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(54) **VACUUM CLEANER HEAD**

(57) A vacuum cleaner head 10 for cleaning carpets and hard floor surfaces comprises an elongate transverse suction mouth 18 on the underside thereof, a seal 30 substantially surrounding the suction mouth 18, wheels 32 for engaging the floor and an actuator 33 having a first position in which the wheels 32 and the seal

30 are raised for cleaning carpets, a second position in which the wheels 32 are lowered and the seal 30 is raised for cleaning surface debris from hard floors, and third position in which the wheels 32 and the seal 30 are lowered for cleaning hard floors with crevices.

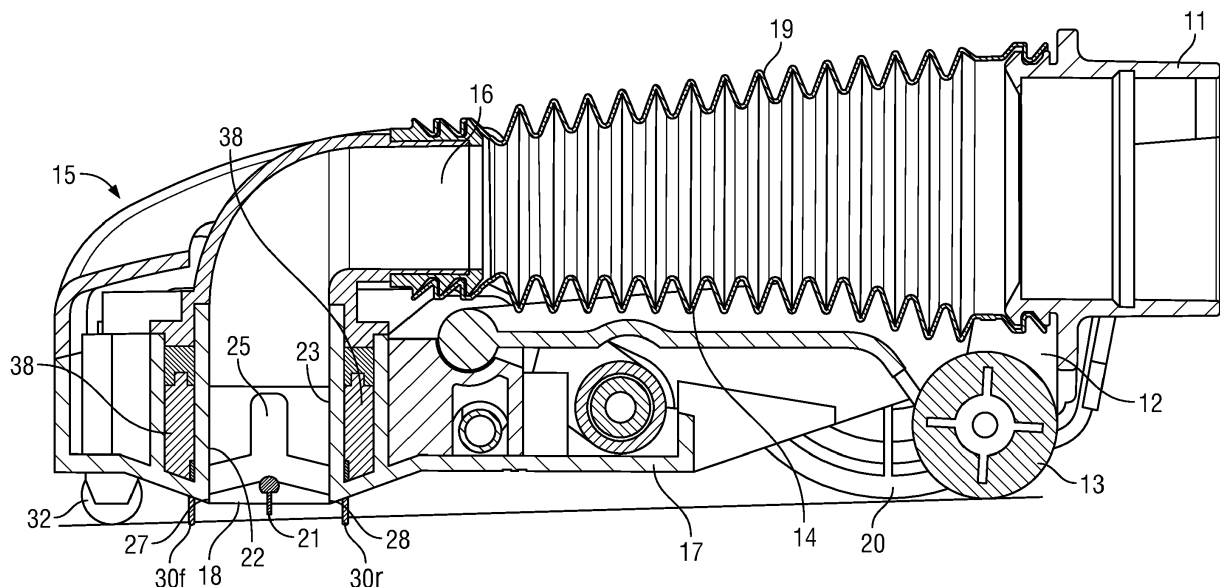


FIG. 7

Description

[0001] This invention relates to a vacuum cleaner head.

[0002] Vacuum cleaners always comprise some form of head which can engage the floor to pick up dirt and dust. In a so-called upright cleaner, the head is pivoted to an upright body which generally contains means for separating and collecting the dirt and dust that is drawn into the cleaner by the induced airflow.

[0003] In a so-called canister cleaner, the head is provided at the end of a tubular wand that is connected to a body of the cleaner via an elongate flexible duct. The body of the cleaner contains means for separating and collecting the dirt and dust that is drawn into the cleaner by a motor and fan unit disposed in the body. Sometimes the head of the canister cleaner may be detachable, so that the user can fit other kinds of cleaning tools to the wand.

[0004] Many dwellings comprise carpets and a variety of other floor coverings, such as wood, tiles, stone and other hard materials. Hence, there is a need to provide a head which can clean carpets and hard floors and can also remove dirt and dust from any crevices in the floor, such as crevices between floorboards.

[0005] We have now devised a head for a vacuum cleaner which meets the above-mentioned need.

[0006] In accordance with the present invention, as seen from a first aspect, there is provided a vacuum cleaner head comprising an elongate transverse suction mouth on the underside thereof, a seal substantially surrounding the suction mouth, wheel means for engaging the floor and an actuator having a first position in which the wheel means and the seal are raised, a second position in which the wheel means are lowered and the seal is raised, and third position in which the wheel means and the seal are lowered.

[0007] In use when cleaning carpets, the actuator is set to the first position such that the underside of the body of the head rests directly on the carpet and draws dirt and dust out of the carpet fibres.

[0008] In use when cleaning hard floors, the actuator is set to the second position in which the wheels engage the floor and lift the head into a raised position above the floor, thereby allowing dirt and dust to pass unhindered under the head where it is drawn into the head by the suction airflow. The wheels also help to prevent the underside of the seal from scratching the floor. In this position, the seal is raised.

[0009] In use when cleaning crevices in hard floors, the actuator is set to the third position in which the wheels engage the floor and the seal is lowered towards the floor. In this manner, an effective seal between the head and the floor is provided by the seal, so that airflow through the crevices is promoted and effective removal of dust from crevices is achieved.

[0010] The seal preferably comprises elastomeric wiper blades and the wheels help to reduce any tractive forces

require to move the head across a hard floor. If necessary, tractive effort can also be reduced on hard floors by switching from the third mode to the second mode.

[0011] Preferably the wheel means is disposed outwardly of the seal, preferably in front of the seal.

[0012] Preferably the head comprises a head portion which is pivotably attached to a chassis portion, the suction mouth being disposed on the underside of the head portion and having front and rear working edges, the head further comprising means for tilting the head portion such that the suction mouth faces rearwardly when the head is moved forwardly across a floor surface and vice-versa to respectively lower front and rear working edges of the suction mouth into engagement with the floor surface when said actuator is in said first position.

[0013] The wheel means preferably act to prevent the head portion from pivoting when the actuator is in said second and third positions so that the suction mouth is positioned at the correct attitude to a hard floor surface.

[0014] Preferably an elongate depending blade extends longitudinally of the suction mouth at a position between the front and rear working edges thereof, the blade comprising a lower edge which lies below the front and rear working edges.

[0015] Preferably the lower edge of the seal extends below the lower edge of the blade when the seal is lowered.

[0016] Preferably the actuator comprises a rotary dial.

[0017] Preferably the actuator is arranged to displace a pair of cams which act on respective cam followers respectively connected to the wheel means and the seal.

[0018] Preferably the wheel means comprises wheels or rollers, which are preferably arranged to caster.

[0019] An embodiment of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

Figure 1 is a perspective view from the front and above of a vacuum cleaner head in accordance with the present invention;

Figure 2 is a perspective view from the front and below of the vacuum cleaner head of Figure 1;

Figure 3 is a perspective view from the front and above of the vacuum cleaner head of Figure 1, when the top cover thereof is removed;

Figure 4 is a perspective view of an actuating mechanism of the vacuum cleaner head of Figure 1;

Figure 5 is a sectional view along the line V-V of Figure 1, when the actuator of Figure 4 is in its first position and the vacuum cleaner head is being moved forwardly;

Figure 6 is a left side view of the vacuum cleaner head of Figure 1, when the actuator is in its second

position and the vacuum cleaner head is being moved forwardly; and Figure 7 is a sectional view along the line V-V of Figure 1, when the actuator of Figure 4 is in its third position and the vacuum cleaner head is being moved forwardly.

[0020] Referring to the drawings, there is shown a vacuum cleaner head 10 in accordance with the present invention for fitting to a canister vacuum cleaner, the rear of the head comprising a rearwardly-extending tubular outlet 11 for releasably coupling to the distal end of a tubular wand (not shown) of the cleaner. In use, a motor and fan unit (not shown) in the body of the cleaner draws air through the head 10 via the wand.

[0021] The head 10 comprises a rear chassis portion 12, from which the outlet 11 extends. A central roller is mounted to the underside of the chassis 12. An arm 14 extends forwardly from the chassis 12 and is pivotally connected thereto for rotation about a first axis, which extends transverse the head 10 and which also forms the rotational axis for the roller 13.

[0022] A body portion 15 of the head 10 comprises a hollow housing having a bottom wall 17, which defines any elongate suction mouth 18 which extends transversely of the head 10. The suction mouth 18 is connected to the suction outlet 11 via an L-shaped duct 16 and a flexible duct 19 which extends rearwardly from the housing to the outlet 11. The flexible duct 19 is omitted from Figure 5.

[0023] The body portion 15 comprises a pair of wheels 20 disposed at the rear of the head 10 on opposite sides of the roller 13. The body portion 15 is pivotally connected to the front end of the arm 14 for rotation about a second axis, the arm 14 providing the sole support between the chassis 12 and body portion 15.

[0024] Any elongate resiliently flexible wiper blade 21 extends longitudinally of the suction mouth 18. The blade 21 is disposed in the suction mouth 18 and extends parallel to front and rear side walls 22, 23 of the suction mouth 18. The lower edge of the blade 21 lies below the front and rear edges 27, 28 of the suction mouth 18. The blade 21 is supported by an elongate carrier 25, which is connected to the front and rear sidewalls 22, 23 by a plurality of spaced-apart webs, which do not substantially obstruct a flow of air into the suction mouth 18.

[0025] The bottom wall 17 of the head portion comprises front and rear portions, which respectively extend upwardly and outwardly from the front and rear edges 27, 28 of the suction mouth 18 respectively to define working edges.

[0026] The suction mouth 18 is surrounded by an elastomeric seal 30 having front and rear portions 30F, 30R, which may be provided with a plurality of openings or slots 31. The seal 30 also comprises opposite end portions 30E. The head 10 further comprises a pair of wheels 32 on its bottom wall 17, the wheels 32 being disposed in front of the suction mouth 18.

[0027] A rotary actuator dial 33 is disposed on the up-

per surface of the body portion 15. The actuator 33 is connected via a gear 34 to a cam assembly 35, which is pivoted to the rear of the body portion 15 for rotation about an axis which extends transversely of the head 10.

5 The cam assembly 35 comprises symmetrical camming end portions disposed on respective opposite sides of the flexible duct 19. The seal 30 is free to move upwardly and downwardly and comprises 4 upstanding shafts 38, which extend into the housing. The two shafts 38 at the front of the head 10 are biased upwardly towards outer ends of respective first cam follower arms 36, which are pivoted to the rear of the body portion 15 and which extend forwardly under respective ends of the cam 35. The two shafts 38 at the rear of the head are also biased upwardly towards inner ends of respective first cam follower arms 36.

[0028] The wheels 32 are mounted to the ends of respective second cam follower arms 37, which are pivoted to the rear of the body portion 15 and which extend forwardly under the respective ends of the cam 35. The arms 36, 37 are biased upwardly against the cam 35.

[0029] In use, when cleaning carpets, the actuator is turned fully counter-clockwise to bring the cam 35 into its most raised position shown in Figure 4. In this position, the cam follower arms 36, 37 are in their most raised position, so that the seal 30 and wheels 32 are retracted inside the head as shown in Figure 5.

[0030] When the wand (not shown) of the vacuum cleaner is used to push the head 10 forwardly across a carpet, the friction between the carpet and bottom wall 17 of the head portion 15 causes a compressive force between the body and chassis portions 15, 12 of the head 10. This compressive force causes the front of the arm 14 to pivot upwards and lift the rear of the body portion 15, such that the suction mouth 18 is rearwardly inclined, with the front edge 27 of the suction mouth forming a working edge which sinks slightly into the pile of the carpet.

[0031] When the wand (not shown) of the vacuum cleaner is used to pull the head 10 rearwardly across the carpet, the friction between the carpet and bottom wall 17 of the body portion 15 causes a tensile force between the body and chassis portions 15, 12. This tensile force causes the front end of the arm 14 to pivot downwardly and lowers the rear of the body portion 15, such that the suction mouth 18 is forwardly inclined, with the rearward edge 28 of the suction mouth 18 forming a working edge which sinks slightly into the pile of the carpet.

[0032] The working edges 27, 28 and the elongate blade 21 act to separate the carpet fibres and assist with the removal of dust.

[0033] In use when cleaning coarse debris from hard floor surfaces, the actuator 33 is turned partly clockwise to lower the cam 35 into a position where the second cam follower arms 37 are biased downwardly, such that the wheels 32 are lowered as shown in Figure 6.

[0034] The wheels 32 lift the head 10 such that the suction mouth 18 is disposed away from the floor surface

being cleaned. The head 10 is lifted sufficiently so that the wiper blade 21 does not engage the floor surface. The wheels 32 act to prevent the head 10 from articulating as it is moved forwardly and rearwardly over the floor surface being cleaned. Any coarse, dirt and debris is able to pass under the head, where it is drawn into the suction mouth 18 by the induced suction airflow.

[0035] In use, when cleaning hard floor surfaces with crevices, the actuator 33 is turned fully clockwise to bring the cam 35 into its most lowered position. In this position, both cam follower arms 36, 37 are in their most lowered position, so that the seal 30 and wheels 32 are lowered as shown in Figure 7.

[0036] In this position, the seal 30 surrounding suction mouth 18 slightly engages the floor surface to provide a seal around the suction mouth 18. When the head 10 passes over a crevice, air is drawn through the crevice into the suction mouth 18 together with any accumulated dust in the crevice.

[0037] A vacuum cleaning head in accordance with the present invention is simple and inexpensive in construction, yet is able to achieve very efficient cleaning of carpets, hard surfaces and hard surfaces having crevices.

Claims

1. A vacuum cleaner head comprising an elongate transverse suction mouth on the underside thereof, a seal substantially surrounding the suction mouth, wheel means for engaging the floor and an actuator having a first position in which the wheel means and the seal are raised, a second position in which the wheel means are lowered and the seal is raised, and third position in which the wheel means and the seal are lowered. 30
2. A vacuum cleaner in claim 1, in which the seal comprises elastomeric wiper blades. 40
3. A vacuum cleaner in claims 1 or 2, in which the wheel means is disposed outwardly of the seal. 45
4. A vacuum cleaner in claim 3, in which the wheel means is disposed in front of the seal. 50
5. A vacuum cleaner in any preceding claim, in which the head comprises a head portion which is pivotably attached to a chassis portion, the suction mouth being disposed on the underside of the head portion and having front and rear working edges, the head further comprising means for tilting the head portion such that the suction mouth faces rearwardly when the head is moved forwardly across a floor surface and vice-versa to respectively lower front and rear working edges of the suction mouth into engagement with the floor surface when said actuator is in said first position. 55
6. A vacuum cleaner in claim 5, in which wheel means act to prevent the head portion from pivoting when the actuator is in said second and third positions.
7. A vacuum cleaner in claims 5 or 6, in which an elongate depending blade extends longitudinally of the suction mouth at a position between the front and rear working edges thereof, the blade comprising a lower edge which lies below the front and rear working edges. 10
8. A vacuum cleaner in claim 7, in which the lower edge of the seal extends below the lower edge of the blade when the seal is lowered. 15
9. A vacuum cleaner in any preceding claim, in which the actuator comprises a rotary dial.
10. A vacuum cleaner in claim 9, in which the actuator is arranged to displace a pair of cams which act on respective cam followers respectively connected to the wheel means and the seal. 20
11. A vacuum cleaner in any preceding claim, in which the wheel means comprises wheels or rollers. 25
12. A vacuum cleaner in claim 11, in which the wheels or rollers are arranged to caster.

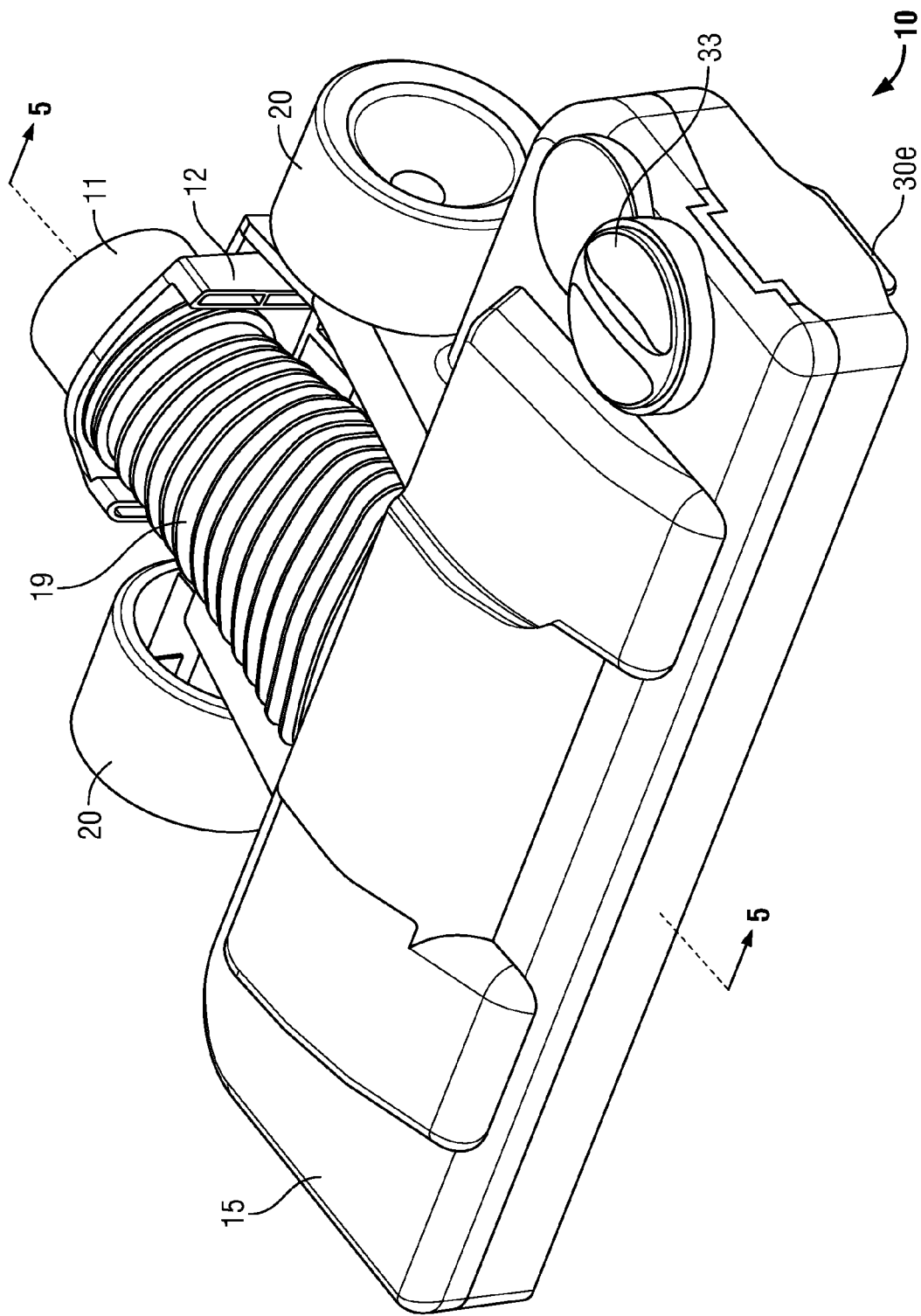


FIG. 1

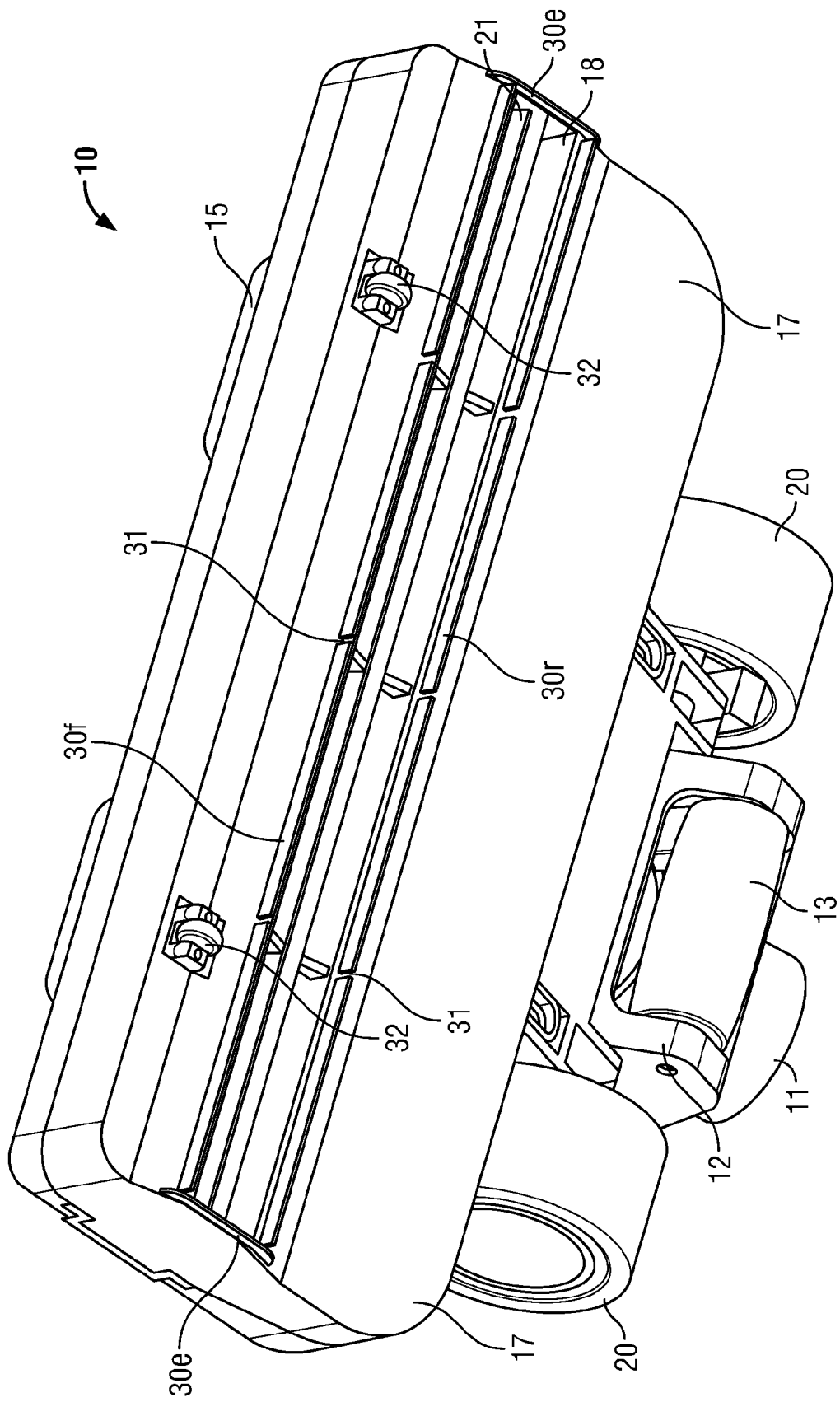


FIG. 2

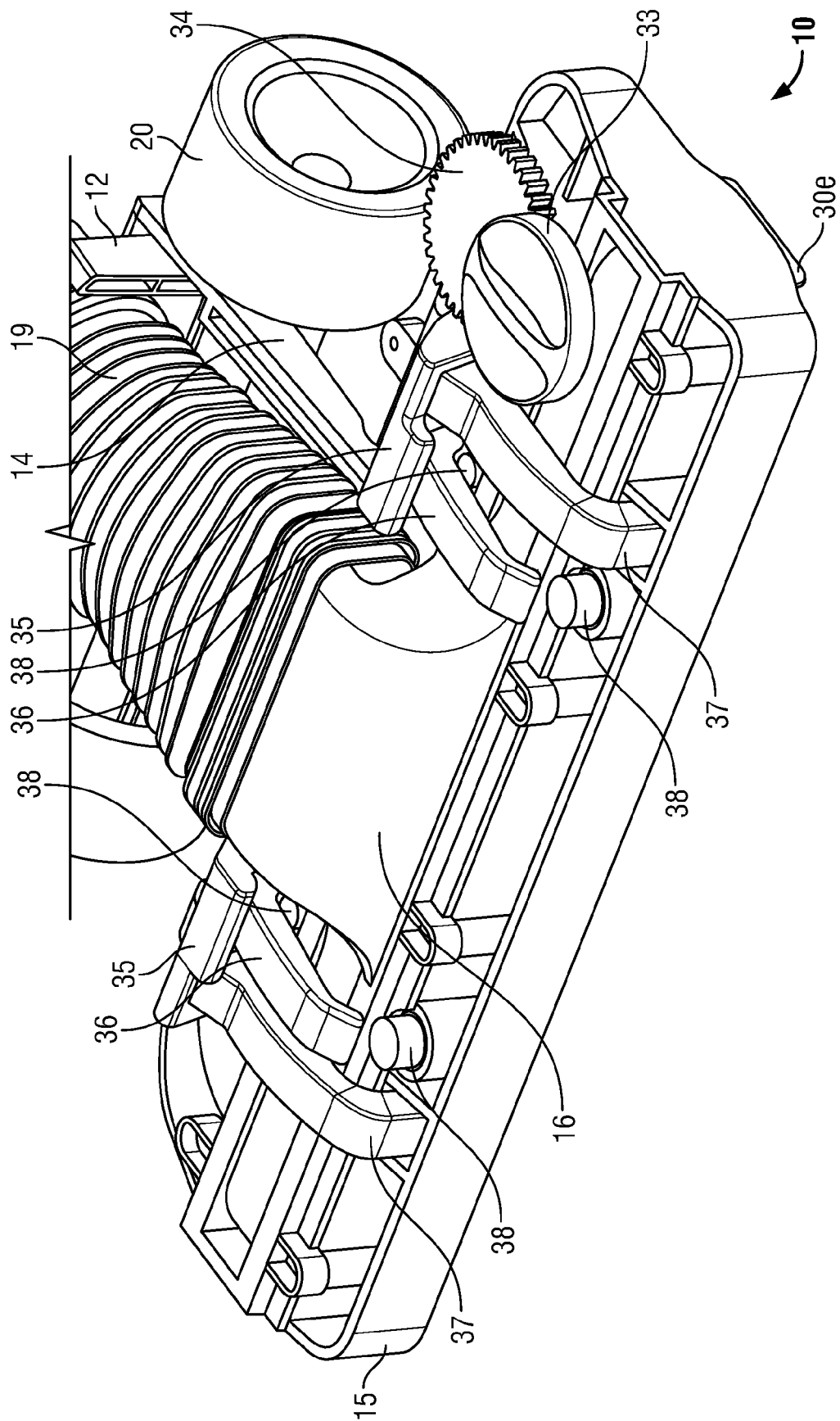


FIG. 3

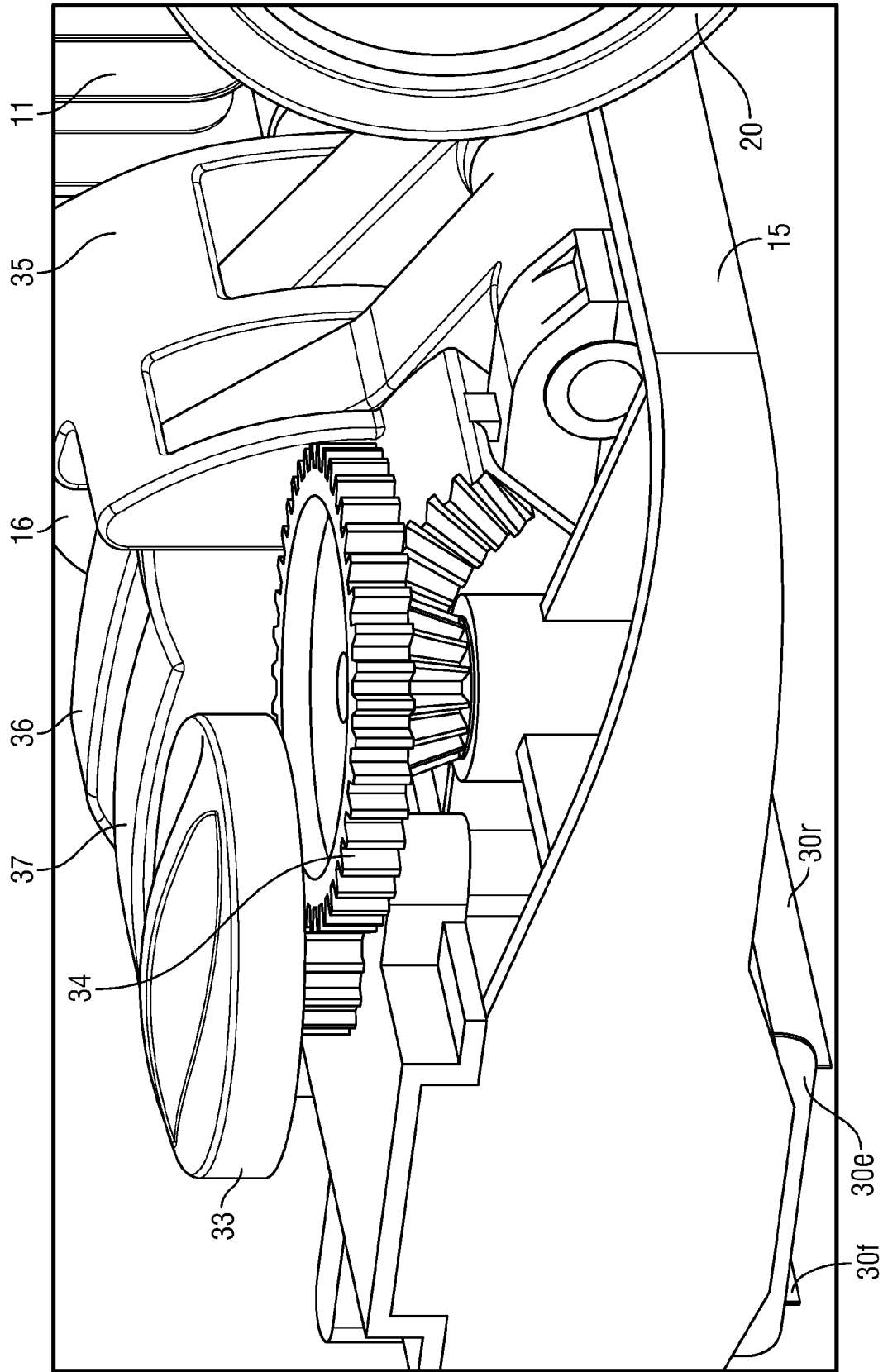


FIG. 4

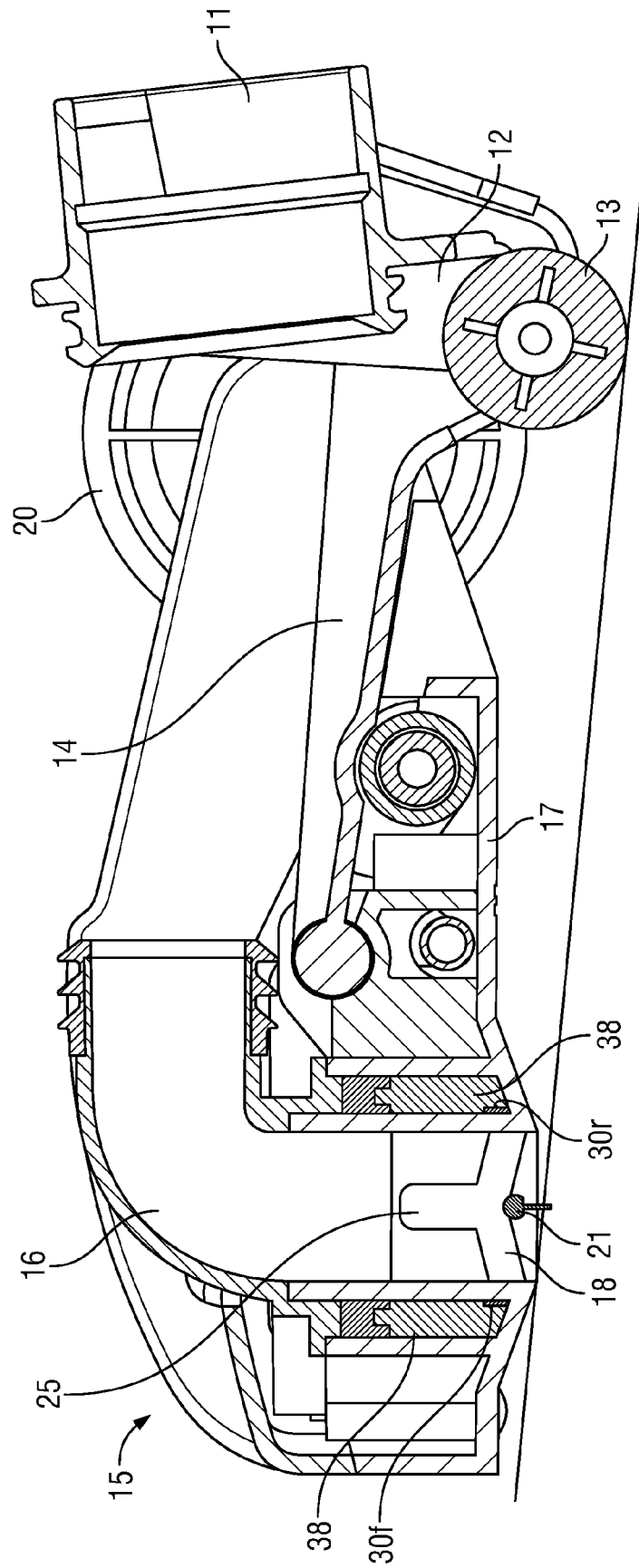


FIG. 5

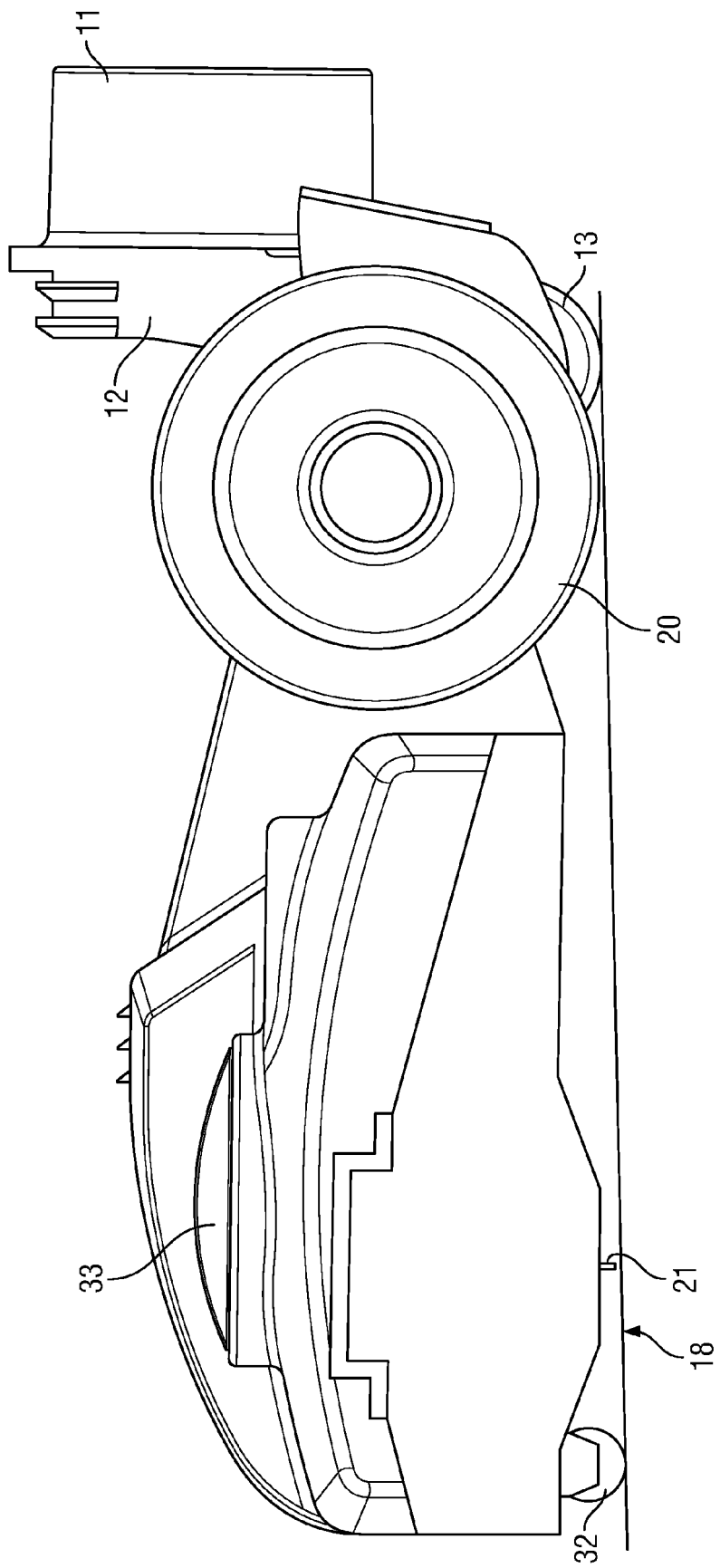


FIG. 6

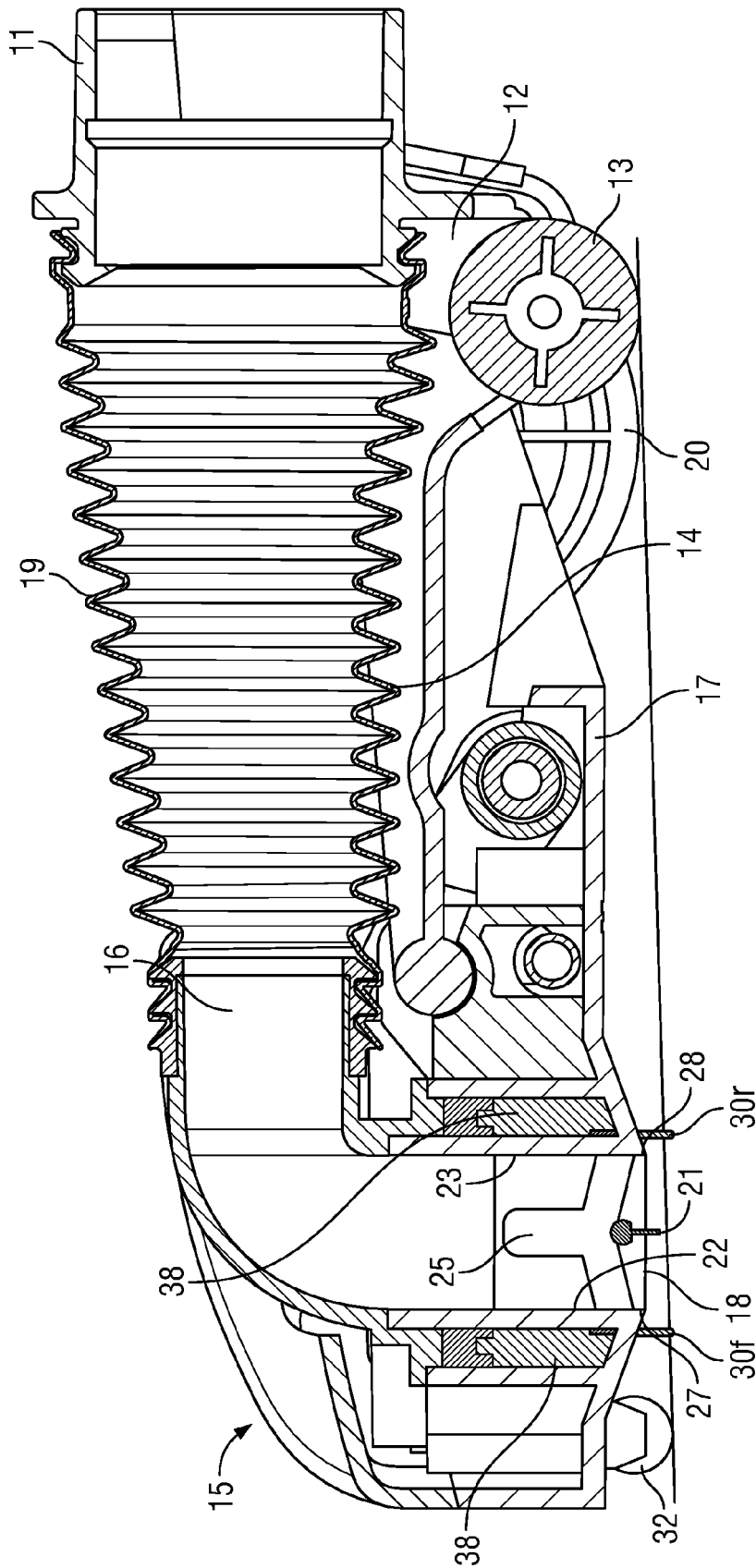


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 15 17 6169

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2013/145577 A1 (DAVIDSHOFER DONALD [US] ET AL) 13 June 2013 (2013-06-13) * claims; figures * -----	1	INV. A47L9/02 A47L5/36 A47L9/00
			TECHNICAL FIELDS SEARCHED (IPC)
			A47L
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 10 November 2015	Examiner Lopez Vega, Javier
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	

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

EP 15 17 6169

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The members are as contained in the European Patent Office EDP file on
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10-11-2015

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		EP 2790560 A1	22-10-2014
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