(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 325 423 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
09.01.2013 Bulletin 2013/02

(51) Int Cl.:
E05B 65/20 *(2006.01)*

(21) Application number: **09176562.8**

(22) Date of filing: **19.11.2009**

(54) **Luggage compartment locking mechanism with a handle operable in unloaded state**

Schließmechanismus für Gepäckfach mit in unbeladenem Zustand bedienbarem Griff

Mécanisme de verrouillage de compartiment à valises doté d'une poignée pouvant être manipulée à l'état déchargé

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

(43) Date of publication of application:
25.05.2011 Bulletin 2011/21

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EP 2 325 423 B1

Printed by Jouve, 75001 PARIS (FR)

Description

Technical Field of the Invention

[0001] The present invention relates to a locking system operating a plurality of luggage compartment flap locks in buses.

Background of the Invention

[0002] Devices for operating a plurality of luggage compartment flap locks in buses are known in the art. Those devices are designed in the manner to operate a plurality of locks at the same and to enable access to operate the mechanism from inside the compartment. This is desired as such compartments provide sleeping space for drivers.

[0003] There are a number of patents/patent applications in the present field. Among others, EP 1 950 367 A1, which is a European patent application of the present applicant, disclosing a similar locking mechanism in terms of the final elements such as the connection lever and the main rotary driver is of relevance.

[0004] The locking device according to the present invention provides an improved locking feature such that upon locking said mechanism, the outer handle is still operable so that a user may operate the handle by pushing the same without any interference with the locking mechanism. This may especially be advantageous when a user unintentionally attempts to force the handle for opening the luggage compartment. A handle displaceable but inactive in terms of driving the locking/unlocking mechanism prevents the user from exerting an unproportionate force with the expectation to open the compartment as the handle which is displacing much smoother in unloaded state will let him/her notice that the compartment is locked and reduce the pressure at his/her hand.

[0005] The locking device according to the present invention is also suitable for operating up to six locks from inside and outside the compartment. It therefore provides a flexible locking mechanism adaptable to a variety of configurations required by different bus models.

Objects of the Invention

[0006] Primary object of the present invention is to provide a luggage compartment locking mechanism having a handle operable without any interference with the locking mechanism, i.e. displaceable but inactive in terms of driving the locking/unlocking mechanism.

[0007] Another object of the present invention is to provide a luggage compartment locking mechanism suitable for operating up to six locks from inside and outside the compartment respectively, ensuring a flexible locking mechanism adaptable to a variety of configurations required by different bus models.

[0008] Another object of the present invention is to provide a luggage compartment locking mechanism in which an easily mountable inner handle structure capable of directly driving means for unlocking flap locks is used.

Summary of the Invention

[0009] The present invention proposes locking mechanism body with a housing having a recess within which a front handle body extends in a manner to be rotatable to lock and unlock said locking mechanism. A transmission element extending to the rear side of said front handle body is joined to the front handle body so as to slidably drive a rear side actuator element on a guiding body, the actuator element being connected to a main rotary driver by means of a connection lever. Said main rotary driver is rotated by said connecting lever against the force of a restoring spring. It is connected to a plurality of flap locks. Said actuation member, on the other hand, drives a plurality of auxiliary drivers by means of connections rods, which are in turn operating flap locks.

Brief Description of the Figures

[0010] Accompanying drawings are given solely for the purpose of exemplifying a luggage compartment locking system whose advantages over prior art were outlined above and will be explained in detail hereinafter:

Fig. 1 demonstrates a perspective view of the locking mechanism body with the front handle body (14) being dismantled.

Fig. 2 demonstrates perspective view of the individual elements constituting the rear side mechanism of said locking mechanism according to the present invention.

Fig. 3 demonstrates perspective view of the rear-side locking mechanism according to the present invention.

Fig. 4 demonstrates perspective view of the rear-side locking mechanism with the inner handle according to the present invention.

Fig. 5 demonstrates the locking mechanism according to the present invention with connection rods, auxiliary drivers and flap locks.

Detailed Description of the Invention

[0011] Referring now to the figures outlined above, the present invention proposes a locking mechanism body (11) on a housing (30) having a recess (13) within which a front handle body (14) extends in a manner to be rotatably movable around an axle (40). Said front handle body (14) can be rotated around said axle (40) by way of manually pushing any of the two planar regions (50)

extending around a reflector portion (60). Said front handle body (14) automatically restores its original position upon release by means of a spring arrangement (not shown) provided in association with said axle (40).

[0012] A transmission element (23) extending to the rear side of said front handle body (14) is joined to the front handle body (14) so as to drive a rear side actuation mechanism as explained below. Said transmission element (23) is pivotally coupled to the rotatable front plate (14) through a spring element (not shown) such that while pushing the upper planar region (50a) inwardly displaces said transmission element (23) in the downward direction, pushing the lower planar region (50b) has no effect on the same as its displacement is prevented by a longitudinal lock guide (15).

[0013] Said longitudinal lock guide (15) is arranged such that it longitudinally displaces to enable said transmission element's (23) tip bear against a retaining means (17) Said retaining means (17) is designed to be a tubular T-form body (Fig. 2) telescopically engaging with a tubular-form actuator guiding body (18). Longitudinal displacement of said longitudinal lock guide (15) in linear directions A-B as in Fig. 2 provides rotation of said tubular-form actuator guiding body (18) around its longitudinal axis as its upper circumferential area (19) has threads engaging with inner threads of a closed region (20) of said longitudinal lock guide (15). Rotation of said tubular-form actuator guiding body (18) also rotates said tubular T-form body (17) upon which said retaining tips (17) rotates to bear against said transmission element (23) or releases movement of said transmission element (23). Lower arrows in Fig. 2 illustrate rotation of said retaining means (17).

[0014] When said tubular T-form body (17) is aligned to face said transmission element (23), displacement of said transmission element (23) moves an elevator element (21) which is guided on said tubular-form actuator guiding body (18). Said elevator element (21) being pivotally connected to an actuator lever (22) therefore rotates the main rotary driver (24) itself around the rotation axis (25) of said actuator (24).

[0015] Said main rotary driver (18) according to the present invention, can either be rotated by said actuation lever (22) or by an inner handle (23) as shown in Fig 4.

[0016] Connection slots (26) being placed around both sides of said main rotary driver (24) are used for connection with flap locks (27). Said main rotary driver (18) is therefore connected to a plurality of flap locks (27) by means of connections rods (28).

[0017] Said main rotary driver (18) is rotated by said connecting lever (22) against the force of a helical restoring spring (not shown) set up on the axis of said main rotary driver (18).

[0018] Said connection lever (22) comprises additional slots (29) for connection to auxiliary driver mechanisms (30) via vertical connection rods (31).

[0019] Said longitudinal lock guide (15) according to the present invention can also be displaced by means of a key inserted into the keyhole. Rotation of a keyhole device (32) moves said longitudinal lock guide (15) longitudinally back and forth by way of a keyhole device rear protrusion (33) being disposed in a cavity (34) of said longitudinal lock guide (15) as indicated in Fig. 2.

[0020] In a nutshell said luggage compartment locking mechanism (11) operates a plurality of flap locks (27). It comprises a housing (30) having a front handle body (14) associated with a transmission element (23) mechanically joined to said front handle body (14) to transmit displacement of said front handle (14) to a rear-side actuating mechanism comprising a rotary driver (24) driving a plurality of connection rods (28) associated with said flap locks (27). Said rear-side actuation mechanism comprises a longitudinal lock guide (15) displacing to selectively enable a retaining means (17) associated with an actuator guiding body (18) bear against said transmission element's (23) tip portion to drive said rotary driver (24) whereby said transmission element's (23) tip portion is allowed movement when said retaining means (17) is not aligned to bear against tip portion.

Claims

1. A locking mechanism (11) for luggage compartments of buses for operating a plurality of flap locks (27) comprising a housing (30) having a front handle body (14) associated with a transmission element (23) mechanically joined to said front handle body (14) to transmit displacement of said front handle (14) to a rear-side actuating mechanism comprising a rotary driver (24) driving a plurality of connection rods (28) associated with said flap locks (27) **characterized in that** said rear-side actuation mechanism comprises a longitudinal lock guide (15) displacing to selectively enable a retaining means (17) associated with an actuator guiding body (18) bear against said transmission element's (23) tip portion to drive said rotary driver (24) whereby said transmission element's (23) tip portion is allowed movement when said retaining means (17) is not aligned to bear against tip portion.

2. A locking mechanism (11) as set forth in Claim 1 wherein an elevator element (21) is slidably moved on said actuator guiding body (18) by said transmission element (23), said elevator element (21) being connected to an actuator lever (22) therefore rotating said main rotary driver (24).

3. A locking mechanism (11) as set forth in Claim 2 wherein said connection lever (22) comprises additional slots (29) for connection to auxiliary driver mechanisms (30) via connection rods (31).

4. A locking mechanism (11) as set forth in Claim 3 wherein said longitudinal lock guide (15) comprises

a closed region (20) having inner threads in communication with threads of an upper circumferential area (19) of said actuator guiding body (18) whereby linear displacement of said longitudinal lock guide (15) provides rotation of said actuator guiding body (18) around its longitudinal axis.

5. A locking mechanism (11) as set forth in any of the Claims 2 to 4 wherein said main rotary driver (24) is rotated by said connecting lever (22) against the force of a restoring spring.

6. A locking mechanism (11) as set forth in any of the preceding Claims wherein said rear-side actuation mechanism further comprises an inner handle (23) coaxially coupled to the main driver (24).

7. A locking mechanism (11) as set forth in Claim 1 wherein said main driver (24), comprises slots (26) for connection with connection rods (28).

8. A locking mechanism (11) as set forth in any of the preceding Claims wherein said mechanism (11) comprises a keyhole device (32) by which said longitudinal lock guide (15) is longitudinally movable back and forth by way of a keyhole device rear protrusion (33) being disposed in a cavity (34) of said longitudinal lock guide (15).

Patentansprüche

1. Verschlussmechanismus (11) für Gepäckfächer von Bussen zum Betätigen einer Mehrzahl von Klappenverschlüssen (27), umfassend ein Gehäuse (30) mit einem vorderseitigen Griffkörper (14), verbunden mit einem Übertragungselement (23), das mechanisch mit dem vorderseitigen Griffkörper (14) verbunden ist, um eine Versetzung des vorderen Griffs (14) zu einem rückseitigen Betätigungsmechanismus, umfassend einen drehbaren Mitnehmer (24), der eine Mehrzahl von Verbindungsstangen (28) antreibt, die mit den Klappenverschlüssen (27) verbunden sind, **dadurch gekennzeichnet, dass** der rückseitige Betätigungsmechanismus eine in Längsrichtung verlaufende Verschlussführung (15) umfasst, die sich versetzt, um selektiv ein Rückhaltemittel (17), das mit einem Betätigungselement-Führungskörper (18) verbunden ist, zu befähigen, gegen den Spitzenabschnitt des Übertragungselements (23) zu drükken, um den drehbaren Mitnehmer (24) anzutreiben, wodurch dem Spitzenabschnitt des Übertragungselements (23) eine Bewegung gestattet wird, wenn die Rückhaltemittel (17) nicht so ausgerichtet sind, dass sie gegen den Spitzenabschnitt drücken.

2. Ein Verschlussmechanismus (11) nach Anspruch 1, bei dem ein Hebeelement (21) durch das Übertragungselement (23) gleitend auf dem Betätigungselement-Führungskörper (18) bewegt wird, wobei das Hebeelement (21) mit einem Betätigungshebel (22) verbunden ist, weshalb der drehbare Hauptmitnehmer (24) gedreht wird.

3. Ein Verschlussmechanismus (11) nach Anspruch 2, bei dem der Verbindungshebel (22) zusätzliche Schlitze (29) zur Verbindung mit Hilfsmitnehmermechanismen (30) über Verbindungsstangen (31) umfasst.

4. Ein Verschlussmechanismus (11) nach Anspruch 3, bei dem die in Längsrichtung verlaufende Verschlussführung (15) einen geschlossenen Bereich (20) mit Innengewinde in Kommunikation mit Gewinde eines oberen Umfangsbereichs (19) des Betätigungselement-Führungskörpers (18) umfasst, wodurch eine lineare Versetzung der in Längsrichtung verlaufenden Verschlussführung (15) eine Drehung des Betätigungselement-Führungskörpers (18) um seine Längsachse bereitstellt.

5. Ein Verschlussmechanismus (11) nach einem der Ansprüche 2 bis 4, bei dem der drehbare Hauptmitnehmer (24) durch den Verbindungshebel (22) gegen die Kraft einer Rückstellfeder gedreht wird.

6. Ein Verschlussmechanismus (11) nach einem der vorhergehenden Ansprüche, bei dem der rückseitige Betätigungsmechanismus ferner einen inneren Griff (23) umfasst, der koaxial mit dem Hauptmitnehmer (24) verbunden ist.

7. Ein Verschlussmechanismus (11) nach Anspruch 1, bei dem der Hauptmitnehmer (24) Schlitze (26) zur Verbindung mit den Verbindungsstangen (28) umfasst.

8. Ein Verschlussmechanismus (11) nach einem der vorhergehenden Ansprüche, bei dem der Mechanismus (11) eine Schlüssellocheinrichtung (32) umfasst, durch die die in Längsrichtung verlaufende Verschlussführung (15) über einen hinteren Vorsprung (33) der Schlüssellocheinrichtung, der in einer Ausnehmung (34) der in Längsrichtung verlaufenden Verschlussführung (15) angeordnet ist, in Längsrichtung vor und zurück bewegbar ist.

Revendications

1. Mécanisme de verrouillage (11) pour les compartiments à bagages de bus destiné à faire fonctionner une pluralité de verrous de battant (27) comprenant un boîtier (30) ayant un corps de poignée avant (14) associé à un élément de transmission (23) relié mécaniquement audit corps de poignée avant (14) pour

transmettre le déplacement de ladite poignée avant (14) à un mécanisme d'actionnement du côté arrière comprenant un organe d'entraînement rotatif (24) entrainant une pluralité de tiges de connexion (28) associées auxdits verrous de battant (27), **caractérisé en ce que** ledit mécanisme d'actionnement du côté arrière comprend une glissière de verrouillage longitudinale (15) se déplaçant pour permettre de manière sélective à des moyens de retenue (17) associés à un corps de guidage d'actionneur (18) de venir en appui contre ladite partie d'extrémité de l'élément de transmission (23) pour entraîner ledit organe d'entraînement rotatif (24) de sorte que ladite partie d'extrémité de l'élément de transmission (23) est autorisée à bouger lorsque lesdits moyens de retenue (17) ne sont pas alignés pour venir en appui contre la partie d'extrémité.

2. Mécanisme de verrouillage (11) selon la revendication 1, dans lequel un élément élévateur (21) est déplacé de façon coulissante sur ledit corps de guidage d'actionneur (18) par ledit élément de transmission (23), ledit élément élévateur (21) étant relié à un levier d'actionnement (22) de manière à faire tourner ledit organe d'entraînement rotatif principal (24).

3. Mécanisme de verrouillage (11) selon la revendication 2, dans lequel ledit levier de connexion (22) comprend des fentes supplémentaires (29) en vue de la connexion à des mécanismes entraînement auxiliaires (30) via des tiges de connexion (31).

4. Mécanisme de verrouillage (11) selon la revendication 3, dans lequel ladite glissière de verrouillage longitudinale (15) comprend une région fermée (20) ayant des filetages intérieurs en communication avec des filetages d'une zone circonférentielle supérieure (19) dudit corps de guidage d'actionneur (18) de sorte que le déplacement linéaire de ladite glissière de verrouillage longitudinale (15) engendre la rotation dudit corps de guidage d'actionneur (18) autour de son axe longitudinal.

5. Mécanisme de verrouillage (11) selon l'une quelconque des revendications 2 à 4, dans lequel ledit organe d'entraînement rotatif principal (24) est mis en rotation par ledit levier de connexion (22) contre la force d'un ressort de rappel.

6. Mécanisme de verrouillage (11) selon l'une quelconque des revendications précédentes, dans lequel ledit mécanisme d'actionnement du côté arrière comprend en outre une poignée intérieure (23) couplée de manière coaxiale à l'organe d'entraînement principal (24).

7. Mécanisme de verrouillage (11) selon la revendication 1, dans lequel ledit organe d'entraînement principal (24), comprend des fentes (26) pour la connexion avec les tiges de connexion (28).

8. Mécanisme de verrouillage (11) selon l'une quelconque des revendications précédentes, dans lequel ledit mécanisme (11) comprend un dispositif de trou de serrure (32) par lequel ladite glissière de verrouillage longitudinale (15) est déplaçable longitudinalement d'avant en arrière par l'intermédiaire d'une saillie arrière du dispositif de trou de serrure (33) étant disposée dans une cavité (34) de ladite glissière de verrouillage longitudinale (15).

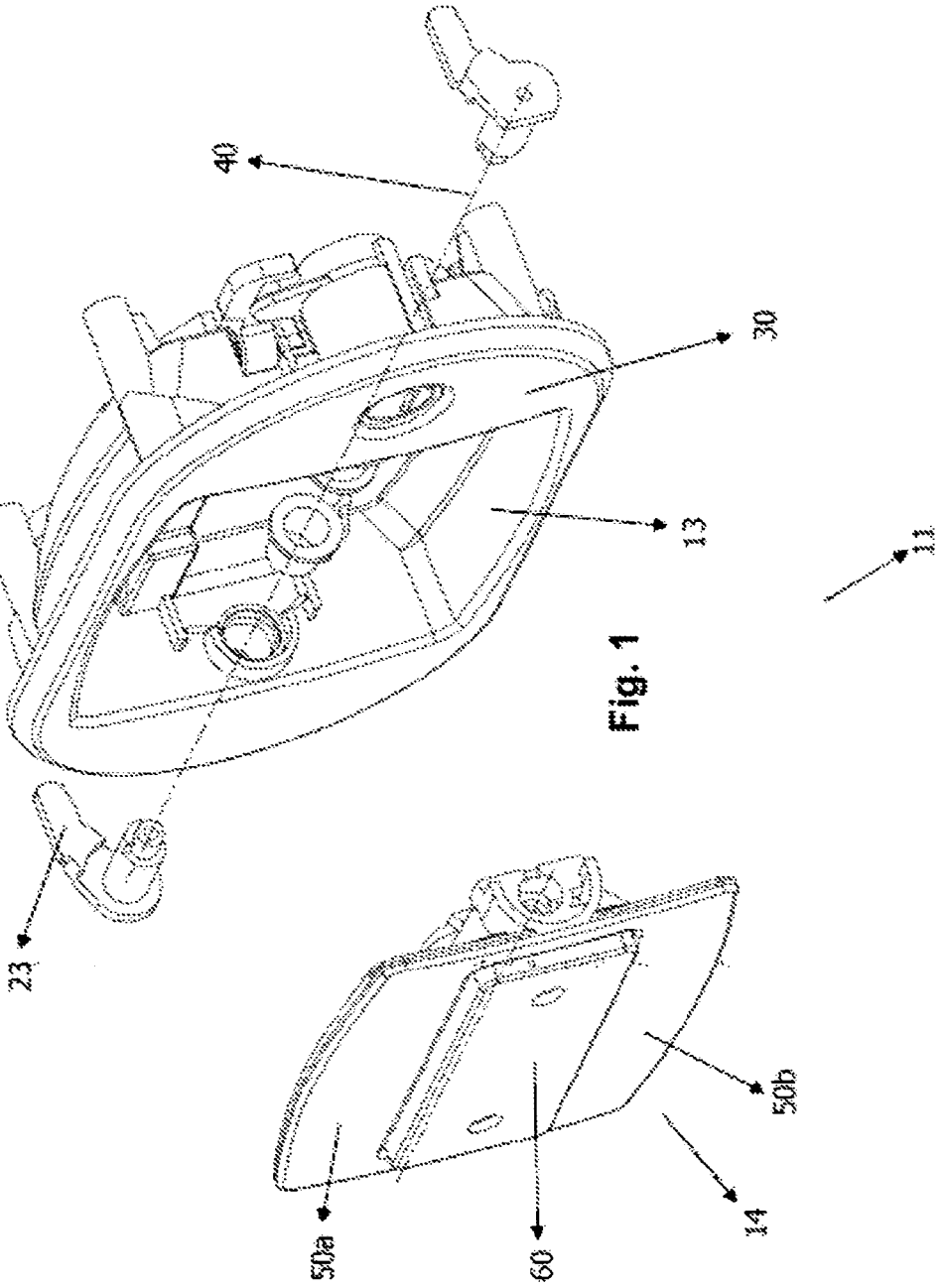

Fig. 1

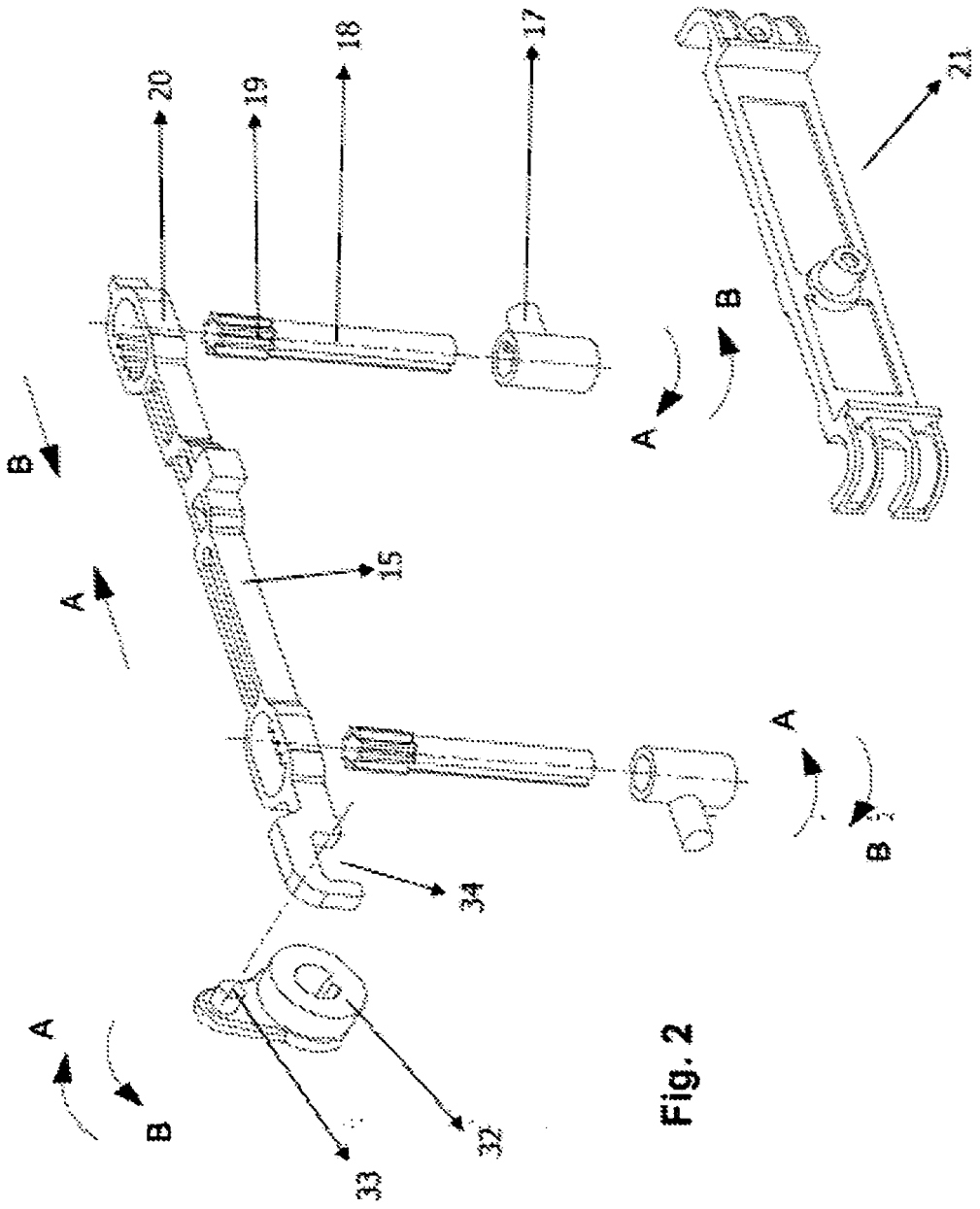

Fig. 2

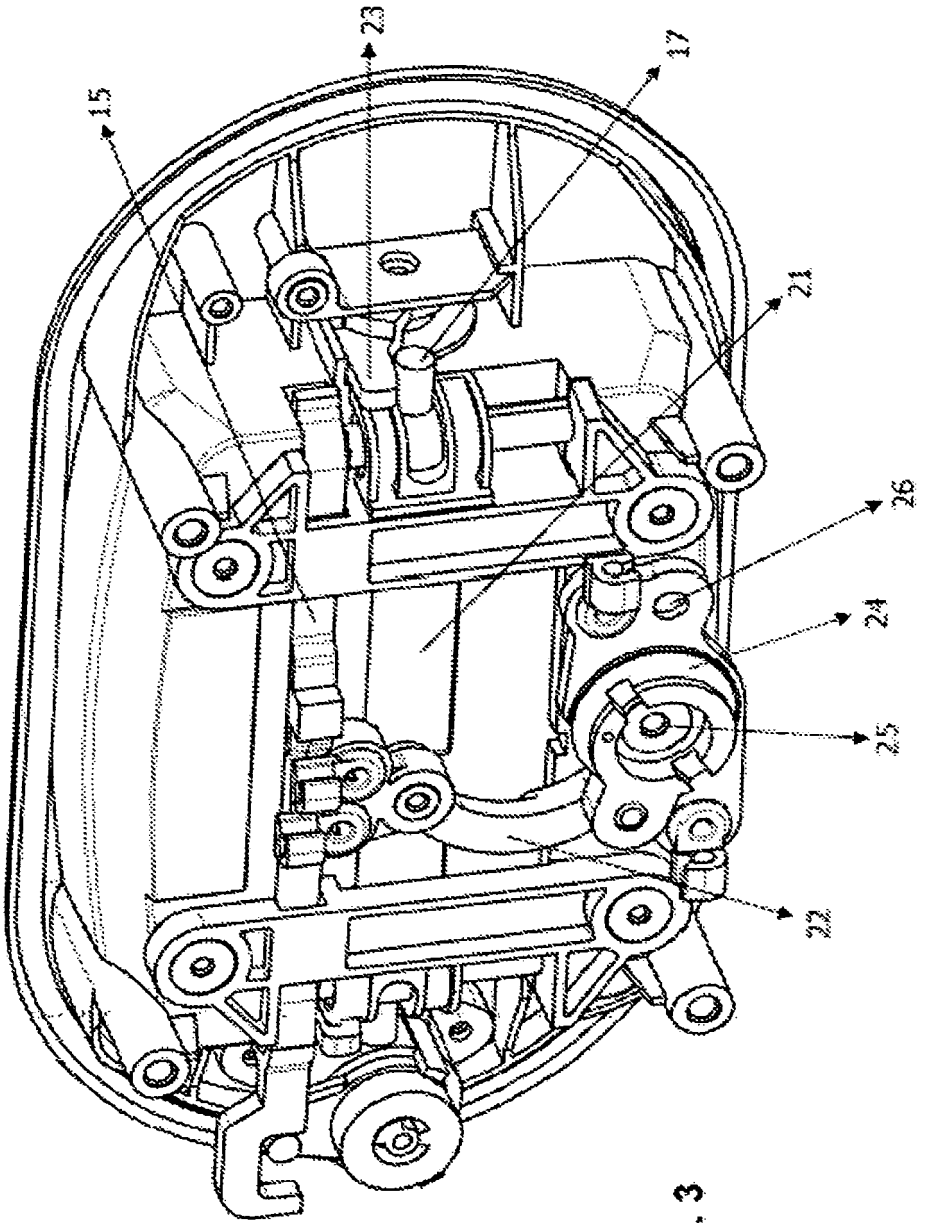

Fig. 3

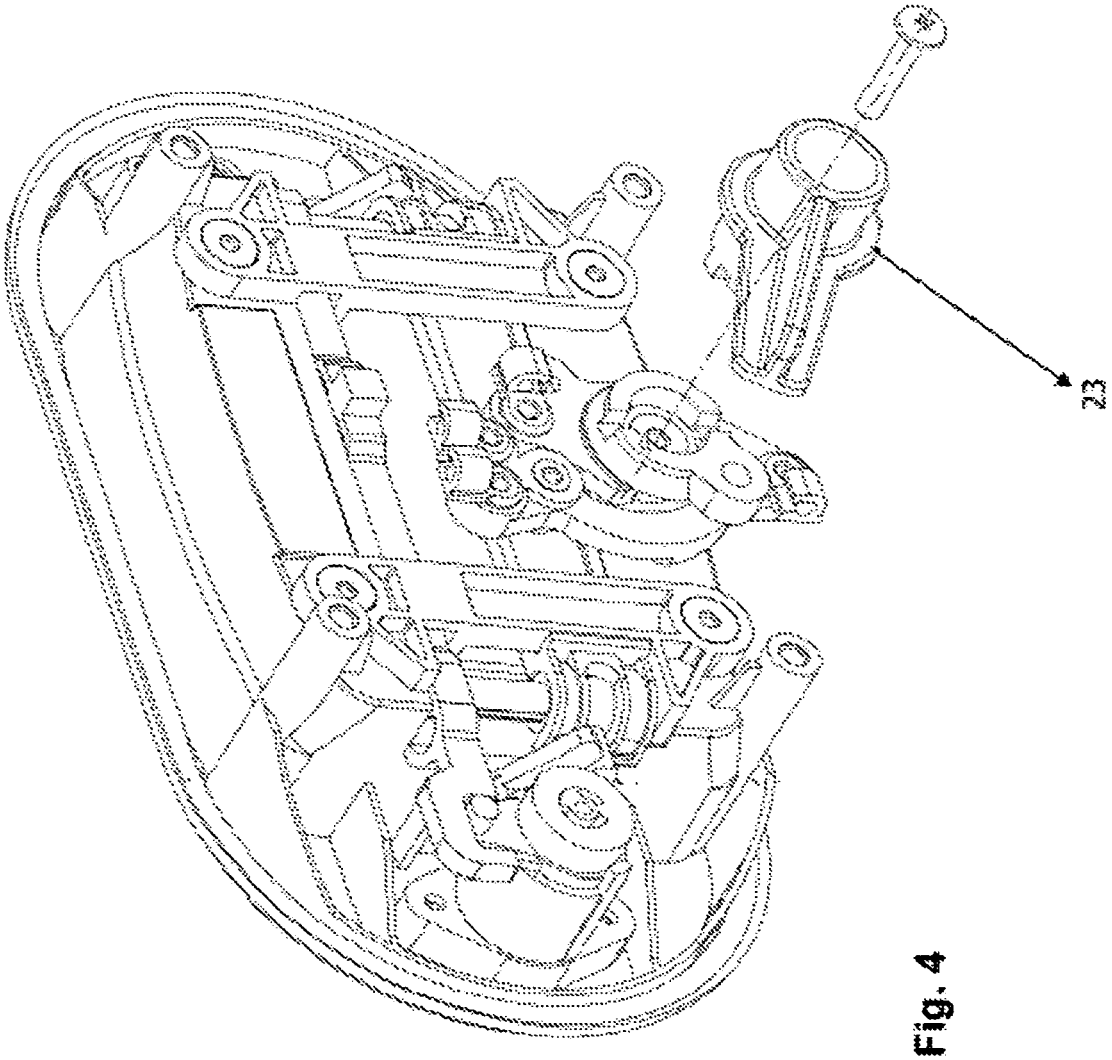

Fig. 4

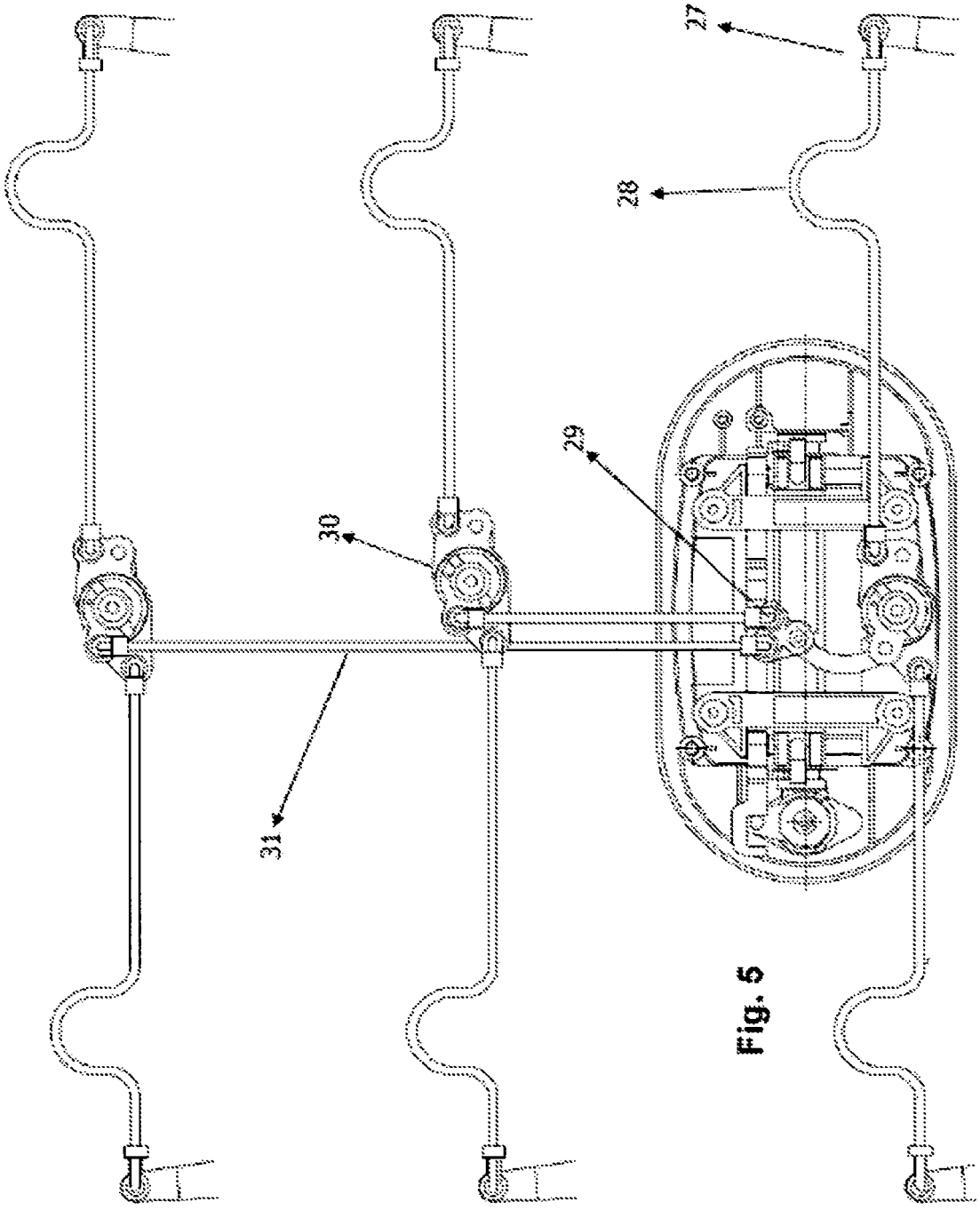

Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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