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(54) **A COOLING DEVICE**

(57) The present invention proposes a cooling device (10) having a cabinet (11) with heat-sealed closed walls (12) configured to form a compartment and a drawer assembly (20), said drawer assembly (20) comprising; a first rail unit (30) and a second rail unit (31) mounted on an interior surface of the cabinet (11) of the cooling device (10) and being opposite to each other; a first gear (40) configured to rotate throughout a first rack (42) and being adjacent to a first elongated connection part (54) provided in the first rail unit (30); a second gear (41) configured

to rotate throughout a second rack (43) and being adjacent to a second elongated connection part (55) provided in the second rail unit (31); a shaft (50) which interconnects said first gear (40) and second gear (41) for transmitting the movement to each other. Said drawer assembly (20) further comprises at least one locking member (60) which is adapted to be movable along said shaft (50) for providing the fixation of the shaft (50) with one of the first gear (40) and/or the second gear (41).

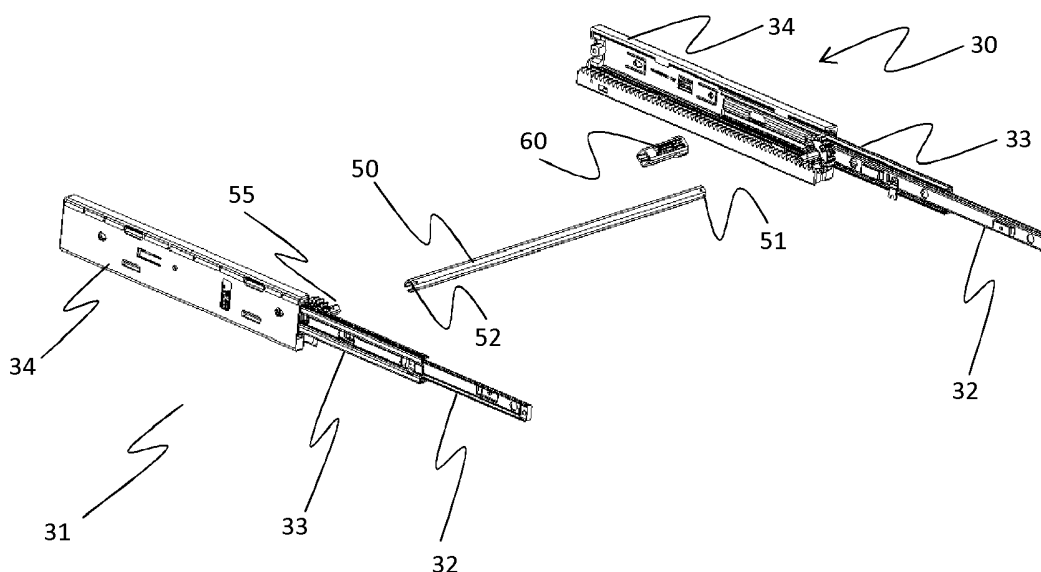


Fig.6

Description

Technical Field of the Invention

[0001] The present invention relates to a cooling device having a drawer assembly, enabling a snap-fit connection between a shaft and a gear.

Background of the Invention

[0002] There exist various types of cooling devices in the market. Each of the cooling devices includes a pullout drawer, especially for a freezer compartment. Pull-out drawers are designed to be wide in order to maximize the volume of the storage space. In bottom mount cooling devices, pull out drawers are used frequently for enhancing the accessibility of items stored in the lower compartment of the cooling device cabinet.

[0003] These drawers are generally mounted on the slides fastened to the inner surface of the walls of the cooling devices and move along the longitudinal axis of said slides. During the pushing and pulling of the drawers, slides extend horizontally towards the opening or closing direction of the drawers. One of the problems of the wide drawers is misalignment of the drawer assembly. In some cases, slides may not extend at the same length/distance and at the same speed; thereby resulting in the wobbling of the drawers. For instance, if the drawer is pushed or pulled from one side, instead of applying a force to the center, the other side tends to stay in its remaining position. This causes instability of the drawers and results in impractical use.

[0004] Rack and gear systems in the drawer assembly are provided for enabling the movement of the slide assemblies and drawers at the same speed and at the same distance/length. The gear rotates along the rack as the drawer extends out of the cabinet and stays within the cabinet. The movement of the drawer is thus synchronized by the rack and gear system attached on the slide assemblies by a shaft.

[0005] In conventional rack-gear systems, the shaft is fixed to the gear by a tool such as screws. Such an installation method may be difficult and takes too much time for the user and may damage the adjacent sections while assembling and disassembling. In addition to this, it is a fact that, support arrangement including a shaft reduces the usable volume of the compartment for some items. In such cases, the user prefers to use a rack and gear system without any shaft for increasing the inner volume of the drawer; however, it may be too complicated to disassemble the shaft.

[0006] At this point, there is a need for a simple and reliable support arrangement of the rack and gear systems which eliminates the requirement of a tool during assembling and disassembling the shaft in the rack and gear system, while keeping the alignment of the drawer assembly.

[0007] The document US2010219727 discloses a syn-

chronizing device for use with a pair of drawer slide assemblies where each drawer slide assembly has at least a first slide member moveable relative to a second slide member, and includes a first stabilization element configured to be coupled to the second slide member of one of the slide assemblies, and a second stabilization element configured to be coupled to the second slide member of the other slide assembly. A linking element extends transverse to an extension direction of the slide assemblies and synchronizes movements of the first slide members of the slide assemblies.

[0008] The invention provides an additional improvement, an additional advantage or an alternative to the prior art.

Summary of the Invention

[0009] The present invention proposes a cooling device having a cabinet with heat sealed closed walls configured to form a compartment and a drawer assembly. Said drawer assembly comprises a first rail unit and a second rail unit mounted on an interior surface of the cabinet of the cooling device and being opposite to each other; a first gear configured to rotate throughout a first rack, a second gear configured to rotate throughout a second rack, a shaft which interconnects said first gear and second gear for transmitting the movement to each other. said drawer assembly further comprises at least one locking member which is adapted to be movable along said shaft for providing the fixation of the shaft with one of the first gear and/or the second gear. Said locking member enables a snap-fit connection between the shaft and gears; thereby providing a simple and quick method for assembling and disassembling of the shaft.

[0010] In a possible embodiment of the invention, the compartment is a freezer compartment. In a possible embodiment of the invention, the interior surface of the cabinet is an interior surface of the freezer compartment. In a possible embodiment of the invention, the first rail unit and the second rail unit are mounted on an interior surface of the freezer compartment of the cooling device and configured to be opposite to each other.

[0011] In a possible embodiment of the invention, the first gear is configured to be adjacent to a first elongated connection part provided in the first rail unit.

[0012] In a possible embodiment of the invention, the second gear is configured to be adjacent to a second elongated connection part provided in the second rail unit.

[0013] In a possible embodiment of the invention, the locking member is configured to engaged at least partly over the first elongated connection part. In a possible embodiment of the invention, the locking member is configured to engaged at least partly over the second elongated connection part.

[0014] In a possible embodiment, both of said first connection part and said second connection part have at least one aperture thereon and are adapted to be en-

gaged with said shaft having a locking aperture thereon. Thus, the user quickly recognizes the connection points and the time required for the installation is reduced.

[0015] In a possible embodiment, the locking member is shaped and dimensioned with respect to said shaft. Since, the locking member is arranged to be movable on the shaft and disposed to be in solid contact with said shaft; the size and shape of the locking member is important in ensuring a stable connection. By adjusting the shape and dimension of the locking member with respect to the shape and dimension of the shaft provides stability in the locking member performance and a secure connection thereof.

[0016] In a possible embodiment, said locking member includes a fixation portion at the inner surface of the locking member, providing a connection by an engagement with said locking aperture on the shaft. Thus, the necessity of the requirement of using any type of tool in assembling and disassembling is eliminated.

[0017] In a possible embodiment, said fixation portion has at least one protrusion which is shaped and dimensioned with respect to locking aperture on the shaft. Thus, the connection of the locking member to the first rail unit and the second rail unit is provided without using any tool such as screws.

[0018] In a possible embodiment, said locking member and connection part form a snap fit connection by the engagement of said fixation portion of the locking member and said locking aperture of the shaft. Thus, the user may easily and quickly assemble and disassemble the shaft to the rail units depending on the needs.

[0019] In a possible embodiment, at least one of the first connection part and the second connection part is partly engaged within the shaft. Thus, the connection of the shaft with the first gear and second gear is provided in a robust manner.

[0020] In a possible embodiment, said locking member comprises a tab which is protruded outwardly from said locking member for releasing the engagement of the locking member and the shaft. Thus, a practical way is obtained for disassembling the locking member and shaft manually without the need of any tool and more than one person.

[0021] In a possible embodiment, said locking member has at least one elongated slit provided in the proximity of said tab of the locking member. A wider space is provided by means of said at least one elongated slit resulting in an easy holding of the tab.

[0022] In a possible embodiment, said gear is a pinion gear having a plurality of teeth along the circumferential direction of said pinion gear.

[0023] In a possible embodiment, the first gear and the second gear are adapted to rotate throughout said first rack and second rack respectively. Thus, synchronization of the drawer assembly is provided.

[0024] In a possible embodiment, said first gear and second gear have a monolithic structure with said first connection part and second connection part respectively.

Thus, a durable structure is ensured by said monolithic form.

[0025] In a possible embodiment, said aperture on the first connection part and the second connection part has a polygonal cross-section, preferably a circular cross-section.

[0026] In a possible embodiment, said drawer assembly includes a first rail guide and a second rail guide adapted to extend along the longitudinal axis of the first rack and the second rack, and to be engaged with the first gear and a second gear providing the opening and closing said drawer assembly.

Brief Description of the Figures

[0027]

FIG.1 is a perspective view of a cooling device having a drawer assembly according to the present invention.

FIG.2 is a perspective view of a drawer assembly wherein the drawer is open according to the present invention.

FIG.3 is a perspective view of a freezer compartment of the cooling device wherein the drawer is retracted according to the present invention.

FIG.4 is a perspective view of a rack and gear system for the drawer assembly according to the present invention.

FIG.5 is an top view of a rack and gear system according to the present invention.

FIG.6 is an exploded view of a rack and gear system according to the present invention.

FIG.7 is an enlarged perspective view of a locking member mounted on a shaft according to the present invention.

FIG.8 is an enlarged perspective view showing the connection of a shaft and a gear according to the present invention.

FIG.9 is a perspective view of a rail unit having a gear and a shaft having a locking member being in a disassembled state according to the present invention.

FIG.10 is a perspective view of a rail unit in which a shaft and a gear are disassembled according to the present invention.

FIG.11 is a perspective view of a locking member being mounted on a shaft according to the present invention.

FIG.12 is a cross-section of a locking member being mounted on a shaft according to the present invention.

FIG. 13 is a cross-section of a locking member being engaged with a shaft according to the present invention.

FIG.14 is a perspective view of a shaft and a rail unit, wherein the shaft is engaged with a screw according to the prior art.

Detailed Description of the Invention

[0028] As shown in the Fig. 1 and Fig. 2, the present invention proposes a cooling device (10) having a mainly a drawer assembly (20) with a first rail unit (30) and a second rail unit (31). The cooling device (10) according to the present invention, includes a cabinet (11), compartments provided in the cabinet (11), and a freezer door (16) and a fridge compartment door (18) for opening and closing the compartments. The cooling device (10) mainly comprises a freezer compartment and a fridge compartment. A horizontal wall (13) divides the inner space of the cabinet (11) into the fridge compartment and freezer compartment.

[0029] The present invention proposes a cooling device (10) having a cabinet (11) with heat-sealed closed walls (12) configured to form a freezer compartment (14) and a drawer assembly (20), said drawer assembly (20) comprising; a first rail unit (30) and a second rail unit (31) mounted on an interior surface of the freezer compartment (14) of the cooling device (10) and being opposite to each other; a first gear (40) configured to rotate throughout a first rack (42) and being adjacent to a first elongated connection part (54) provided in the first rail unit (30); a second gear (41) configured to rotate throughout a second rack (43) and being adjacent to a second elongated connection part (55) provided in the second rail unit (31); a shaft (50) which interconnects said first gear (40) and second gear (41) for transmitting the movement to each other. Said drawer assembly (20) further comprises at least one locking member (60) which is adapted to be movable along said shaft (50) for providing the fixation of the shaft (50) with one of the first gear (40) and/or the second gear (41).

[0030] FIG.1 illustrates a schematic representation of a cooling device (10), in particular a refrigerator, which comprises a fridge compartment (15) and a freezer compartment (14) both for holding items. As depicted in FIG. 1, the freezer compartment (14) is disposed at the bottom of the cooling device (10) and the fridge compartment (15) is located at the upper section of the freezer compartment (14).

[0031] The fridge compartment door (18) may be mounted to cabinet (11) through hinges. The freezer compartment (14) is adapted to be sealed by means of the freezer door (16) and includes a drawer assembly (20) as seen in FIG. 1. Referring to FIG.1 and FIG. 2; the cooling device (10) accommodates the drawer assembly (20) which may be insertable within the freezer compartment (14) and includes a drawer (21) having a box-like structure. The drawer (21) is accessed from the outer part of the cabinet (11) by pulling out the drawer (21) via a grasping means (17) such as a handle. The drawer assembly (20) can have at least one drawer part and a drawer door part having the grasping means (17) thereon.

[0032] As illustrated in FIG. 4, FIG. 5 and FIG.6; the drawer assembly (20) includes a first rail unit (30) and a

second rail unit (31) which allow the drawer (21) to move in and out of the freezer compartment (14). The first rail unit (30) and the second rail unit (31) are coupled to the opposing inner walls of the freezer compartment (14).

[0033] Referring to FIG.4 and FIG. 6; the first rail unit (30) and the second rail unit (31) comprise a rail bracket (34) coupled to the inner walls of the freezer compartment (14), as being opposite to each other. Each of the first rail unit (30) and second rail unit (31) includes the rail bracket (34) which is coupled to the inner wall of the freezer compartment (14), an inner rail (32) and a middle rail (33) which is disposed between the rail bracket (34) and the inner rail (32). The rail brackets (34), middle rails (33) and inner rails (32) may be formed of metal. The rail units (30, 21) can move linearly with each side of the drawer assembly (20). The rail bracket (34) remains in a fixed state; while the middle rail (33) and the inner rail (32) moves in or out of the freezer compartment (14) depending on the position of the drawer assembly (20). Referring to FIG.2 and FIG.4, the inner rail (32) and the middle rail (33) extends outwardly from the freezer compartment (14), when the drawer (21) is in its extended position. The rail bracket (34), the middle rail (33) and the inner rail (32) are all overlapped in case the drawer assembly (20) is closed.

[0034] According to the present invention; the drawer assembly (20) includes the inner rails (32) adapted to extend along the longitudinal axis of the first rack (42) and the second rack (43), and to be engaged with the first gear (40) and a second gear (41).

[0035] As depicted in FIG. 7 and FIG. 8; each of the first rail units (30) and the second rail unit (31) further comprises a rack coupled to the rail bracket (34) on the inner wall of the freezer compartment (14) and a gear adapted to be rotated along the rack. According to the present invention, the first gear (40) and second gear (41) are interconnected with the shaft (50) at the opposite ends. The first rack (42) and the second rack (43) are configured to be on the first rail unit (30) and second rail unit (31) respectively, and mounted as being opposite to each other to the inner walls of the freezer compartment (14). Each of the racks (42, 43) includes a plurality of teeth provided longitudinally along said racks. Each of the gears (40, 41) includes a plurality of teeth provided circumferentially. The first gear (40) and the second gear (41) as shown in FIG 7 and FIG. 8 are a pinion gear having a plurality of teeth along the circumferential direction thereof.

[0036] The first gear (40) and the second gear (41) have rotational and linear movement equally and are configured to rotate along the first rack (42) and the second rack (43) respectively as the drawer (21) moves in and out of the freezer compartment (14). The first gear (40) and the second gear (41) are coupled to each other by the shaft (50). Therefore, the first rail unit (30) and the second rail unit (31) are also connected to each other by said shaft (50). The gear and rack system is provided to facilitate the movement of the drawer assembly in a con-

trolled manner and helps to keep the alignment of the drawer.

[0037] When one of the gears (40, 41) is rotated along the racks (42, 43), the other gear is also rotated equally; thereby the drawer (21) moves in the same direction due to the engagement of the gears with the racks. The shaft (50) and gear-rack system synchronizes the movement of the rail units (30, 31) as the rail units (30, 31) is extended or retracted for opening or closing the drawer (21).

[0038] Referring to FIG. 4 and FIG. 6; the shaft (50) comprises a first end (51) and a second end (52), which are engaged with the first gear (40) and second gear (41) respectively in order to provide the rotation of the gears at the same time. The first end (51) and the second end (52) of the shaft (50) has a cavity along the longitudinal axis of the shaft (50) which provides the engagement of the first elongated connection part (54) and second elongated connection part (55) to said cavities of the shaft (50). The first gear (40) and the second gear (41) includes the first elongated connection part (54) and the second elongated connection part (55) respectively as depicted in FIG. 9. The first gear (40) and the second gear (41) have a monolithic structure with the first elongated connection port (54) and the second elongated connection port (55), respectively. Hence, a unitary body can be obtained.

[0039] When the shaft (50) is pressed at its one first end (51) onto the first elongated connection part (54) of the gear, the engagement of the shaft (50) and the gears is provided as shown in FIG. 10. Hence, the shaft (50) is held securely by the first elongated connection part (54) and the second elongated connection part (55). As shown in FIG. 9; the elongated connection parts (54, 55) of the gears (40, 41) can have at least one aperture (56) which has a polygonal cross-section, preferably a circular cross-section. The shaft (50) is coupled to the first elongated connection part (54) and the second elongated connection part (55) at its opposite ends through a partly formed cavity on one surface of the shaft (50). Thus, the first elongated connection part (54) and the second elongated connection part (55) is partly engaged within the shaft (50).

[0040] FIG. 6 depicts an exploded view of the shaft (50) and rack - gear system in accordance with one embodiment of the present invention. Referring to FIG. 10; the drawer assembly (20) includes a locking member (60) which is adapted to be movable along said shaft (50) and said elongated connection parts (54, 55) for providing the fixation of the shaft (50) with one of the first gear (40) and the second gear (41). The locking member (60) is a separate part and arranged to be slidable.

[0041] FIG. 11 illustrates the locking member (60) which is shaped and dimensioned with respect to the shaft (50). The cross-section of the locking member (60) can be larger than the cross-section of the shaft (50) since the locking member (60) is mounted onto the shaft (50). The shaft (50) has a locking aperture (60) which provides an engagement with the shaft (50) and the locking mem-

ber (60). The locking member (60) can include a fixation portion (62) at the inner surface thereof, providing a connection with the engagement with said locking aperture (61) on the shaft (50). The locking aperture (61) is shaped and dimensioned with respect to the fixation portion (62) for directly receive said fixation portion (62). As shown in FIG. 13; the fixation portion (62) is formed as a protrusion which is shaped and dimensioned with respect to the locking aperture (61) on the shaft (50).

[0042] As depicted in FIG. 13; the connection is established as the fixation portion (62) of the locking member (60) and the locking aperture (61) of the shaft (50) is overlapped. When the fixation portion (62) is fitted within the locking aperture (61) of the shaft (50), the locking member (60) engages to the shaft (50) securely with a snap-fit connection. Thus, the assembly of the shaft (50) to the first gear (40) and/or second gear (41) is simply realized by moving the locking member (60) towards the direction of the locking aperture (61) being on the shaft (50).

[0043] The locking member (60) includes a tab (63) which is protruded outward from the locking member (60). The engagement between the shaft (50) and the first gear (40) and/or second gear (41) can be released by pulling out the tab (63) of the locking member (60). The locking member (60) can be formed of elastic/resilient/thermoplastic material. The locking member (60) further includes at least one elongated slit (64) provided in the proximity of the tab (63). The elongated slit (64) provides a space for pulling the tab (63) easily. When the user holds the tab (63) and pulls it outwardly, the fixation portion (62) gets out of the locking aperture (61) of the shaft (50). Following this, disassembly of the shaft (50) and the first gear (40) and/or second gear (41) is provided by the movement of the locking member (60) to the opposite direction of the current position, namely towards the other the gear.

[0044] The cooling device (10) according to the present invention may be a side-by-side refrigerator, a top mount refrigerator or a bottom mount refrigerator. As shown in FIG. 1; the cooling device (10) is a bottom mount refrigerator.

Reference list:

[0045]

10. Cooling device
11. Cabinet
12. Heat-sealed closed walls
13. Horizontal wall
14. Freezer compartment
15. Fridge compartment
16. Freezer door
17. Grasping means
18. Fridge compartment door
20. Drawer assembly
21. Drawer

- 30. First rail unit
- 31. Second rail unit
- 32. Inner rail
- 33. Middle rail
- 34. Rail bracket
- 40. First gear
- 41. Second gear
- 42. First rack
- 43. Second rack
- 50. Shaft
- 51. First end
- 52. Second end
- 54. First elongated connection part
- 55. Second elongated connection part
- 56. Aperture
- 60. Locking member
- 61. Locking aperture
- 62. Fixation portion
- 63. Tab
- 64. Elongated slit
- 65. Screw

Claims

1. A cooling device (10) having a cabinet (11) with heat-sealed closed walls (12) configured to form a compartment and a drawer assembly (20), said drawer assembly (20) comprising;
 - a first rail unit (30) and a second rail unit (31) mounted on an interior surface of the cabinet (11) of the cooling device (10) and being opposite to each other;
 - a first gear (40) configured to rotate throughout a first rack (42);
 - a second gear (41) configured to rotate throughout a second rack (43);
 - a shaft (50) which interconnects said first gear (40) and second gear (41) for transmitting the movement to each other;**characterized in that;** said drawer assembly (20) further comprises at least one locking member (60) which is adapted to be movable along said shaft (50) for providing the fixation of the shaft (50) with one of the first gear (40) and/or the second gear (41).
2. The cooling device (10) according to claim 1, wherein the first gear (40) is configured to be adjacent to a first elongated connection part (54) provided in the first rail unit (30).
3. The cooling device (10) according to claim 1 or claim 2, wherein the second gear (41) is configured to be adjacent to a second elongated connection part (55) provided in the second rail unit (31).
4. The cooling device (10) according to claim 3; wherein the first elongated connection part (54) and the second elongated connection part (55) have at least one

aperture (56) thereon and are adapted to be engaged with said shaft (50) having a locking aperture (61) thereon.

5. The cooling device (10) according to claim 4, wherein said locking member (60) includes a fixation portion (62) at the inner surface of the locking member (60), providing a connection by an engagement with said locking aperture (61) on the shaft (50).
6. The cooling device (10) according to claim 5, wherein said fixation portion (62) has at least one protrusion which is shaped and dimensioned with respect to locking aperture (61) on the shaft (50).
7. The cooling device (10) according to claim 5 or 6, wherein said locking member (60) and the first elongated connection part (54) or the second elongated connection part (55) are configured to form a snap fit connection by the engagement of said fixation portion (62) of the locking member (60) and said locking aperture (61) of the shaft (50).
8. The cooling device (10) according to any one of the preceding claims; wherein at least one of the first elongated connection part (54) and the second elongated connection part (55) is partly engaged within the shaft (50).
9. The cooling device (10) according to any one of the preceding claims, wherein said locking member (60) comprises a tab (63) which is protruded outwardly from said locking member (60) for releasing the engagement of the locking member (60) and the shaft (32).
10. The cooling device (10) according to claim 9, wherein said locking member (60) has at least one elongated slit (64) provided in the proximity of said tab (63) of the locking member (60).
11. The cooling device (10) according to one any of the preceding claims, wherein said first gear (40) and second gear (41) are a pinion gear having a plurality of teeth along the circumferential direction.
12. The cooling device (10) according to any one of the preceding claims, wherein the first gear (40) and the second gear (41) are adapted to rotate throughout said first rack (42) and second rack (43), respectively.
13. The cooling device (10) according to any one of the preceding claims, wherein said first gear (40) and second gear (41) have a monolithic structure with said first elongated connection part (54) and second elongated connection part (55), respectively.

14. The cooling device (10) according to any one of the preceding claims, wherein said drawer assembly (20) includes a first rail unit (30) and a second rail unit (31) adapted to extend along the longitudinal axis of the first rack (42) and the second rack (43), and to be engaged with the first gear (40) and a second gear (41) providing the opening and closing said drawer assembly (20). 5
15. The cooling device (10) according to any one of the preceding claims; wherein said cooling device (10) is a bottom mount refrigerator. 10

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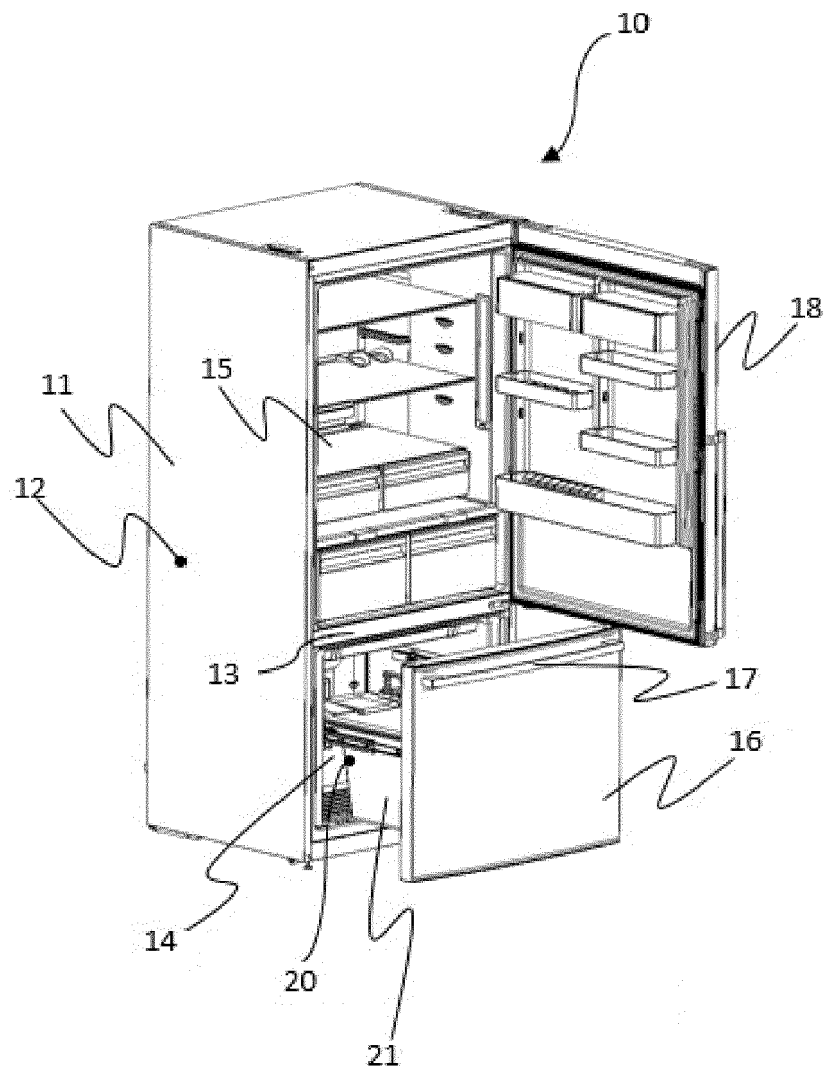


Fig.1

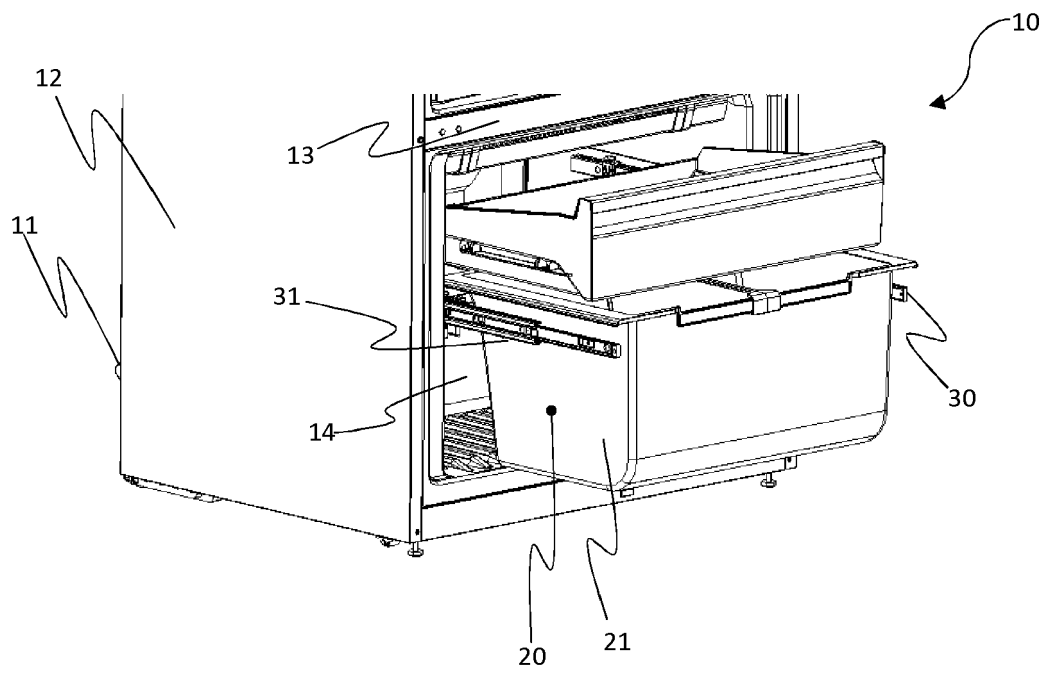


Fig.2

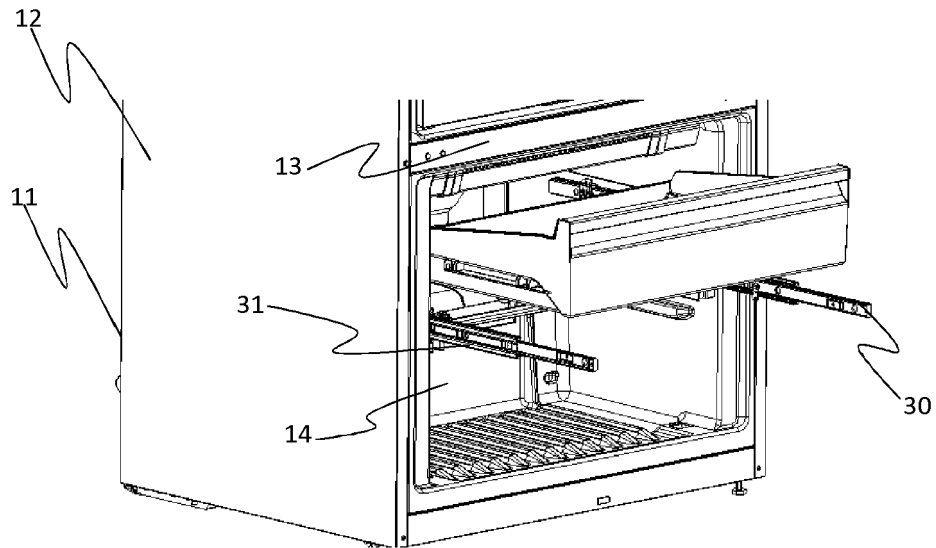


Fig.3

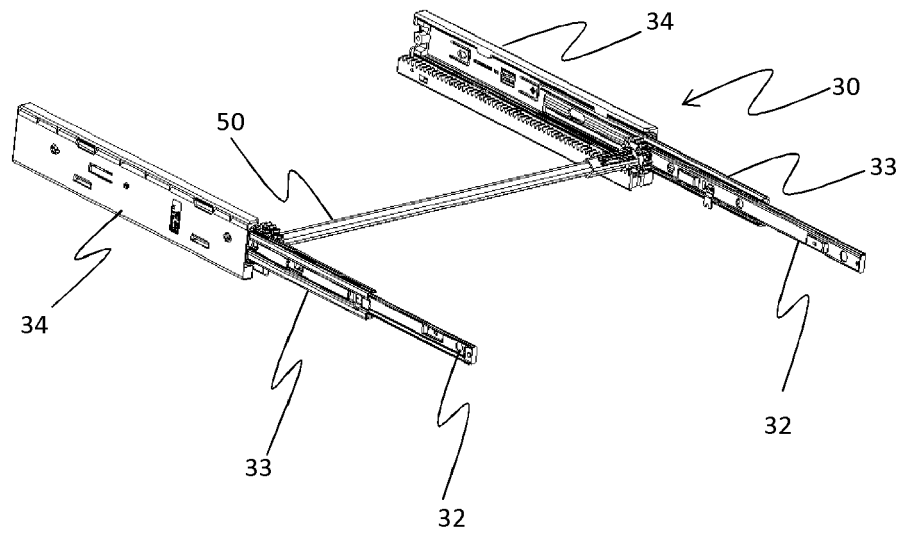


Fig.4

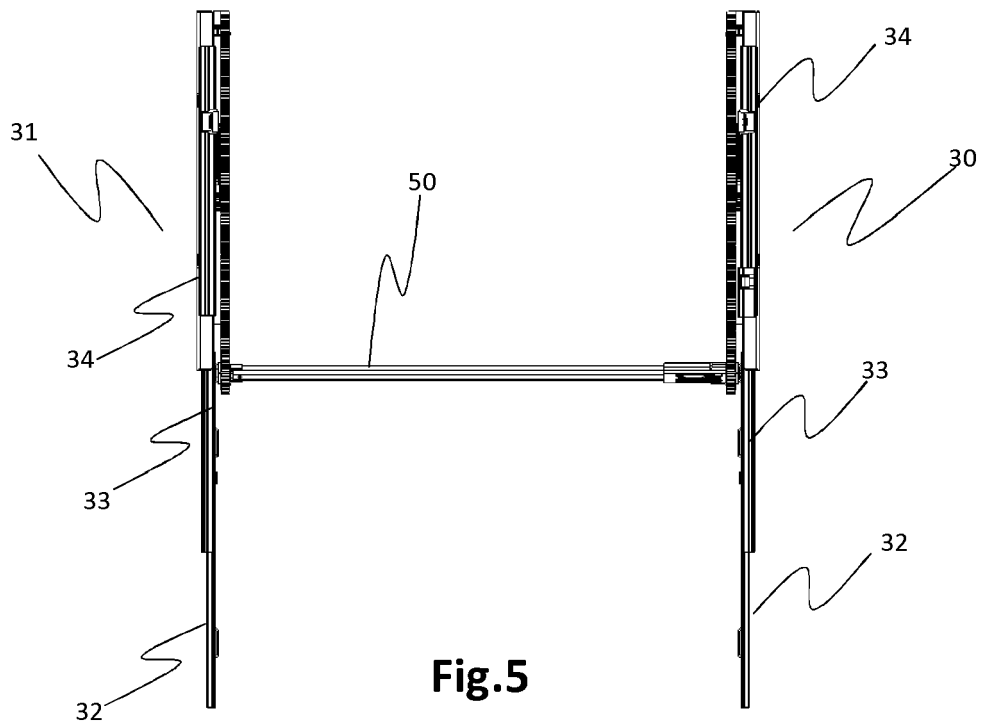


Fig.5

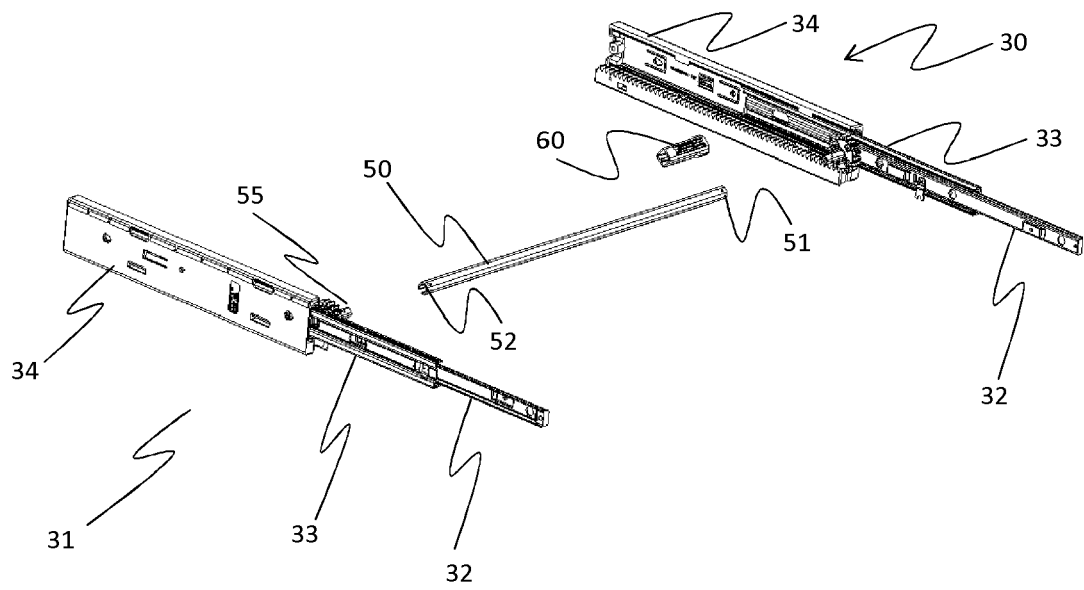


Fig.6

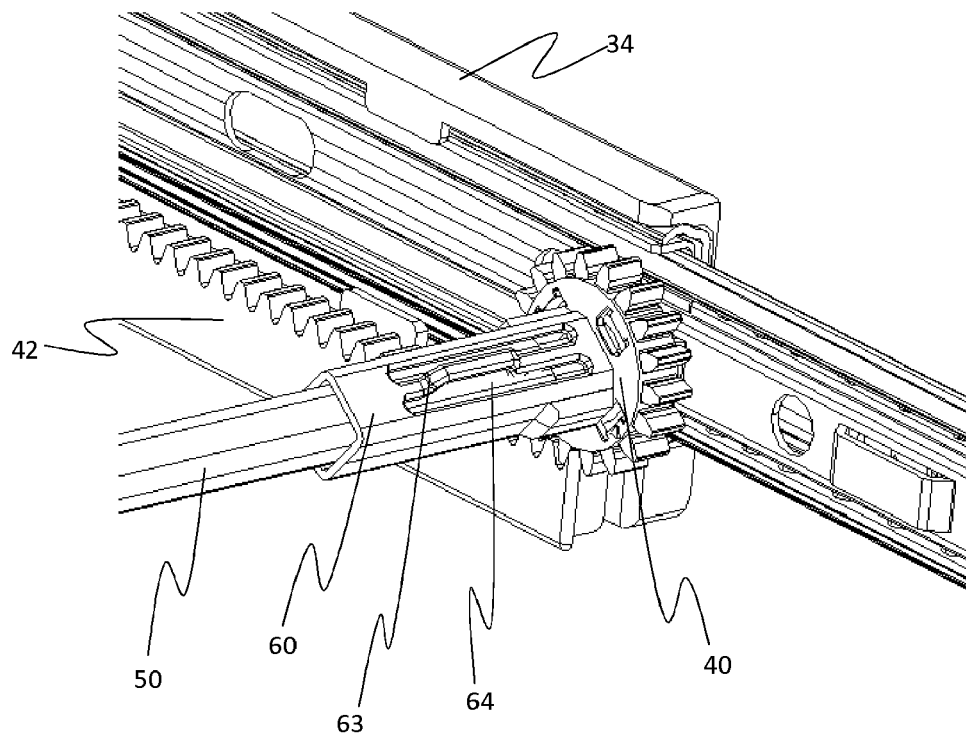


Fig.7

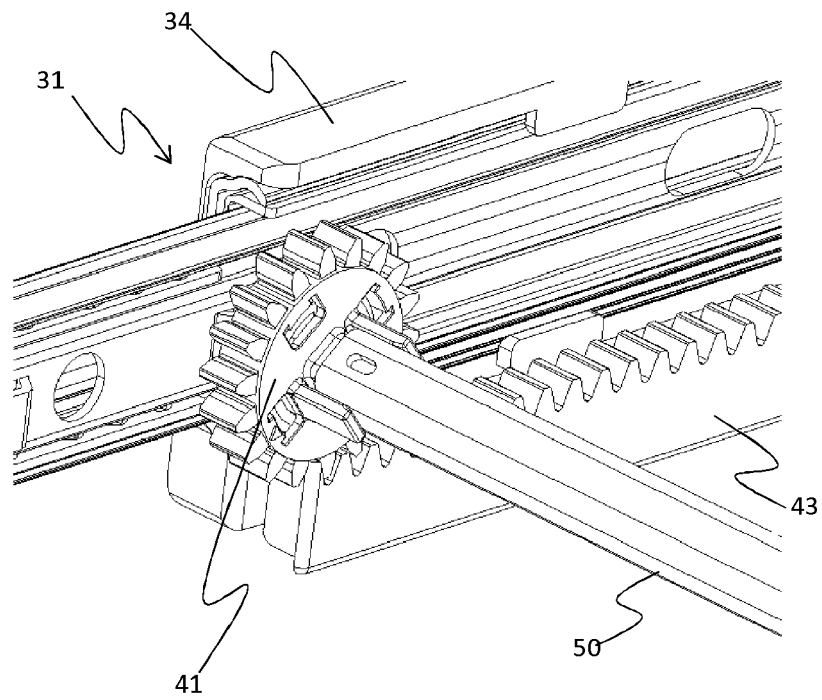


Fig.8

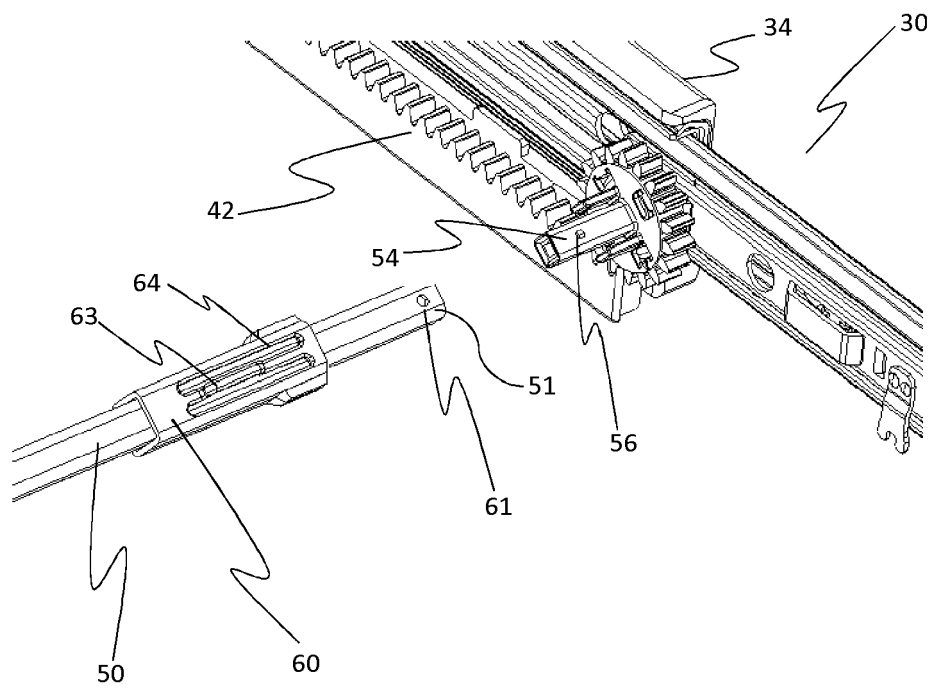


Fig.9

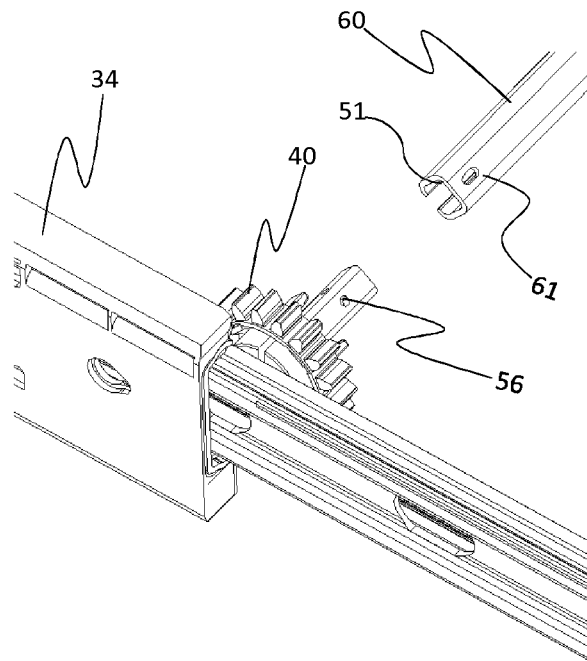


Fig.10

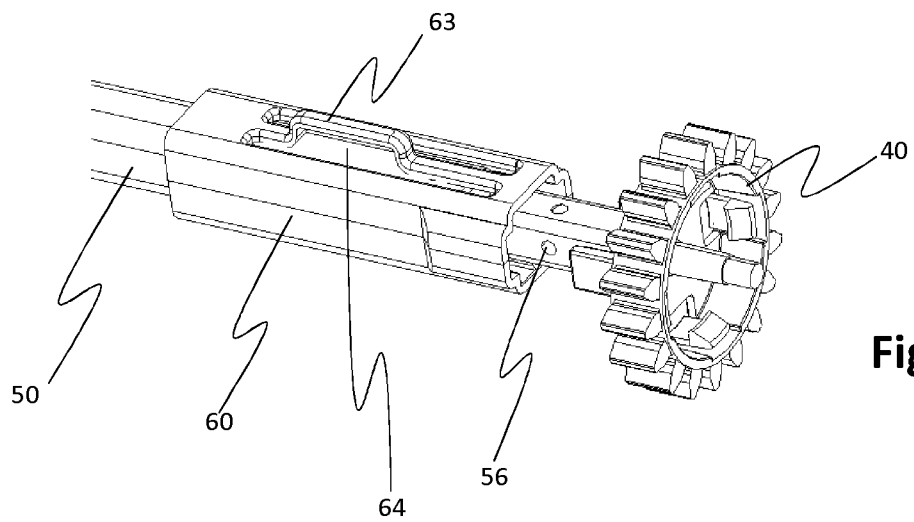


Fig.11

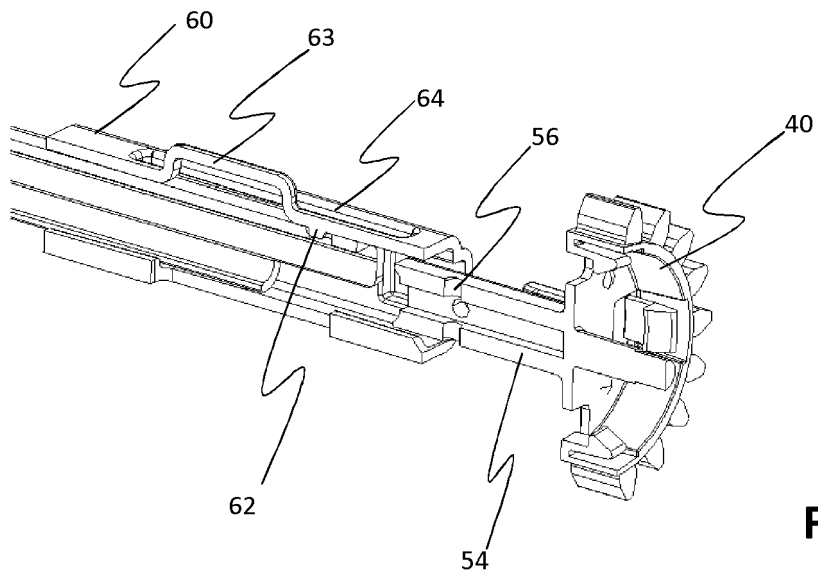


Fig.12

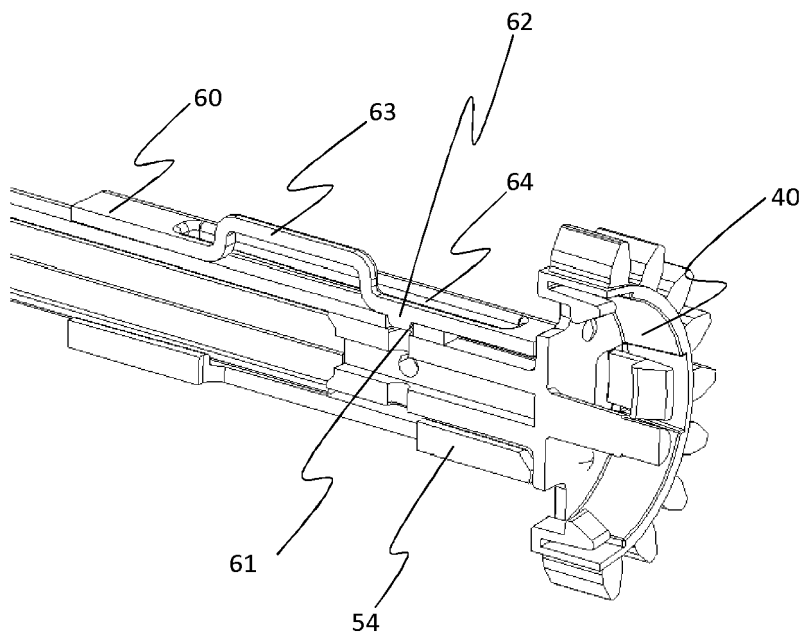


Fig.13

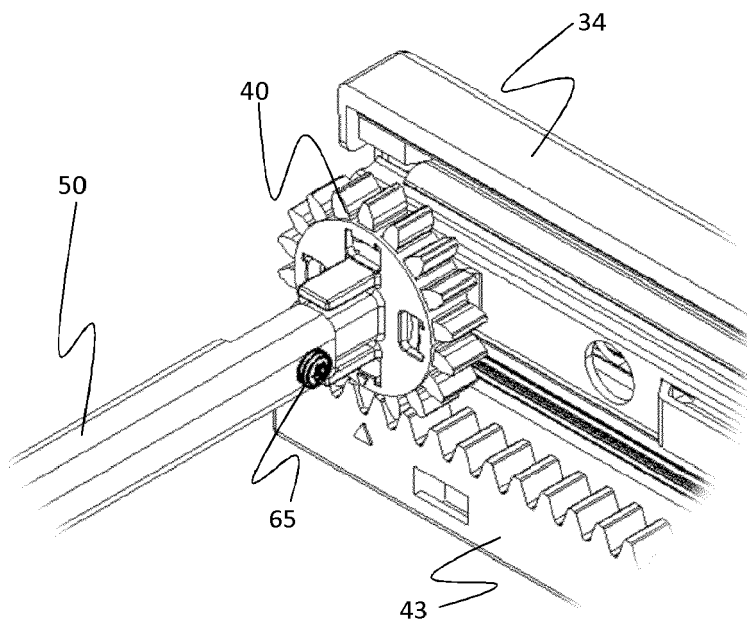


Fig.14 (Prior Art)



EUROPEAN SEARCH REPORT

 Application Number
 EP 20 19 3621

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 248 442 A1 (CHEN TSUNG YAO [TW]) 10 November 2010 (2010-11-10) * figures 2-4 *	1-4,14, 15 5-13	INV. F25D25/02
A	-----		
A,D	WO 2010/017505 A1 (ACCURIDE INT INC [US]; AGUILAR ANTE JOSE ROBERTO [MX] ET AL.) 11 February 2010 (2010-02-11) * the whole document *	1-15	
X	EP 2 644 053 A1 (SLIDE MEI YAO INTERNAT CO LTD [TW]) 2 October 2013 (2013-10-02) * figure 2 *	1 2-15	
A	CA 2 699 699 A1 (CHEN TSUNG YAO [TW]) 5 November 2010 (2010-11-05) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25D A47B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 January 2021	Examiner de Graaf, Jan Douwe
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 20 19 3621

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-01-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2248442 A1	10-11-2010	AU 2010201521 A1	25-11-2010
		CA 2699699 A1	05-11-2010
		EP 2248442 A1	10-11-2010
		ES 2428229 T3	06-11-2013
		JP 5630063 B2	26-11-2014
		JP 2010259782 A	18-11-2010
		KR 20100120264 A	15-11-2010
		PL 2248442 T3	31-01-2014
		PT 2248442 E	30-10-2013
		TW 201039777 A	16-11-2010
		US 2010283365 A1	11-11-2010
WO 2010017505 A1	11-02-2010	DE 112009001940 T5	16-06-2011
		GB 2472959 A	23-02-2011
		US 2010219727 A1	02-09-2010
		WO 2010017505 A1	11-02-2010
EP 2644053 A1	02-10-2013	AU 2013201904 A1	10-10-2013
		BR 102013006933 A2	28-07-2015
		CA 2810640 A1	26-09-2013
		CN 103355965 A	23-10-2013
		EP 2644053 A1	02-10-2013
		JP 2013198739 A	03-10-2013
		KR 20130109073 A	07-10-2013
		PH 12013000091 A1	08-10-2014
		RU 2013113185 A	27-09-2014
		TW 201338726 A	01-10-2013
		US 2013249367 A1	26-09-2013
CA 2699699 A1	05-11-2010	AU 2010201521 A1	25-11-2010
		CA 2699699 A1	05-11-2010
		EP 2248442 A1	10-11-2010
		ES 2428229 T3	06-11-2013
		JP 5630063 B2	26-11-2014
		JP 2010259782 A	18-11-2010
		KR 20100120264 A	15-11-2010
		PL 2248442 T3	31-01-2014
		PT 2248442 E	30-10-2013
		TW 201039777 A	16-11-2010
		US 2010283365 A1	11-11-2010

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2010219727 A [0007]