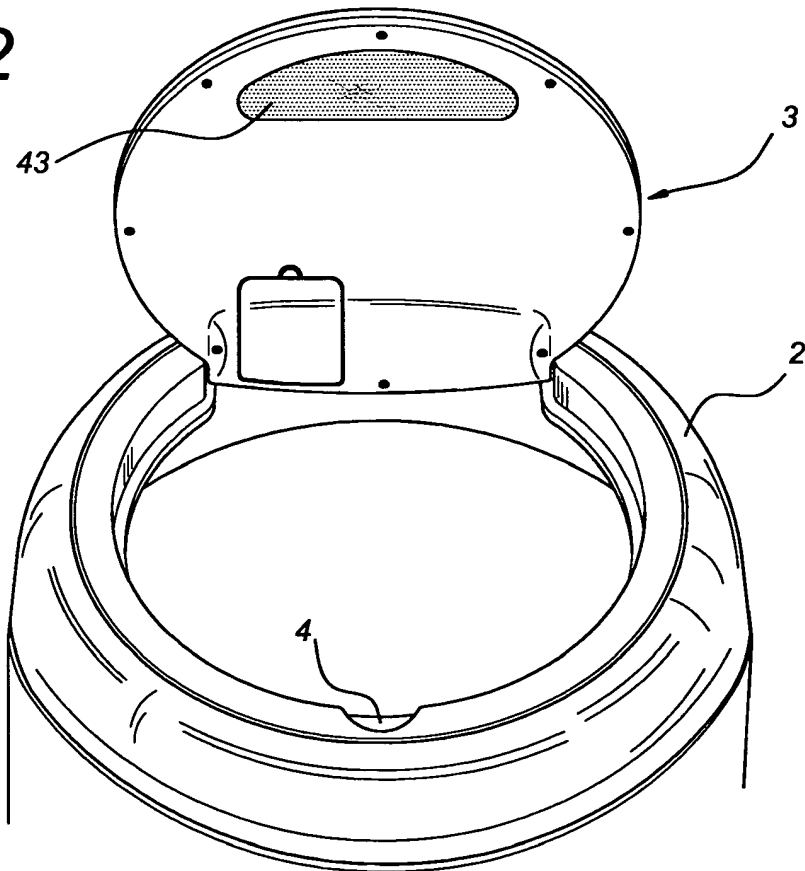


Fig 3

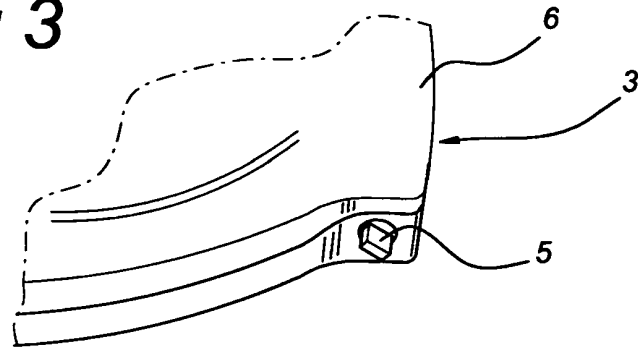


Fig 4

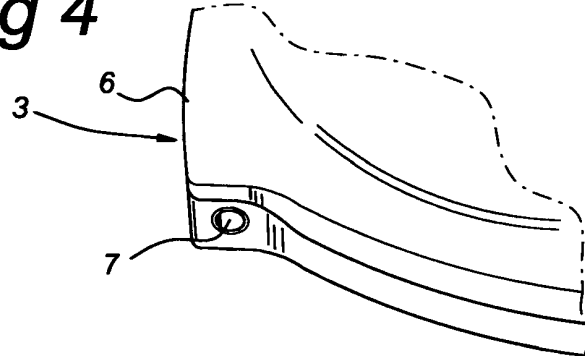


Fig 5

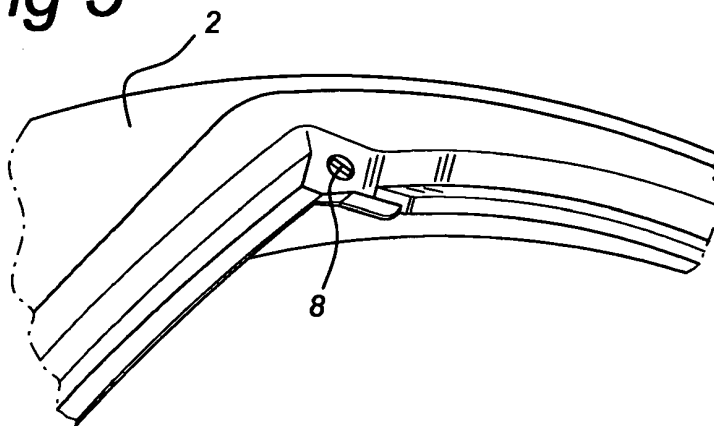


Fig 6

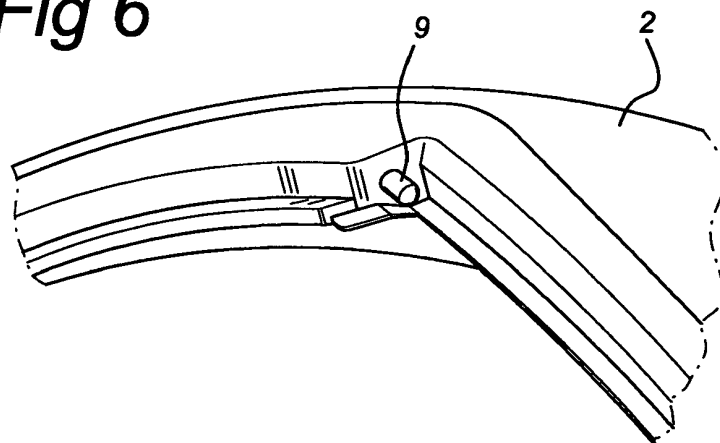
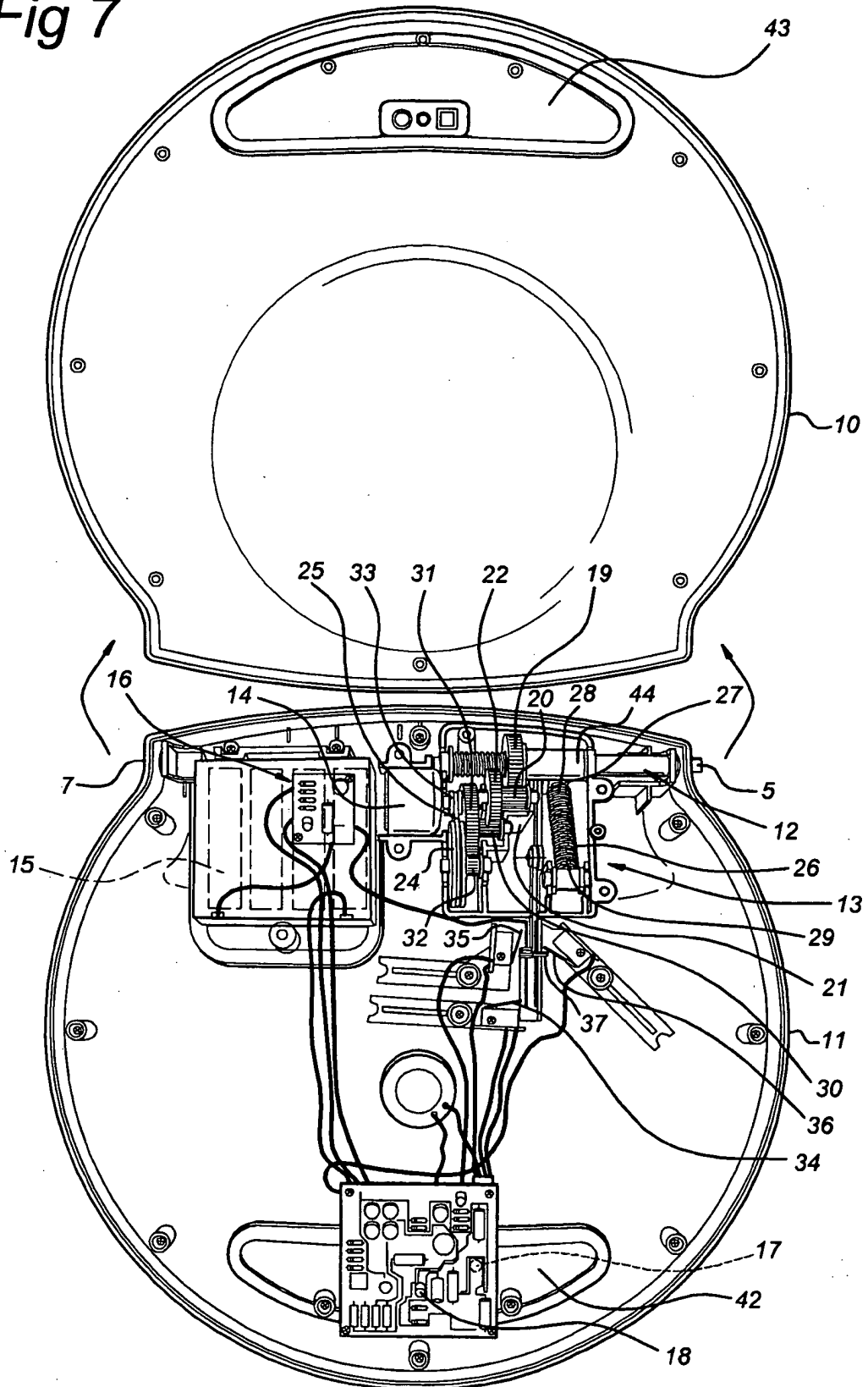
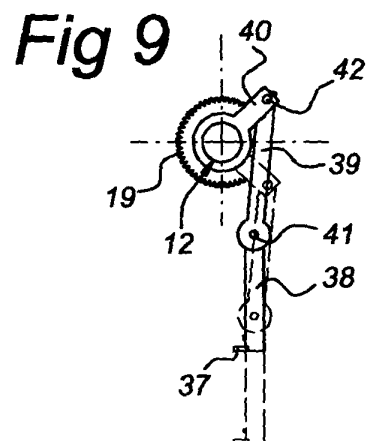
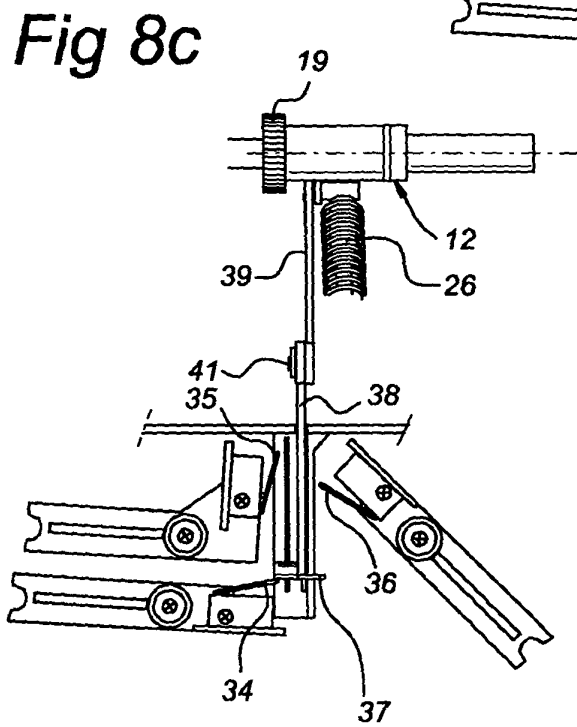
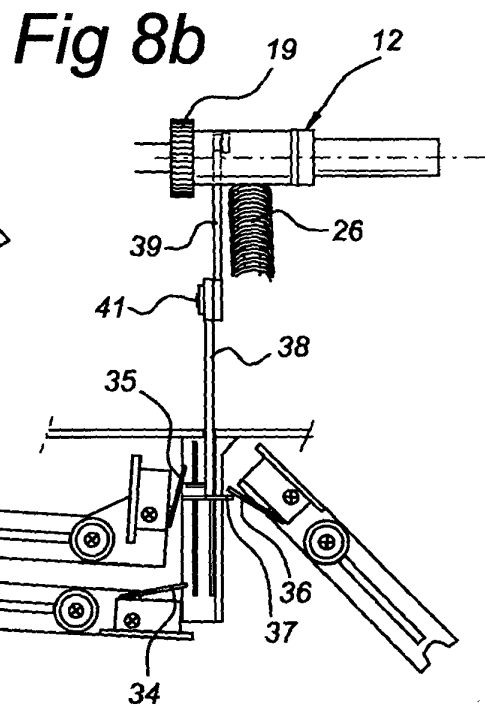
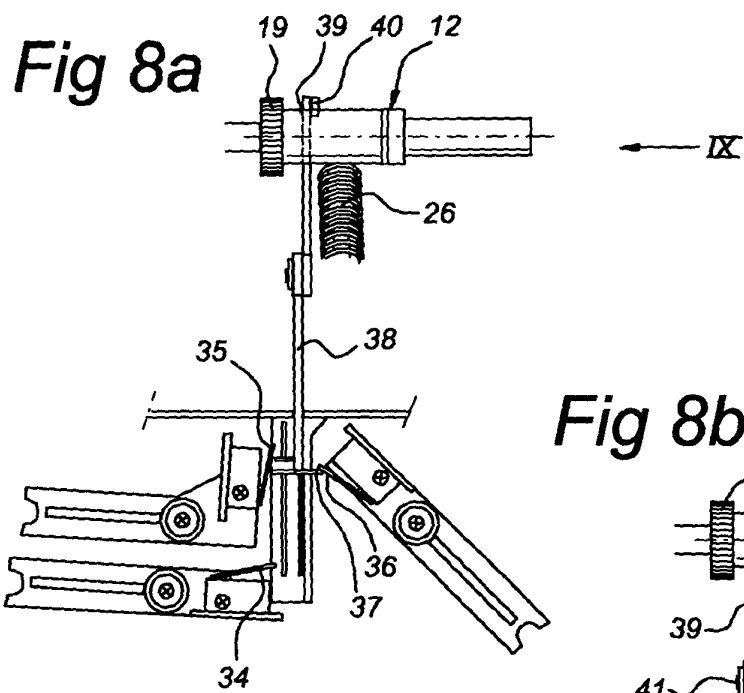


Fig 7





REFERENCES CITED IN THE DESCRIPTION

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