



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.09.2013 Bulletin 2013/38

(51) Int Cl.:
E05D 11/06 (2006.01) E05D 11/10 (2006.01)

(21) Application number: **13159048.1**

(22) Date of filing: **13.03.2013**

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

(30) Priority: **16.03.2012 TR 201203022**

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(54) **Hinge with a checkarm**

(57) The subject matter invention relates to a hinge (1) with a checkarm having at least one fixed body (10) and at least one movable body (20) connected to each other by means of at least one joint (15) in order to connect a door (60) onto a vehicle body (50) in a rotatable manner, **characterized** in that, in order to limit opening extent of the door (60) to a predetermined angle with respect to the vehicle body (50) when intended, the present invention comprises a checkarm (30) connected to any of the fixed and movable bodies (10, 20) from one side by means of a joint (42) in a rotatable manner and on the other side thereof, having at least one lock member (32) retained by a gripping member (14) when the door is opened at said angle, where said gripping member (24) is assembled to the vehicle body or to any of the fixed and movable bodies (10, 20).

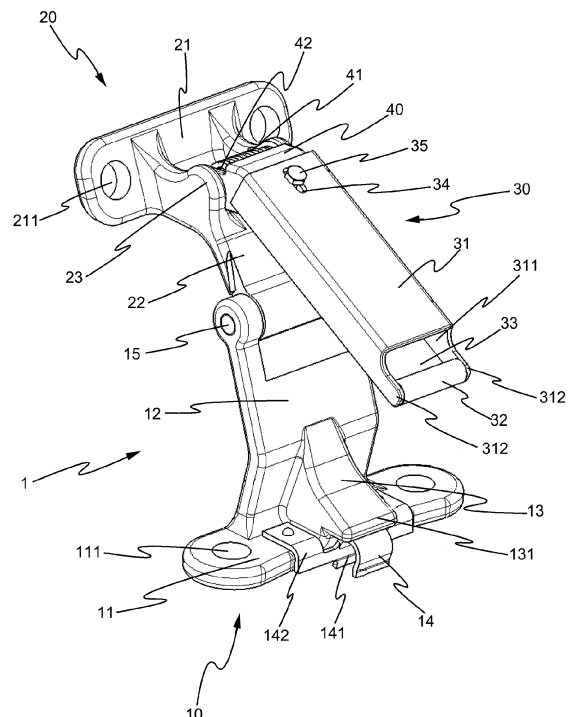


Figure 1

Description

TECHNICAL FIELD

[0001] The present invention relates to a hinge with a checkarm, in order to provide fixation of the door at a predetermined angle while the door is being opened in vehicles and particularly in rear cargo doors.

PRIOR ART

[0002] Today, in automotive sector, hinges with pluralities of functions are utilized connecting vehicle doors and vehicle body to each other. There are hinges providing opening or closing of vehicle doors without separating completely from the vehicle body by realizing circular movement at certain angles in the axis of points where the vehicle doors are connected to the vehicle body. These hinge systems can be used in all parts of the vehicles where opening- closing mechanisms are required, like the baggage doors, vehicle doors, front doors or the sunroofs. Hinges are members generally carrying the door by connecting it to the vehicle body and providing opening and closing of the door at a certain axis.

[0003] The checkarms in the present system prevent the door from opening in an excessive manner or prevent the door from closing automatically unless a force is applied or unless there is an intervention while the door is in open position. When a force is applied on the door or when the checkarm is intervened manually, the door is opened a little more. The door continues to be opened in a stepped manner at an angle and number changing depending on the force or intervention. In this case, the door can be opened in a stepped manner and again, it can be closed in a stepped manner. In general, checkarms are mechanisms whose some part is provided in the vehicle body and whose some part is provided in the vehicle door.

[0004] In the present art, the hinge and the checkarm are positioned in the vehicles in an independent manner from each other. After the vehicle door is connected to the vehicle body, the checkarm is assembled from the bottom part or top part of the hinge. However, in order to use the hinge and the checkarm in the same places, the vehicle producers form different housings for the hinges and different housings for the checkarms. Moreover, the hinge and the checkarm are connected to the door and to the body by being screwed. Using two different materials for the two different functions leads to an increase in the number of pieces utilized. Thus, the assembly durations for the door and the body are increasing, and the cost is increasing. Thus, great amount of time and cost loss are occurring for the producers.

[0005] As a result, because of the abovementioned problems, an improvement is required in the related technical field.

BRIEF DESCRIPTION OF THE INVENTION

[0006] The present invention relates to a hinge with a checkarm, in order to eliminate the abovementioned problems and to bring new advantages to the related technical field.

[0007] The main object of the present invention is to provide a hinge with a checkarm which can present the functions of hinge and of checkarms together.

10 [0008] Another object of the present invention is to provide a hinge with a checkarm for decreasing the time consumed for the assembly of the hinges and of the checkarms.

15 [0009] In order to realize all of the abovementioned objects and the objects which are to be deducted from the detailed description below, the present invention is a hinge with a checkarm having at least one fixed body and at least one movable body connected to each other by means of at least one joint in order to connect a door onto a vehicle body in a rotatable manner. Accordingly, in order to limit opening extent of the door to a predetermined angle with respect to the vehicle body when intended, the present invention comprises a checkarm connected to any of the fixed and movable bodies from one side by means of a joint in a rotatable manner and on the other side thereof, having at least one lock member retained by a gripping member when the door is opened at said angle, where said gripping member is assembled to the vehicle body or to any of the fixed and movable bodies. Thus, when the lock member is retained by the gripping member, the door is fixed such that the door cannot be opened more.

25 [0010] In a preferred embodiment of the subject matter invention, the checkarm is connected to the movable body from one side and the gripping member, the lock member is retained thereby, is provided in a part of the fixed body close to the vehicle body or directly on the vehicle body.

35 [0011] In another preferred embodiment of the subject matter invention, the lock member is provided on the checkarm so as to define a gripping opening through which the gripping member can pass after the door is opened at a certain angle and defined between the checkarm body of the checkarm and the lock member. Thus, the gripping member is passing through the gripping opening and joins the lock member.

40 [0012] In another preferred embodiment of the subject matter invention, there is at least one lock arm provided in tab form outwardly from the end part of said checkarm body and whereon said lock member is positioned so as to define the gripping opening. Thus, the lock member is positioned at a long distance from the checkarm body such that a gripping opening is defined in between.

45 [0013] In another preferred embodiment of the subject matter invention, said gripping member is provided on the base part of the fixed body connected to the vehicle body. Thus, the position of the gripping member is fixed as the assembly of the hinge with a checkarm is realized.

[0014] In another preferred embodiment of the subject matter invention, the gripping member comprises a lock housing wherein the lock member is retained. Thus, the lock member remains fixed when it is retained by the gripping member.

[0015] In another preferred embodiment of the subject matter invention, there is at least one press spring disposed onto said joint and connected to the movable body from one end and connected to the checkarm from the other end in order to press the checkarm towards the fixed body. Thus, while the checkarm is passing to the open position from the closed position, the lock member is joining with the gripping member. Moreover, during the movement from the open position to the closed position, the checkarm is entering to the checkarm opening formed on the vehicle body.

[0016] In another preferred embodiment of the subject matter invention, there is at least one press arm whereto the press spring is connected in the connection of the checkarm to the fixed body.

[0017] In another preferred embodiment of the subject matter invention, the checkarm comprises at least one connection member in the connection of the press arm to the checkarm body. Thus, the press arm and the checkarm are connected in a removable manner.

[0018] In another preferred embodiment of the subject matter invention, the checkarm body comprises at least one adjustment slot through which said connection member passes. Thus, the total length of the checkarm can be changed as the connection member displaces along the length of the adjustment slot.

[0019] In another preferred embodiment of the subject matter invention, the checkarm body comprises a body inner gap extending in a longitudinal manner and having dimensions such that the gripping member can enter therein at least partially. Thus, while passing to the open position from the closed position, the lock member and the gripping member are positioned in the same direction.

[0020] In another preferred embodiment of the subject matter invention, there is at least one guide ramp provided in a rib-like structure between the base part and the arm part extending towards the movable body from the base part of the fixed body. Thus, the checkarm is guided towards the checkarm opening during the passage from the open position to the closed position. Moreover, by means of said rib structure, the strength of the fixed body is increased.

[0021] In another preferred embodiment of the subject matter invention, the guide ramp comprises at least one ramp end part extending at least partially towards the gripping member. Thus, during the movements of the checkarm, as the checkarm contacts the outer part of the gripping member, the form changes, which may occur in the gripping member, are prevented.

[0022] In another preferred embodiment of the subject matter invention, the gripping member comprises at least one gripping connection piece for providing the connection of the fixed body to the base part. Thus, the gripping

member is produced as a separate piece and it can be assembled to the fixed body afterwards.

[0023] In another preferred embodiment of the subject matter invention, in order to provide the connection of the movable body to the checkarm, there is at least one checkarm connection extension wherein the joint is bedded.

BRIEF DESCRIPTION OF THE FIGURES

[0024] In Figure 1, the representative isometric view of the subject matter hinge with a checkarm is given.

[0025] In Figure 2, the representative isometric view of the closed position of the subject matter hinge with a checkarm is given.

[0026] In Figure 3, a representative lateral view of the closed position of the subject matter hinge with a checkarm is given.

[0027] In Figure 4, a representative isometric view of the semi-open position of the subject matter hinge with a checkarm is given.

[0028] In Figure 5, a representative lateral view of the semi-open position of the subject matter hinge with a checkarm is given.

[0029] In Figure 6, a representative lateral view of the open position of the subject matter hinge with a checkarm is given.

[0030] In Figure 7 and 8, the representative views of the vehicle body and of the semi-open position of the subject matter hinge with a checkarm are given.

REFERENCE NUMBERS

[0031]

1 Hinge with a checkarm

10 Fixed body

11 Base part

111 Assembly opening

12 Arm part

13 Guide ramp

131 Ramp end part

14 Gripping member

141 Lock housing

142 Gripping connection piece

15 Joint

20 Movable body

21 Base part

211 Assembly opening

22 Arm part

- 23 Checkarm connection extension
- 30 Checkarm
 - 31 Checkarm body
 - 311 Body inner gap
 - 312 Lock arm
 - 32 Lock member
 - 33 Gripping opening
 - 34 Adjustment slot
 - 35 Connection member
- 40 Press arm
 - 41 Press spring
 - 42 Joint
- 50 Vehicle body
 - 51 Checkarm opening
- 60 Door

THE DETAILED DESCRIPTION OF THE INVENTION

[0032] In this detailed description, the subject matter hinge (1) with a checkarm is explained with references to examples without forming any restrictive effect in order to make the subject more understandable.

[0033] As can be seen in Figure 1, the subject matter hinge (1) with the checkarm essentially comprises a fixed body (10) to be connected to the vehicle body (50), a movable body (20) to be connected to the vehicle door (60), and a checkarm (30) extending between the fixed body (10) and the movable body (20) for keeping the door (60) fixed when the door (60) is opened.

[0034] The fixed body (10) comprises a base part (11) to be connected to the vehicle body (50), and an arm part (12) extending outwardly from the base part (11). On said base part (11), there is at least one assembly opening (111) through which a connection member will be passed for providing connection of the fixed body (10) to the vehicle body (50). Moreover, there is a guide ramp (13) provided in rib form in the intersection of the arm part (12) and the base part (11). There is a gripping member (14) whose inlet part is facing the side the base part (11) will be connected thereto and provided in a U-like form, at the combination of the base part (11) and the ramp end part (131) of said guide ramp (13). Said gripping member (14) is connected to the base part (11) of the fixed body (10) by means of the gripping connection piece (142).

[0035] The movable body (20) comprises a base part (21) which is to be connected to the vehicle door (60) and an arm part (22) extending outwardly from said base part (21). Said arm part (22) is connected in a rotatable

manner in the joint axis (15) to the arm part (12) of the fixed body (10) by means of a joint (15).

[0036] There is a press arm (40) bedded by means of a joint (42) to the checkarm connection extension (23) provided on the arm part (22) of the movable body (20). A press spring (41) disposed onto said joint (42) and connected to the press arm (40) from one end and connected to the movable body (20) from the other end is pressing the press arm (40) towards the arm part (22) of the movable body (20). There is a checkarm (30) connected to the end of the press arm (40) and extending towards the fixed body (10) and which is in arm form. The connection of the press arm (40) and of the checkarm body (31) of said checkarm (30) is realized by means of an adjustment slot (34) provided on the checkarm body (31) and by means of a connection member (35) passing through said adjustment slot (34) and connected to the press arm (40). On the other end of the checkarm body (31), there are lock arms (312), provided in tab form on the other end thereof, and there is a cylindrical lock member (32) extending between said lock arms (312). Since said lock member (32) is provided at a vicinity of the end of the lock arms (312), a gripping opening (33) is obtained between the lock member (32) and the checkarm body (31). In the preferred embodiment of the present invention, the checkarm body (31) is embodied so as to have a U-like cross section, and thanks to this embodiment, the checkarm body (31) comprises a body inner gap (311).

[0037] In Figure 2 and Figure 3, the closed position (I) of the hinge (1) with checkarm is given where the door (60) is in closed position. In said closed position (I), the arm parts (12, 22) of the fixed and movable body (10, 20) are overlapped, and meanwhile, they enter into a checkarm opening (51) formed at the vicinity of the part in the vehicle body (50) of the checkarm (30) the fixed body (10) is connected thereto. In this position of the checkarm (30), the ramp end part (131) of the guide ramp (13) and the gripping member (14) are positioned in the body inner gap (311) of the checkarm body (31). When the door (60) is moved in order for being opened, since the press spring (41) continues to press the press arm (40) and thus the checkarm (30) towards the arm parts (12, 22), the gripping member (14) continues to be positioned in the body inner gap (311) of the checkarm body (31). When the door (60) continues to be opened, the hinge (I) with the checkarm is arriving at the semi-open position (II) illustrated in Figure 4 and 5. During the movement of the checkarm (30) while it is arriving at said semi-open position (II), the gripping member (14) approaches the lock member (32), and it encounters the lock member (32) by passing through the gripping opening (33). Thus, the lock member (32) is retained by the lock housing (141) of the gripping member (14). There is preferably an angle of 90 degrees between the base parts (11, 21) in the semi-open position (II) of the hinge (1) with the checkarm. In other words, the vehicle door (60) is opened approximately 90 degrees. The length of the checkarm (30) is changed by changing the position of the connection

member (35) inside the adjustment slot (34) provided on the checkarm body (31), and the position of the door (60) can be adjusted within the predetermined tolerances.

[0038] In order to provide opening of the door (60) more than the semi-open position (II), first of all the door (60) is closed partially and the lock member (32) is removed from the lock housing (141). Afterwards, the checkarm (30) is drawn by a force which will overcome the press force of the press spring (41), and the gripping member (14) is removed from the body inner gap (311) in the checkarm body (31). Afterwards, the door (60) is continued to be opened, and the lock member (32) is provided to reach on the guide ramp (13) without being gripped by the gripping member (14). Thus, the door (60) is continued to be opened more, and reaches the open position (III) illustrated in Figure 6.

[0039] When the door is moved for being closed while the door is in open position (III), first of all, the checkarm (30) begins approaching the fixed body (10) and the lock member (32) is seating on the guide ramp (13). When the door (60) is continued to be closed, the lock member (32) is sliding on the guide ramp (13), and provides the checkarm (30) to enter into the checkarm opening (51) provided in the vehicle body (50).

[0040] In the alternative embodiments of the present invention, the gripping member (14) can be provided on the vehicle body (50) in the region of the fixed body (10) the vehicle body (50) is connected thereto instead of the fixed body (10). In another alternative embodiment of the present invention, the checkarm (30) can be provided on the fixed body (10) and the gripping member (14) can be provided on the movable body (20) or on the door (60). In the alternative embodiments of the present invention, the checkarm and the gripping member can be provided in different forms.

[0041] The protection scope of the present invention is set forth in the annexed Claims and cannot be restricted to the illustrative disclosures given above, under the detailed description. It is because a person skilled in the relevant art can obviously produce similar embodiments under the light of the foregoing disclosures, without departing from the main principles of the present invention.

Claims

1. A hinge (1) with a checkarm having at least one fixed body (10) and at least one movable body (20) connected to each other by means of at least one joint (15) in order to connect a door (60) onto a vehicle body (50) in a rotatable manner, **characterized in that**, in order to limit opening extent of the door (60) to a predetermined angle with respect to the vehicle body (50) when intended, the present invention comprises a checkarm (30) connected to any of the fixed and movable bodies (10, 20) from one side by means of a joint (42) in a rotatable manner and on the other side thereof, having at least one lock member (32)

retained by a gripping member (14) when the door is opened at said angle, where said gripping member (24) is assembled to the vehicle body or to any of the fixed and movable bodies (10, 20).

2. A hinge (1) with a checkarm according to Claim 1, **characterized in that** the checkarm (30) is connected to the movable body (20) from one side and the gripping member (14), the lock member (32) is retained thereby, is provided in a part of the fixed body (10) close to the vehicle body (50) or directly on the vehicle body (50).
3. A hinge (1) with a checkarm according to any one of the preceding claims, **characterized in that** the lock member (32) is provided on the checkarm (30) so as to define a gripping opening (33), existing between the checkarm body (31) of the checkarm (30) and the lock member (32), through which the gripping member (14) can pass after the door (60) is opened at a certain angle.
4. A hinge (1) with a checkarm according to Claim 3, **characterized by** comprising at least one lock arm (312) provided in tab form outwardly from the end part of said checkarm body (31) and whereon said lock member (32) is positioned so as to define the gripping opening (33).
5. A hinge (1) with a checkarm according to any one of the preceding claims, **characterized in that** said gripping member (14) is provided on the base part (11) of the fixed body (10) connected to the vehicle body (50).
6. A hinge (1) with a checkarm according to any one of the preceding claims, **characterized in that** the gripping member (14) comprises a lock housing (141) wherein the lock member (32) is retained.
7. A hinge (1) with a checkarm according to any one of the preceding claims, **characterized by** comprising at least one press spring (41) disposed onto said joint (42) and connected to the movable body (20) from one end and connected to the checkarm (30) from the other end in order to press the checkarm (30) towards the fixed body (10).
8. A hinge (1) with a checkarm according to Claim 7, **characterized by** comprising at least one press arm (40) where to the press spring (41) is connected in the connection of the checkarm (30) to the fixed body (10).
9. A hinge (1) with a checkarm according to Claim 8, **characterized in that** the checkarm (30) comprises at least one connection member (35) in the connection of the press arm (40) to the checkarm body (31).

10. A hinge (1) with a checkarm according to Claim 9, **characterized in that** the checkarm body (31) comprises at least one adjustment slot (34) through which said connection member (35) passes. 5
11. A hinge (1) with a checkarm according to any of the claims between Claim 3 and 10, **characterized in that** the checkarm body (31) comprises a body inner gap (311) extending in a longitudinal manner and having dimensions such that the gripping member (14) can enter therein at least partially. 10
12. A hinge (1) with a checkarm according to any one of the preceding claims, **characterized by** comprising at least one guide ramp (13) provided in a rib-like structure between the base part (11) and the arm part (12) extending towards the movable body (20) from the base part (11) of the fixed body (10). 15
13. A hinge (1) with a checkarm according to Claim 12, **characterized in that** the guide ramp (13) comprises at least one ramp end part (131) extending at least partially towards the gripping member (14). 20
14. A hinge (1) with a checkarm according to any one of the preceding claims, **characterized in that** the gripping member (14) comprises at least one gripping connection piece (142) for providing the connection of the fixed body (10) to the base part (11). 25 30
15. A hinge (1) with a checkarm according to any one of the preceding claims, **characterized in that** in order to provide the connection of the movable body (20) to the checkarm (30), there is at least one checkarm connection extension (23) wherein the joint (42) is bedded. 35

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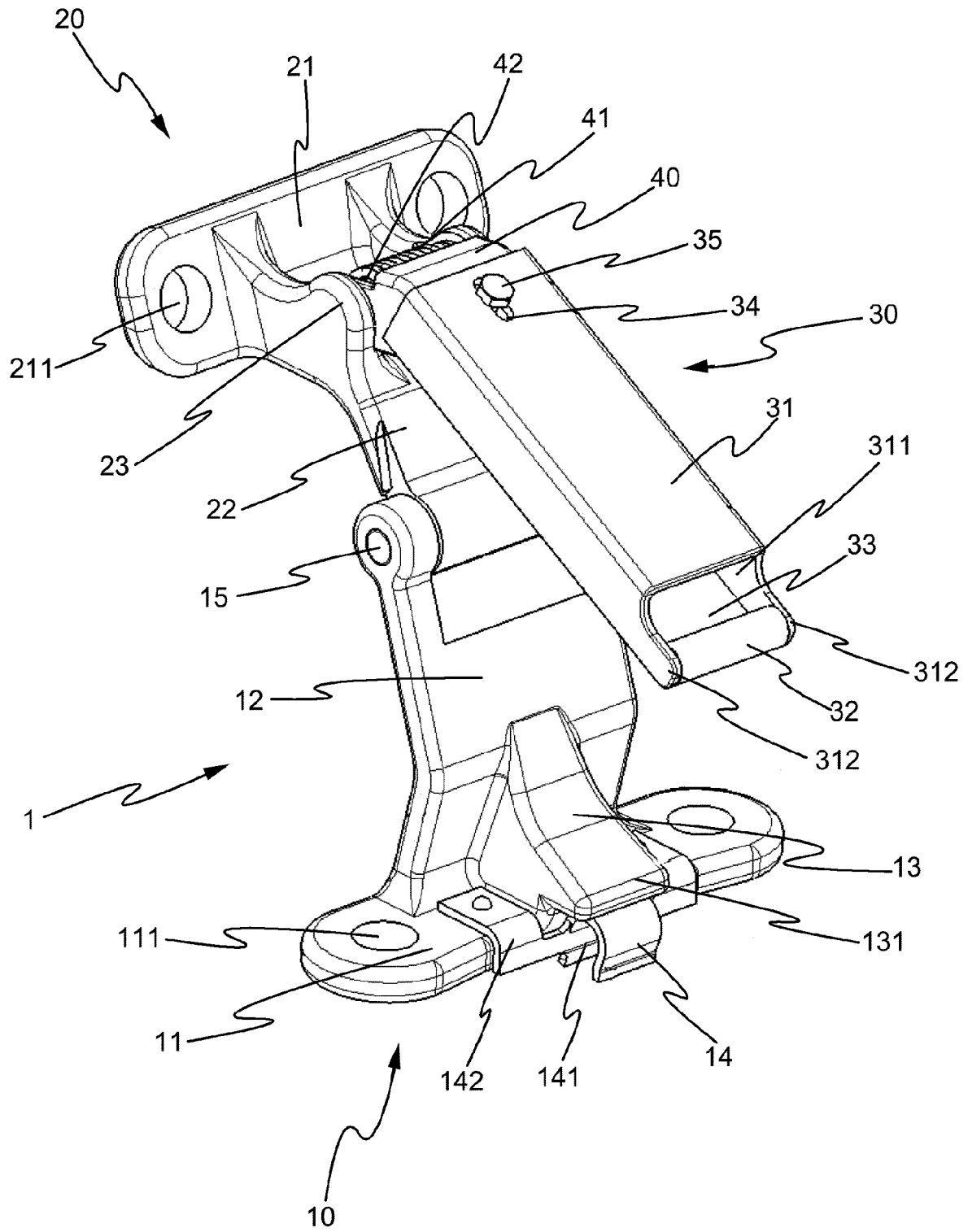


Figure 1

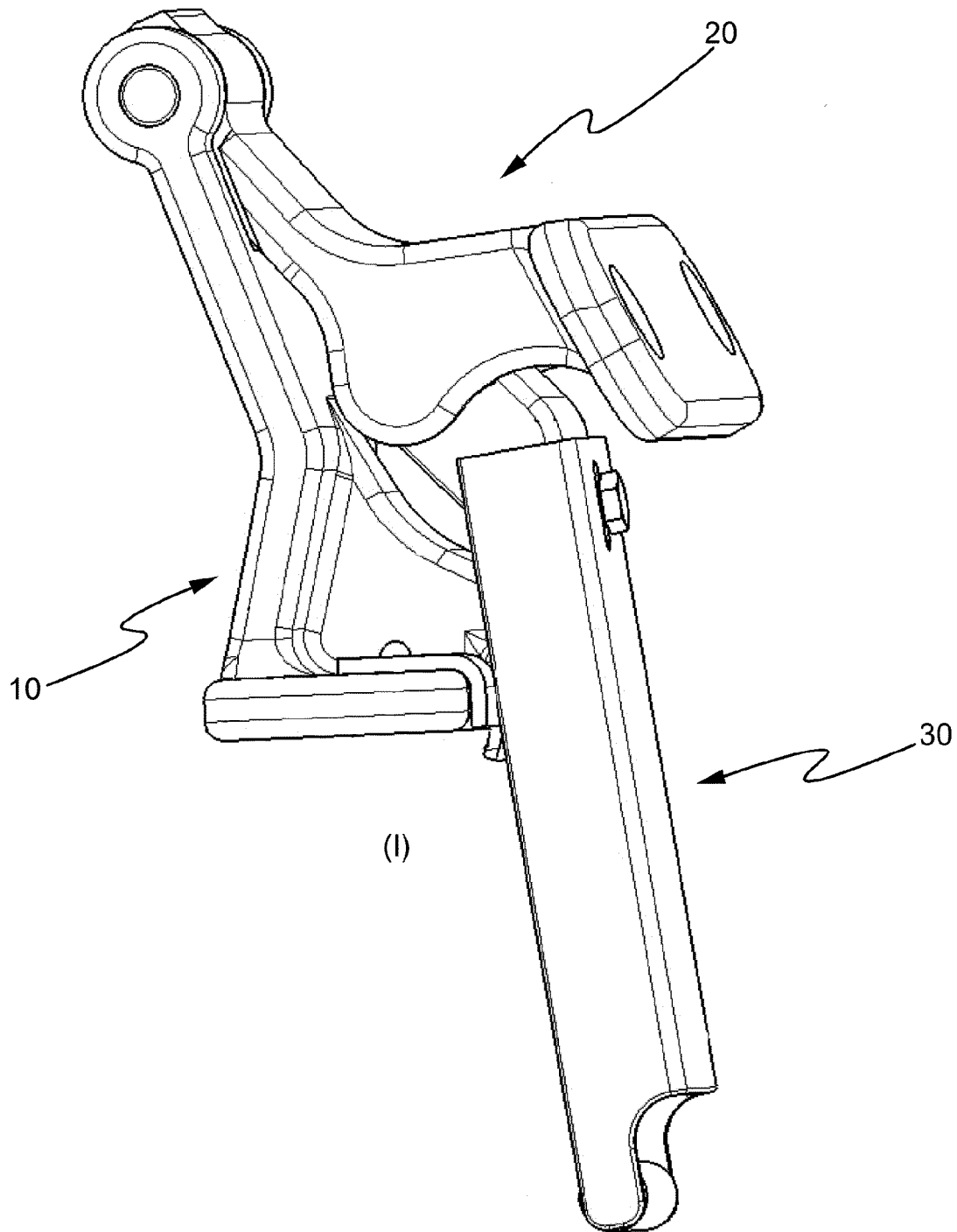


Figure 2

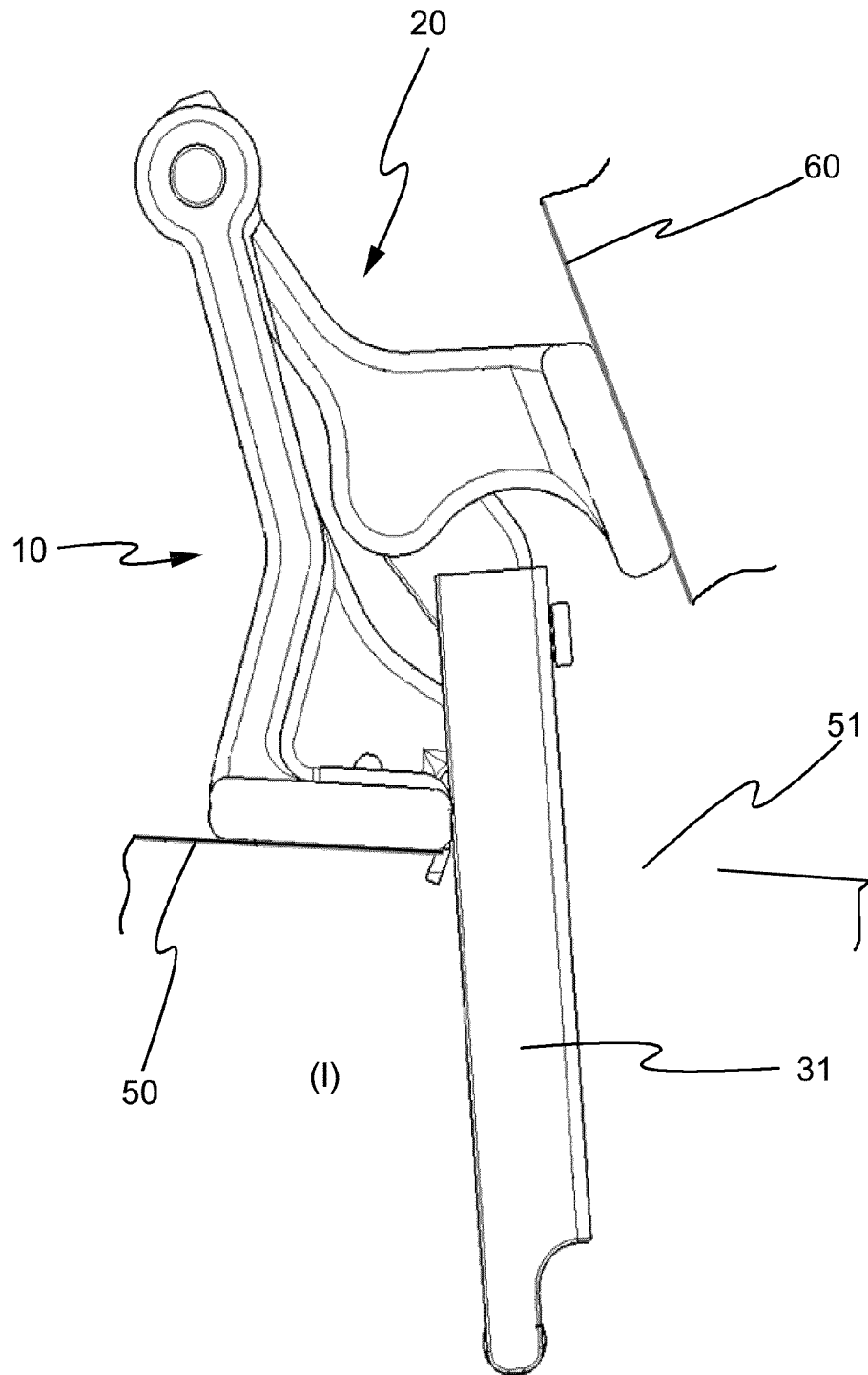


Figure 3

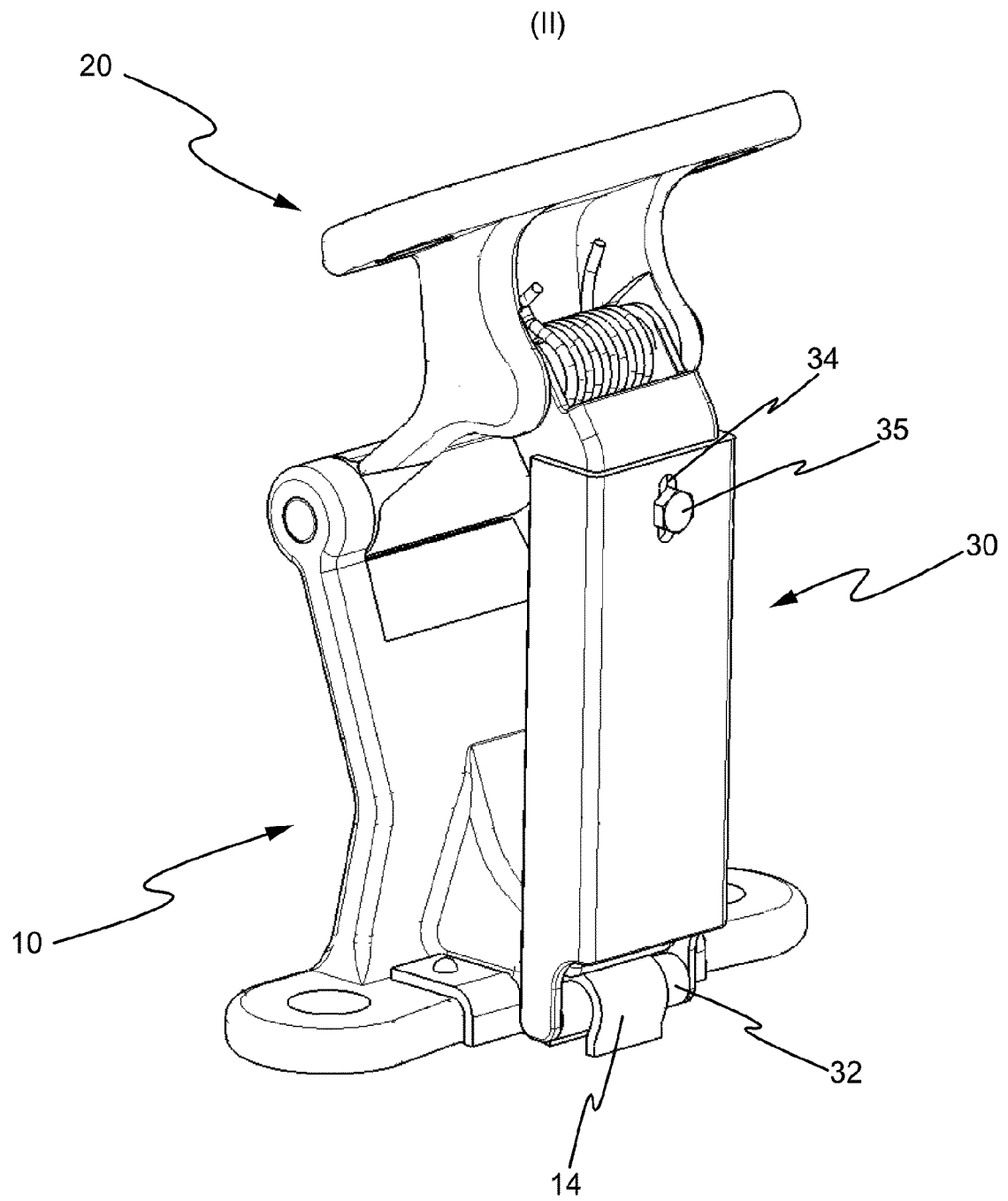


Figure 4

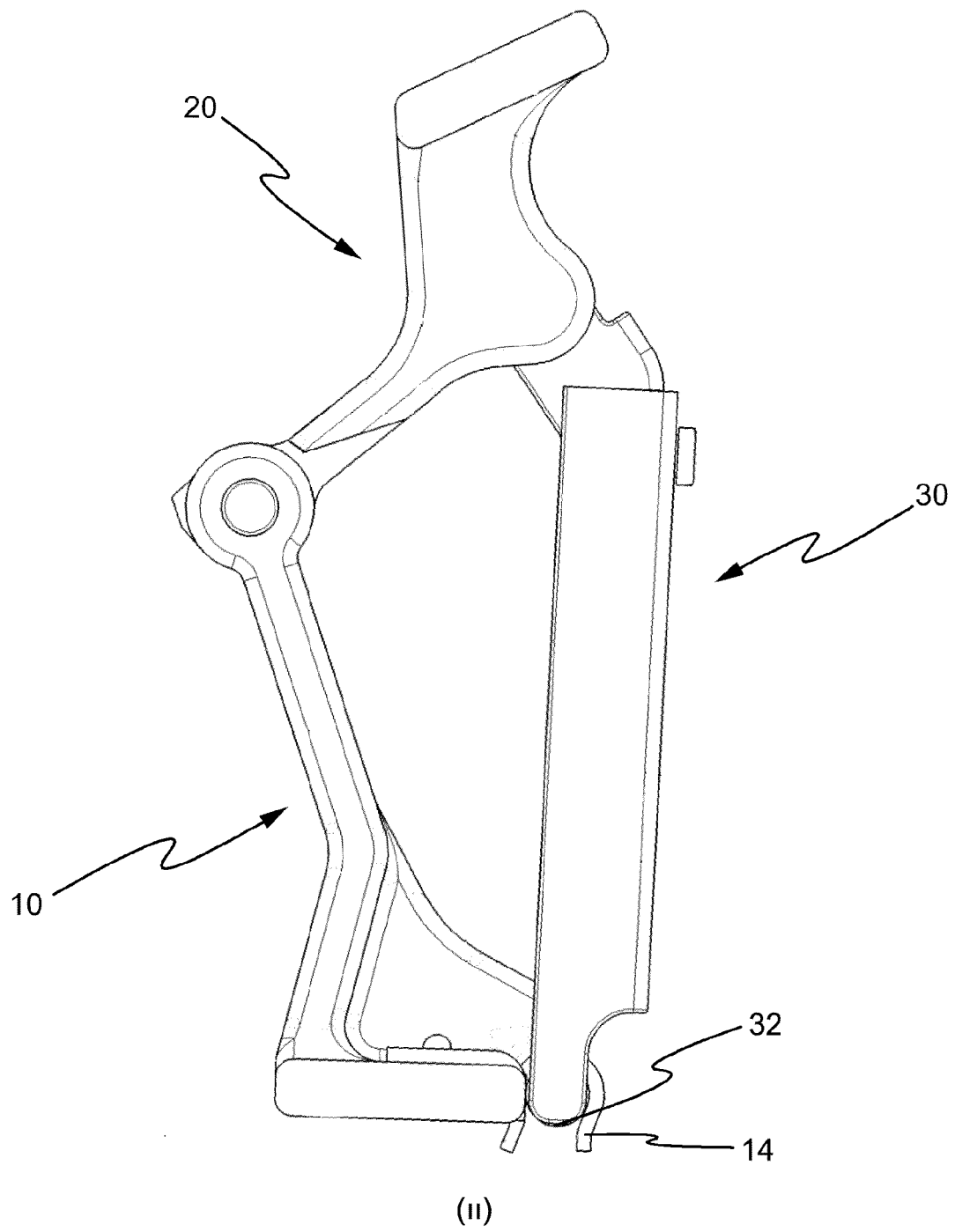


Figure 5

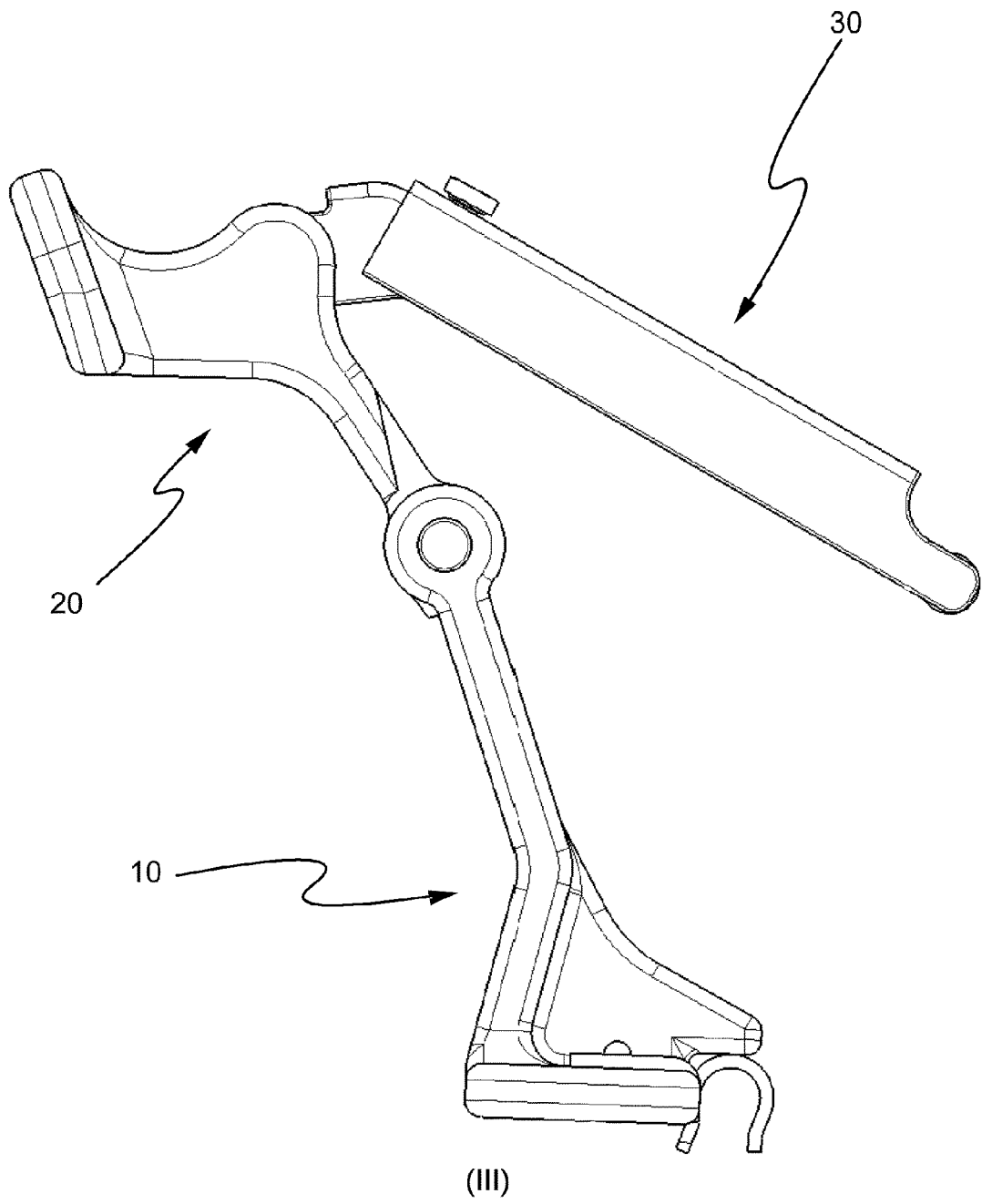


Figure 6

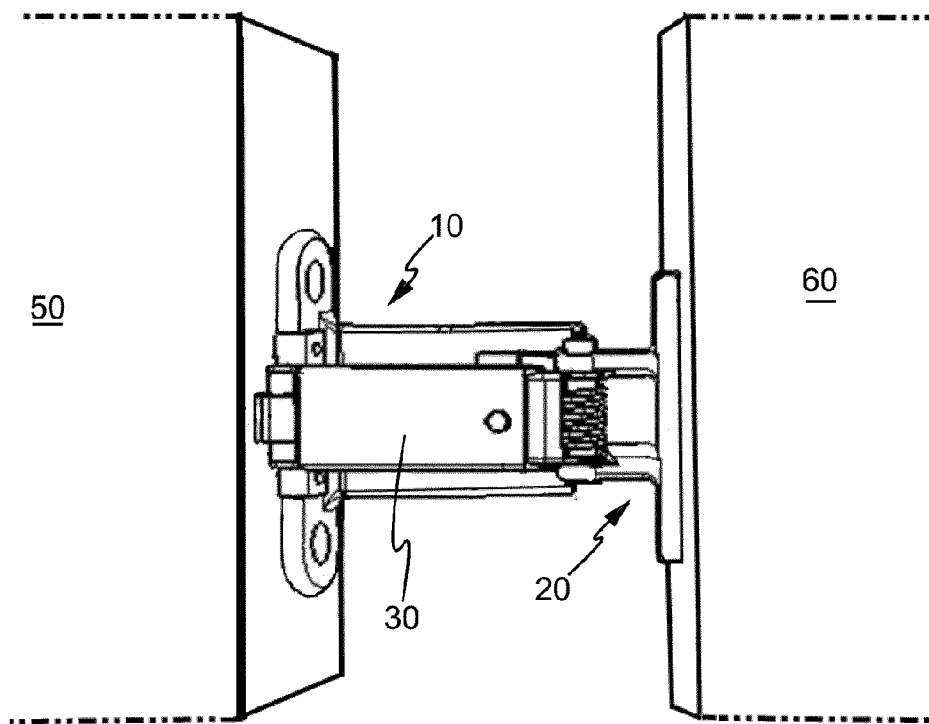


Figure 7

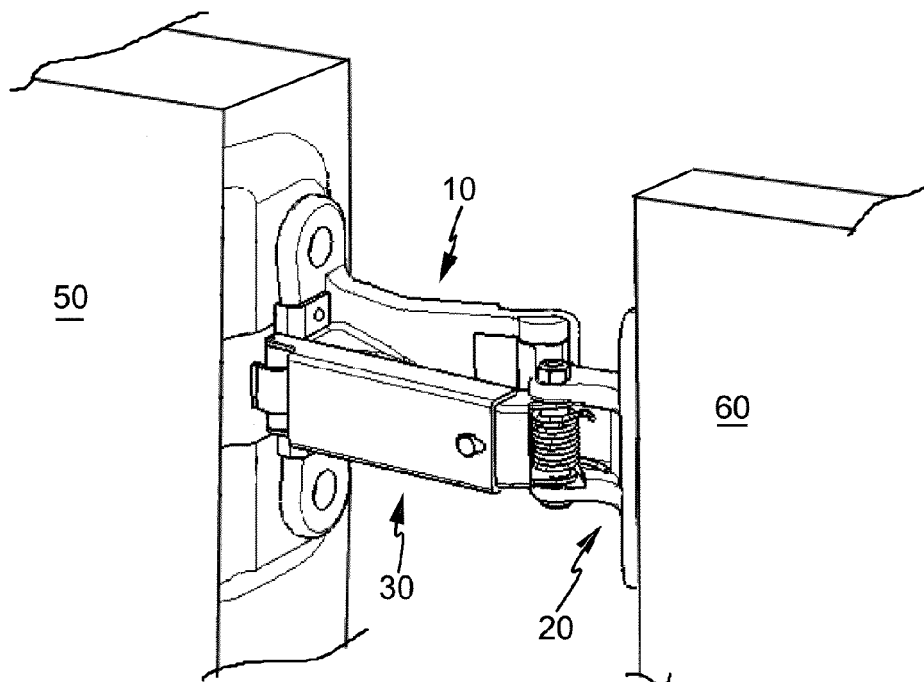


Figure 8