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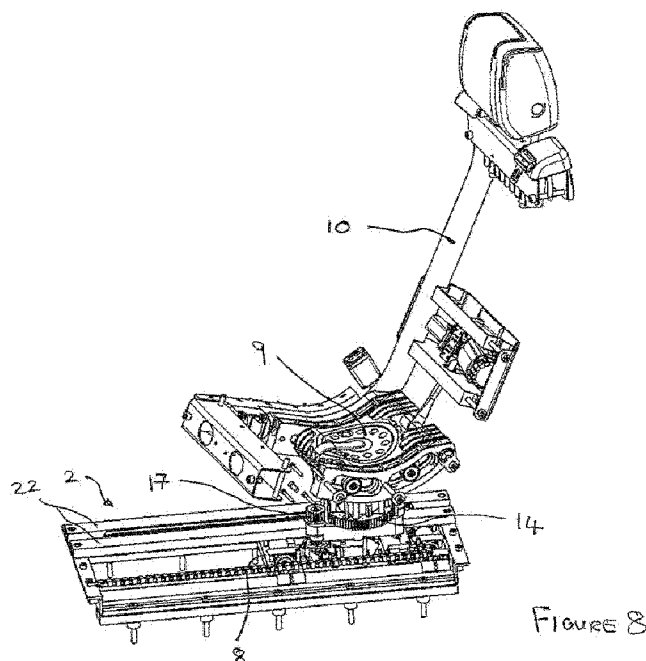


FIGURE 8

(57) Abstract: Aspects of the present invention relate to a vehicle seat support assembly for supporting a seat frame in a vehicle. The vehicle seat support assembly comprises a seat frame pedestal for supporting the seat frame; and a base mountable in the vehicle. The base comprising pedestal mounting means configured to permit the seat frame pedestal to be mounted to the base such that the seat frame can swivel relative to the base.



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VEHICLE SEAT SUPPORT ASSEMBLY

TECHNICAL FIELD

The present disclosure relates to a vehicle seat support assembly. An aspect of the invention relates to a vehicle comprising the vehicle seat support assembly.

BACKGROUND

Seats are an essential comfort feature of a vehicle. Conventional vehicle seats are mounted on metal rails that are fixed directly to the vehicle structure with mechanical fixings. The seats slide longitudinally, in line with the direction of car travel, to accommodate different height occupants whilst still maintaining the proximity to the driving controls.

There is a desire to increase the flexibility of vehicle seats by providing them with increased functionality and range of movement. For example, the continuing development of autonomous vehicles may eventually lead to a 'self-driving' vehicle, thereby releasing the occupant to carry out other tasks. This may involve providing the seats with a greater freedom of movement so that the driver need not always face the direction of travel. Passengers may also prefer to have the option of facing each other whilst seated in the vehicle, as opposed to always facing a fixed direction, usually the direction of travel of the vehicle.

It is an aim of the present invention to address one or more of the disadvantages associated with the prior art.

SUMMARY OF THE INVENTION

Aspects and embodiments of the invention provide a vehicle seat support assembly and a vehicle comprising the vehicle seat support assembly as claimed in the appended claims.

According to an aspect of the present invention there is provided a vehicle seat support assembly for supporting a seat frame in a vehicle, the vehicle seat support assembly comprising:

a seat frame pedestal for supporting the seat frame; and
a base mountable in the vehicle, the base comprising pedestal mounting means configured to permit the pedestal to be mounted to the base such that the seat frame can swivel relative to the base.

The pedestal mounting means of the invention enables one or more of the seats in a vehicle to be mounted such that they can rotate or swivel to facilitate a change in occupant orientation, e.g. from forward to rear facing or any intermediate angle such as to enhance ingress egress or provide a position where adjacent occupants are inclined towards one another.

In an embodiment of the invention, the pedestal mounting means comprises a cavity in the base configured to receive and support a seat frame swivel mechanism.

10 Optionally, the seat frame swivel mechanism comprises a drivetrain. In this instance, the cavity in the base may be configured to receive and support the drivetrain.

The drivetrain may comprise a seat frame swivel gear and a pinion gear configured to rotate the seat frame swivel gear. Optionally, the cavity comprises a first recess configured to receive the seat frame swivel gear and, a second recess configured to receive the pinion gear. The base may rotatably support the seat frame swivel gear in the first recess and rotatably support the pinion gear in the second recess.

20 The first and second recesses may be configured such that, when a seat frame swivel gear is received in the first recess, and a pinion gear is received in the second recess, the axes of rotation of the seat frame swivel gear and the pinion gear are parallel, and the seat frame swivel gear and the pinion gear are in meshing engagement with each other.

25 Optionally, the vehicle seat support assembly comprises a seat frame support shaft upstanding from the seat frame swivel gear along an axis of rotation of the seat frame swivel gear.

The seat frame pedestal may be mountable to the seat frame support shaft upstanding from the seat frame swivel gear.

30

In an embodiment of the invention, a plurality of bearing shafts upstand from the seat frame swivel gear. The pedestal may comprise openings to receive each of the bearing shafts when the pedestal is mounted on the seat frame support shaft.

35 Optionally, the pedestal is configured to be slideable along the bearing shafts. A linear bearing may be provided to permit the pedestal to slide along the bearing shafts.

In embodiments, the vehicle seat support assembly may comprise a seat frame height adjustment device configured to cause the pedestal to slide along the bearing shafts.

5 Optionally, the height adjustment device may comprise an air spring or electric device mounted between the seat frame support shaft and the pedestal.

In embodiments of the invention, the base may comprise a plurality of outer supporting struts for mounting the base in the vehicle and, a bridge connecting the outer supporting struts.

10 The outer supporting struts may be configured to support the bridge above a cabin floor of the vehicle.

Optionally, the outer supporting struts and the bridge are integrally formed.

15 The cavity may be formed in the bridge of the base.

Optionally, the base may comprise an intermediate strut mountable to the bridge between the outer struts. The intermediate strut can be configured to extend over a pinion gear received in the second recess.

20

In embodiments, the intermediate strut may comprise an opening to permit a drive shaft of the pinion gear to extend through the intermediate strut into the second recess to drive the pinion gear.

25 In another embodiment, the seat support assembly may comprise a rotational lock mechanism to lock the seat frame pedestal in a selected one of a plurality of predetermined rotational positions.

30 The rotational lock mechanism may comprise a locking pin biased by a biasing member in a direction towards a periphery of the seat frame swivel gear, and the periphery of the seat frame swivel gear may comprise a plurality of detents. The locking pin may be configured to seat in one of said detents, depending on the position of the seat frame swivel gear, to prevent rotation of the seat frame swivel gear.

35 The locking mechanism may comprise a rotatable threaded lead screw and a stationary lock control member threadingly engaged with the threaded lead screw. The lock control member and the locking pin may be configured such that the lock control member slides the locking

pin in a direction away from the seat frame swivel gear, against the bias provided by the biasing member, upon rotation of the threaded lead screw.

In embodiments, the locking pin may extend over the lock control member, and the lock control member may comprise a laterally extending tab that is slideably received in an elongate slot formed in the locking pin.

Optionally, the vehicle seat support assembly according to embodiments of the invention comprises a seat frame mounted to the pedestal.

According to another aspect of the invention, there is provided a vehicle comprising the vehicle seat support assembly of the invention.

Within the scope of this application it is expressly intended that the various aspects, embodiments, examples and alternatives set out in the preceding paragraphs, in the claims and/or in the following description and drawings, and in particular the individual features thereof, may be taken independently or in any combination. That is, all embodiments and/or features of any embodiment can be combined in any way and/or combination, unless such features are incompatible. The applicant reserves the right to change any originally filed claim or file any new claim accordingly, including the right to amend any originally filed claim to depend from and/or incorporate any feature of any other claim although not originally claimed in that manner.

BRIEF DESCRIPTION OF THE DRAWINGS

One or more embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a vehicle seat support platform that forms or supports part of a cabin floor of a vehicle, a base for rotatably mounting a seat frame pedestal being slideably mounted to the seat support platform;

Figure 2 shows the perspective view of Figure 1, but with a seat frame pedestal mounted to the seat support platform;

Figure 3 shows a perspective view of the seat frame pedestal;

Figure 4 shows a perspective view of the base for rotatably mounting a seat frame pedestal, and a carriage to which the base is mounted;

5 Figure 5 shows an exploded perspective view of the seat frame swivel mechanism, with parts of the seat support platform, the carriage, and the base removed for clarity;

Figure 6 shows a cross-sectional perspective view through the base and carriage of Figure 4;

10 Figure 7 shows a perspective view of the seat frame swivel gear;

Figure 8 shows the view of Figure 5, but with a seat frame pedestal and a seat frame mounted to the seat frame swivel mechanism;

15 Figure 9 shows the perspective view of Figure 2, with a seat frame mounted to the pedestal;

Figure 10 shows a cross-sectional perspective view through the base and carriage according to another embodiment of the invention that includes a rotational lock device;

20 Figure 11 shows another cross-sectional perspective view of the base and carriage shown in Figure 10, but with the rotational lock device shown in exploded form; and

Figure 12 shows a vehicle in accordance with an embodiment of the invention,

25

DETAILED DESCRIPTION

A vehicle seat support assembly 1, in accordance with an embodiment of the present invention, is described herein with reference to the accompanying Figures.

30 With reference to Figure 1, a vehicle seat support assembly 1 includes a platform 2 which forms part of a cabin floor of a vehicle 3, or which at least supports part of the cabin floor of a vehicle 3, and to which a base 4 having pedestal mounting means 5 is slideably mounted.

35 The base 4 has struts 6 that extend through slots 7 in the platform 2 and which attach to a carriage 8 slideably mounted beneath the platform 2, so that the base 4 and the carriage 8 can slide together in a direction extending along the length of the slots 7. The platform 2

slides on linear bearings 31 on shafts 30 forming part of the platform 2. Motors 32 mounted to the carriage 8 are used to drive the carriage 8 along the shafts 30.

Figure 2 is the same drawing as Figure 1, but shows a seat frame pedestal 9 attached to the pedestal mounting means 5, an enlarged perspective view of the pedestal 9 also being shown in Figure 3. As shown in Figures 8 and 9, a seat frame 10 is attachable to the pedestal 9. In particular, the seat frame 10 may be attachable to the pedestal 9 so that it can move, preferably pivot, relative to the pedestal 9, in order to change the angle of inclination of an occupant seated in the seat frame 10.

Figure 4 shows the base 4 attached to the carriage 8, but the platform 2 has been omitted from this Figure. It will be appreciated that the base 4 could be attached to the cabin floor of the vehicle 3 in other ways. For example, it could be a static fixing, i.e. the carriage 8 and seat support platform 2 could be omitted and so the base 4 could then be directly attached to the cabin floor. In such an embodiment, the base 4 may be immovable.

The pedestal mounting means 5 is configured to enable a pedestal 9, and a seat frame 10 attached thereto, to be mounted to the base 4 via a seat frame swivel mechanism 11, so that an occupant of the seat frame 10 can swivel the seat frame 10 and thereby change the direction in which the seat frame 10 is facing within the vehicle 3. In an embodiment of the invention, the pedestal mounting means 5 comprises a cavity 12 in the base 4 which is configured to receive and mount the seat frame swivel mechanism 11.

An exploded perspective view of the seat frame swivel mechanism 11 according to an embodiment of the invention is shown in Figure 5, and in which a part of the seat frame platform 2, the carriage 8, and the base 4, are omitted for clarity. The seat frame swivel mechanism 11 comprises a drivetrain that connects a motor 13 or other drive member with the pedestal 9 and seat frame 10 so that operation of the motor 13 will cause the pedestal 9 and seat frame 10 to swivel. In certain embodiments, the drivetrain comprises a seat frame swivel gear 14, shown most clearly in Figure 7, but also visible in Figures 5 and 8. The seat frame swivel gear 14 is mounted within the cavity 12 in the base 4 for rotation about a vertical axis A-A (see Figure 7). A seat frame support shaft 15 upstands from a centre of the seat frame swivel gear 14 and the pedestal 9 is attached to the seat frame support shaft 15. Optionally, an air spring 16 is located between the seat frame support shaft 15 and the pedestal 9 to provide additional comfort to an occupant. As will be described hereinafter, the air spring 16 may also be used to control the height of the seat frame 10.

The seat frame swivel mechanism 11 also comprises a pinion gear 17, as shown in Figures 5, 6 and 8, rotatably mounted in the cavity 12 formed in the base 4. The pinion gear 17 has its axis of rotation B-B (see Figure 8) spaced from, but parallel to, the axis of rotation A-A of the seat frame swivel gear 14, and lies in meshing engagement with the seat frame swivel gear 14 so that rotation of the motor 13 drives the pinion gear 17 which, in turn, drives the seat frame swivel gear 14 to rotate the pedestal 9 and seat frame 10.

The cavity 12 in the base 4 forming the seat frame pedestal mounting means 5 may include two side-by-side recesses 18, 19, one for each of the seat frame swivel gear 14 and the pinion gear 17. The recesses 18, 19 may be generally cylindrical in shape and overlap such that they open into each other and to permit the pinion gear 17 and seat frame swivel gear 14 to mesh with each other in the region of overlap, as well as to rotatably mount each of the seat frame swivel gear 14 and the pinion gear 17.

The recesses 18, 19 are formed in a bridge portion 20 of the base 4 that extends between the outer struts 6, which may be integrally formed with the bridge portion. When the base 4 is mounted to the carriage 8 with the outer struts 6 extending through the slots 7 in the platform 2, the bridge portion 20 occupies an elevated position, spaced from the platform 2. The recess 18 for the seat frame swivel gear 14 may extend into the bridge portion 20 from an upper side of the base 4 that faces the pedestal 9 and seat frame 10 attached thereto. The recess 19 for the pinion gear 17 may extend into the bridge portion 20 from below, i.e. the recess 19 opens towards the platform 2 and is located in the bridge portion 20 between the outer struts 6.

The pinion gear 17 is rotatably driven by a pinion gear drive shaft 21 that extends in a downward direction from the pinion gear 17 and out of the recess 19 to pass through a central slot 22 between the slots 7 through which the outer struts 6 pass. The pinion gear drive shaft 21 may then be connected to the drive motor 13 which may be mounted to the carriage 8 beneath the platform 2.

To provide additional support for the pinion gear drive shaft 21, the base 4 may comprise an intermediate strut 23 that extends from the bridge portion 20 and through the central slot 22 to attach to the carriage 8 beneath the platform 2. The intermediate strut 23 has an opening 24 to receive the pinion gear drive shaft 21 and may also be configured to form a cover that closes the recess 19 in which the pinion gear 17 is received. The intermediate strut 23 is removably attachable to the base 4. The intermediate strut 23 may have a contoured shape,

similar to that of the outer struts 7, such that the intermediate strut 23 will slide freely along the central slot 22 in the seat support platform 2.

5 The seat frame swivel mechanism 11 may also be configured to permit the height of the seat frame 10 and pedestal 9 to be adjusted. To permit such height adjustment, a plurality of parallel bearing shafts 25 upstand from an upper face 14a of the seat frame swivel gear 14 and surround the seat frame support shaft 15. The bearing shafts 25 are each received on linear bearings mounted within openings 26 in the pedestal 9 so that, when a vertically directed force is applied to the pedestal 9, the pedestal 9 slides along the bearing shafts 25
10 on the linear bearings.

The application of a vertically directed force to the pedestal 9 to adjust the height of the seat frame 10 and pedestal 9 may be achieved through the air spring unit. However, another kind of manual or electric drive may be employed. For example, a manual ratchet system is
15 considered a feasible alternative.

The pedestal mounting means 5 may include a tubular cowling 27 which sits in a shoulder 28 formed about the peripheral edge of the recess 18 in which the seat frame swivel gear 14 is received. The cowling 27 upstands from the bridge portion of the base 4 and surrounds
20 the seat frame support shaft 14 and any air spring 16 mounted thereto. The pedestal 9 may also comprise a correspondingly shaped cowling 29 (partly shown in Figure 3) that depends from its underside. When the pedestal 9 is mounted to the seat frame support shaft 15 or air spring 16, the cowling 27 upstanding from the bridge portion 20 nests within the cowling 29 depending from the pedestal 9. The cowlings 27, 29 may slide relative to each other as the
25 height of the pedestal 9 changes.

A modified embodiment of the carriage 8 and the base 4, that forms a part of the seat support assembly 1 according to embodiments of the invention, will now be described with
30 reference to the cross-sectional views of Figures 10 and 11.

The modified embodiment is similar to the previously described embodiment, except that it includes a rotational lock mechanism 35 for preventing rotation of the seat frame swivel gear 14. The rotational lock mechanism 35 permits the seat frame 10 to be fixed in one or more rotational positions and maintains structural stability and integrity at a given rotated position
35 by avoiding the need to rely on the motor 13, or drivetrain, to prevent unintentional rotation of the seat frame 10.

With reference to Figures 10 and 11, an additional lock motor drive 36 is mounted to the carriage 8. The lock motor drive 36 is operational to rotate a threaded lead screw 37 upstanding in a direction away from the carriage 8, and which extends into the intermediate strut 23 of the base 4. A lock control member 38 is threadingly engaged on the threaded lead screw 37, and a locking pin 39 is slideably received over the threaded lead screw 37 and cooperates with the lock control member 38. More specifically, the locking pin 39 has an elongate longitudinally extending slot 40, and a tab 41 protruding laterally from the lock control member 38 is slideably received in the slot 40. The tab 41 also extends beyond the slot 40 and engages with a shoulder 42 formed in the intermediate strut 23 so that the lock control member 38 and the locking pin 39 are both unable to rotate.

The seat frame swivel gear 14 is provided with detents 43 at predetermined positions spaced around its periphery. The detents 43 are configured to receive the remote end 39a of the locking pin 39. The predetermined position of each of the detents 43 may be chosen to provide preferred seat locking positions and include front and rear facing as well as one or more intermediate positions, such as those considered optimum for ingress into, or egress from, the vehicle 3.

It will be appreciated that, when the remote end 39a of the locking pin 39 is received in a detent 43, rotation of the seat frame swivel gear 14 is prevented and so the seat frame 10 is locked in position until the locking pin 39 is retracted. The locking pin 39 is biased in a direction towards the seat frame swivel gear 14 so that the free end of the pin 39 is pressed against the seat frame swivel gear 14 and will automatically engage in a detent 43 when a detent 43 is aligned with the axis of movement of the locking pin 39 along the threaded lead screw 37. Once the locking pin 39 has seated in a detent 43, the seat frame 10 is held in a fixed rotational position until the locking pin 39 is withdrawn from the detent 43.

The locking pin 39 may be biased into a locked position by a spring 44 housed inside the locking pin 39 and which extends between the locking pin 39 and the lock control member 38. To retract the locking pin 39 from a detent 43, the lock motor drive 36 is energised to rotate the threaded lead screw 37. As the lock control member 38 is unable to rotate, due to the tab 41 extending laterally through the elongate slot 40 in the locking pin 39 and engagement of the tab 41 with the shoulder 42 in the intermediate strut 23, the lock control member 38 engages with a lower end 40a of the elongate slot 40 in the locking pin 39. Continued rotation of the threaded lead screw 37 causes the lock control member 38 to pull the locking pin 39 downward and thereby withdraw the upper end 39a of the locking pin 39 out of a detent 43.

Figure 12 shows a vehicle 3 according to an embodiment of the invention that comprises the seat support assembly 1.

- 5 It will be appreciated that various changes and modifications can be made to the present invention without departing from the scope of the present application.

CLAIMS

1. A vehicle seat support assembly for supporting a seat frame in a vehicle, the
5 vehicle seat support assembly comprising:
a seat frame pedestal for supporting the seat frame; and
a base mountable in the vehicle, the base comprising pedestal mounting means
configured to mount the seat frame pedestal to the base such that the seat frame pedestal
can swivel relative to the base.
- 10 2. A vehicle seat support assembly according to claim 1, wherein the pedestal
mounting means comprises a cavity in the base configured to receive and support a seat
frame swivel mechanism.
- 15 3. A vehicle seat support assembly according to claim 2, wherein the seat frame
swivel mechanism comprises a drivetrain, the cavity in the base being configured to receive
the drivetrain.
4. A vehicle seat support assembly according to claim 3, wherein the drivetrain
20 comprises a seat frame swivel gear and a pinion gear configured to rotate the seat frame
swivel gear, the cavity comprising a first recess configured to receive the seat frame swivel
gear and, a second recess configured to receive the pinion gear.
5. A vehicle seat support assembly according to claim 4, wherein the first and second
25 recesses are configured such that, when a seat frame swivel gear is received in the first
recess, and a pinion gear is received in the second recess, the axes of rotation of the seat
frame swivel gear and the pinion gear are parallel, the seat frame swivel gear and the
pinion gear being in meshing engagement with each other.
- 30 6. A vehicle seat support assembly according to claim 5, comprising a seat frame
support shaft upstanding from the seat frame swivel gear along an axis of rotation of the
seat frame swivel gear.
7. A vehicle seat support assembly according to claim 6, wherein the pedestal is
35 mountable to the seat frame support shaft upstanding from the seat frame swivel gear.

8. A vehicle seat support assembly according to claim 7, comprising a plurality of parallel bearing shafts upstanding from the seat frame swivel gear, the pedestal comprising openings to receive each of the bearing shafts when the pedestal is mounted on the seat frame support shaft .

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9. A vehicle seat support assembly according to claim 8, wherein the pedestal is configured to be slideable along the bearing shafts.

10. A vehicle seat support assembly according to claim 9, wherein the bearing shafts are spaced from each other and positioned to upstand from the seat frame swivel gear around the periphery of the seat frame support shaft.

11. A vehicle seat support assembly according to claim 8 to 10, comprising a seat frame height adjustment device configured to cause the pedestal to slide along the bearing shafts.

12. A vehicle seat support assembly according to claim 11, wherein the height adjustment device comprises an air spring or electric device mounted between the seat frame support shaft and the pedestal.

13. A vehicle seat support assembly according to any preceding claim, wherein the base comprises a plurality of outer supporting struts for mounting the base in the vehicle and, a bridge portion connecting the outer supporting struts.

25

14. A vehicle seat support assembly according to claim 13, wherein the outer supporting struts are configured to support the bridge portion above a cabin floor of the vehicle.

15. A vehicle seat support assembly according to claim 14, wherein the outer supporting struts and the bridge portion are integrally formed.

16. A vehicle seat support assembly according to claim 15, when dependent on claim 2, wherein the cavity is formed in the bridge portion of the base.

35

17. A vehicle seat support assembly according to any of claims 13 to 16, wherein the base comprises an intermediate strut mountable to the bridge portion between the outer struts.

5 18. A vehicle seat support assembly according to claim 17, when dependent on claim 4 or 5, said intermediate strut being configured to extend over a pinion gear received in the second recess .

10 19. A vehicle seat support assembly according to claim 18, wherein the intermediate strut comprises an opening to permit a pinion gear drive shaft to extend through the intermediate strut into the second recess to drive the pinion gear.

15 20. A vehicle seat support assembly according to any of claims 17 to 19, comprising a rotational lock mechanism to lock the seat frame pedestal in a selected one of a plurality of predetermined rotational positions.

20 21. A vehicle seat support assembly according to claim 20, wherein the rotational lock mechanism comprises a locking pin biased by a biasing member in a direction towards a periphery of the seat frame swivel gear , and the periphery of the seat frame swivel gear comprises a plurality of detents , wherein the locking pin is configured to seat in one of said detents depending on the position of the seat frame swivel gear , to prevent rotation of the seat frame swivel gear .

25 22. A vehicle seat support assembly according to claim 21, wherein the locking mechanism comprises a rotatable threaded lead screw and a stationary lock control member threadingly engaged with the threaded lead screw, the lock control member and the locking pin being configured such that the lock control member slides the locking pin in a direction away from the seat frame swivel gear , against the bias provided by the biasing member , upon rotation of the threaded lead screw .

30

23. A vehicle seat support assembly according to claim 22, wherein the locking pin extends over the lock control member, and the lock control member comprises a laterally extending tab that is slideably received in an elongate slot formed in the locking pin.

35 24. A vehicle seat support assembly according to any preceding claim, comprising a seat frame mounted to the pedestal.

25. A vehicle comprising the vehicle seat support assembly of claim 24.

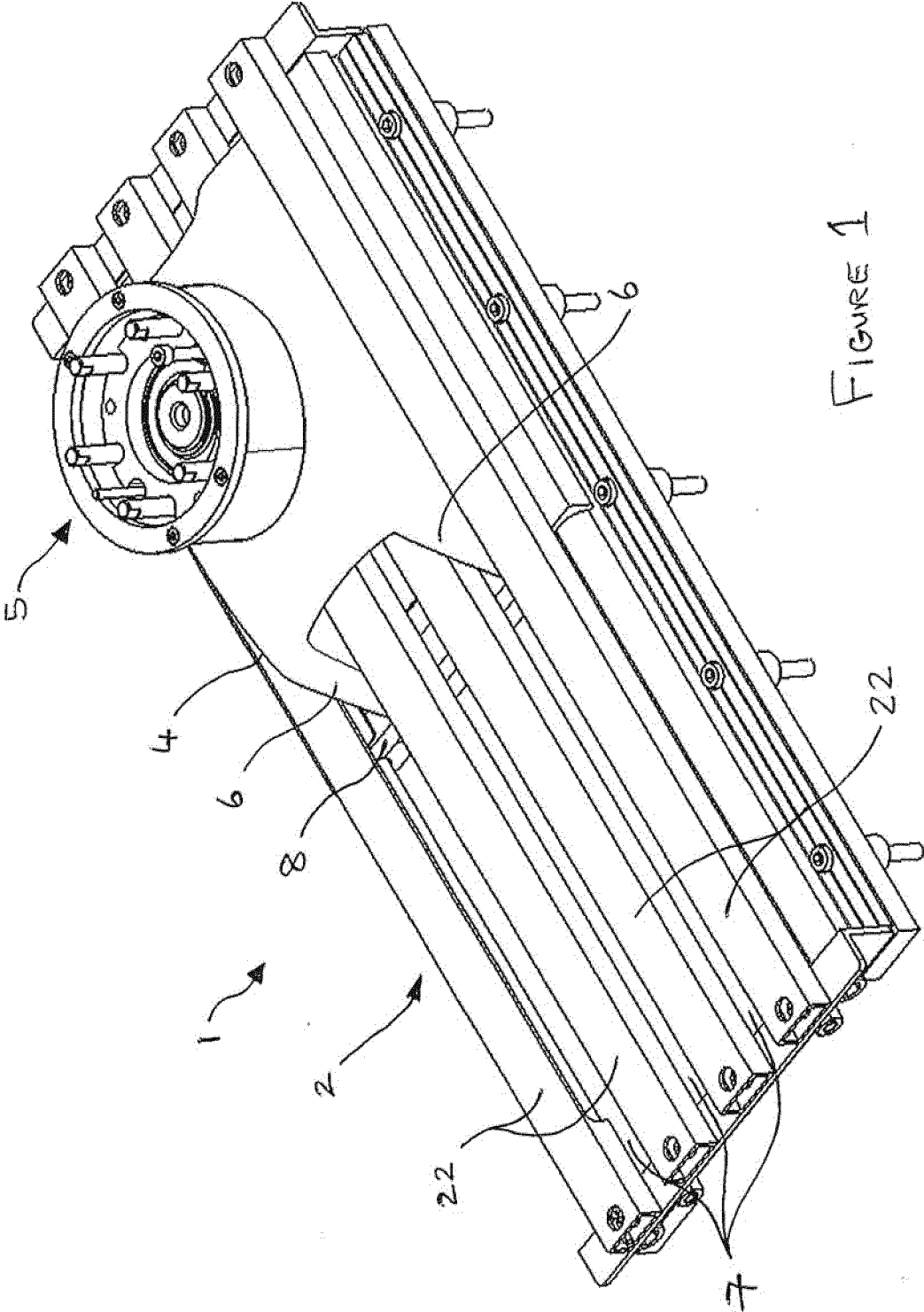


FIGURE 1

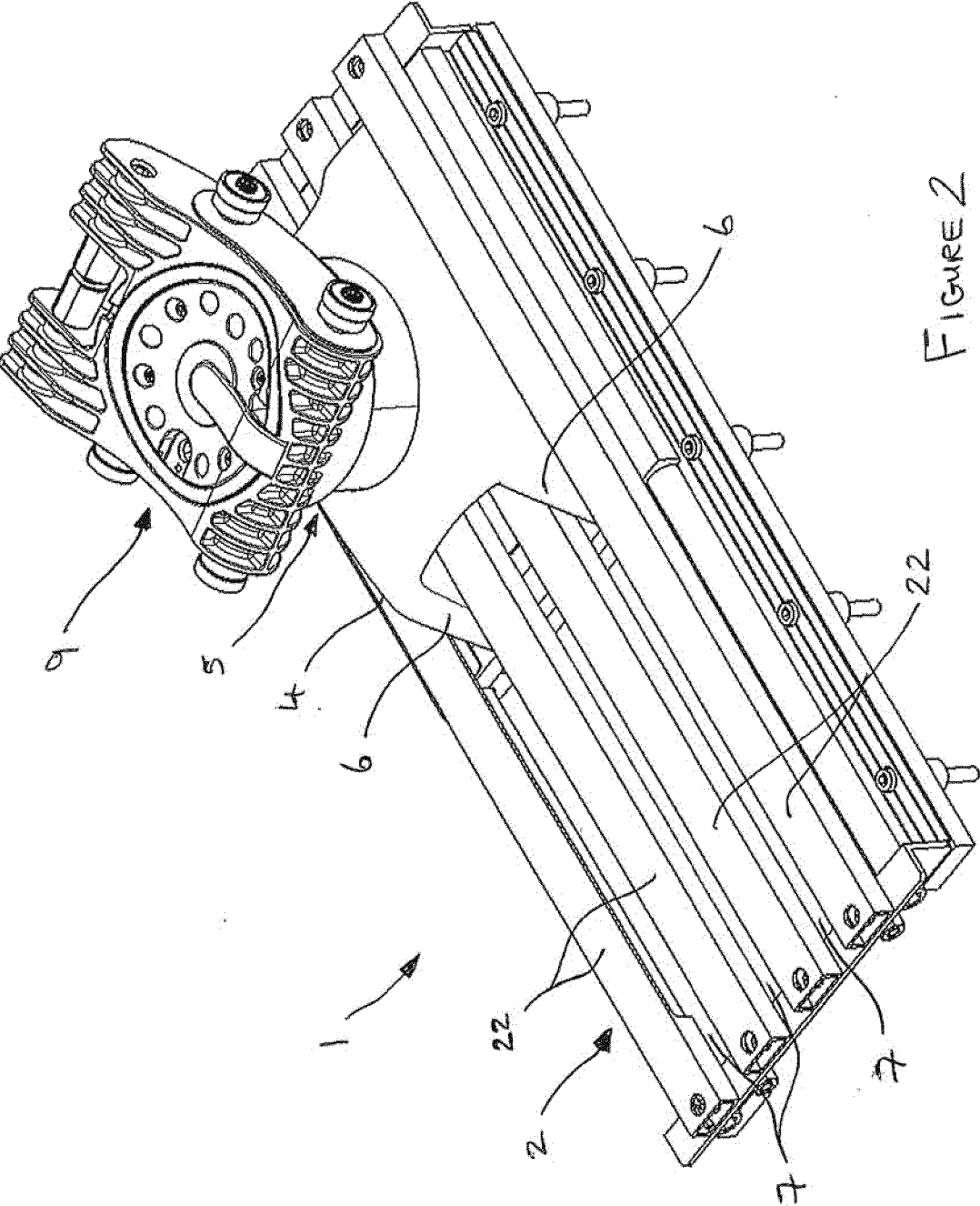


FIGURE 2

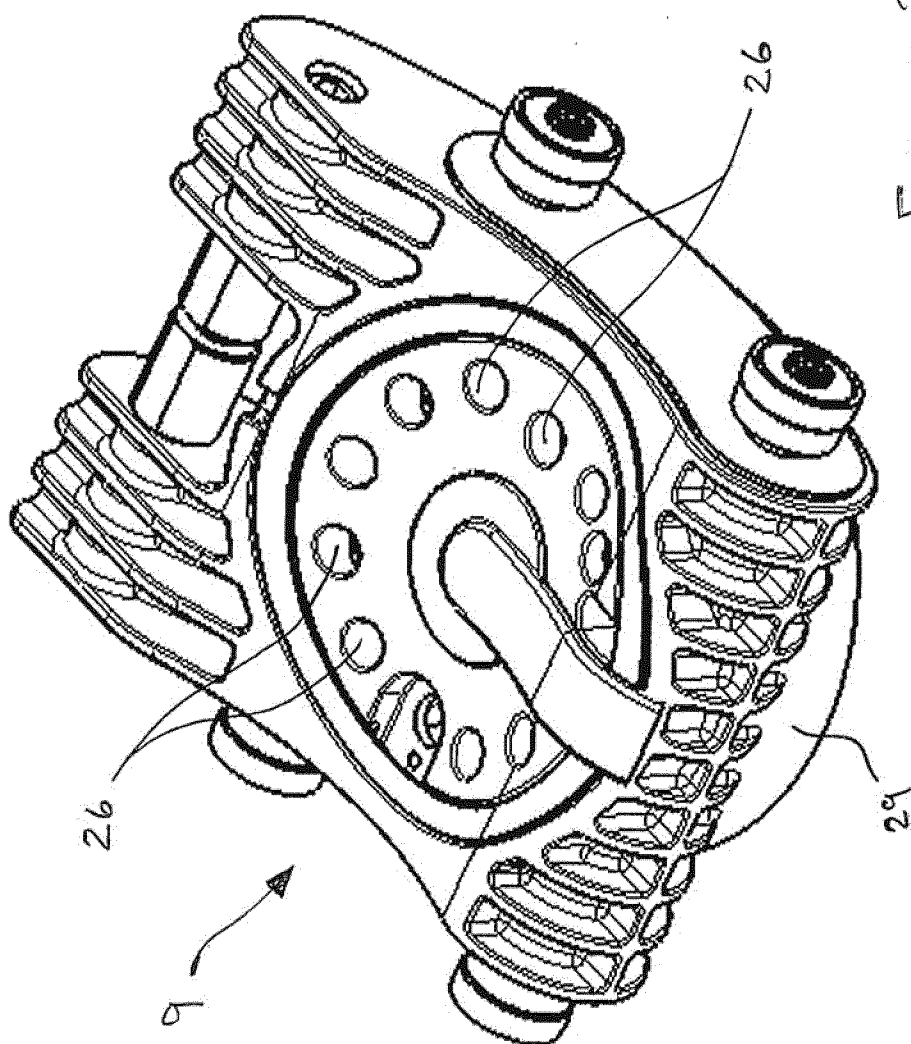


FIGURE 3

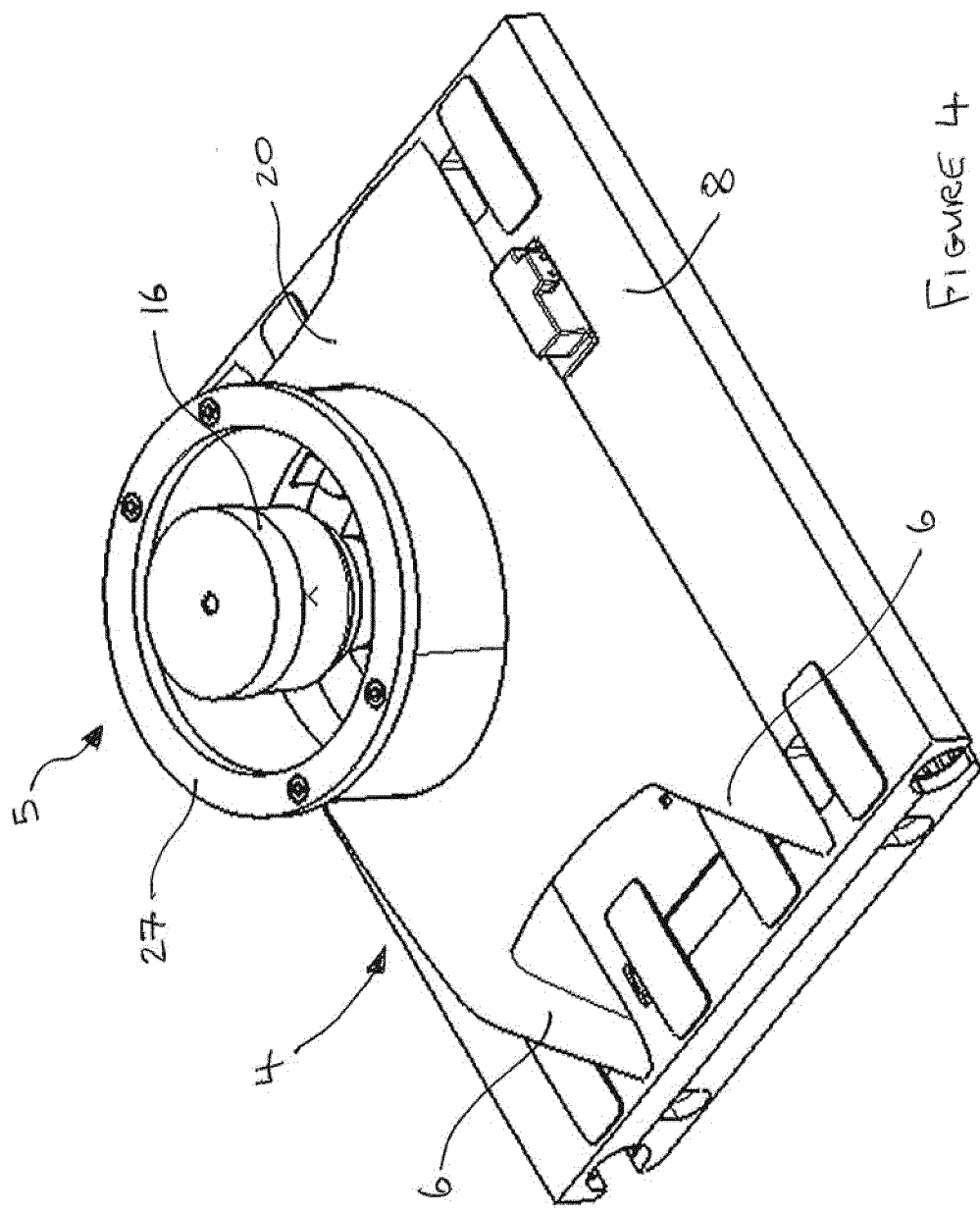


FIGURE 4

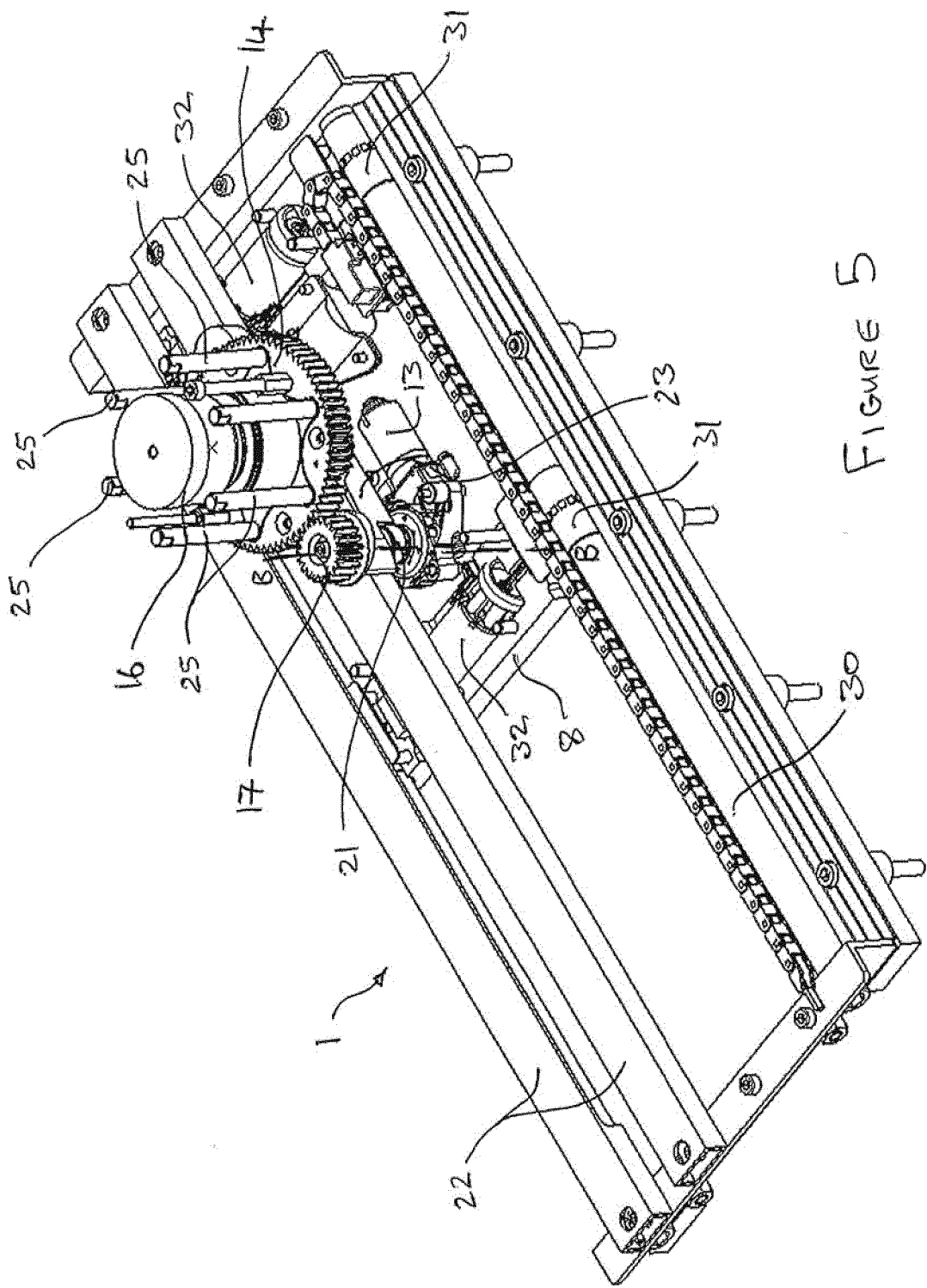


Figure 5

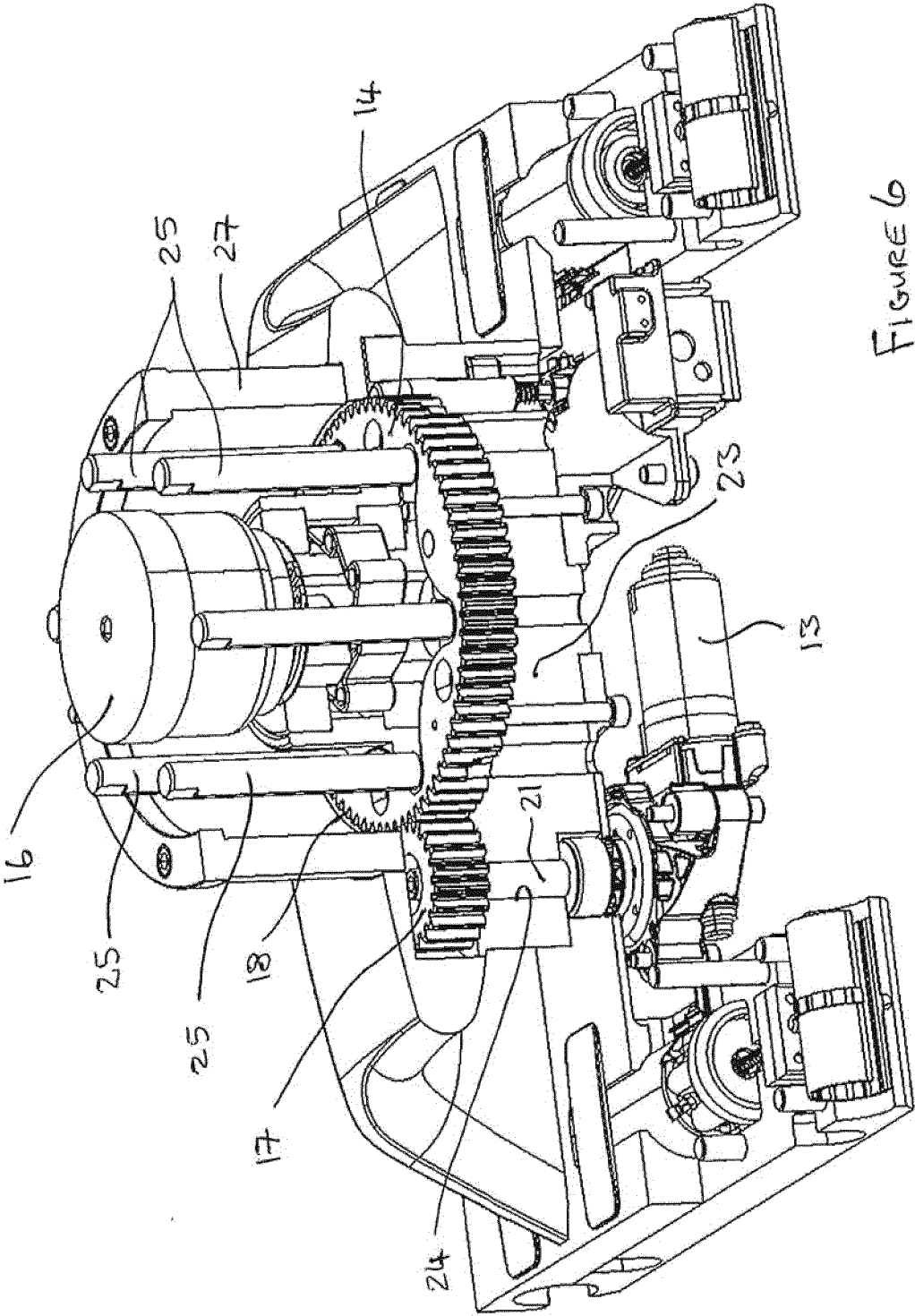


Figure 6

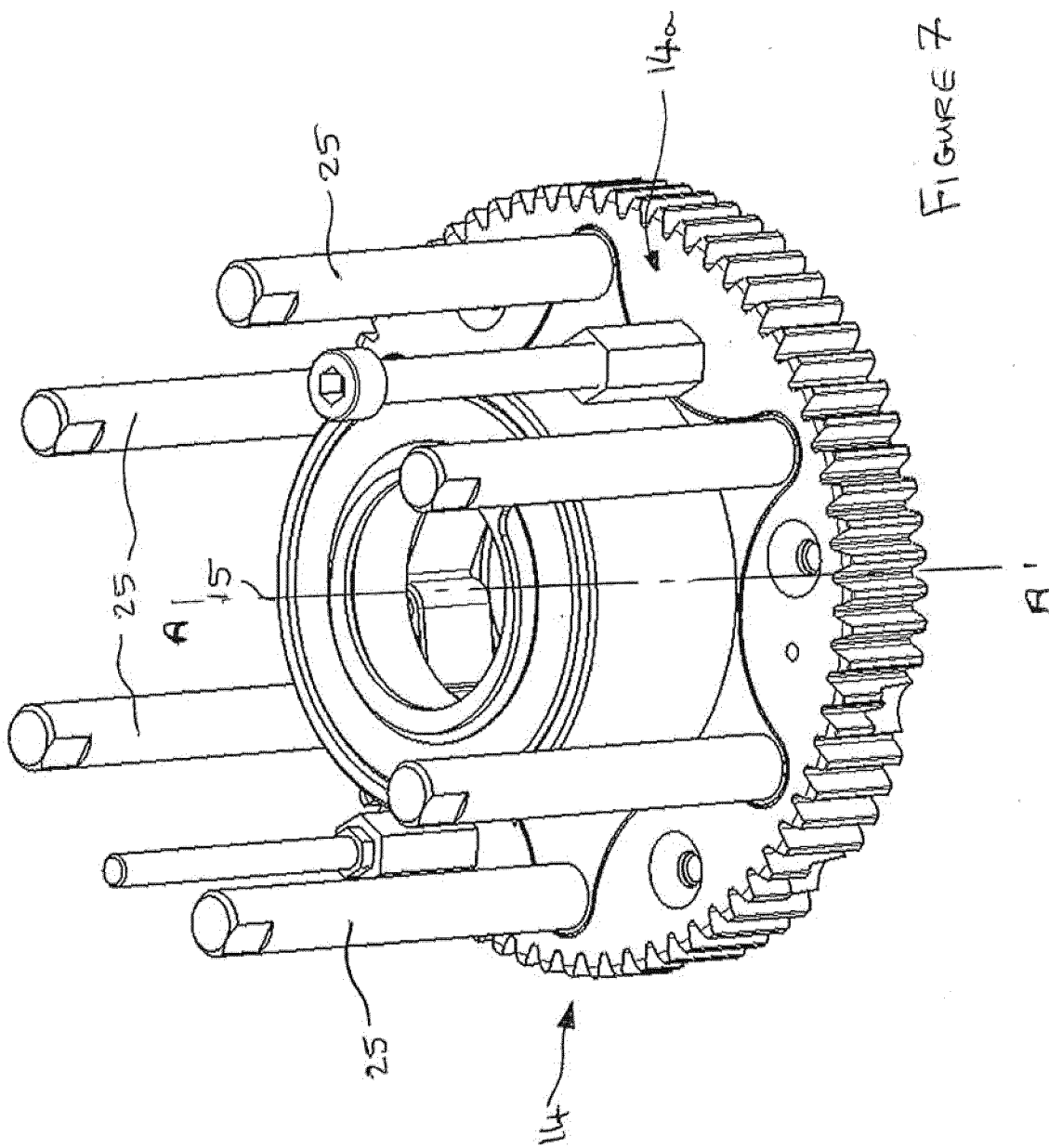


FIGURE 7

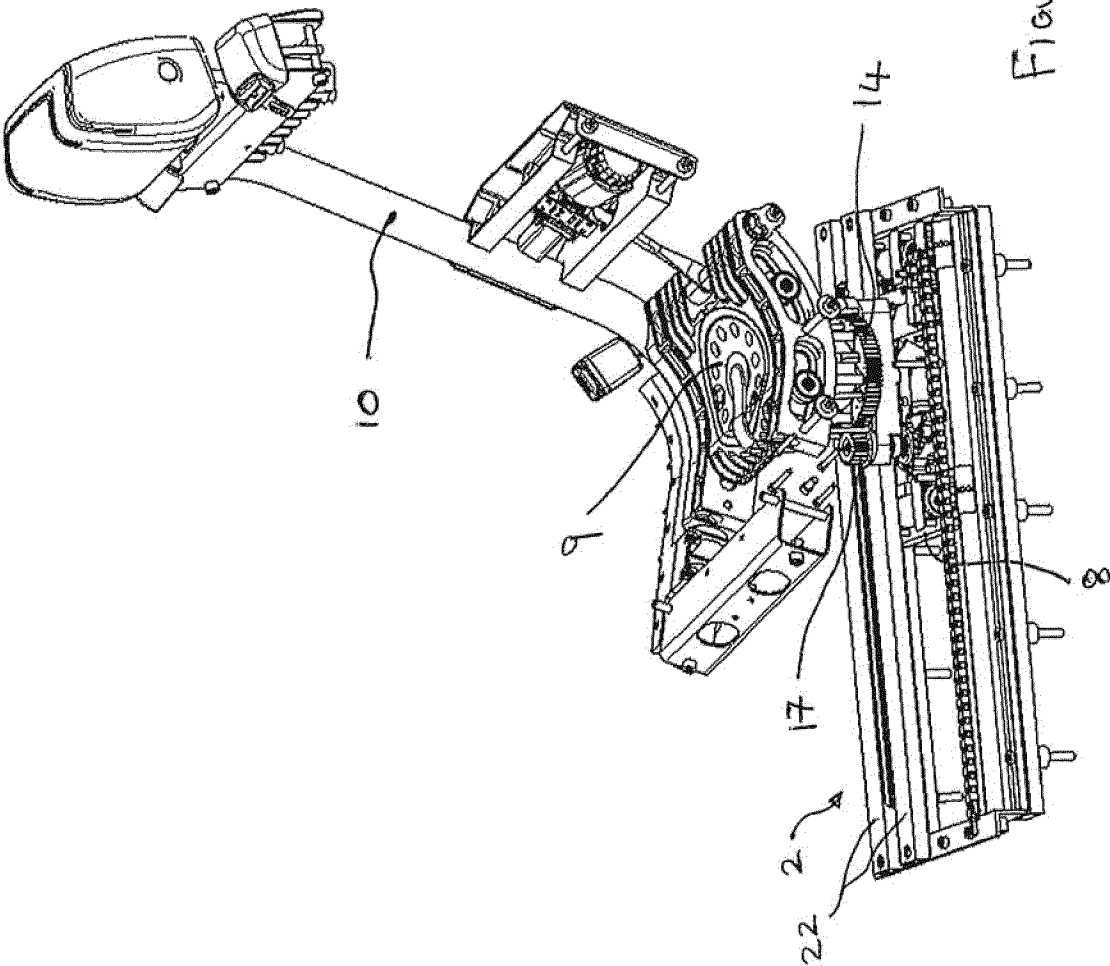
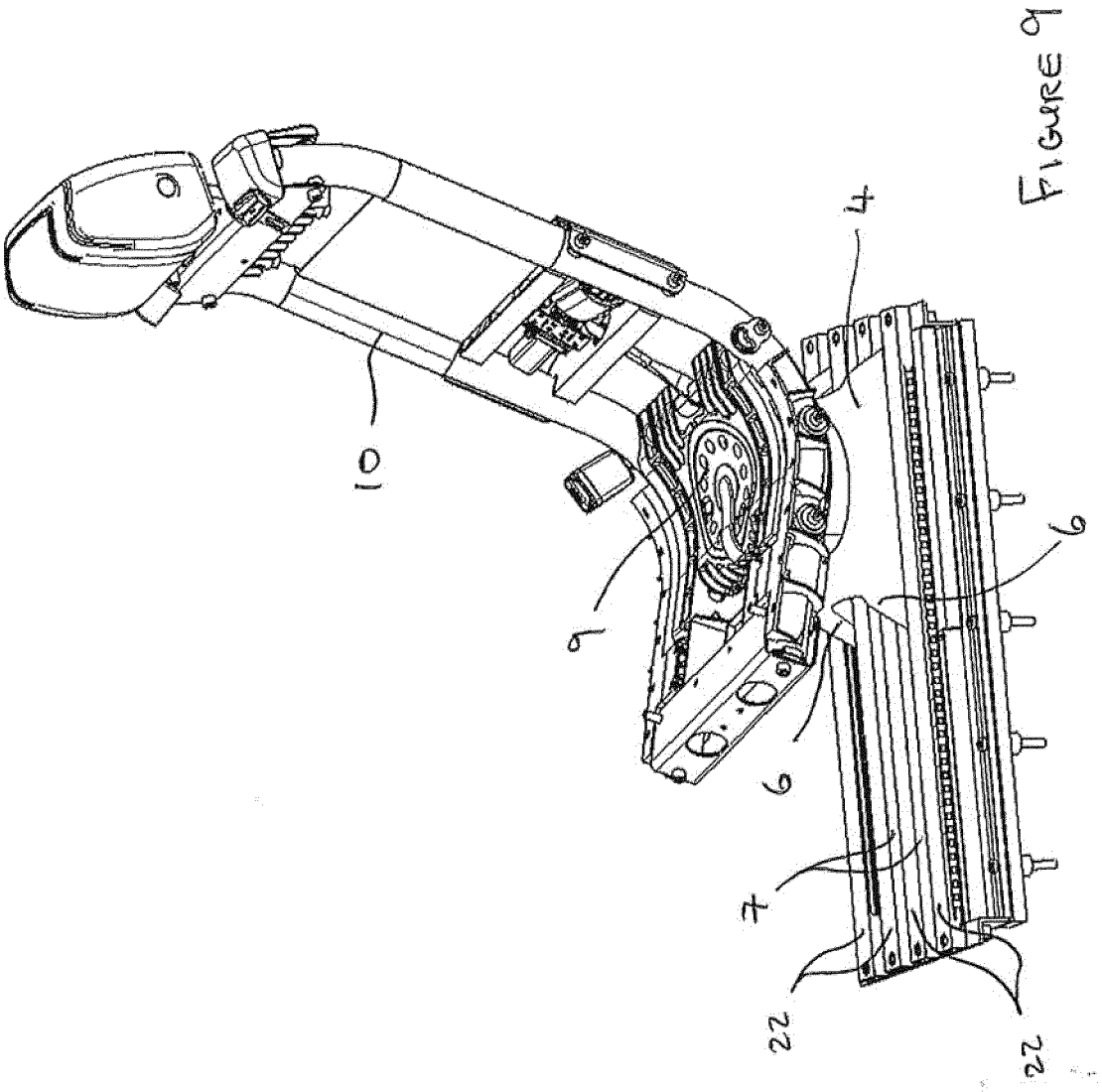


Figure 8



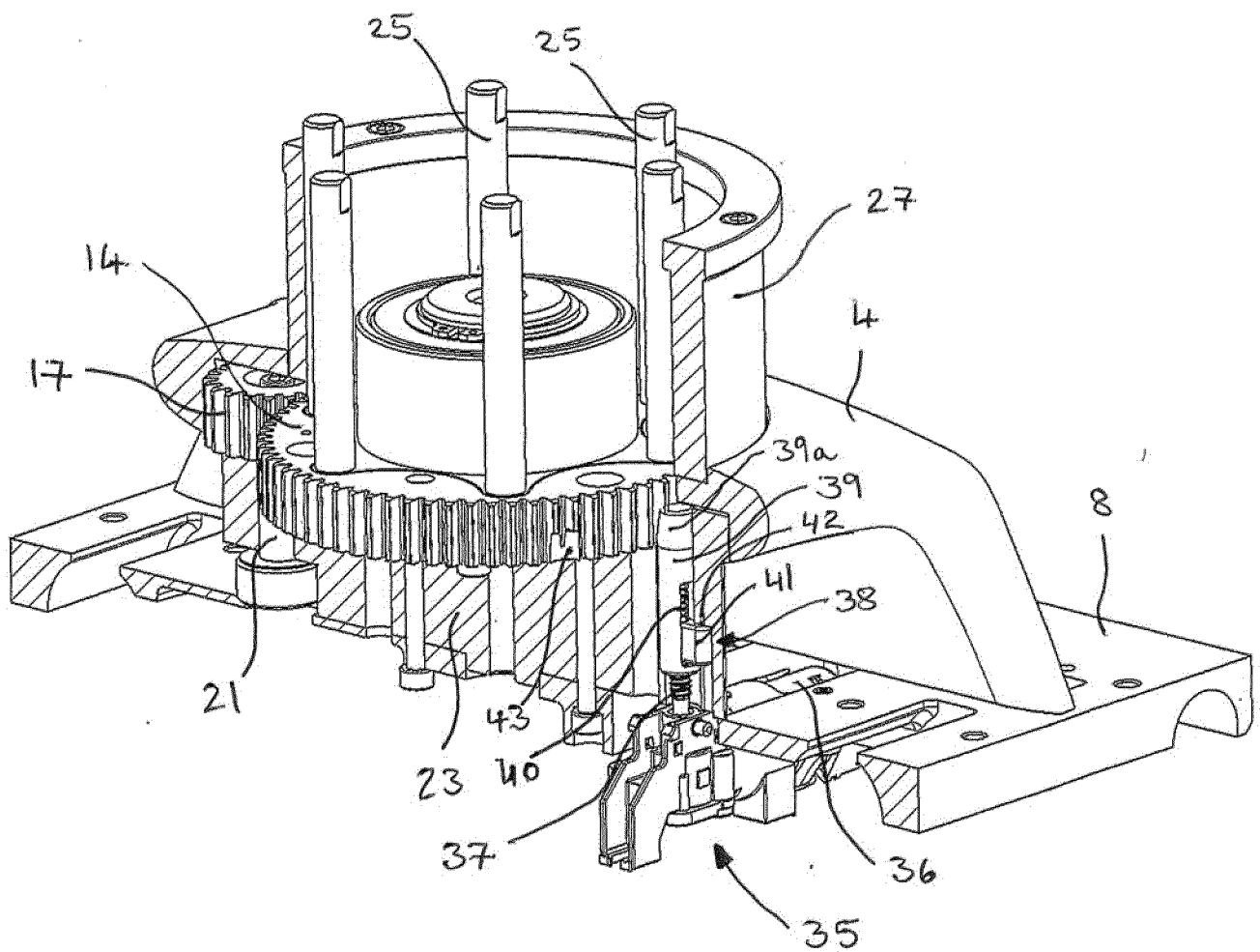


FIGURE 10.

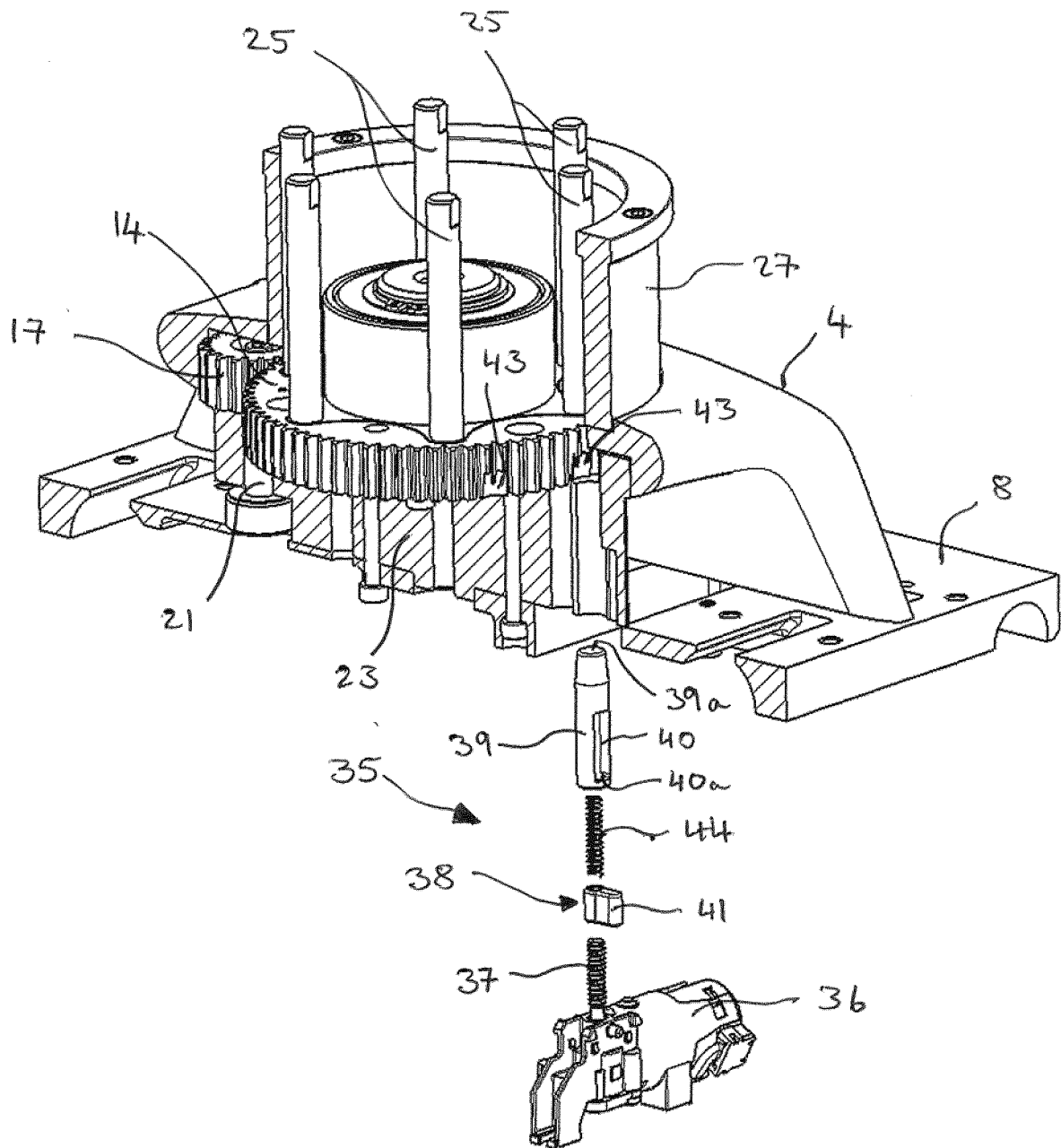


FIGURE 11.

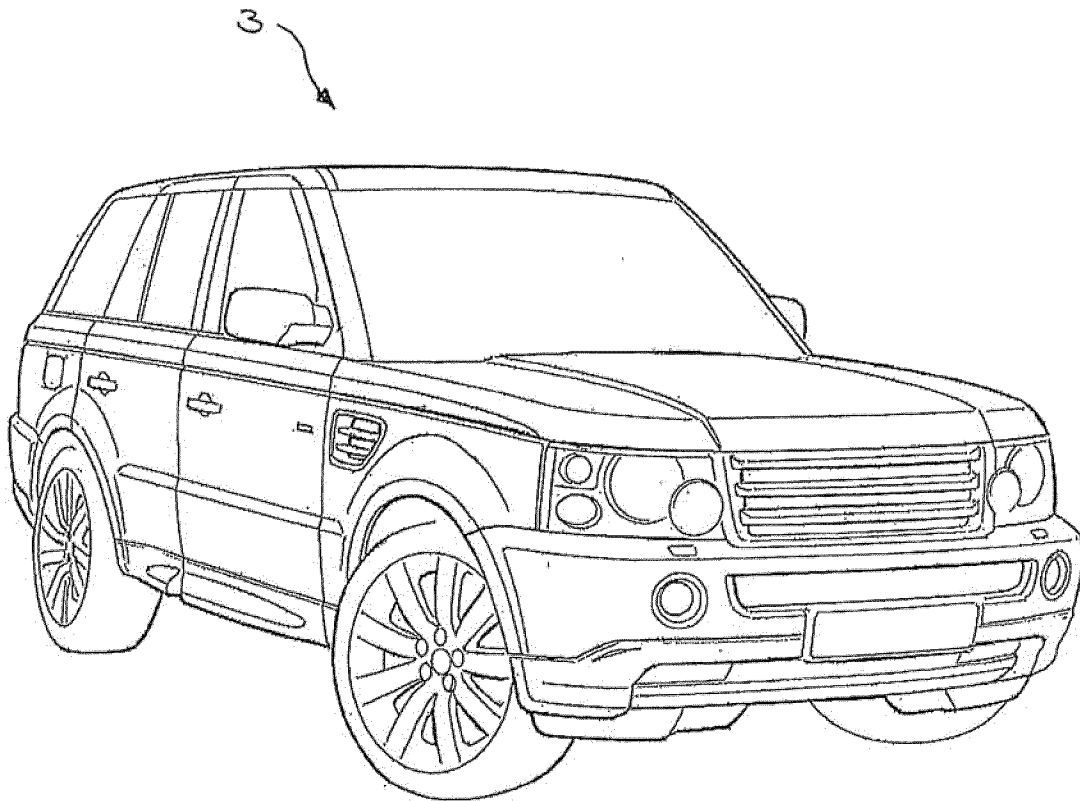


FIGURE 12

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2019/078280

A. CLASSIFICATION OF SUBJECT MATTER
INV. B60N2/02 B60N2/06 B60N2/14
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B60N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP 2017 210125 A (TOYOTA BOSHOKU CORP) 30 November 2017 (2017-11-30) abstract -----	1-10,24, 25 11-23
X A	CN 108 556 691 A (YANFENG ADIENT SEATING CO LTD) 21 September 2018 (2018-09-21) the whole document -----	1-10,24, 25 11-23
X A	DE 10 2018 205465 A1 (BOSCH GMBH ROBERT [DE]) 25 October 2018 (2018-10-25) the whole document -----	1-10,24, 25
X A	GB 2 508 522 A (E V S LTD [US]) 4 June 2014 (2014-06-04) the whole document -----	1-10,24, 25 11-23
	----- -/-	



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2019/078280

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/290680 A1 (BUSHA BRYAN [US] ET AL) 27 November 2008 (2008-11-27)	1,13-17
A	the whole document -----	18-23
X	FR 2 916 167 A3 (RENAULT SAS [FR]) 21 November 2008 (2008-11-21)	1,13-17
A	the whole document -----	18-23
X	FR 2 900 876 A1 (ANTOLIN GRUPO ING SA [ES]) 16 November 2007 (2007-11-16)	1,13-17
A	the whole document -----	18-23

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2019/078280

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2017210125 A	30-11-2017	NONE	
CN 108556691 A	21-09-2018	NONE	
DE 102018205465 A1	25-10-2018	DE 102018205465 A1 WO 2018197215 A1	25-10-2018 01-11-2018
GB 2508522 A	04-06-2014	NONE	
US 2008290680 A1	27-11-2008	NONE	
FR 2916167 A3	21-11-2008	NONE	
FR 2900876 A1	16-11-2007	EP 2021207 A2 FR 2900876 A1 WO 2007135249 A2	11-02-2009 16-11-2007 29-11-2007