

# US Patent & Trademark Office

## Patent Public Search | Text View

---

United States Patent	12391162
Kind Code	B2
Date of Patent	August 19, 2025
Inventor(s)	Lee; Tae Hoon et al.

---

### Armrest assembly for rear seat of vehicle

---

#### Abstract

An embodiment armrest assembly for a vehicle includes an armrest rotatably coupled to an armrest board and configured to be extended from the armrest board by rotating forward or to be housed in the armrest board by rotating and standing and a speed-reduction damper mechanism connecting the armrest and the armrest board and configured to make a rotational speed of the armrest uniform by reducing the rotational speed when the armrest rotates to be extended.

---

**Inventors:** Lee; Tae Hoon (Suwon-si, KR), Kim; Ji Hwan (Seoul, KR), Son; Byeong Seon (Seoul, KR), Kim; Sang Ho (Incheon, KR), Park; Sang Hoon (Incheon, KR), Bae; Il Hwan (Suwon-si, KR), Kim; Jeong Ho (Ulsan, KR), Jeong; Bong Jae (Anyang-si, KR), Kim; Min Soo (Ulsan, KR)

**Applicant:** Hyundai Motor Company (Seoul, KR); Kia Corporation (Seoul, KR); Hyundai Transys Inc. (Seosan-si, KR); Hyundai Ind. Co., Ltd. (Ulsan, KR)

**Family ID:** 1000008766129

**Assignee:** HYUNDAI MOTOR COMPANY KIA CORPORATION (Seoul, KR); KIA CORPORATION (Seoul, KR); HYUNDAI TRANSYS INC. (Seosan-si, KR); HYUNDAI IND. CO., LTD. (Ulsan, KR)

**Appl. No.:** 18/303154

**Filed:** April 19, 2023

#### Prior Publication Data

Document Identifier	Publication Date
US 20240149767 A1	May. 09, 2024

#### Foreign Application Priority Data

KR	10-2022-0146999	Nov. 07, 2022
----	-----------------	---------------

---

## Publication Classification

**Int. Cl.:** B60N2/75 (20180101); B60N2/90 (20180101)

**U.S. Cl.:**

**CPC** B60N2/753 (20180201); B60N2/938 (20180201); B60N2002/952 (20180201)

## Field of Classification Search

**CPC:** B60N (2/752); B60N (2/938); B60N (2/952); A47C (7/543); A47C (7/541)

**USPC:** 297/411.3; 297/411.32; 297/411.38

---

## References Cited

### U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
5076645	12/1990	Yokota	297/411.32	B60N 2/753
9022463	12/2014	Cha	297/411.32	B60N 2/757
10207612	12/2018	Lee	N/A	B60N 2/757
11465539	12/2021	Wang	N/A	B60N 2/753
2004/0140697	12/2003	Yuhki	297/113	B60N 2/757
2014/0368017	12/2013	Girbinger	297/411.32	B60N 2/753
2017/0021749	12/2016	Ward	N/A	B60N 2/79
2021/0370815	12/2020	Zimmermann	N/A	B60N 2/919

### FOREIGN PATENT DOCUMENTS

Patent No.	Application Date	Country	CPC
20140082341	12/2013	KR	N/A

---

*Primary Examiner:* Dunn; David R

*Assistant Examiner:* Thompson; Jessica Kathryn

*Attorney, Agent or Firm:* SLATER MATSIL, LLP

---

## Background/Summary

### CROSS-REFERENCE TO RELATED APPLICATIONS

(1) This application claims the benefit of Korean Patent Application No. 10-2022-0146999, filed on Nov. 7, 2022, which application is hereby incorporated herein by reference.

### TECHNICAL FIELD

(2) The present invention relates to an armrest assembly for a rear seat of a vehicle.

### BACKGROUND

(3) In general, an armrest may be provided in a second seat (rear seat) in a passenger vehicle, and the passenger seated in the rear seat may use the armrest.

(4) The armrest in the rear seat may be used suitably for its purpose by the passenger when the

armrest is rotated forward and extended to protrude. When the armrest is rotated rearward and stands, the armrest is housed and stored in an armrest board.

(5) Because structures for rotating and locking the armrest in the related art are operated by friction between an armrest component and an armrest board component, there are problems in that noise is caused by the friction during an operation, abrasion occurs because of the friction, and the occurrence of abrasion makes it difficult to implement a secure locking structure. In particular, there is a problem in that a non-uniform falling velocity occurs when the armrest is extended, which makes it difficult to implement an impression of high-level quality.

(6) The foregoing explained as the background is intended merely to aid in the understanding of the background of embodiments of the present invention and is not intended to mean that the present invention falls within the purview of the related art that is already known to those skilled in the art.

## SUMMARY

(7) The present invention relates to an armrest assembly for a rear seat of a vehicle. Particular embodiments relate to a technology associated with an armrest assembly for a rear seat of a vehicle, which is capable of improving high-level quality by implementing a uniform falling speed when an armrest is extended, the armrest assembly having a novel locking structure capable of more securely fixing the armrest that is extended or housed.

(8) Embodiments of the present invention can solve problems in the art and provide an armrest assembly for a rear seat of a vehicle that implements a rotation of an armrest by using a speed-reduction damper mechanism using a gas spring, the armrest assembly being capable of improving high-level quality by implementing a uniform falling speed when the armrest is extended and of preventing operational noise and improving durability.

(9) Embodiments of the present invention also provide an armrest assembly for a rear seat of a vehicle, which has a locking structure capable of more securely fixing an armrest that is extended or housed.

(10) Embodiments of the present invention provide an armrest assembly for a rear seat of a vehicle, the armrest assembly including an armrest rotatably coupled to an armrest board and configured to be extended from the armrest board by rotating forward or to be housed in the armrest board by rotating and standing and a speed-reduction damper mechanism installed to connect the armrest and the armrest board and configured to make a rotational speed of the armrest uniform by reducing the rotational speed when the armrest rotates to be extended.

(11) The armrest may include an upper part having an armrest lid and a lower part having an accommodation space therein, and the speed-reduction damper mechanism may be installed and positioned in the accommodation space of the lower part.

(12) The speed-reduction damper mechanism may include a gas spring positioned in an accommodation space in the armrest, disposed in a longitudinal direction of the armrest, and having one end coupled to the armrest, a hinge pin fixed to a hinge bracket of the armrest board and coupled to the other end of the gas spring, and a hinge bushing fitted with the hinge pin and configured to enable the armrest to rotate.

(13) The speed-reduction damper mechanism may be provided as a pair of speed-reduction damper mechanisms disposed at left and right sides in an accommodation space in the armrest.

(14) The armrest assembly may further include a knob rotatably coupled to the armrest and configured to be manipulated by a user and a locking mechanism installed in the armrest and connected to the knob by means of a wire, the locking mechanism being configured to lock the armrest by connecting the armrest to hinge brackets of the armrest board when the user does not manipulate the knob or to unlock the armrest by disconnecting the armrest and the hinge brackets when the user manipulates the knob.

(15) The armrest may include an upper part having an armrest lid and a lower part having an accommodation space therein, the knob may be rotatably coupled to the lower part by means of a knob spring, and the locking mechanism may be disposed in the accommodation space of the lower

part while extending leftward and rightward.

(16) The locking mechanism may include a rotary bracket positioned in an accommodation space in the armrest, connected to the wire, and configured to rotate when the wire is pulled or released, left and right pin holders coupled to the rotary bracket, extending in opposite leftward/rightward directions, and configured to rotate together with the rotary bracket, and left and right locking pins respectively coupled to the left and right pin holders and configured to lock the armrest while being kept simultaneously penetrating left and right surfaces of the armrest and the hinge brackets when the user does not manipulate the knob or to unlock the armrest by disconnecting the armrest and the hinge brackets while separating from the hinge brackets when the user manipulates the knob.

(17) The locking mechanism may further include a locking pin housing fixed to the armrest and configured such that the left and right locking pins are inserted into the locking pin housing while extending leftward and rightward and a rotary cap and a screw configured to fix the rotary bracket to the locking pin housing so that the rotary bracket is rotatable.

(18) The locking mechanism may further include a locking pin bushing installed in the locking pin housing while extending leftward and rightward and configured such that the left and right locking pins are inserted into the locking pin bushing while extending in a longitudinal direction, the locking pin bushing being configured to guide rectilinear movements of the left and right locking pins.

(19) The locking mechanism may further include a locking pin spring positioned in the locking pin housing and having two opposite ends supported by the left and right locking pins, the locking pin spring being configured to provide an elastic force in a direction in which the left and right locking pins move away from each other.

(20) In addition, embodiments of the present invention provide an armrest assembly for a rear seat of a vehicle, the armrest assembly including an armrest rotatably coupled to an armrest board and configured to be extended from the armrest board by rotating forward or to be housed in the armrest board by rotating and standing, a knob rotatably coupled to the armrest and configured to be manipulated by a user, and a locking mechanism installed in the armrest and connected to the knob by means of a wire, the locking mechanism being configured to lock the armrest by connecting the armrest to hinge brackets of the armrest board when the user does not manipulate the knob or unlock the armrest by disconnecting the armrest and the hinge brackets when the user manipulates the knob.

(21) The locking mechanism may include a rotary bracket positioned in an accommodation space in the armrest, connected to the wire, and configured to rotate when the wire is pulled or released, left and right pin holders coupled to the rotary bracket, extending in opposite leftward/rightward directions, and configured to rotate together with the rotary bracket, and left and right locking pins respectively coupled to the left and right pin holders and configured to lock the armrest while being kept simultaneously penetrating left and right surfaces of the armrest and the hinge brackets when the user does not manipulate the knob or unlock the armrest by disconnecting the armrest and the hinge brackets while separating from the hinge brackets when the user manipulates the knob.

(22) The locking mechanism may further include a locking pin housing fixed to the armrest and configured such that the left and right locking pins are inserted into the locking pin housing while extending leftward and rightward and a rotary cap and a screw configured to fix the rotary bracket to the locking pin housing so that the rotary bracket is rotatable.

(23) The locking mechanism may further include a locking pin bushing installed in the locking pin housing while extending leftward and rightward and configured such that the left and right locking pins are inserted into the locking pin bushing while extending in a longitudinal direction, the locking pin bushing being configured to guide rectilinear movements of the left and right locking pins.

(24) The locking mechanism may further include a locking pin spring positioned in the locking pin housing and having two opposite ends supported by the left and right locking pins, the locking pin

spring being configured to provide an elastic force in a direction in which the left and right locking pins move away from each other.

(25) The armrest assembly for a rear seat of a vehicle according to embodiments of the present invention implements the rotation of the armrest by using the speed-reduction damper mechanism using the gas spring. When the armrest is rotated to be extended, the gas spring may make a rotational speed of the armrest uniform by reducing the rotational speed. Therefore, a uniform falling speed may be implemented when the armrest is extended, which makes it possible to improve high-level quality, prevent operational noise, and improve durability.

(26) In addition, according to embodiments of the present invention, the restrictive forces of the left and right locking pins, which rectilinearly move when the user manipulates the knob, more securely lock the extended or housed armrest. Therefore, it is possible to further increase the restrictive force applied to the armrest, thereby preventing the rattling of the armrest and improving durability of the armrest.

---

## Description

### BRIEF DESCRIPTION OF THE DRAWINGS

(1) FIG. 1 is a view illustrating a state in which an armrest of an armrest assembly for a rear seat of a vehicle according to embodiments of the present invention is extended.

(2) FIG. 2 is a view illustrating a state in which the armrest is housed in an armrest board.

(3) FIG. 3 is an exploded view illustrating an upper part and a lower part of the armrest.

(4) FIG. 4 is a view for explaining a speed-reduction damper mechanism according to embodiments of the present invention.

(5) FIG. 5 is a view illustrating a portion where the speed-reduction damper mechanism is installed when viewed from a lateral side of a hinge bracket.

(6) FIG. 6 is a view illustrating a state in which a gas spring is compressed in length in a state in which the armrest is housed.

(7) FIG. 7 is a view illustrating a state in which the gas spring is extended in length in a state in which the armrest is extended.

(8) FIG. 8 is a view for explaining a knob and a locking mechanism according to embodiments of the present invention.

(9) FIG. 9 is a top plan view of the locking mechanism.

(10) FIG. 10 is an exploded view of the locking mechanism.

(11) FIG. 11 is a view for explaining a state in which the armrest is locked when the knob is not manipulated.

(12) FIGS. 12 and 13 are views for explaining a state in which the armrest is unlocked when the knob is manipulated.

### DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

(13) Hereinafter, embodiments disclosed in the present specification will be described in detail with reference to the accompanying drawings. The same or similar constituent elements are assigned with the same reference numerals, and the repetitive description thereof will be omitted.

(14) The suffixes “module”, “unit”, “part”, and “portion” used to describe constituent elements in the following description are used together or interchangeably in order to facilitate the description, but the suffixes themselves do not have distinguishable meanings or functions.

(15) In the description of the embodiments disclosed in the present specification, the specific descriptions of publicly known related technologies will be omitted when it is determined that the specific descriptions may obscure the subject matter of the embodiments disclosed in the present specification.

(16) In addition, it should be interpreted that the accompanying drawings are provided only to

allow those skilled in the art to easily understand the embodiments disclosed in the present specification, and the technical spirit disclosed in the present specification is not limited by the accompanying drawings, and includes all alterations, equivalents, and alternatives that are included in the spirit and the technical scope of the present invention.

(17) The terms including ordinal numbers such as “first,” “second,” and the like may be used to describe various constituent elements, but the constituent elements are not limited by the terms. These terms are used only to distinguish one constituent element from another constituent element.

(18) When one constituent element is described as being “coupled” or “connected” to another constituent element, it should be understood that one constituent element can be coupled or connected directly to another constituent element, and an intervening constituent element can also be present between the constituent elements.

(19) When one constituent element is described as being “coupled directly to” or “connected directly to” another constituent element, it should be understood that no intervening constituent element is present between the constituent elements.

(20) Singular expressions include plural expressions unless clearly described as different meanings in the context.

(21) In the present specification, it should be understood the terms “comprises,” “comprising,” “includes,” “including,” “containing,” “has,” “having” or other variations thereof are inclusive and therefore specify the presence of stated features, integers, steps, operations, elements, components, or combinations thereof, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, or combinations thereof.

(22) In addition, the term “control unit” or “unit” included in the name of “motor control unit (MCU)” or “hybrid control unit (HCU)” is merely a term widely used to name a control device (controller or control unit) for controlling a particular vehicle function but does not mean a generic function unit.

(23) The control unit (controller) may include a communication device configured to communicate with another control unit or a sensor to control a corresponding function, a memory configured to store an operating system, a logic instruction, and input/output information, and one or more processors configured to perform determination, computation, decision, or the like required to control the corresponding function.

(24) Hereinafter, an armrest assembly for a rear seat of a vehicle according to an exemplary embodiment of the present invention will be described with reference to the accompanying drawings.

(25) As illustrated in FIGS. **1** to **13**, the armrest assembly for a rear seat of a vehicle according to embodiments of the present invention includes an armrest **200** rotatably coupled to an armrest board **100** and configured to be extended from the armrest board **100** by rotating forward or to be housed in the armrest board **100** by rotating and standing and a speed-reduction damper mechanism **300** installed to connect the armrest **200** and the armrest board **100** and configured to make a rotational speed of the armrest **200** uniform by reducing the rotational speed when the armrest **200** rotates to be extended.

(26) A general rear seat for a passenger vehicle includes a left seat and a right seat. The armrest **200** is provided between the left seat and the right seat. A passenger seated in the rear seat rotates the armrest **200** forward to use the armrest **200**.

(27) The armrest board **100** is fixed to a frame of the rear seat. One end of the armrest **200** is rotatably and hingedly coupled to the armrest board **100**.

(28) As illustrated in FIG. **1**, the user may rotate the armrest **200** of the rear seat forward relative to the armrest board **100** so that the armrest **200** is extended and protrudes, and then the passenger may use the armrest **200** for suitable purposes by supporting the passenger's arm on the armrest **200**. As illustrated in FIG. **2**, when the user rotates the armrest **200** rearward and stands the armrest **200**, the armrest **200** is housed and stored in the armrest board **100**.

- (29) The armrest **200** includes an upper part **220** having an armrest lid **210** and a lower part **240** having an accommodation space **230** therein.
- (30) The speed-reduction damper mechanism **300** is positioned and installed in the accommodation space **230** of the lower part **240** that constitutes the armrest **200**. Therefore, the speed-reduction damper mechanism **300** is not exposed to the outside, such that an external aesthetic appearance may be implemented.
- (31) Two speed-reduction damper mechanisms **300** are provided to implement a smooth rotational operation of the armrest **200**. The two speed-reduction damper mechanisms **300** are respectively installed at left and right sides of a rear portion of the accommodation space **230** of the lower part **240** and extend forward and rearward.
- (32) The speed-reduction damper mechanisms **300** are respectively provided at the left and right sides of the rear portion of the accommodation space **230** and installed in a longitudinal direction of the armrest **200**, which makes it possible to minimize an installation space for the armrest **200**.
- (33) The speed-reduction damper mechanisms **300** each include a gas spring **310** positioned in the accommodation space **230** in the armrest **200**, disposed in the longitudinal direction of the armrest **200**, and having one end coupled to the armrest **200**, a hinge pin **320** fixed to a hinge bracket no of the armrest board **100** and coupled to the other end of the gas spring **310**, and a hinge bushing **330** fitted with the hinge pin **320** and configured to enable the rotation of the armrest **200**. The two opposite ends of the gas spring **310** are fixed to fixing rings **340** each having an 'E' shape.
- (34) The speed-reduction damper mechanism **300** is positioned and installed in the accommodation space **230** in the lower part **240** that constitutes the armrest **200**.
- (35) The lower part **240** of the armrest **200** includes a box frame **241** made of a plastic material and configured to define the accommodation space **230** and a cover frame **242** made of a steel material and configured to reinforce the box frame **231** while partially surrounding a bottom surface of the box frame **231**.
- (36) The gas spring **310** includes a cylinder having an interior filled with gas and a rod configured to move along the cylinder. An overall length of the gas spring **310** varies depending on the movement of the rod.
- (37) One end of the cylinder is rotatably coupled to the cover frame **242** by means of the E-shaped fixing ring **340**, and the cover frame **242** is made of a steel material and constitutes the lower part **240** of the armrest **200**.
- (38) The hinge pin **320** is a component that fastens the armrest **200** to the hinge bracket **110** of the armrest board **100**.
- (39) The hinge pin **320** includes a portion disposed in the accommodation space **230** and coupled to one end of the rod of the gas spring **310** by means of the E-shaped fixing ring **340** and a portion fixed to the hinge bracket **110** of the armrest board **100** while penetrating a lateral surface of the lower part **240** of the armrest **200**.
- (40) The hinge brackets no are provided at two opposite sides of a lower end of the armrest board **100** and rotation center parts of the armrest **200** are coupled to the hinge brackets **110**.
- (41) The portion of the hinge pin **320**, which is fixed to the hinge bracket no while penetrating the lateral surface of the lower part **240**, has an elliptical cross-section, such that the hinge pin **320** is fixed to the hinge bracket no without rotating even though the armrest **200** rotates.
- (42) The hinge bushing **330** is fitted with the portion of the hinge pin **320** that penetrates the lateral surface of the lower part **240**. The hinge bushing **330** is in contact with the lower part **240** and serves to enable the armrest **200** to rotate.
- (43) FIG. 6 illustrates a state in which the gas spring **310** is compressed in length in the state in which the armrest **200** is housed in the armrest board **100**, and FIG. 7 illustrates a state in which the gas spring **310** is extended in length in the state in which the armrest **200** is rotated forward and extended.
- (44) The length of the gas spring **310** varies when the armrest **200** rotates. In particular, when the

armrest **200** is rotated to be extended, the gas spring **310** may make a rotational speed of the armrest **200** uniform by reducing the rotational speed. Therefore, a uniform falling speed may be implemented when the armrest **200** is extended, which makes it possible to improve high-level quality, prevent operational noise, and improve durability.

(45) The armrest assembly according to embodiments of the present invention further includes a knob **400** rotatably coupled to the armrest **200** and configured to be manipulated by a user and a locking mechanism **600** installed in the armrest **200** and connected to the knob **400** by means of a wire **500**, the locking mechanism **600** being configured to lock the armrest **200** by connecting the armrest **200** to the hinge brackets no of the armrest board **100** when the user does not manipulate the knob **400** or to unlock the armrest **200** by disconnecting the armrest **200** and the hinge brackets no when the user manipulates the knob **400**.

(46) The knob **400** is rotatably installed on the lower part **240** of the armrest **200** by means of a knob spring **410**.

(47) The knob **400** is installed to be exposed to the outside while penetrating the lower part **240** of the armrest **200**. The passenger may use the knob **400** by rotating the knob **400**. When an operating force applied to the knob **400** by the passenger is eliminated from the knob **400**, the rotated knob **400** is returned to an initial position by the knob spring **410**.

(48) The wire **500** and the locking mechanism **600** are positioned and installed in the accommodation space **230** of the lower part **240** that constitutes the armrest **200**. The knob **400** and the locking mechanism **600** are respectively positioned at one end and the other end of the lower part **240** and spaced apart from each other. The wire **500** connects the knob **400** and the locking mechanism **600**.

(49) The locking mechanism **600** is disposed at a position adjacent to a hinge part of the armrest **200** and extends toward left and right sides of the accommodation space **230**.

(50) The locking mechanism **600** includes a rotary bracket **610** positioned in the accommodation space **230** in the armrest **200**, connected to the wire **500**, and configured to rotate when the wire **500** is pulled or released, left and right pin holders **620** and **630** coupled to the rotary bracket **610**, extending in opposite leftward/rightward directions, and configured to rotate together with the rotary bracket **610**, and left and right locking pins **640** and **650** respectively coupled to the left and right pin holders **620** and **630** and configured to lock the armrest **200** while being kept simultaneously penetrating left and right surfaces of the armrest **200** and the hinge brackets no when the user does not manipulate the knob **400** or to unlock the armrest **200** by disconnecting the armrest **200** and the hinge brackets no while separating from the hinge brackets no when the user manipulates the knob **400**.

(51) The wire **500** is pulled when the knob **400** is rotated as the user manipulates the knob **400**. When the user eliminates the operating force from the knob **400**, the knob **400** is returned by an elastic force of the knob spring **410**, and the pulled wire **500** is released.

(52) The rotary bracket **610** rotates when the wire **500** is pulled or released. When the rotary bracket **610** rotates, the left and right pin holders **620** and **630** rotate together. When the left and right pin holders **620** and **630** rotate, the left and right locking pins **640** and **650** rectilinearly move leftward and rightward, respectively.

(53) FIG. **11** is a view for explaining a state in which the armrest **200** is locked when the user does not manipulate the knob **400**.

(54) No force is transmitted through the wire **500** when the user does not manipulate the knob **400**, such that the left and right locking pins **640** and **650** are kept simultaneously penetrating the left and right surfaces of the armrest **200** and the hinge brackets no. In this case, the armrest **200** is kept in a locked state in which the locking forces of the left and right locking pins **640** and **650** make it impossible to rotate the armrest **200**.

(55) FIG. **12** illustrates a state in which the user manipulates and rotates the knob **400** in the arrow direction, and FIG. **13** is a view for explaining a state in which the armrest **200** is unlocked by the



rotation of the knob **400**.

(56) When the user manipulates and rotates the knob **400** in the state in which the armrest **200** is locked, the rotary bracket **610** rotates as the wire **500** is pulled. When the rotary bracket **610** rotates, the left and right pin holders **620** and **630** rotate together. When the left and right pin holders **620** and **630** rotate, the left locking pin **640** rectilinearly moves rightward, and the right locking pin **650** rectilinearly moves leftward, such that an interval between the left and right locking pins decreases.

(57) Both the left and right locking pins **640** and **650** separate from the hinge brackets no as the left and right locking pins **640** and **650** move, such that the armrest **200** and the hinge brackets no are disconnected. In this case, the armrest **200** is unlocked, such that the armrest **200** is in the unlocked state in which the armrest **200** may rotate.

(58) In an embodiment according to the present invention, the armrest **200** is locked by restrictive forces of the left and right locking pins **640** and **650** that rectilinearly move when the knob **400** operates. Therefore, it is possible to more securely fix the extended or housed armrest **200** by the restrictive force.

(59) As illustrated, the rotary bracket **610** may be configured by the two components, i.e., upper and lower parts, or configured by a single component.

(60) The locking mechanism **600** according to embodiments of the present invention further includes a locking pin housing **660** fixed to the armrest **200** and configured such that the left and right locking pins **640** and **650** are inserted into the locking pin housing **660** while extending leftward and rightward, a rotary cap **670** and a screw **671** configured to fix the rotary bracket **610** to the locking pin housing **660** so that the rotary bracket **610** is rotatable, a locking pin bushing **680** installed in the locking pin housing **660** while extending leftward and rightward and configured such that the left and right locking pins **640** and **650** are inserted into the locking pin bushing **680** while extending in the longitudinal direction, the locking pin bushing **680** being configured to guide the rectilinear movements of the left and right locking pins **640** and **650**, and a locking pin spring **690** positioned in the locking pin housing **660** and having two opposite ends respectively supported by the left and right locking pins **640** and **650**, the locking pin spring **690** being configured to provide an elastic force in a direction in which the left and right locking pins **640** and **650** move away from each other.

(61) The locking pin housing **660** is positioned in the accommodation space **230** in the lower part **240** and fixedly installed on the lower part **240** by means of a plurality of coupling members (screws).

(62) The locking pin housing **660** is provided in the form of a hollow pipe, and two opposite ends of the locking pin housing **660** extend leftward and rightward. The locking pin bushing **680**, the locking pin spring **690**, and the left and right locking pins **640** and **650** are installed in the locking pin housing **660** while extending leftward and rightward.

(63) In addition, the armrest assembly for a rear seat of a vehicle according to embodiments of the present invention includes the armrest **200** rotatably coupled to the armrest board **100** and configured to be extended from the armrest board **100** by rotating forward or to be housed in the armrest board **100** by rotating and standing, the knob **400** rotatably coupled to the armrest **200** and configured to be manipulated by a user, and the locking mechanism **600** installed in the armrest **200** and connected to the knob **400** by means of the wire **500**, the locking mechanism **600** being configured to lock the armrest **200** by connecting the armrest **200** to the hinge brackets no of the armrest board **100** when the user does not manipulate the knob **400** or unlock the armrest **200** by disconnecting the armrest **200** and the hinge brackets no when the user manipulates the knob **400**.

(64) As described above, the armrest assembly for a rear seat of a vehicle according to embodiments of the present invention implements the rotation of the armrest **200** by using the speed-reduction damper mechanism **300** using the gas spring **310**. When the armrest **200** is rotated to be extended, the gas spring **310** may make a rotational speed of the armrest **200** uniform by

reducing the rotational speed. Therefore, a uniform falling speed may be implemented when the armrest **200** is extended, which makes it possible to improve high-level quality, prevent operational noise, and improve durability.

(65) In addition, according to embodiments of the present invention, the restrictive forces of the left and right locking pins **640** and **650**, which rectilinearly move when the user manipulates the knob **400**, more securely lock the extended or housed armrest **200**. Therefore, it is possible to further increase the restrictive force applied to the armrest **200**, thereby preventing the rattling of the armrest **200** and improving durability of the armrest **200**.

(66) While the specific embodiments of the present invention have been illustrated and described, it will be obvious to those skilled in the art that the present invention may be variously modified and changed without departing from the technical spirit of the present invention defined in the appended claims.

## Claims

1. An armrest assembly for a vehicle, the armrest assembly comprising: an armrest rotatably coupled to an armrest board and configured to be extended from the armrest board by rotating forward or to be housed in the armrest board by rotating and standing; a speed-reduction damper mechanism connecting the armrest and the armrest board and configured to make a rotational speed of the armrest uniform by reducing the rotational speed when the armrest rotates to be extended; and a knob rotatably coupled to the armrest and configured to be manipulated by a user; and a locking mechanism installed in the armrest and connected to the knob by a wire, the locking mechanism being configured to: lock the armrest by connecting the armrest to hinge brackets of the armrest board when there is no manipulation of the knob by the user; and unlock the armrest by disconnecting the armrest and the hinge brackets in response to a manipulation of the knob by the user, wherein: the armrest comprises: an upper part having an armrest lid; and a lower part having an accommodation space therein; the knob is rotatably coupled to the lower part by a knob spring; and the locking mechanism is disposed in the accommodation space of the lower part and extends leftward and rightward.
2. The armrest assembly of claim 1, wherein the speed-reduction damper mechanism is installed and positioned in the accommodation space of the lower part.
3. The armrest assembly of claim 1, wherein the speed-reduction damper mechanism comprises: a gas spring positioned in the accommodation space in the armrest, disposed in a longitudinal direction of the armrest, and having a first end coupled to the armrest; a hinge pin fixed to a hinge bracket of the hinge brackets of the armrest board and coupled to a second end of the gas spring; and a hinge bushing fitted with the hinge pin and configured to enable the armrest to rotate.
4. The armrest assembly of claim 1, wherein the speed-reduction damper mechanism is provided as a pair of speed-reduction damper mechanisms disposed at left and right sides in the accommodation space in the armrest.
5. The armrest assembly of claim 1, wherein the locking mechanism comprises: a rotary bracket positioned in the accommodation space in the armrest, connected to the wire, and configured to rotate based on whether the wire is pulled or released; left and right pin holders coupled to the rotary bracket, extending in opposite leftward/rightward directions, and configured to rotate together with the rotary bracket; and left and right locking pins respectively coupled to the left and right pin holders and configured to: lock the armrest while being kept simultaneously penetrating left and right surfaces of the armrest and the hinge brackets when there is no manipulation of the knob by the user; and unlock the armrest by disconnecting the armrest and the hinge brackets while separating from the hinge brackets in response to the manipulation of the knob by the user.
6. The armrest assembly of claim 5, wherein the locking mechanism further comprises: a locking pin housing fixed to the armrest and configured such that the left and right locking pins are inserted

into the locking pin housing while extending leftward and rightward; and a rotary cap and a screw configured to fix the rotary bracket to the locking pin housing so that the rotary bracket is rotatable.

7. The armrest assembly of claim 6, wherein the locking mechanism further comprises a locking pin bushing installed in the locking pin housing while extending leftward and rightward and configured such that the left and right locking pins are inserted into the locking pin bushing while extending in a longitudinal direction, the locking pin bushing being configured to guide rectilinear movements of the left and right locking pins.

8. The armrest assembly of claim 6, wherein the locking mechanism further comprises a locking pin spring positioned in the locking pin housing and having two opposite ends supported by the left and right locking pins, the locking pin spring being configured to provide an elastic force in a direction in which the left and right locking pins move away from each other.

9. An armrest assembly for a vehicle, the armrest assembly comprising: an armrest rotatably coupled to an armrest board and configured to be extended from the armrest board by rotating forward or to be housed in the armrest board by rotating and standing; a knob rotatably coupled to the armrest and configured to be manipulated by a user; and a locking mechanism installed in the armrest and connected to the knob by a wire, the locking mechanism being configured to: lock the armrest by connecting the armrest to hinge brackets of the armrest board when there is no manipulation of the knob by the user; and unlock the armrest by disconnecting the armrest and the hinge brackets in response to a manipulation of the knob by the user, wherein the locking mechanism comprises: a rotary bracket positioned in an accommodation space in the armrest, connected to the wire, and configured to rotate based on whether the wire is pulled or released; left and right pin holders coupled to the rotary bracket, extending in opposite leftward/rightward directions, and configured to rotate together with the rotary bracket; and left and right locking pins respectively coupled to the left and right pin holders and configured to: lock the armrest while being kept simultaneously penetrating left and right surfaces of the armrest and the hinge brackets when there is no manipulation of the knob by the user; and unlock the armrest by disconnecting the armrest and the hinge brackets while separating from the hinge brackets in response to the manipulation of the knob by the user.

10. The armrest assembly of claim 9, wherein the locking mechanism further comprises: a locking pin housing fixed to the armrest and configured such that the left and right locking pins are inserted into the locking pin housing while extending leftward and rightward; and a rotary cap and a screw configured to fix the rotary bracket to the locking pin housing so that the rotary bracket is rotatable.

11. The armrest assembly of claim 10, wherein the locking mechanism further comprises a locking pin bushing installed in the locking pin housing while extending leftward and rightward and configured such that the left and right locking pins are inserted into the locking pin bushing while extending in a longitudinal direction, the locking pin bushing being configured to guide rectilinear movements of the left and right locking pins.

12. The armrest assembly of claim 10, wherein the locking mechanism further comprises a locking pin spring positioned in the locking pin housing and having two opposite ends supported by the left and right locking pins, the locking pin spring being configured to provide an elastic force in a direction in which the left and right locking pins move away from each other.

13. A vehicle comprising: a left seat and a right seat in an interior of the vehicle; an armrest board disposed between the left seat and the right seat; an armrest rotatably coupled to the armrest board and configured to be extended from the armrest board by rotating forward or to be housed in the armrest board by rotating and standing; a speed-reduction damper mechanism connecting the armrest and the armrest board and configured to make a rotational speed of the armrest uniform by reducing the rotational speed when the armrest rotates to be extended; and a knob rotatably coupled to the armrest and configured to be manipulated by a user; and a locking mechanism installed in the armrest and connected to the knob by a wire, the locking mechanism being configured to: lock the armrest by connecting the armrest to hinge brackets of the armrest board when there is no

manipulation of the knob by the user; and unlock the armrest by disconnecting the armrest and the hinge brackets in response to a manipulation of the knob by the user, wherein the locking mechanism comprises: a rotary bracket positioned in an accommodation space in the armrest, connected to the wire, and configured to rotate based on whether the wire is pulled or released; left and right pin holders coupled to the rotary bracket, extending in opposite leftward/rightward directions, and configured to rotate together with the rotary bracket; left and right locking pins respectively coupled to the left and right pin holders and configured to: lock the armrest while being kept simultaneously penetrating left and right surfaces of the armrest and the hinge brackets when there is no manipulation of the knob by the user; and unlock the armrest by disconnecting the armrest and the hinge brackets while separating from the hinge brackets in response to the manipulation of the knob by the user; a locking pin housing fixed to the armrest and configured such that the left and right locking pins are inserted into the locking pin housing while extending leftward and rightward; a rotary cap and a screw configured to fix the rotary bracket to the locking pin housing so that the rotary bracket is rotatable; and a locking pin bushing installed in the locking pin housing while extending leftward and rightward and configured such that the left and right locking pins are inserted into the locking pin bushing while extending in a longitudinal direction, the locking pin bushing being configured to guide rectilinear movements of the left and right locking pins.

14. The vehicle of claim 13, wherein the armrest comprises: an upper part having an armrest lid; and a lower part having the accommodation space therein, wherein the speed-reduction damper mechanism is installed and positioned in the accommodation space of the lower part.

15. The vehicle of claim 13, wherein the speed-reduction damper mechanism comprises: a gas spring positioned in the accommodation space in the armrest, disposed in a longitudinal direction of the armrest, and having a first end coupled to the armrest; a hinge pin fixed to a hinge bracket of the hinge brackets of the armrest board and coupled to a second end of the gas spring; and a hinge bushing fitted with the hinge pin and configured to enable the armrest to rotate.

---