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VEHICLE MIRROR DEVICE

Abstract

A vehicle mirror device includes a visor rim and visor cover. The visor rim includes a housing tube that extends along a specific axial line direction, and that has a one-side in the axial line direction open with a mirror provided in an interior thereof, and includes a first engagement portion that is provided at an outer peripheral portion of the housing tube. The visor cover includes a first engaging portion that is capable of engaging with, or detaching from, the first engagement portion. The visor cover is supported by the visor rim in a mode positioned at an outer peripheral side of the housing tube when the first engaging portion has engaged with the first engagement portion.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based on and claims priority under 35 USC 119 from Japanese Patent Application No. 2024-019686, filed on Feb. 13, 2024, the disclosure of which is incorporated by reference herein.

BACKGROUND

Technical Field

[0002] The present disclosure relates to a vehicle mirror device.

Related Art

[0003] Japanese Utility Model Registration No. 3194921 discloses a vehicle mirror device including a visor rim (body) that includes a housing tube to house a mirror and that is supported by a vehicle door through a support member, and a visor cover (cover member) that is installed so as to be capable of attaching to, or detaching from, the visor rim in a mode positioned at an outer peripheral side of the housing tube. The visor cover is connected to the visor rim by an engagement member of the visor rim engaging with an engagement member of the visor cover.

[0004] The engagement member of the visor rim is positioned at an inner peripheral side of the housing tube. This means that a large engagement member is not able to be provided to the visor rim in cases in which the diameter of the housing tube is small. Namely, a large engagement force has not been able to be achieved between the engagement member of the visor rim and the engagement member of the visor cover when the diameter of the housing tube is small.

[0005] In consideration of the above circumstances, an object of the present disclosure is to obtain a vehicle mirror device that is capable of providing a visor rim including a housing tube with a large first engagement portion for engaging with a first engaging portion of a visor cover, even when a diameter of a housing tube for housing a mirror is small.

SUMMARY

[0006] A vehicle mirror device of a first aspect of the present disclosure includes a visor rim and a visor cover. The visor rim includes a housing tube that extends along a specific axial line direction, that has one side in an axial line direction open, and that has a mirror provided in an interior of the housing tube, and the visor rim including a first engagement portion that is provided at an outer peripheral portion of the housing tube. The visor cover includes a first engaging portion that is engageable with, or detachable from, the first engagement portion, the visor cover being supported by the visor rim in an aspect in which the visor cover is positioned at an outer peripheral side of the housing tube when the first engaging portion is engaged with the first engagement portion.

[0007] A vehicle mirror device of a second aspect of the present disclosure is the vehicle mirror device of the first aspect of the present disclosure, wherein the housing tube includes a resilient deformation section at which the first engagement portion is provided, and that is configured by a cantilever beam that is resiliently deformable to an inner peripheral side and an outer peripheral side of the housing tube.

[0008] A vehicle mirror device of a third aspect of the present disclosure is the vehicle mirror device of the second aspect of the present disclosure, wherein the housing tube is provided with a U-shaped cutout including a first portion adjacent to an end portion at the one side of the resilient deformation section, a second portion adjacent to an upper edge portion of the resilient deformation section and connected to the first portion, and a third portion adjacent to a lower edge portion of the resilient deformation section and connected to the first portion.

[0009] A vehicle mirror device of a fourth aspect of the present disclosure is the vehicle mirror device of any one of the first aspect to the third aspect of the present disclosure, wherein the visor rim is equipped with a second engagement portion positioned at an outer peripheral side of the housing tube, the visor cover. The visor cover includes a second engaging portion and the first engaging portion. The second engaging portion is engageable with, or detachable from, the second engagement portion, and restricts relative movement of the visor cover to the one side with respect

to the visor rim by engaging with the second engagement portion. The first engaging portion, by engaging with the first engagement portion from the one side when the second engaging portion is engaged with the second engagement portion, restricts relative movement of the visor cover toward another side in the axial line direction with respect to the visor rim.

[0010] In the vehicle mirror device of the first aspect of the present disclosure, the visor rim includes the housing tube that extends along the specific axial line direction, and that has the one-side in the axial line direction open with the mirror provided in the interior thereof, and includes the first engagement portion provided to the outer peripheral portion of the housing tube. Furthermore, the visor cover that is supported by the visor rim in a mode positioned at the outer peripheral side of the housing tube includes the first engaging portion that is capable of engaging with, or detaching from, the first engagement portion. This means that the vehicle mirror device of the first aspect of the present disclosure is able to provide a large first engagement portion to the visor rim for engaging with the first engaging portion of the visor cover even in cases in which the diameter of the housing tube is small.

[0011] The housing tube of the vehicle mirror device of the second aspect of the present disclosure includes the resilient deformation section that is provided with the first engagement portion and that is configured by the cantilever beam capable of resiliently deforming to the inner peripheral side and the outer peripheral side of the housing tube. This means that in the vehicle mirror device of the second aspect, the first engagement portion and the first engaging portion are easily engaged.

[0012] In the vehicle mirror device of the third aspect of the present disclosure, for example, a tool inserted into a gap between the housing tube and the mirror is used to facilitate resilient deformation of the resilient deformation section such that engagement with the first engaging portion is released for the first engagement portion engaged with the first engaging portion.

[0013] The vehicle mirror device of the fourth aspect of the present disclosure enables relative movement of the visor cover to the one-side or the other-side in the axial line direction with respect to the visor rim to be restricted.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Exemplary embodiments of the present disclosure will be described in detail based on the following figures, wherein:

[0015] FIG. 1 is a perspective view of a door mirror device of an exemplary embodiment of the present disclosure, as viewed from the rear;

[0016] FIG. 2 is a perspective view of a door mirror device in a state in which a mirror and an upper cover have been separated, as viewed from the rear;

[0017] FIG. 3 illustrates a perspective view of a door mirror device in a state in which an upper cover has been separated, as viewed from the front;

[0018] FIG. 4 is an enlarged perspective view of a left side portion of a visor rim;

[0019] FIG. 5 is an enlarged perspective view of a left side portion of an upper cover;

[0020] FIG. 6 is a schematic perspective view of an inner face of a left side portion of a housing tube when a resilient deformation section is in a free state;

[0021] FIG. 7 is a cross-section of a visor rim left side portion and an upper cover left side portion illustrating a state in which a first engaging portion has contacted a resilient deformation section, as sectioned at the same position as arrow line 8-8 of FIG. 1; and

[0022] FIG. 8 is a cross-section taken along arrow line 8-8 of FIG. 1.

DETAILED DESCRIPTION

[0023] Description follows regarding a vehicle mirror device 10 (hereafter referred to as door mirror device 10) of the present exemplary embodiment, with reference to the appended drawings.

The door mirror device **10** of the present exemplary embodiment is provided to a side door (omitted in the drawings) on the left side of a vehicle. Note that as appropriately illustrated in the drawings, arrow FR indicates a front direction, arrow UP indicates upward, and arrow LH indicates a left direction.

[0024] As illustrated in FIG. **1** to FIG. **3**, the door mirror device **10** includes an arm member **15**, a stowing mechanism **24**, an actuator support member **25**, a mirror **28**, a visor rim **30**, a lower cover **50**, and an upper cover (visor cover) **60**.

[0025] A one-end portion of the arm member **15** is supported by a side door. A support portion **16** is provided at an other-end portion of the arm member **15**. Furthermore, the stowing mechanism **24** is provided on an upper face of the support portion **16**, and the actuator support member **25** is provided to an upper portion of the stowing mechanism **24**. Furthermore, the mirror **28** is supported by a mirror drive actuator (omitted in the drawings) provided to a rear portion of the actuator support member **25**. An angle of the mirror **28** with respect to the actuator support member **25** is changed when the mirror drive actuator is operated.

[0026] The visor rim **30** that is an integrally molded component made from a resin includes, as illustrated in FIG. **2** to FIG. **4**, a frame shaped portion **31**, a flange portion **32**, a housing tube **33**, a bottom plate portion **34**, and a lower supported portion **35**. A face-on profile of the frame-shaped portion **31** that configures a rear end portion of the visor rim **30** is a substantially rectangular shape. The ring-shaped flange portion **32** projects forward from an outer peripheral edge portion of the frame-shaped portion **31**. The ring-shaped housing tube **33** further projects forward from an inner peripheral edge portion of the frame-shaped portion **31**. An amount by which the housing tube **33** projects forward is greater than that of the flange portion **32**. The outer peripheral edge portion of the bottom plate portion **34** is connected to an inner peripheral edge portion of a front end portion of the housing tube **33**. A through hole **34A** is formed in a center portion of the bottom plate portion **34**. Center axes (axial lines) AX of the frame-shaped portion **31** and the housing tube **33** (see FIG. **1** and FIG. **8**) are substantially parallel to a front-rear direction. Furthermore, the lower supported portion **35** extends forward from a lower end portion of the frame-shaped portion **31**.

[0027] As illustrated in FIG. **2** to FIG. **4**, a cutout **37** having a U-shaped profile in side view is formed in a left side portion of the housing tube **33**. The cutout **37** includes a first portion **37A** configuring a rear end portion thereof, a second portion **37B** that extends forward from an upper end portion of the first portion **37A**, and a third portion **37C** that extends forward from a lower end portion of the first portion **37A**. A resilient deformation section **38** is formed to a left side portion of the housing tube **33** so as to be accordingly surrounded by the cutout **37**. Namely, a rear end portion of the resilient deformation section **38** is adjacent to the first portion **37A**, an upper edge portion of the resilient deformation section **38** is adjacent to the second portion **37B**, and a lower edge portion of the resilient deformation section **38** is adjacent to the third portion **37C**. The resilient deformation section **38** is a cantilever beam with a front end portion thereof serving as a supported end. Namely, the resilient deformation section **38** is capable of deforming resiliently in a thickness direction (to an inner peripheral side and an outer peripheral side) of the left side portion of the housing tube **33**. When the resilient deformation section **38** is in a free state as illustrated in FIG. **6** and FIG. **7**, a design face **33A** that is an inner peripheral face of the housing tube **33**, and an inner face of the resilient deformation section **38**, are in the same plane as each other.

[0028] Furthermore, as illustrated in FIG. **4** and FIG. **8**, a first engagement portion **42** is provided to an outer face (left side face) of the resilient deformation section **38**. A profile of the first engagement portion **42** is substantially a triangular column that is substantially parallel to the height direction. A rear face of the first engagement portion **42** is configured by an engagement face **43** formed from a flat face, and an outer face (left side face) of the first engagement portion **42** is configured from a guide face **44** formed from a flat face inclined with respect to the engagement face **43** in plan view.

[0029] Furthermore, as illustrated in FIG. **2**, FIG. **3**, FIG. **7**, and FIG. **8**, a second engagement

portion **47** is provided to an entire front edge portion of the flange portion **32** excluding a lower end portion thereof.

[0030] Part of the visor rim **30** having such a configuration is fixed to the actuator support member **25**, and a rear portion of the actuator support member **25** passes rearward through a through hole **34A**. When the visor rim **30** is fixed to the actuator support member **25**, the mirror **28** is positioned at the interior of the housing tube **33**, as illustrated in FIG. **1**.

[0031] The lower cover **50**, which is an integrally molded component made from a resin, is screwed to the visor rim **30** at plural individual locations.

[0032] The upper cover **60**, which is an integrally molded component made from a resin, is a hollow body opening at a rear face and a lower face. As illustrated in FIG. **5**, a first engaging portion **61** is provided to an inner face at a left side portion of the upper cover **60**. The first engaging portion **61** includes three engagement projections **62** separated from each other in the height direction. A guided face **63** is formed to a right side edge portion of each of the engagement projections **62** so as to be inclined with respect to the left-right direction and the front-rear direction in plan view, and an engaging face **64** is formed to a front edge portion of each of the engagement projections **62** so as to be substantially perpendicular to the front-rear direction in plan view.

[0033] Furthermore, as illustrated in FIG. **7** and FIG. **8**, a second engaging portion **67** configured as a groove is formed around the entire periphery of a rear edge portion of the upper cover **60**.

[0034] When the upper cover **60** that is separated to the front from the visor rim **30**, as illustrated in FIG. **2** and FIG. **3**, is moved rearward, the guided face **63** of each of the engagement projections **62** of the first engaging portion **61** contacts the guide face **44** of the first engagement portion **42** provided to the resilient deformation section **38**, which is in a free state, of the visor rim **30**, as illustrated in FIG. **7**. When the upper cover **60** is moved further rearward from this state, each of the engagement projections **62** overrides the guide face **44** toward the rear by the resilient deformation section **38** deforming resiliently toward the inner peripheral side (right side) of the visor rim **30** about the support end (front end portion). The resilient deformation section **38** attempts to return to the free state when each of the engagement projections **62** has been moved to the rear of the guide face **44**. As a result thereof, the engagement face **43** of the first engagement portion **42** of the resilient deformation section **38** that is in a slightly resiliently deformed state from the free state, and the engaging face **64** of each of the engagement projections **62**, engage with each other, as illustrated in FIG. **8**. Furthermore, the entire second engaging portion **67** of the upper cover **60** engages with the second engagement portion **47** of the flange portion **32** of the visor rim **30**. The upper cover **60** is, as illustrated in FIG. **1**, accordingly installed attachable to, or detachable from, the visor rim **30** and to the lower cover **50** so as to cover the stowing mechanism **24** and the actuator support member **25**. Furthermore, the visor rim **30** and the upper cover **60** are then screwed together at plural individual locations. This thereby completes the door mirror device **10** illustrated in FIG. **1**.

[0035] Next, description follows of the operation and advantageous effects of the present exemplary embodiment.

[0036] The visor rim **30** of the door mirror device **10** includes the housing tube **33** that extends along the center axis AX, and that has a center axis AX direction one-side (rear side) that is open and that has the mirror **28** provided in the interior thereof, and the first engagement portion **42** is provided to an outer peripheral portion of the housing tube **33**. Furthermore, the upper cover **60** supported by the visor rim **30** in a mode positioned at the outer peripheral side of the housing tube **33** includes the first engaging portion **61** that is engageable with the first engagement portion **42**. The first engagement portion **42** is provided to the outer peripheral portion of the housing tube **33** in this manner, and so this enables a large first engagement portion **42** for engaging with the first engaging portion **61** to be provided to the visor rim **30** even in cases in which a diameter of the housing tube **33** having the center axis AX at the center thereof is small. Accordingly, the door mirror device **10** is able to achieve a larger engagement force between the first engagement portion

42 and the first engaging portion **61** even in cases in which the diameter of the housing tube **33** is small.

[0037] Furthermore, the first engaging portion **61** is equipped with the three individual engagement projections **62** and so a larger engagement force can be achieved between the first engagement portion **42** and the first engaging portion **61** than cases in which the first engaging portion **61** is configured by a single individual engagement projection **62**.

[0038] The housing tube **33** of the visor rim **30** of the door mirror device **10** includes the resilient deformation section **38** that is provided with the first engagement portion **42** and that is configured as a cantilever beam capable of resiliently deforming to the inner peripheral side and the outer peripheral side of the housing tube **33**. This thereby enables the first engaging portion **61** to be engaged with the first engagement portion **42** easily when the upper cover **60** is installed to the visor rim **30**.

[0039] Furthermore, the visor rim **30** of the door mirror device **10** is equipped with the second engagement portion **47**, and the upper cover **60** is equipped with the second engaging portion **67**. The second engagement portion **47** and the second engaging portion **67** engage with each other further rearward than the first engagement portion **42** and the first engaging portion **61**. This means that relative movement of the upper cover **60** toward the center axis AX direction one-side (rear) and other-side (front) with respect to the visor rim **30** is restricted by the first engagement portion **42**, the second engagement portion **47**, the first engaging portion **61**, and the second engaging portion **67**.

[0040] Furthermore, when a direction perpendicular to the center axis AX in plan view is defined as being a perpendicular direction PX as illustrated in FIG. 8, the engagement face **43** of the first engagement portion **42** engaged with the engagement projection **62** is inclined at an angle α to the rear with respect to the perpendicular direction PX. This means that when a forward external force is imparted to the upper cover **60** in this state, each of the engagement projections **62** is guided to the right side by the engagement face **43**. Namely, the first engaging portion **61** is moved, by the engagement face **43**, in a direction to increase the amount of engagement between the engaging face **64** and the engagement face **43**. This means that there is little concern of disengagement of the engaged state between the first engagement portion **42** and the first engaging portion **61** even if a forward force were to be unintendedly imparted to the upper cover **60**.

[0041] Furthermore, the first portion **37A** is provided to a rear end portion of the cutout **37**. This means that the engagement between the first engagement portion **42** and the first engaging portion **61** can be intentionally released by inserting a tool **70** (see FIG. 8) into a gap between a left side section of the frame-shaped portion **31** and the housing tube **33**, and left side section of the mirror **28**, and by using a leading end portion of the tool **70** to move a rear end portion of the resilient deformation section **38** toward the inside (right side) of the housing tube **33**. Namely, after the plural screws mentioned above have been removed from the visor rim **30** and the upper cover **60**, the upper cover **60** can be intentionally removed from the visor rim **30** easily by using the tool **70**.

[0042] Furthermore, as illustrated in FIG. 6 and FIG. 7, when the resilient deformation section **38** is in a free state, the design face **33A** that is the inner peripheral face of the housing tube **33**, and the inner face of the resilient deformation section **38**, are in the same plane as each other. This means that styling of the door mirror device **10** is not liable to be spoilt by the resilient deformation section **38** even in cases in which the design face **33A** is exposed through a gap between the left side portions of the frame-shaped portion **31** and the housing tube **33**, and the left side portion of the mirror **28**.

[0043] Although explanation has been given above regarding the door mirror device **10** according to an exemplary embodiment, appropriate design changes to the door mirror device **10** are possible within a range not departing from the spirit of the present disclosure.

[0044] The first engaging portion **61** may be equipped with a single individual engagement projection **62** alone. The first engaging portion **61** may also be equipped with two or four or more

of the engagement projections **62**.

[0045] The shape of each of the engagement projections **62** may be different to the shape in the above exemplary embodiment.

[0046] The present disclosure is also applicable to a door mirror device on the right side.

Claims

1. A vehicle mirror device, comprising: a visor rim including a housing tube that extends along a specific axial line direction, that has one side in an axial line direction open, and that has a mirror provided in an interior of the housing tube, and the visor rim including a first engagement portion that is provided at an outer peripheral portion of the housing tube; and a visor cover including a first engaging portion that is engageable with, or detachable from, the first engagement portion, the visor cover being supported by the visor rim in an aspect in which the visor cover is positioned at an outer peripheral side of the housing tube when the first engaging portion is engaged with the first engagement portion.
 2. The vehicle mirror device of claim 1, wherein the housing tube includes a resilient deformation section at which the first engagement portion is provided, and that is configured by a cantilever beam that is resiliently deformable to an inner peripheral side and an outer peripheral side of the housing tube.
 3. The vehicle mirror device of claim 2, wherein the housing tube is provided with a U-shaped cutout including a first portion adjacent to an end portion at the one side of the resilient deformation section, a second portion adjacent to an upper edge portion of the resilient deformation section and connected to the first portion, and a third portion adjacent to a lower edge portion of the resilient deformation section and connected to the first portion.
 4. The vehicle mirror device of claim 1, wherein: the visor rim is equipped with a second engagement portion positioned at an outer peripheral side of the housing tube, and the visor cover includes: a second engaging portion that is engageable with, or detachable from, the second engagement portion, and that restricts relative movement of the visor cover to the one side with respect to the visor rim by engaging with the second engagement portion; and the first engaging portion that, by engaging with the first engagement portion from the one side when the second engaging portion is engaged with the second engagement portion, restricts relative movement of the visor cover toward another side in the axial line direction with respect to the visor rim.
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