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(54) **Vehicle door hinge**

(57) The present invention relates to a hinge for a vehicle door (15) comprising a first knuckle (2) adapted to be mounted on a body (17) of the vehicle, a second knuckle (3) adapted to be mounted on the door (15) of the vehicle, wherein the door (15) is movable between a closed position and an open position, a hinge pin (4) adapted to connect the two knuckles (2, 3) to each other in a hinged manner, and a door check strap (5) for preventing the door (15) from being opened beyond a predetermined opening angle and for holding the door (15) open at said predetermined opening angle. A catching member (6) is adapted to provide a detachable clipped connection between itself and the door check strap (5) in the open position of the door (15) at the predetermined opening angle.

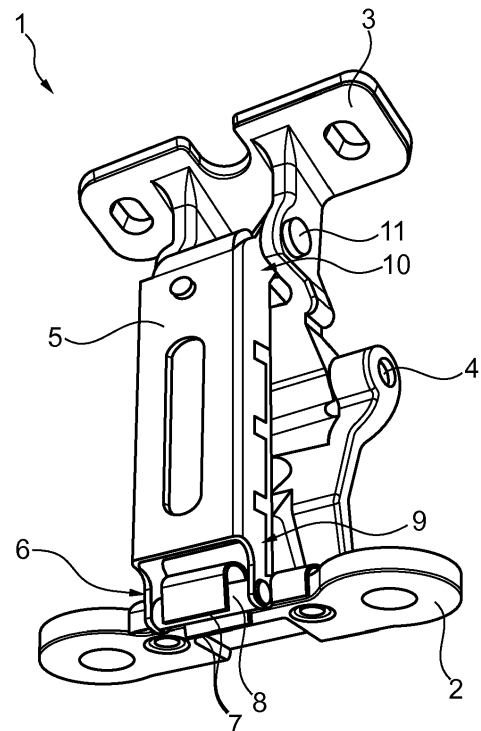


Fig. 1

Description

[0001] The present invention relates to a hinge for a vehicle door, particularly for a vehicle rear door or cargo door, according to the preamble of claim 1.

[0002] Certain motor vehicles, such as utility vehicles of the small van type, for example, are equipped with rear doors that can be moved between a closed position and an open position up to a predetermined opening angle. It is desirable that when the rear door is in its open position it will be in a detent position which will prevent inadvertent closure. In order to hold the door open at the predetermined opening angle specifically designed door hinges are known in the prior art.

[0003] For example, US 6,591,452 B2 discloses a hinge for a motor vehicle rear door comprising a fixed knuckle mounted on the body of the vehicle, a moving knuckle mounted on the rear door, wherein the door is movable between a closed position and an open position. The two knuckles are connected to each other by an intermediate knuckle. The intermediate knuckle is connected to each of the two knuckles by a hinge pin. Furthermore, the hinge also includes a means for holding the door open in a wide-open position. The means includes a cam, one end of which is mounted articulated on the intermediate knuckle and the other end of which has a notch on a first lateral edge of the cam cooperating, when the rear door is in the open position, with a fixed roller rotatably supported by the fixed knuckle. The first lateral edge of the cam is held against the fixed roller by a moving roller rotatably supported by the fixed knuckle and cooperating with a second lateral edge of the cam opposite the first lateral edge. The moving roller is held against the second lateral edge by a spring.

[0004] Another known door hinge, as for example disclosed in US 7,610,657 B2, comprises a first knuckle mounted on a door panel and a second knuckle mounted on a body, the first and second knuckles being pivotally connected by a hinge pin. An engaging member is provided on the first knuckle and a check arm is movably connected to the second knuckle. The check arm has an engaging surface with at least one detent. The engaging surface is engaged with the engaging member. The check arm is biased into engagement with the engaging member by a spring. A similar approach is also pursued with a door hinge disclosed in DE 20 2004 013 177 U1.

[0005] Furthermore, US 6,601,268 B2 discloses a door hinge for vehicles which is adapted to serve as a door checker thus eliminating the necessity of installing a separate door checker.

[0006] The afore-mentioned door hinges are rather complex in design. In particular, they comprise an increased number of parts resulting in an increased number of assembling processes raising the assembling cost thereof.

[0007] Against this background, the present invention has the object to provide a hinge for a vehicle door, particularly for a rear door of a utility vehicle, that either pro-

vides a hinged connection between the rear door and a vehicle body, wherein the rear door shall be movable between a closed position and an open position up to a predetermined opening angle, and holds the door open at the predetermined opening angle to prevent inadvertent closure thereof, thereby reducing the number of parts and assembling processes and decreasing manufacturing costs thereof.

[0008] This object is achieved by a door hinge having the features of claim 1. Further, particularly advantageous embodiments of the invention are disclosed in the dependent claims.

[0009] It should be noted that the individual features listed in the description below can be combined in any technically meaningful way with each other and show further embodiments of the invention. The description of the invention is additionally characterized and specified particularly in connection with the figures.

[0010] According to the present invention a hinge for a vehicle door, particularly for a rear door or cargo door of a utility vehicle, comprises a first knuckle adapted to be mounted on a body of the vehicle, a second knuckle adapted to be mounted on the door of the vehicle, wherein the door is movable between a closed position and an open position, a hinge pin adapted to connect the two knuckles to each other in a hinged manner, and a door check strap for preventing the door from being opened beyond a predetermined opening angle and for holding the door open at said predetermined opening angle. Furthermore, the door hinge of the present invention comprises a catching member adapted to provide a detachable clipped connection between itself and the door check strap in the open position of the door at the predetermined opening angle. According to the present invention a clipped connection is to be interpreted substantially as a frictional engagement between the catching member and the door check strap. The number of parts can be reduced since no separate spring elements are necessary to realize the clipped connection, for example, thereby reducing the number of assembling processes and the weight of the door hinge.

[0011] According to an advantageous embodiment of the present invention one end of the door check strap is hingedly attached to one of the two knuckles and the catching member is attached to the other one of the two knuckles. In this way, a compact design of the door hinge is realizable.

[0012] A further advantageous embodiment of the present invention provides that the knuckle to which the catching member is attached comprises a rigid dead stop protruding from the knuckle which is adapted to limit the movement of the door check strap in the open position of the door at the predetermined opening angle. By means of the dead stop the maximum opening angle of the door can be defined. The dead stop provides a means for securely stopping the opening movement of the door as the dead stop represents a rigid barrier the door check strap is not able to pass.

[0013] According to yet another advantageous embodiment of the present invention the catching member is positioned adjacently to the dead stop abutting the same, thereby giving support to the catching member. Thus, the catching member itself can be made of a flexible material enhancing the properties of the clipped connection.

[0014] A still further advantageous embodiment of the present invention provides that the catching member comprises two flexible, spaced apart tongues adapted to resiliently sandwich a pin-like member there between formed on the door check strap, thereby providing a detachable clipped connection between the catching member and the door check strap having a simple design and requiring only a minimum number of parts.

[0015] According to yet another advantageous embodiment of the present invention the door check strap is biased by a spring towards the catching member. The spring provides guidance to the door check strap in the sense that either the clipped connection between the door check strap and the catching member as well as the stoppage of the door at the predetermined opening angle are always guaranteed.

[0016] A further advantageous embodiment of the present invention provides that the catching member is fastened to one of the two knuckles by means of at least one screw. Thus, even conventional hinges for vehicle doors lacking the catching member can be retrofitted in an easy way to obtain a hinge for a vehicle door according to the present invention.

[0017] Further features and advantages of the present invention will become apparent from the following description of a non-limiting embodiment of the invention which will be explained below with reference to the drawing. In this drawing:

FIG. 1 is a perspective view of an exemplary embodiment of a hinge according to the present invention;

FIG. 2 is another perspective view of the hinge of FIG. 1;

FIG. 3 is a perspective view of the hinge of FIG. 1 being utilized on a rear door of a van-type vehicle; and

FIG. 4 is an enlarged perspective view of the hinge of FIG. 3 being utilized on the rear door of the van-type vehicle.

[0018] In the different figures same parts are always provided with the same reference numerals so that they are generally described only once.

[0019] FIG. 1 is a perspective view of an exemplary embodiment of a hinge 1 for a vehicle door according to the present invention. The hinge 1 comprises a first knuckle 2 adapted to be mounted on a body of the vehicle (not shown), a second knuckle 3 adapted to be mounted

on the door of the vehicle (also not shown in FIG. 1). The door is movable between a closed position and an open position. The first and second knuckles 2, 3 are connected to each other in a hinged manner by a hinge pin 4. Further, the embodiment of the hinge 1 shown in FIG. 1 comprises a door check strap 5 preventing the door from being opened beyond a predetermined opening angle and holding the door open at the predetermined opening angle. To this end, the hinge 1 comprises a catching member 6. This catching member 6 provides a detachable clipped connection between itself and the door check strap 5 in the open position of the door at the predetermined opening angle. In the embodiment of the hinge 1 shown in FIG. 1, the catching member 6 comprises two flexible, spaced apart tongues 7 adapted to resiliently sandwich a pin-like member 8 there between. The pin-like member 8 is formed on the door check strap 5, particularly, as shown in FIG. 1, it is formed on a free end 9 of the door check strap 5.

[0020] As is apparent from FIG. 1, a second end 10 of the door check strap 5 (attached end 10) is hingedly attached to the second knuckle 3 by a hinge pin 11, whereas the catching member 6 is attached to the first knuckle 2.

[0021] FIG. 2 is another perspective view of the hinge 1 of FIG. 1 depicted from a different viewing angle. In order to better see the features of the first knuckle 2 of the embodiment of the hinge 1 shown in FIG. 2, only a portion of the attached end 10 of the door check strap 5 is shown in FIG. 2. The rest of the door check strap 5 is cut away below the attached end 10 of the door check strap 5. As is apparent from FIG. 2, the knuckle 2 to which the catching member 6 is attached comprises a rigid dead stop 12 protruding from the knuckle 2. The dead stop 12 is adapted to limit the movement of the door check strap 5 in the open position of the door at the predetermined opening angle as the pin-like member 8 of the door check strap 5 (shown in FIG. 1) clashes against the dead stop 12 in the open position of the door. Thus, the dead stop 12 defines the maximum opening angle of the vehicle door.

[0022] As shown in FIG. 2, advantageously the catching member 6 of the embodiment of the hinge 1 is fastened to the first knuckle 2 by means of two screws 13. Thus, even conventional hinges for vehicle doors lacking the catching member 6 can be retrofitted in an easy way to obtain a hinge 1 according to the present invention.

[0023] As is further apparent from FIG. 2, the catching member 6 is positioned adjacently to the dead stop 12 abutting the same, thereby giving support to the catching member 6. Thus, the catching member 6 itself can be made of a flexible material enhancing the properties of the clipped connection.

[0024] Furthermore, in FIG. 2 it is shown that the door check strap 5 of the hinge 1 comprises a spring 14 biasing the door check strap 5 towards the catching member 6 as well as towards the dead stop 12. The spring 14 provides guidance to the door check strap 5, particularly to

the pin-like member 8 of the door check strap 5, in the sense that the pin-like member 8 securely engages the catching member 8 in the open position of the vehicle door at the predetermined opening angle and that the opening movement of the door check strap 5 is being

securely stopped by the dead stop 12 in this position. **[0025]** FIGS. 3 and 4 are perspective views of the hinge 1 of FIG. 1 being utilized on a rear door 15 of a van-type vehicle 16. FIG. 4 depicts the usage of the hinge 1 on the rear door 15 of the van-type vehicle 16 in an enlarged view. As is apparent from FIG. 4, the first knuckle 2 is mounted on the body 17 of the vehicle 16 shown in FIG. 3.

[0026] The above described hinge for a vehicle door according to the present invention is not limited to the embodiment disclosed herein, but also encompasses other embodiments having the same effect.

[0027] In a preferred embodiment the hinge for a vehicle door according to the present invention is used in a motor vehicle of the van type hingedly connecting at least one rear door with the vehicle body.

List of reference numerals:

[0028]

- 1 Hinge
- 2 First knuckle
- 3 Second knuckle
- 4 Hinge pin
- 5 Door check strap
- 6 Catching member
- 7 Flexible tongue
- 8 Pin-like member
- 9 Free end of 5
- 10 Attached end of 5
- 11 Hinge pin
- 12 Dead stop
- 13 Screw
- 14 Spring
- 15 Rear door
- 16 Van-type vehicle
- 17 Body of 16

Claims

1. A hinge for a vehicle door (15) comprising a first knuckle (2) adapted to be mounted on a body (17) of the vehicle, a second knuckle (3) adapted to be mounted on the door (15) of the vehicle, wherein the door (15) is movable between a closed position and an open position, a hinge pin (4) adapted to connect the two knuckles (2, 3) to each other in a hinged manner, and a door check strap (5) for preventing the door (15) from being opened beyond a predetermined opening angle and for holding the door (15) open at said predetermined opening angle, **characterized by**

a catching member (6) adapted to provide a detachable clipped connection between itself and the door check strap (5) in the open position of the door (15) at the predetermined opening angle.

2. The hinge according to claim 1, **characterized in that** one end (10) of the door check strap (5) is hingedly attached to one of the two knuckles (2, 3) and the catching member (6) is attached to the other one of the two knuckles (2, 3).
3. The hinge according to the preceding claim, **characterized in that** the knuckle (2) to which the catching member (6) is attached comprises a rigid dead stop (12) protruding from the knuckle (2) which is adapted to limit the movement of the door check strap (5) in the open position of the door (15) at the predetermined opening angle.
4. The hinge according to the preceding claim, **characterized in that** the catching member (6) is positioned adjacently to the dead stop (12) abutting the same.
5. The hinge according to any one of the preceding claims, **characterized in that** the catching member (6) comprises two flexible, spaced apart tongues (7) adapted to resiliently sandwich a pin-like member (8) therebetween formed on the door check strap (5).
6. The hinge according to any one of the preceding claims, **characterized in that** the door check strap (5) is biased by a spring (14) towards the catching member (6).
7. The hinge according to any one of the preceding claims, **characterized in that** the catching member (6) is fastened to one of the two knuckles (2, 3) by means of at least one screw (13).

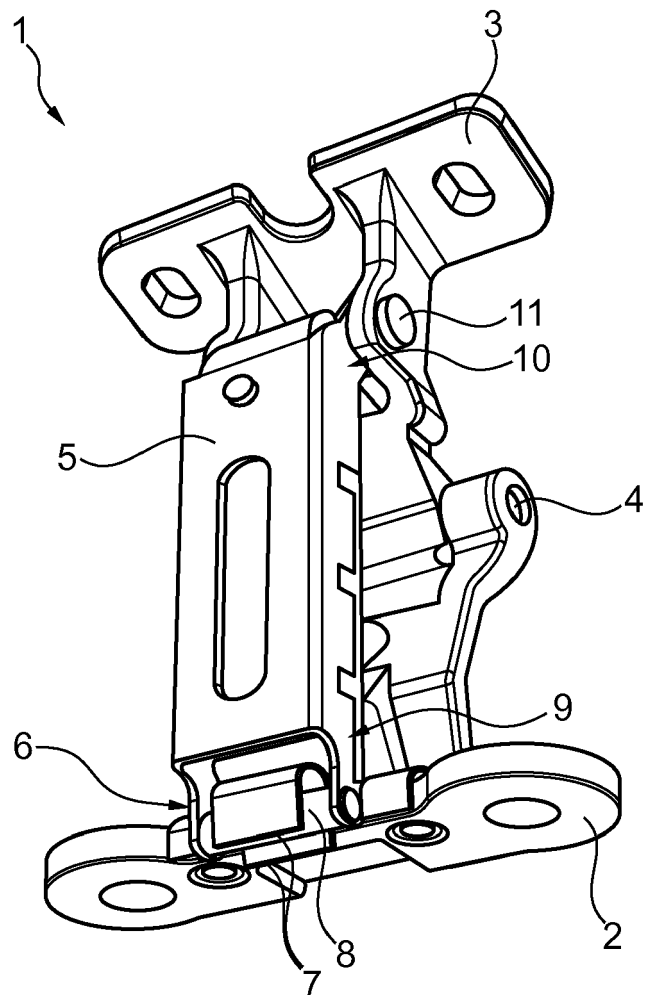


Fig. 1

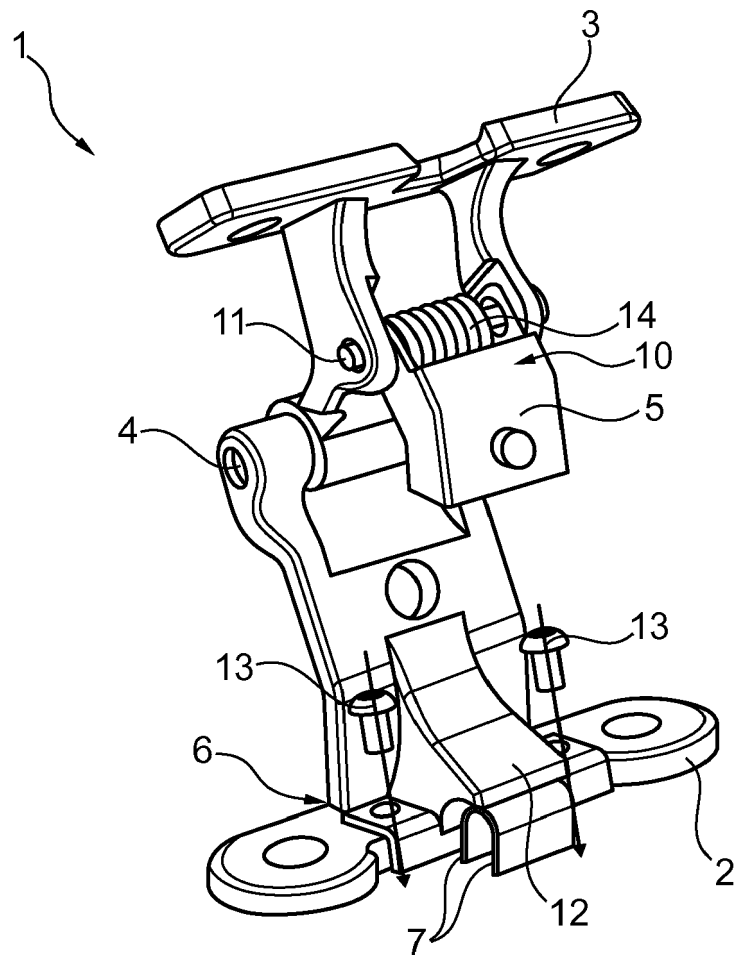


Fig. 2

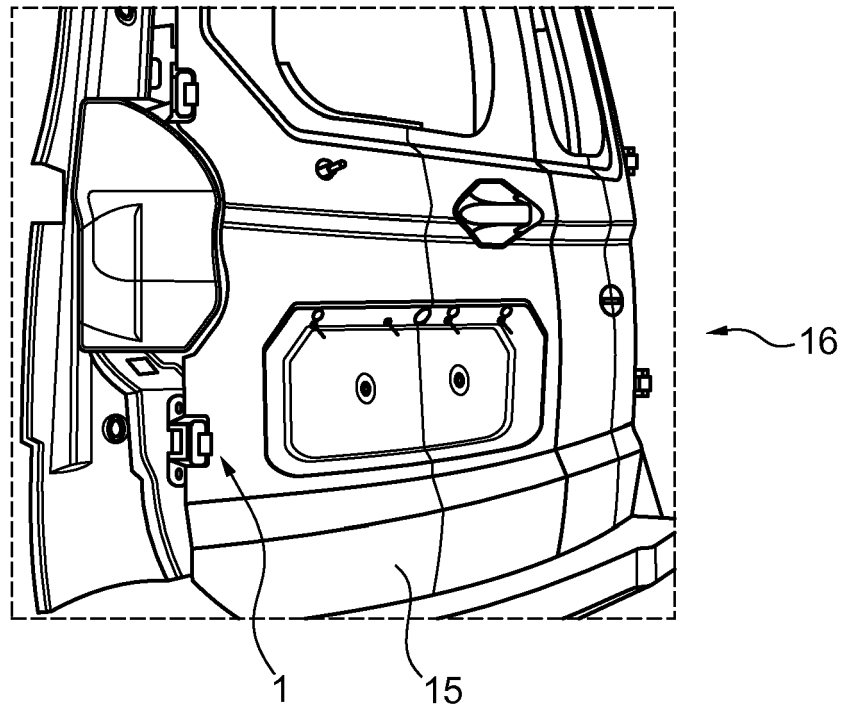


Fig. 3

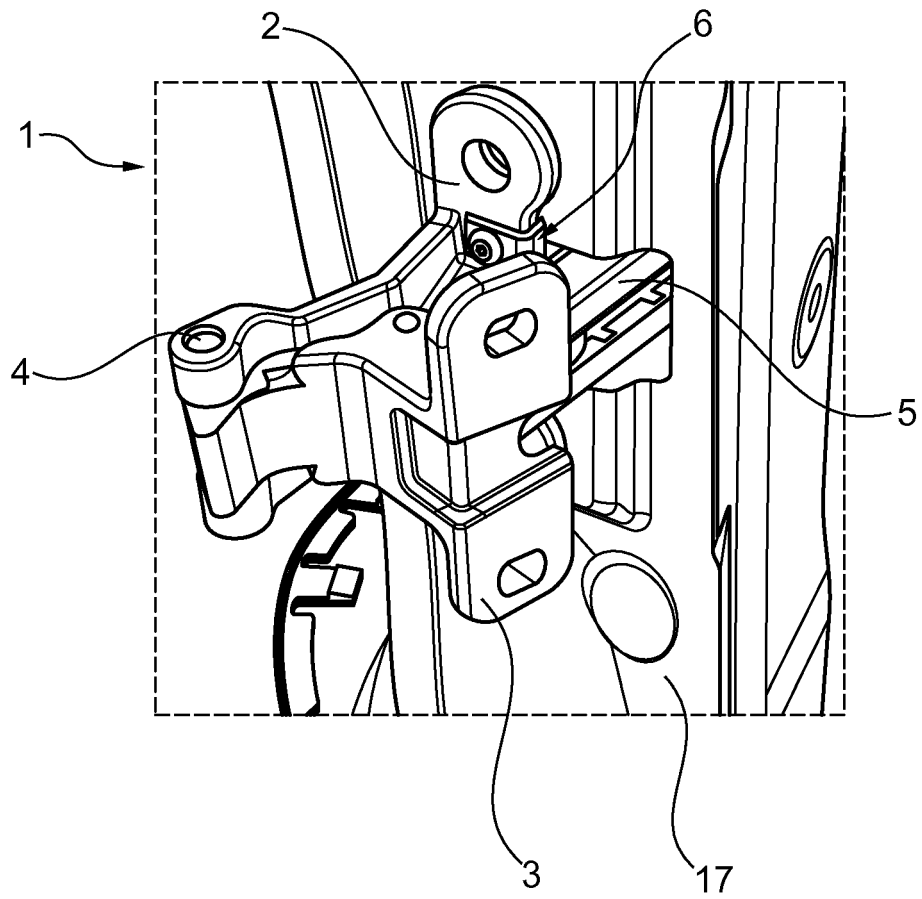


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 14 16 3542

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 August 2014	Examiner Klemke, Beate
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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