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## Operation pedal device for vehicle


### Abstract

A vehicle operation pedal device includes a pedal bracket, an operation pedal, a rotation lever, and a shear portion. The rotation lever includes a contact portion and a pressing portion. The rotation lever is configured to, by receiving a load greater than or equal to a threshold when the contact portion comes into contact with the vehicle body structural member, rotate about the rotation shaft such that the pressing portion presses the input shaft. The shear portion is configured to fix the rotation lever to the pedal arm when the load applied to the rotation lever from the vehicle body structural member is less than the threshold, and cancel the fixation by being broken when the load is greater than or equal to the threshold.



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## Field of Classification Search

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## Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS

(1) This application is national stage application of International Application No. PCT/JP2023/020622, filed on Jun. 2, 2023, which claims the benefit of priority from Japanese Patent Application No. 2022-092267, filed on Jun. 7, 2022, the entire contents of each of which are incorporated herein by reference.

TECHNICAL FIELD

(2) The present disclosure relates to a vehicle operation pedal device.

BACKGROUND ART

(3) Vehicles such as automobiles are equipped with vehicle operation pedal devices used in brake devices, clutch devices, or the like. For instance, Patent Literature 1 discloses a brake pedal device **100** used in a brake device of a related art shown in FIG. **20**. The brake pedal device **100** includes a pedal bracket **101** and a brake pedal **103** as its basic structure. The pedal bracket **101** is fixed to the dash panel **102**. The brake pedal **103** includes a brake arm **104** rotatably supported by the pedal bracket **101**. The brake pedal device **100** actuates a brake booster **105** by moving a push rod **106**, which is the input shaft of the brake booster **105**, in conjunction with rotation of the brake arm **104**.

(4) The brake pedal device **100** further includes a mechanism (rearward movement reduction mechanism), which reduces rearward movement of the brake pedal **103** (hereinafter, referred to as “rearward movement”) when an impact is applied to a vehicle body **108** from the front due to a collision of the vehicle. The rearward movement reduction mechanism includes a connecting arm **107**, a rotation arm **110**, and a rivet shaft **116**.

(5) The connecting arm **107** is rotatably supported by the pedal bracket **101**. The connecting arm **107** connects the push rod **106** and the brake arm **104** to each other. The rotation arm **110** includes a first link **111**, which is rotatably supported by the connecting arm **107** via a first connecting shaft **112**, and a second link **113**, which is rotatably supported by the connecting arm **107** via a second connecting shaft **114**. The first link **111** and the second link **113** are connected to each other by a third connecting shaft **115**. The rivet shaft **116** is inserted through the first link **111**, the second link **113**, and the connecting arm **107**.

(6) With the above-described brake pedal device **100**, the dash panel **102** moves rearward together with the brake pedal device **100** during a collision of the vehicle. The first link **111** comes into contact with an instrument panel reinforcement **117**, which is a vehicle body structural member disposed rearward of the dash panel **102**. When the first link **111** receives a load exceeding a threshold from the instrument panel reinforcement **117** due to this contact, the rivet shaft **116** breaks due to shearing or similar forms of stress. This allows both the first link **111** and the second link **113** to be rotatable relative to the connecting arm **107**. Rotation of the first link **111** is transmitted to the second link **113** via the third connecting shaft **115**. When rotating relative to the connecting arm **107**, the second link **113** presses the push rod **106** from below. This pressing action bends the push rod **106**, causing the brake pedal **103** to move forward.

CITATION LIST

Patent Literature

(7) Patent Literature 1: Japanese Laid-Open Patent Publication No. 2015-72504

SUMMARY OF INVENTION

Technical Problem

(8) However, in the brake pedal device **100** of the related art, in which the push rod **106** is connected to the connecting arm **107**, the following issues may arise during non-collision situations of the vehicle. If the connecting arm **107** is deformed or if the push rod **106** is disconnected from the connecting arm **107**, it becomes difficult to push the push rod **106** when the brake pedal **103** is

depressed. This leads to difficulties in achieving a stable pedal operation.
(9) The above-described issue is not limited to the brake pedal device **100**, but can commonly occur in any vehicle operation pedal device that moves the input shaft of a device to which depression force of an operation pedal is transmitted.
Solution to Problem
(10) In one general aspect of the present disclosure, a vehicle operation pedal device employed in a vehicle includes a partition wall that partitions a passenger compartment from a portion of a vehicle body forward of the passenger compartment, and a vehicle body structural member disposed behind the partition wall. The vehicle operation pedal device includes a pedal bracket fixed to the partition wall, an operation pedal, a rotation lever, and a shear portion. The operation pedal includes a pedal arm rotatably supported by the pedal bracket. An input shaft of a device to which a depression force of the operation pedal is transmitted is connected to the pedal arm. The operation pedal is configured such that the input shaft is moved in conjunction with rotation of the pedal arm. The rotation lever includes a contact portion and a pressing portion, is supported by the pedal arm via a rotation shaft, and is configured to, by receiving a load greater than or equal to a threshold when the contact portion comes into contact with the vehicle body structural member at a collision of the vehicle, rotate about the rotation shaft such that the pressing portion presses the input shaft in a direction intersecting with an axis of the input shaft. The shear portion is configured to fix the rotation lever to the pedal arm when the load applied to the rotation lever from the vehicle body structural member is less than the threshold. The shear portion is also configured to cancel the fixation by being broken when the load is greater than or equal to the threshold.

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## Description

BRIEF DESCRIPTION OF DRAWINGS
(1) FIG. **1** is a side view of a brake pedal device according to an embodiment together with a brake booster.
(2) FIG. **2** is a perspective view of the brake pedal device shown in FIG. **1**.
(3) FIG. **3** is a partial front view of the brake pedal device shown in FIG. **2** in a state in which a part of a pedal arm is omitted.
(4) FIG. **4** is a plan view as seen from the direction of arrow A in FIG. **1**.
(5) FIG. **5** is a plan view corresponding to FIG. **4**, showing a comparative example.
(6) FIG. **6** is a partial cross-sectional view taken along line **6-6** in FIG. **1**.
(7) FIG. **7** is a partial side view of the brake pedal device together with the brake booster, in which an operation pedal is depressed from the state shown in FIG. **1**.
(8) FIG. **8** is a partial side view of the brake pedal device according to the embodiment of FIG. **1**, in which an input shaft is being bent by a pressing portion at the time of collision of the vehicle.
(9) FIG. **9** is a partial side view of the brake pedal device according to the embodiment of FIG. **1**, in which the input shaft is further bent from the state of FIG. **8**.
(10) FIG. **10** is a partial side view illustrating a lever ratio in the brake pedal device shown in FIG. **1**.
(11) FIG. **11** is a partial side view illustrating a lever ratio in the brake pedal device shown in FIG. **1**.
(12) FIG. **12** is a partial cross-sectional view corresponding to FIG. **6**, showing a rotation shaft and a shear portion according to a first modification.
(13) FIG. **13** is a partial cross-sectional view corresponding to FIG. **6**, showing a rotation shaft and a shear portion according to a second modification.
(14) FIG. **14** is a partial side view of a brake pedal device, illustrating advantages of the second modification shown in FIG. **13**.

(15) FIG. **15** is a partial cross-sectional view corresponding to FIG. **6**, showing a rotation shaft and a shear portion according to a third modification.
(16) FIG. **16** is a partial cross-sectional view corresponding to FIG. **6**, showing a rotation shaft and a shear portion according to a fourth modification.
(17) FIG. **17** is a partial cross-sectional view corresponding to FIG. **6**, showing a rotation shaft and a shear portion according to a fifth modification.
(18) FIG. **18** is a side view showing a brake pedal device according to modification in which a rib is formed on a rotation lever.
(19) FIG. **19** is a cross-sectional view taken along line **19-19** in FIG. **18**.
(20) FIG. **20** is a side view showing a brake pedal device of a related art.

DESCRIPTION OF EMBODIMENTS

(21) A brake pedal device, which is an example of a vehicle operation pedal device, will now be described with reference to FIGS. **1** to **11**.
(22) In the following description, the direction in which a vehicle **10** advances forward will be referred to as the front, and the reverse direction will be referred to as the rear. The vertical direction refers to the vertical direction of the vehicle **10**, and the lateral direction refers to the vehicle width direction that corresponds with the lateral direction when the vehicle **10** is advancing forward.
(23) As shown in FIG. **1**, the vehicle **10** includes a dash panel **12**, which is a partition wall. The dash panel **12** separates a passenger compartment **11** from a portion of a vehicle body **15** forward of the passenger compartment **11**; for example, an engine compartment. An instrument panel reinforcement **13** and a collision bracket **14**, which are vehicle body structural members, are disposed rearward of the dash panel **12**. The instrument panel reinforcement **13** is a pipe-shaped member extending in the lateral direction to reinforce the vehicle body **15**. The collision bracket **14** is fixed to a front lower portion of the instrument panel reinforcement **13**.

Basic Structure of Brake Device **20**

(24) The vehicle **10** is provided with a brake device **20** that applies a braking force to wheels (not shown). The brake device **20** includes a brake pedal device **21** and a brake booster **40**, which is a booster device.
(25) As shown in FIGS. **1** to **3**, the brake pedal device **21** includes a pedal bracket **22** and an operation pedal **25**. The pedal bracket **22** is fixed directly to the dash panel **12** or to a separate member attached to the dash panel **12**. The pedal bracket **22** includes two side plate portions **23** disposed in parallel to each other in a state of being spaced apart from each other in the lateral direction. An operation shaft **24** extends between the two side plate portions **23**.
(26) The operation pedal **25** includes a pedal arm **26** and a pedal pad **28**. The pedal arm **26** is formed from a metal plate. The pedal arm **26** is shaped to be longer in the vertical direction than in the front-rear direction. The pedal arm **26** is rotatably supported by the pedal bracket **22** at its upper end via the operation shaft **24**. The pedal pad **28** is a portion to be depressed by the driver, and is fixed to the lower end of the pedal arm **26**.
(27) As shown in FIG. **1**, the brake booster **40** (booster device) is an example of a device to which the depression force of the operation pedal **25** is transmitted. The brake booster **40** is configured to reduce the amount of depression force applied to the operation pedal **25**, and includes a plunger **41** and an input shaft **42**. The plunger **41** is movable in the front-rear direction. The input shaft **42** includes a push rod **43** and a clevis **44**. An axis L**1** of the push rod **43** extends in the front-rear direction and agrees with the axis of the input shaft **42**. The push rod **43** has a ball portion **43*a*** at the front end. The ball portion **43*a*** is engaged with the plunger **41**. The push rod **43** is swingable relative to the plunger **41** about the ball portion **43*a***. As shown in FIG. **4**, the clevis **44** includes two side plates **45** arranged parallel to each other with a gap between them in the lateral direction. The clevis **44** also includes a connecting plate **46**, which links the front ends of the side plates **45**. In a top view, the clevis **44** forms a U-shape. A connecting pin **47** extends between rear end portions of

the side plates **45**. A central portion of the connecting plate **46** in the lateral direction is fixed to the rear end of the push rod **43**. This fixation is achieved using fastening members **48** such as a bolt and a nut. Through this fixation, the push rod **43** and the clevis **44** are integrated as a single unit.
(28) As shown in FIG. **1**, the brake pedal device **21** actuates the brake booster **40** by moving (pushing) the input shaft **42** in conjunction with rotation of the pedal arm **26**.
(29) The brake pedal device **21** further includes a rearward movement reduction mechanism **50**, which includes a rotation lever **51**, a rotation shaft **60**, and a shear portion **80**. The axis L**2** of the rotation shaft **60** and the axis L**3** of the shear portion **80** both extend in the lateral direction. In the present embodiment, the pedal arm **26** has the same or similar external shape as a pedal arm used in a brake pedal device (not shown) that does not include the rearward movement reduction mechanism **50**. No significant changes have been made to the shape of the pedal arm due to the addition of the rearward movement reduction mechanism **50**.
Rotation Lever **51**
(30) As shown in FIGS. **2** and **6**, the rotation lever **51** is made of metal such as iron and is formed of a plate having a thickness smaller than that of the pedal arm **26**. The lateral direction, which is a direction along the axis L**2** of the rotation shaft **60**, is a thickness direction of the rotation lever **51**. The core structure of the rotation lever **51** is a plate-shaped lever main body **52**, which is longer in the vertical direction than in the front-rear direction. As shown in FIGS. **1** and **2**, the upper end of the lever main body **52** is positioned at about the same height as an intermediate portion of the collision bracket **14** in the vertical direction. The front lower end of the lever main body **52** is located below the operation shaft **24**. The lever main body **52** is disposed in a state of being overlapped with one side in the thickness direction of the pedal arm **26**, that is, on the left side in the present embodiment, but may be disposed in a state of being overlapped with the right side.
(31) The rotation lever **51** further includes a contact portion **53** and a pressing portion **54**. The contact portion **53** is formed on the rear surface of the upper end of the lever main body **52** at a position forward of the collision bracket **14**.
(32) As shown in FIGS. **2** and **4**, the pressing portion **54** protrudes from the front edge of the front lower end of the lever main body **52** toward the pedal arm **26** in the thickness direction of the lever main body **52**. In this example, the pressing portion **54** protrudes rightward. The pressing portion **54** has the shape of a plate that extends vertically. The pressing portion **54** has a lateral dimension larger than the thickness of the lever main body **52**. In the present embodiment, the dimension of the pressing portion **54** in the lateral direction is set to a dimension close to the distance between the side plates **45** of the clevis **44**. The pressing portion **54** is formed integrally with the lever main body **52** by bending the front lower end of the plate used to form the lever main body **52**.
(33) As shown in FIGS. **1** and **4**, the pressing portion **54** is disposed below the instrument panel reinforcement **13** and the collision bracket **14** and above the input shaft **42**. In addition, the pressing portion **54** is disposed such that an intermediate portion thereof in the lateral direction is located above the axis L**1**.
(34) The rotation lever **51** is supported by the pedal arm **26** via the rotation shaft **60** at a rear lower end of the lever main body **52**, the rear lower end being different from the contact portion **53** and the pressing portion **54**.
(35) The rotation lever **51** rotates about the rotation shaft **60** so that the pressing portion **54** presses the connecting plate **46** in a direction intersecting with (in the present embodiment, orthogonal to) the axis L**1** when the following condition is met. The condition is that the rotation lever **51** receives a load greater than or equal to a predetermined threshold from the collision bracket **14** when the contact portion **53** comes into contact with the collision bracket **14** due to a collision of the vehicle **10**.
(36) As shown in FIG. **6**, in order for the rotation lever **51** to be supported by the pedal arm **26** via the rotation shaft **60**, an arm hole **31** is formed in the pedal arm **26** at a position rearward of the input shaft **42**. A lever hole **55** having a larger diameter than the arm hole **31** is formed in the lever

main body **52** at a position rearward of the input shaft **42**. Rotation Shaft **60**

(37) The rotation shaft **60** is a metal stepped pin that includes a small diameter portion **61**, a large diameter portion **62**, and a flange **63**. The small diameter portion **61** is fitted into the arm hole **31**. An end of the small diameter portion **61** on the side farther from the lever main body **52** (on the right side) is exposed from the arm hole **31**. An upset portion **64**, which is larger in the radial direction than the small diameter portion **61**, is formed at the exposed end by upsetting the end. The large diameter portion **62** has a larger diameter than the small diameter portion **61** and is fitted into the lever hole **55**. The small diameter portion **61** is fixed to the pedal arm **26** by sandwiching the pedal arm **26** from the left and right sides by the large diameter portion **62** and the upset portion **64**. An end of the large diameter portion **62** on the side farther from the pedal arm **26** (on the left side) is exposed from the lever hole **55**. The flange **63** is formed at the end of the large diameter portion **62**, and has a larger diameter than the lever hole **55**. The flange **63** is separated from the lever main body **52** in a direction away from the pedal arm **26** (to the left side) by a gap G**1**. The rotation shaft **60** has the shear strength to withstand the load received by the rotation lever **51** from the collision bracket **14** during a collision of the vehicle **10** without breaking.

Shear Portion **80**

(38) The shear portion **80** has a function similar to that of what is generally called a shear pin. Specifically, the shear portion **80** fixes the rotation lever **51** to the pedal arm **26** when the load applied to the rotation lever **51** from the collision bracket **14** is less than the threshold. When the load applied to the rotation lever **51** is greater than or equal to the threshold, the shear portion **80** is broken to cancel the fixation. The fixation by the shear portion **80** refers to restriction of rotation of the rotation lever **51** about the rotation shaft **60** with respect to the pedal arm **26**. This fixation includes not only a state in which the rotation lever **51** cannot move in the thickness direction of the rotation lever **51** with respect to the pedal arm **26**, but also a state in which the rotation lever **51** can move in that direction.

(39) In order to allow the shear portion **80** to exhibit the above-described functionality, an arm hole **32** is formed in the pedal arm **26** by pressing at a position obliquely forward and upward with respect to the arm hole **31**. A lever hole **56** having a smaller diameter than the arm hole **32** is formed in the lever main body **52** at a position obliquely forward and upward with respect to the lever hole **55**.

(40) The shear portion **80** is a metal stepped pin including a large diameter portion **81**, a flange **82**, and a small diameter portion **83**. The large diameter portion **81** is fitted into the arm hole **32**. An end of the large diameter portion **81** on the side farther from the lever main body **52** (on the right side) is exposed from the arm hole **32**. The flange **82** is formed at the end of the large diameter portion **81** and has a diameter larger than that of the arm hole **32**.

(41) The small diameter portion **83** has a smaller diameter than the large diameter portion **81** and is fitted into the lever hole **56**. The small diameter portion **83** is formed to have a diameter smaller than that of the small diameter portion **61** of the rotation shaft **60**. By setting the diameters as described above, the shear strength of the shear portion **80** is set to be smaller than the shear strength of the rotation shaft **60**. An end of the small diameter portion **83** on the side farther from the pedal arm **26** (on the left side) is exposed from the lever hole **56**. An upset portion **84**, which is larger in the radial direction than the small diameter portion **83**, is formed at the exposed end by upsetting the end.

(42) From the perspective of ensuring that the shear portion **80** breaks during a collision of the vehicle **10**, it is preferable to use, as the shear portion **80**, a straight pin having a relatively small diameter in the large diameter portion **81** as well as in the small diameter portion **83**. This would require the diameter of the arm hole **32** to be relatively small like the diameter of the lever hole **56**. Nevertheless, the diameter of the arm hole **32** is made larger than the diameter of the lever hole **56**, and a stepped pin is used for the following reason. As described above, the thickness of the pedal arm **26** is greater than the thickness of the lever main body **52**. If an arm hole **32** with a small

diameter, similar to the lever hole **56**, were formed in the relatively thick pedal arm **26**, it would be necessary to perform machining (formation of a pilot hole, reaming, chamfering). This would increase the cost of formation.

(43) In contrast, forming the arm hole **32** through pressing can be done at a lower cost than machining, leading to a reduction in the overall cost of the structure that fixes the rotation lever **51** using the shear portion **80**.

(44) Further, in the present embodiment, as shown in FIGS. **1** and **4**, the input shaft **42** of the brake booster **40** is connected to the pedal arm **26**. Specifically, the pedal arm **26** includes a clevis hole **27** in a part of the front portion, in the present embodiment, at a position forward of the rotation shaft **60** (arm hole **31**). The clevis hole **27** and its peripheral portion of the pedal arm **26** are disposed between the side plates **45** of the clevis **44**. As described above, the connecting pin **47** extending between the side plates **45** is inserted into the clevis hole **27**. The push rod **43** is connected to the pedal arm **26** by the clevis **44** and the connecting pin **47**.

(45) Operation of the above-described present embodiment will now be described.

Non-Collision State of Vehicle **10**

(46) FIG. **1** shows the brake pedal device **21** when the vehicle **10** is not in a collision, and the operation pedal **25** is not being depressed by the driver. The contact portion **53** of the rotation lever **51** is separated forward from the collision bracket **14**. The shear portion **80** fixes the rotation lever **51** to the pedal arm **26** together with the rotation shaft **60** in a state in which the position of the rotation lever **51** is determined in the rotation direction around the rotation shaft **60**. The pressing portion **54** is separated upward from the connecting plate **46**.

(47) FIG. **7** shows the brake pedal device **21** when the vehicle **10** is not in a collision, and the operation pedal **25** is being depressed by the driver, applying force to the pedal pad **28**. During this depression operation, the operation pedal **25** rotates forward around the operation shaft **24**. This rotation is transmitted to the push rod **43** via the connecting pin **47** and the clevis **44**. The push rod **43** is moved (pushed forward) so as to actuate the brake booster **40**. The shear portion **80** fixes the rotation lever **51** to the pedal arm **26** together with the rotation shaft **60**. Therefore, the rotation lever **51** moves integrally with the operation pedal **25** around the operation shaft **24** at a position away from the collision bracket **14**. The pressing portion **54** is separated obliquely rearward and upward from the connecting plate **46**.

Collision State of Vehicle **10**

(48) From the state shown in FIG. **1**, when an external force (impact) is applied to the vehicle body **15** from the front due to a collision of the vehicle **10**, the dash panel **12** moves rearward together with the brake pedal device **21**. This reduces the distance between the dash panel **12** and the collision bracket **14**. When the rotation lever **51** comes into contact with the collision bracket **14** at the contact portion **53**, the rotation lever **51** receives a load (reaction force) from the collision bracket **14**. This load acts on the rotation shaft **60** and the shear portion **80**.

(49) When the load received by the rotation lever **51** from the collision bracket **14** is greater than or equal to the threshold, the shear portion **80** is broken (cut) due to shearing or similar forms of stress. The rotation shaft **60** is not broken. The fixation of the rotation lever **51** to the pedal arm **26** by the shear portion **80** is cancelled. This allows the rotation lever **51** to rotate around the rotation shaft **60** with respect to the pedal arm **26**.

(50) The rotation lever **51** rotates forward, and the pressing portion **54** comes into contact with the connecting plate **46** from above. As shown in FIGS. **8** and **9**, the pressing portion **54** presses the connecting plate **46** downward in a direction intersecting with the axis L**1** of the push rod **43** (a direction orthogonal to the axis L**1** in the present embodiment). This pressing action bends the input shaft **42** downward. Due to the bending action, the operation pedal **25**, in particular, the pedal pad **28**, moves forward, which is the direction of depression of the pedal pad **28**. In FIGS. **8** and **9**, the pedal arm **26** indicated by the long-dash double-short-dash lines indicates the position of the pedal arm **26** before the collision of the vehicle **10**. In this manner, the rearward movement of the

operation pedal **25** at the time of collision of the vehicle **10** is reduced.
(51) The present embodiment has the following advantages.
(52) (1) In the present embodiment, the input shaft **42** of the brake booster **40** is connected to the pedal arm **26** as shown in FIG. **1**. The phenomenon in which the push rod **106** connected to the connecting arm **107** of the related art shown in FIG. **20** is detached from the connecting arm **107** does not occur in the present embodiment. Further, as shown in FIG. **1**, in the present embodiment, even if the rotation lever **51** is deformed, the connection state of the input shaft **42** to the pedal arm **26** is not affected. Therefore, in a non-collision state of the vehicle **10**, the input shaft **42** can be stably moved (pushed) in conjunction with rotation of the pedal arm **26** regardless of the state of the rotation lever **51** in the present embodiment. In a non-collision state of the vehicle **10**, the brake booster **40** can be actuated by stably performing the depression operation of the operation pedal **25** similarly to the brake pedal device not provided with a rearward movement reduction mechanism.
(53) (2) If the vehicle body structural members (the instrument panel reinforcement **13** and the collision bracket **14**) were positioned at the same height as in the present embodiment, the advantage of item (1) would also be obtained by pressing the input shaft **42** from below with the pressing portion **54**. In this case, however, since the pressing portion **54** would need to be located below the input shaft **42**, the rotation lever **51** would have a complicated shape and be increased in size. In this regard, in the present embodiment, the pressing portion **54** is disposed below the vehicle body structural member (the collision bracket **14**) and above the input shaft **42** as shown in FIG. **1**. Therefore, the input shaft **42** can be pressed from above by the pressing portion **54**, allowing the rotation lever **51** to have a simple shape and reduced size.
(54) (3) When the shear portion **80** is broken upon a collision of the vehicle **10**, the rotation lever **51** becomes rotatable relative to the pedal arm **26** as described above. In this situation, if the flange **63** of the rotation shaft **60** is in contact with the lever main body **52**, the rotation lever **51** may resist rotation due to sliding resistance between the flange **63** and the lever main body **52**. In this regard, in the present embodiment, the small diameter portion **61** is fixed to the pedal arm **26** by sandwiching the pedal arm **26** from both left and right sides by the large diameter portion **62** and the upset portion **64** as shown in FIG. **6**. In this state, the flange **63** is separated from the lever main body **52** by the gap G**1**. By setting the gap G**1**, the sliding resistance between the flange **63** and the lever main body **52** is reduced, allowing the rotation lever **51** to rotate smoothly. This improves the rearward movement reduction performance of the rearward movement reduction mechanism **50**.
(55) (4) In the present embodiment, the pressing portion **54** has the shape of a plate extending in the vertical direction as shown in FIGS. **1** to **4**. This configuration increases the strength of the pressing portion **54** in the vertical direction, which is the bending direction of the input shaft **42**. The pressing portion **54** is thus prevented from being deformed when the input shaft **42** is bent. By designing the shape of the rotation lever **51** in this manner, the strength in the vertical direction of the pressing portion **54** is increased. Thus, there is no need to add separate components for the same purpose.
(56) (5) As shown in FIG. **5**, a part of the front end of the lever main body **52** that is parallel to the axis L**1** of the push rod **43** may be used as the pressing portion **54**. In this case, the dimension of the pressing portion **54** in the lateral direction is the same as the thickness of the lever main body **52**. The contact area of the pressing portion **54** with the connecting plate **46** is relatively small. The input shaft **42** is swingable about the ball portion **43***a*. Thus, if the pressing portion **54** presses the connecting plate **46** at a position deviated from the axis L**1** in the lateral direction, the following concern arises. When that deviated position of the connecting plate **46** is pressed by the small contact area of the pressing portion **54**, a force is generated that attempts to rotate the input shaft **42** around the axis L**1**, as indicated by arrow B. The pressing portion **54** presses the connecting plate **46** downward in a state in which the balance in the lateral direction is disrupted. In other words, the pressing force of the pressing portions **54** is used to rotate the input shaft **42** about the axis L**1**. Accordingly, the pressing force used to bend the input shaft **42** is reduced, and the bending

efficiency may thus be reduced.
(57) In this regard, in the present embodiment, the dimension of the pressing portion **54** in the lateral direction is larger than the thickness of the lever main body **52** as shown in FIG. **4**. The contact area of the pressing portion **54** with the connecting plate **46** is larger than that of the comparative example of FIG. **5**. The pressing portion **54** presses the connecting plate **46** downward in a state in which the balance in the lateral direction is maintained. This restricts rotation of the input shaft **42** about the axis L**1**. The pressing force of the pressing portion **54** is less likely to be used to rotate the input shaft **42** about the axis L**1**. The pressing force of the pressing portion **54** is predominantly used to bend the input shaft **42**, thereby preventing a reduction in bending efficiency. This allows for stable bending of the input shaft **42**.
(58) It is possible to increase the contact area with the connecting plate **46** by adding another component to the rotation lever **51**. However, this would increase the number of components. In the present embodiment, since the pressing portion **54**, which is a part of the rotation lever **51**, has a large contact area with the connecting plate **46**, it is not necessary to add another component.
(59) (**6**) In the present embodiment, the pressing portion 54 is formed by bending a portion (front end) of the plate used to form the lever main body **52** as shown in FIG. **4**. In other words, the pressing portion **54** is formed integrally with the lever main body **52**. Therefore, a separate member for forming the pressing portion **54** is unnecessary.
(60) (7) The rearward movement reduction mechanism of the related art shown in FIG. **20** includes the connecting arm **107**, the first link **111**, the second link **113**, the first connecting shaft **112**, the second connecting shaft **114**, the third connecting shaft **115**, and the rivet shaft **116**. The number of parts forming the rearward movement reduction mechanism is large. In particular, there are many shafts for rotation (the first connecting shaft **112** and the second connecting shaft **114**). Therefore, the cost of components and the cost required for assembly increase, and the rearward movement reduction mechanism is relatively large in size.
(61) In contrast, in the present embodiment, the rearward movement reduction mechanism **50** includes a smaller number of components, including the rotation lever **51**, the rotation shaft **60**, and the shear portion **80** as shown in FIG. **1**. There is only one shaft for rotation (the rotation shaft **60**). Further, the lever main body **52**, the contact portion **53**, and the pressing portion **54** are formed as a single component. This configuration reduces the cost of components and the cost required for assembly. Furthermore, the compact design of the rearward movement reduction mechanism **50** allows for space-saving optimization.
(62) (8) The rearward movement reduction mechanism **50** is capable of adjusting the load applied from the collision bracket **14** to the contact portion **53** and the force with which the pressing portion **54** bends the input shaft **42** during a collision of the vehicle **10**, by changing the position of at least one of the rotation shaft **60** or the shear portion **80**.
(63) As shown in FIGS. **10** and **11**, the distance from the axis L**2** of the rotation shaft **60** to the contact portion **53** is defined as R**1**. The distance from the axis L**2** to the contact point of the pressing portion **54** with the connecting plate **46** is defined as R**2**. The distance from the axis L**2** to the axis L**3** of the shear portion **80** is defined as R**3**. Distances R**1** to R**3** indicated by solid lines in FIG. **10** indicate the distances R**1** to R**3** in the rearward movement reduction mechanism **50** of the present embodiment.
(64) The ratio of the distance R**1** to the distance R**2** (R**1**/R**2**) is referred to as a bending lever ratio. By changing the position of the rotation shaft **60**, at least one of the distances R**1** and R**2** is changed, and the bending lever ratio (R**1**/R**2**) is changed.
(65) By increasing the bending lever ratio (R**1**/R**2**), the load applied to the contact portion **53** is reduced. For example, when the position of the rotation shaft **60** is changed obliquely forward and downward, the distance R**1** becomes longer and the distance R**2** becomes shorter than those in the present embodiment as indicated by the long-dash double-short-dash lines in FIG. **10**. Accordingly, the bending lever ratio (R**1**/R**2**) increases as compared to that of the present embodiment, and the

load applied to the contact portion **53** decreases.
(66) Conversely, by decreasing the bending lever ratio (R**1**/R**2**), the amount by which the pressing portion **54** bends the input shaft **42** is increased, enhancing the rearward movement reduction effect. For example, when the position of the rotation shaft **60** is changed obliquely rearward and upward, the distance R**1** becomes shorter and the distance R**2** becomes longer than those in the present embodiment as indicated by the long-dash double-short-dash lines in FIG. **11**. Accordingly, the bending lever ratio (R**1**/R**2**) decreases as compared to that of the present embodiment, and the amount by which the pressing portion **54** bends the input shaft **42** increases.
(67) Further, as shown in FIGS. **10** and **11**, the ratio of the distance R**1** to the distance R**3** (R**1**/R**3**) is defined as a shear lever ratio. By changing the position of at least one of the rotation shaft **60** and the shear portion **80**, the distances R**1** and R**3** are changed, so that the shear lever ratio is changed (R**1**/R**3**).
(68) By increasing the shear lever ratio (R**1**/R**3**), the load applied to the contact portion **53** is reduced. For example, when the position of the shear portion **80** is changed downward, the distance R**3** becomes shorter than that in the present embodiment as indicated by the broken lines in FIG. **11**. Accordingly, the shear lever ratio (R**1**/R**3**) increases as compared to that of the present embodiment, and the load applied to the contact portion **53** decreases.
(69) The rearward movement reduction mechanism **50** of the present embodiment uses only one rotation shaft **60** as a shaft for rotation as shown in FIG. **1**. Therefore, in the present embodiment, it is easy to design the positions of the rotation shaft **60** and the shear portion **80**. Consequently, it is easy to achieve the optimal settings needed to meet the target values for the rearward movement reduction performance required for the rearward movement reduction mechanism **50** in each vehicle **10**. Moreover, the operation of each component of the rearward movement reduction mechanism **50** is unlikely to be overly complex.
(70) The rearward movement reduction mechanism of the related art shown in FIG. **20** can also adopt a similar lever ratio design as the present embodiment. However, the mechanism of the related art uses multiple members (the first connecting shaft **112** and the second connecting shaft **114**) as shafts for rotation. Therefore, complex design requirements are imposed, making the design process difficult. Moreover, the operation of each component of the rearward movement reduction mechanism is overly complex.
(71) (9) As shown in FIGS. **1** and **6**, the pedal arm **26** of the present embodiment has the same or a similar external shape as the pedal arm in a brake pedal device (not shown) that does not include the rearward movement reduction mechanism **50**. The shape of the pedal arm has not been significantly altered for the formation of the arm holes **31**, **32**. Therefore, the size of the pedal arm **26** is not increased due to the addition of the rearward movement reduction mechanism **50**.
(72) In contrast, in the related art configuration shown in FIG. **20**, the brake arm **104** and the connecting arm **107** connected to the brake arm **104** correspond to the pedal arm **26** of the present embodiment. If the brake pedal device **100** of the related art did not include the rearward movement reduction mechanism, the connecting arm **107** would have a shape indicated by the long-dash double-short-dash lines in FIG. **20**. In order to form portions through which the first connecting shaft **112**, the second connecting shaft **114**, and the rivet shaft **116** are respectively inserted, the connecting arm **107** would need to be expanded upward as shown by the solid lines in FIG. **20**. Of the brake arm **104** and the connecting arm **107**, which correspond to the pedal arm **26** of the present embodiment, the size of the connecting arm **107** is increased.
(73) The above-described embodiment may be modified as follows. The above-described embodiment and the following modifications can be combined as long as the combined modifications remain technically consistent with each other.
Modifications to Rotation Lever **51**
(74) In a case in which the lever main body **52** is a plate longer in the vertical direction than in the front-rear direction as shown in FIGS. **18** and **19**, a rib **57** extending in the vertical direction may be

formed along the rear edge of the lever main body **52**. The rib **57** is formed by bending a plate used for forming the lever main body **52** toward one side in the thickness direction, that is, toward the left side in FIGS. **18** and **19**. The formation of the rib **57** increases the stiffness of the rotation lever **51**. This configuration prevents the rotation lever **51** from being deformed or tilted in the lateral direction even if the rotation lever **51** receives a large load from the collision bracket **14**. Additionally, the configuration prevents the rotation lever **51** from being deformed due to the reaction force from the input shaft **42** when the input shaft **42** is bent by the pressing portion **54**. Moreover, it is not necessary to add separate components to increase the stiffness of the lever main body **52**, which reduces the cost of the rotation lever **51**.
(75) The rib **57** may be formed to extend vertically along the front edge of the lever main body **52** instead of or in addition to the rear edge. The rib **57** may also be formed as a separate member from the lever main body **52**.
(76) As shown in FIG. **5**, a part of the lever main body **52** parallel to the axis L**1** of the push rod **43** may be the pressing portion **54**. If the pressing portion **54** protrudes to the left or right from the lever main body **52**, the dimension in the lateral direction of the pressing portion **54** may be changed to be larger or smaller than that of the above-described embodiment.
(77) The location at which the pressing portion **54** presses the clevis **44** may be changed to a location different from the connecting plate **46**. Further, the location at which the pressing portion **54** presses the input shaft **42** may be changed to a location different from the clevis **44**.
(78) At least one of the contact portion **53** and the pressing portion **54** may be formed by a member separate from the lever main body **52**.
(79) The pressing portion **54** may press the input shaft **42** in a direction obliquely intersecting with the axis L**1**.
Modifications to Rotation Shaft **60** and Shear Portion **80**
(80) As shown in FIGS. **12** to **17**, the rotation shaft **60** and the shear portion **80** may be changed to those having configurations different from those of the above-described embodiment.
(81) In a first modification shown in FIG. **12**, the arm hole **31** and the lever hole **55** are formed to have the same diameter. The rotation shaft **60** may be a metal straight pin that is fitted into the arm hole **31** and the lever hole **55** and includes a shaft **65** having a uniform diameter and a flange **66**. In this case, an end of the shaft **65** on the side farther from the pedal arm **26** (on the left side) is exposed from the lever hole **55**. The flange **66** is formed at the exposed end, and has a larger diameter than the lever hole **55**. An end of the shaft **65** on the side farther from the lever main body **52** (on the right side) is exposed from the arm hole **31**. An upset portion **67**, which is larger in the radial direction than the shaft **65**, is formed at the exposed end by upsetting the end.
(82) Similarly to the above-described embodiment, the rotation shaft **60** fixes the rotation lever **51** to the pedal arm **26** together with the shear portion **80** in a non-collision state of the vehicle **10**, and serves as the center of rotation of the rotation lever **51** at the time of collision. This also applies to the rotation shaft **60** in each of the modifications shown in FIGS. **13** to **17**.
(83) In the first modification shown in FIG. **12**, the arm hole **32** and the lever hole **56** are formed to have the same diameter. The shear portion **80** may be a metal straight pin that is fitted into the arm hole **32** and the lever hole **56** and includes a shaft **85** having a uniform diameter and a flange **86**. In this case, an end of the shaft **85** on the side farther from the pedal arm **26** (on the left side) is exposed from the lever hole **56**. The flange **86** is formed at the exposed end, and has a larger diameter than the lever hole **56**. An end of the shaft **85** on the side farther from the lever main body **52** (on the right side) is exposed from the arm hole **32**. An upset portion **87**, which is larger in the radial direction than the shaft **85**, is formed at the exposed end by upsetting the end.
(84) Similarly to the above-described embodiment, in a non-collision state of the vehicle **10**, the shear portion **80** fixes the rotation lever **51** to the pedal arm **26** together with the rotation shaft **60** in a state in which the position of the rotation lever **51** is determined in the rotation direction around the rotation shaft **60**. This also applies to each of the modifications shown in FIGS. **13** to **15**.

(85) As in a second modification shown in FIG. **13**, the rotation shaft **60** may be formed by a combination of a nut **69** and a bolt **68** including a head **68***a* and a shaft **68***b*. In this case, the arm hole **31** and the lever hole **55** are formed to have the same diameter. The shaft **68***b* is inserted through the arm hole **31** and the lever hole **55**. The head **68***a* may be disposed on the opposite side (right side) of the pedal arm **26** from the lever main body **52**, or may be disposed on the opposite side (left side) of the lever main body **52** from the pedal arm **26**. The nut **69** is fastened to an end of the shaft **68***b* on the side opposite to the head **68***a*.
(86) In the rotation shaft **60** of the second modification, the distance between the nut **69** and the head **68***a* of the bolt **68** can be changed. Therefore, even when multiple types of pedal arms **26** having different thicknesses are used, the rotation shaft **60** can be applied to each of the pedal arms **26**. By fastening the bolts **68** and the nuts **69**, the difference in thickness can be absorbed, and the manufacturing cost will be reduced.
(87) Further, the modification is expected to provide the following advantages. Since, as shown in FIG. **14**, the rotational direction in which the nut **69** is loosened is the same as the rotational direction of the rotation lever **51** when the rearward movement reduction mechanism **50** is operated, the rotation lever **51** functions as a tool for loosening the nut **69** when the rearward movement reduction mechanism **50** operates. Specifically, when the rotation lever **51** is rotated forward as indicated by arrow C in FIG. **14**, the nut **69** is loosened. In FIG. **14**, the counterclockwise direction of the arrow over the nut **69** is the direction in which the nut **69** is loosened, and the clockwise direction of the arrow is the direction in which the nut **69** is tightened. The fastening force by the bolt **68** and the nut **69** is reduced, and the rotation lever **51** is easily rotated forward. This improves the rearward movement reduction performance of the rearward movement reduction mechanism **50**.
(88) The rotation shaft **60**, which includes the combination of the bolt **68** and the nut **69**, is also used as the rotation shaft **60** in each of the modifications shown in FIGS. **15** to **17**. As shown in FIG. **13**, the shear portion **80** may include a combination of a bolt **88** and a nut **89**, similarly to the rotation shaft **60** in FIG. **13**. In this case, the lever hole **56** is formed to have a diameter smaller than that of the arm hole **32** as in the above-described embodiment. The bolt **88** includes a head **88***a*, a large diameter shaft portion **88***b*, and a small diameter shaft portion **88***c*, which has a smaller diameter than the large diameter shaft portion **88***b*. The head **88***a* is disposed on the opposite side (right side) of the pedal arm **26** from the lever main body **52**. The large diameter shaft portion **88***b* is inserted through a large portion of the arm hole **32**. The small diameter shaft portion **88***c* is inserted through the entire lever hole **56** and a part of the arm hole **32**. The nut **89** is fastened to an end of the small diameter shaft portion **88***c* on the side (left side) opposite to the head **88***a*.
(89) As in the third modification shown in FIG. **15**, the lever main body **52** may include a circular protrusion **91** that is formed by plastically deforming a part of the lever main body **52** by pressing, and the protrusion **91** may be used as the shear portion **80**. The protrusion **91** is engaged with the arm hole **32**. The shear portion **80** does not sandwich the lever main body **52** and the pedal arm **26** from the left and right sides. However, this does not cause any issues because the rotation shaft **60** sandwiches the lever main body **52** and the pedal arm **26** from the left and right sides.
(90) With the third modification, since a part of the lever main body **52** functions as the shear portion **80**, a separate component for fixing such as a stepped pin or a straight pin is not necessary. Further, the lever hole **56** is also unnecessary. In addition, the cost required for forming the shear portion **80** is reduced.
(91) The protrusion **91** may have an outer shape different from a circular shape. In this case, the shape of the arm hole **32** is changed in accordance with the outer shape of the protrusion **91**.
(92) As in a fourth modification shown in FIG. **16**, the shear portion **80** may be formed by plastic molding using a plastic. In this case, the arm hole **32** and the lever hole **56** are formed to have the same diameter. The shear portion **80** includes a shaft **92**, a flange **93**, and multiple locking lugs **94**. The shaft **92** is fitted in the lever hole **56** and at least a portion of the arm hole **32** adjacent to the

lever hole **56**. A part of the shaft **92** is inserted into the arm hole **32**. An end of the shaft **92** on the side farther from the pedal arm **26** (on the left side) is exposed from the lever hole **56**. The flange **93** is formed at the exposed end, and has a larger diameter than the lever hole **56**. The locking lugs **94** extend from the outer circumferential portion of the shaft **92** in a direction away from the lever main body **52** (right side) along the axis L**3**, and are elastically deformable in the radial direction of the shaft **92**. Distal ends of the locking lugs **94** are exposed from the arm hole **32**. Each locking lug **94** includes a hook **94***a*, which protrudes outward in the radial direction of the shaft **92**, in the exposed portion. The distance between the shaft **92** and the hook **94***a* is less than the thickness of the pedal arm **26**. The hook **94***a* of each locking lug **94** is locked to a peripheral portion of the arm hole **32** in the pedal arm **26**.
(93) In a case in which the rotation lever **51** is fixed to the pedal arm **26** by the shear portion **80** of the fourth modification, the shear portion **80** is inserted into the lever hole **56** and the arm hole **32** in that order with the hooks **94***a* at the leading end. This insertion is performed in a state in which the locking lugs **94** are elastically deformed inward in the radial direction of the shaft **92**. When the shear portion **80** is inserted to a position where the hooks **94***a* are exposed from the arm hole **32**, each of the locking lugs **94** is elastically deformed radially outward by an elastic restoring force. The hook **94***a* of each locking lug **94** is locked to a peripheral portion of the arm hole **32** in the pedal arm **26**. In this manner, a method of fixing the rotation lever **51** to the pedal arm **26** by inserting and locking the shear portion **80** into the lever hole **56** and the arm hole **32** using the elasticity of the locking lugs **94** is also referred to as snap-fit fixing.
(94) The fourth modification facilitates the work of fixing the rotation lever **51** to the pedal arm **26** using the shear portion **80**. In addition, the fourth modification has an advantage in that the shear portion **80** can be formed at a lower cost than in a case in which an iron pin is used as the shear portion **80**.
(95) In addition, the portion of the shaft **92** that extends into the arm hole **32** is used to position the rotation lever **51** in the rotational direction around the rotation shaft **60**. The shear portion **80** fixes the rotation lever **51** to the pedal arm **26** together with the rotation shaft **60** in a state in which the positioning is completed.
(96) In a case in which the shear portion **80** is a pin made of molded plastic, the shear portion **80** can be formed with higher precision than a shear portion **80** that is a protrusion (protrusion **91**) produced by pressing shown in FIG. **15**. This allows for more stable positioning accuracy.
(97) FIG. **17** shows a fifth modification, in which a pedal arm **26** with a smaller thickness than that used in FIG. **16** is employed. Even in this case, since at least a part of the shaft **92** is fitted into the arm hole **32**, the positioning function is maintained. In other words, the shear portion **80** of this modification can be applied to various types of pedal arms **26** with different plate thicknesses. Therefore, it is possible to standardize the component (shear portion **80**).
(98) When the pedal arm **26** having a thickness smaller than that of FIG. **16** is used as shown in FIG. **17**, a total value T**2** of the thicknesses of the pedal arm **26** and the lever main body **52** is smaller than the distance T**1** between the flange **93** and the hook **94***a*. In a state in which the pedal arm **26** is in contact with the hook **94***a* and the lever main body **52** is in contact with the pedal arm **26**, a gap G**2** is created between the lever main body **52** and the flange **93**. The gap G**2** allows the rotation lever **51** to move in a direction along the axis L**3** of the shear portion **80**. However, the movement is restricted by the flange **93**.
(99) In this case, the force with which the shear portion **80** sandwiches the lever main body **52** and the pedal arm **26** from the left and right sides is relatively small. However, this does not cause any issues because the rotation shaft **60** sandwiches the lever main body **52** and the pedal arm **26** from the left and right sides.
(100) In addition, the strength of a plastic product is generally lower than the strength of a product made of metal such as iron. Therefore, even if the shaft **92** in the modification is made thicker (increased in diameter) than the small diameter portion **83** in the above-described embodiment (see

FIG. **6**), the shaft **92** can be broken by shearing or the like.
(101) The combination of the rotation shaft **60** and the shear portion **80** in the rearward movement reduction mechanism **50** may be changed to a combination different from that used in the above-described embodiment and the modifications shown in FIGS. **12** to **17**.
Other Modifications
(102) The vehicle body structural member with which the rotation lever **51** comes into contact at the time of collision of the vehicle **10** may be the instrument panel reinforcement **13** instead of the collision bracket **14**, or may be a separate member that is fixed to the instrument panel reinforcement **13** and is different from the collision bracket **14**.
(103) The input shaft **42** may be pressed from below by the pressing portion **54**.
(104) The pedal arm **26** may have a shape different from that of a pedal arm in a brake pedal device (not shown) that is not provided with the rearward movement reduction mechanism **50**.
(105) The above-described vehicle operation pedal device can be employed in a wide range of applications, such as a booster device to which the depression force of the operation pedal is transmitted. In addition to the brake pedal device **21**, applicable devices include clutch pedal devices and accelerator pedal devices.
(106) The above-described embodiments include configurations described in the following clauses.
(107) Clause 1
(108) A vehicle operation pedal device employed in a vehicle including a partition wall that partitions a passenger compartment from a portion of a vehicle body forward of the passenger compartment, and a vehicle body structural member disposed behind the partition wall, the vehicle operation pedal device including: a pedal bracket fixed to the partition wall; an operation pedal that includes a pedal arm rotatably supported by the pedal bracket, in which an input shaft of a device to which a depression force of the operation pedal is transmitted is connected to the pedal arm, and the operation pedal is configured such that the input shaft is moved in conjunction with rotation of the pedal arm; a rotation lever that includes a contact portion and a pressing portion, is supported by the pedal arm via a rotation shaft, and is configured to, by receiving a load greater than or equal to a threshold when the contact portion comes into contact with the vehicle body structural member at a collision of the vehicle, rotate about the rotation shaft such that the pressing portion presses the input shaft in a direction intersecting with an axis of the input shaft; and a shear portion that is configured to fix the rotation lever to the pedal arm when the load applied to the rotation lever from the vehicle body structural member is less than the threshold, and cancel the fixation by being broken when the load is greater than or equal to the threshold.
Clause 2
(109) The vehicle operation pedal device according to clause 1, in which the pressing portion is disposed below the vehicle body structural member and above the input shaft.
(110) Clause 3
(111) The vehicle operation pedal device according to clause 1 or clause 2, in which a direction along an axis of the rotation shaft is a thickness direction of the rotation lever, and the rotation lever includes: a plate-shaped lever main body that is longer in a vertical direction than in a front-rear direction; and a rib that extends in the vertical direction along at least one of a front edge or a rear edge of the lever main body.
Clause 4
(112) The vehicle operation pedal device according to any one of clauses 1 to 3, in which the pedal arm includes an arm hole, the rotation lever includes a lever hole having a larger diameter than the arm hole, the rotation shaft includes: a large diameter portion fitted in the lever hole; a small diameter portion fitted in the arm hole and fixed to the pedal arm; and a flange located at an end of the large diameter portion exposed from the lever hole, the flange having a larger diameter than the lever hole, and the flange is separated from the rotation lever in a direction away from the pedal arm.

REFERENCE SIGNS LIST
(113) **10**) Vehicle **11**) Passenger Compartment **12**) Dash Panel (Partition Wall) **13**) Instrument Panel Reinforcement (Vehicle Body Structural Member) **14**) Collision Bracket (Vehicle Body Structural Member) **15**) Vehicle Body **21**) Brake Pedal Device (Vehicle Operation Pedal Device) **22**) Pedal Bracket **25**) Operation Pedal **26**) Pedal Arm **31**, **32**) Arm Holes **40**) Brake Booster (Device to which Depression Force is Transmitted) **42**) Input Shaft **51**) Rotation Lever **52**) Lever Main Body **53**) Contact Portion **54**) Pressing Portion **55**, **56**) Lever Holes **57**) Rib **60**) Rotation Shaft **61**) Small Diameter Portion **62**) Large Diameter Portion **63**) Flange **80**) Shear Portion L**1**, L**2**, L**3**) Axes

## Claims

1. A vehicle operation pedal device employed in a vehicle including a partition wall that partitions a passenger compartment from a portion of a vehicle body forward of the passenger compartment, and a vehicle body structural member disposed behind the partition wall, the vehicle operation pedal device comprising: a pedal bracket fixed to the partition wall; an operation pedal that includes a pedal arm rotatably supported by the pedal bracket, wherein an input shaft of a device to which a depression force of the operation pedal is transmitted is connected to the pedal arm, and the operation pedal is configured such that the input shaft is moved in conjunction with rotation of the pedal arm; a rotation lever that includes a contact portion and a pressing portion, is supported by the pedal arm via a rotation shaft, and is configured to, by receiving a load greater than or equal to a threshold when the contact portion comes into contact with the vehicle body structural member at a collision of the vehicle, rotate about the rotation shaft such that the pressing portion presses the input shaft in a direction intersecting with an axis of the input shaft; and a shear portion that is configured to fix the rotation lever to the pedal arm when the load applied to the rotation lever from the vehicle body structural member is less than the threshold, and cancel the fixation by being broken when the load is greater than or equal to the threshold.
2. The vehicle operation pedal device according to claim 1, wherein the pressing portion is disposed below the vehicle body structural member and above the input shaft.
3. The vehicle operation pedal device according to claim 1, wherein a direction along an axis of the rotation shaft is a thickness direction of the rotation lever, and the rotation lever includes: a lever main body that is longer in a vertical direction than in a front-rear direction; and a rib that extends in the vertical direction along at least one of a front edge or a rear edge of the lever main body.
4. The vehicle operation pedal device according to claim 1, wherein the pedal arm includes an arm hole, the rotation lever includes a lever hole having a larger diameter than the arm hole, the rotation shaft includes: a first diameter portion fitted in the lever hole; a second diameter portion fitted in the arm hole and fixed to the pedal arm, the first diameter portion has a larger diameter than the second diameter portion; and a flange located at an end of the first diameter portion exposed from the lever hole, the flange having a larger diameter than the lever hole, and the flange is separated from the rotation lever in a direction away from the pedal arm.