United States Patent	12384297
Kind Code	B2
Date of Patent	August 12, 2025
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Towing mirror assembly

Abstract

A towing mirror assembly is for mounting to an exterior rear-view mirror. The towing mirror assembly includes a positioning seat, an auxiliary mirror piece, and an engaging unit. The positioning seat is for mounting over the exterior rear-view mirror, and has a hook set for engaging removably a main mirror frame of the exterior rear-view mirror, and a receiving groove unit having an engaging groove and a connecting subunit. The auxiliary mirror piece is mounted on the positioning seat. The engaging unit has an insertion member engaging removably the engaging groove, a cover plate for engaging removably the frame rim portion of the exterior rear-view mirror, and an engaging subunit matchingly engaged with the connecting subunit.

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Appl. No.: **18/189748**

Filed: **March 24, 2023**

Prior Publication Data

Document Identifier	Publication Date
US 20240239268 A1	Jul. 18, 2024

Foreign Application Priority Data

TW	112200561	Jan. 16, 2023

Publication Classification

Int. Cl.: **B60R1/078** (20060101)

U.S. Cl.:

CPC **B60R1/078** (20130101);

Field of Classification Search

CPC: B60R (1/078)

USPC: 359/872

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION

(1) This application claims priority to Taiwanese Utility Model Application No. 112200561, filed on Jan. 16, 2023.

FIELD

(2) The disclosure relates to a towing mirror, and more particularly to a towing mirror assembly adapted to be mounted to an exterior rear-view mirror.

BACKGROUND

(3) A conventional towing mirror is adapted to be installed on an exterior rear-view mirror of a vehicle so that a driver of the vehicle may be able to drive safely with a broader field of vision.

(4) Referring to FIG. **8**, Taiwanese Patent No. 1256358 discloses a fastening device that includes a fastening unit **1** and two straps **2**. The fastening device is adapted to fasten a conventional towing mirror **3** mounted on a supporting frame **4** to an exterior rear-view mirror of a vehicle. The supporting frame **4** has hooks **41** for attachment to a frame rim of the exterior rear-view mirror of the vehicle.
(5) However, the fastening unit **1** of the fastening device is quite complex and has many parts which makes the fastening unit **1** difficult to assemble and manufacture. This may lead to higher costs for the manufacturers of the fastening device. Additionally, it should be noted that the straps **2** of the fastening device are serrated which may limit the available selection of materials for the straps **2**, and this may also increase costs.

SUMMARY

(6) Therefore, an object of the disclosure is to provide a towing mirror assembly that can alleviate at least one of the drawbacks of the prior art.
(7) According to the disclosure, the towing mirror assembly is adapted to be mounted to an exterior rear-view mirror. The exterior rear-view mirror has a main mirror frame, and a main mirror that is mounted in the main mirror frame. The main mirror frame has a frame rim portion. The towing mirror assembly includes a positioning seat, an auxiliary mirror piece, and an engaging unit. The positioning seat is adapted for mounting over the exterior rear-view mirror, and has an external housing wall, an external housing rim, a hook set, and a receiving groove unit. The external housing rim extends transversely from the external housing wall and is adapted to surround the frame rim portion. The hook set extends from one side of the external housing rim and is adapted to engage removably the frame rim portion of the main mirror frame. The receiving groove unit is formed on another side of the external housing rim opposite to the hook set. The receiving groove unit has an engaging groove, and a connecting subunit that is adjacent to the engaging groove. The auxiliary mirror piece is mounted on the positioning seat and is adapted to be disposed at a lateral side of the main mirror. The engaging unit is detachably mounted to the receiving groove unit and has an insertion member, a cover plate, and an engaging subunit. The insertion member engages removably the engaging groove. The cover plate is connected to the insertion member, and is adapted to engage removably the frame rim portion of the main mirror frame. The engaging subunit is connected to at least one of the insertion member and the cover plate. The engaging subunit is matchingly engaged with the connecting subunit.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) Other features and advantages of the disclosure will become apparent in the following detailed description of the embodiment(s) with reference to the accompanying drawings. It is noted that various features may not be drawn to scale.
(2) FIG. **1** is a perspective view illustrating an embodiment of a towing mirror assembly according to the present disclosure mounted to an exterior rear-view mirror.
(3) FIG. **2** is an exploded perspective view illustrating the embodiment.
(4) FIG. **3** is a fragmentary enlarged exploded perspective view of the embodiment.
(5) FIG. **4** is a perspective view illustrating an engaging unit of the embodiment.
(6) FIG. **5** is a front view of the embodiment mounted to the exterior rear-view mirror.
(7) FIG. **6** is a fragmentary cross-sectional view of the embodiment taken along line VI-VI in FIG. **5**.
(8) FIG. **7** is a fragmentary cross-sectional view of the embodiment taken along line VII-VII in FIG. **5**.
(9) FIG. **8** is an exploded perspective view showing a conventional towing mirror and a fastening

device.

DETAILED DESCRIPTION

(10) Before the disclosure is described in greater detail, it should be noted that where considered appropriate, reference numerals or terminal portions of reference numerals have been repeated among the figures to indicate corresponding or analogous elements, which may optionally have similar characteristics.

(11) It should be noted herein that for clarity of description, spatially relative terms such as “top,” “bottom,” “upper,” “lower,” “on,” “above,” “over,” “downwardly,” “upwardly” and the like may be used throughout the disclosure while making reference to the features as illustrated in the drawings. The features may be oriented differently (e.g., rotated 90 degrees or at other orientations) and the spatially relative terms used herein may be interpreted accordingly.

(12) Referring to FIGS. **1**, **2** and **5**, an embodiment of the towing mirror assembly according to the present disclosure is adapted to be mounted to an exterior rear-view mirror **100**. The exterior rear-view mirror **100** has a main mirror frame **101**, and a main mirror **102** that is mounted in the main mirror frame **101**. The main mirror frame **101** has a frame rim portion **103**, and a connecting portion **104** disposed on a side of the main mirror frame **101** for being connected to a vehicle (not shown). The towing mirror assembly includes a positioning seat **10**, an auxiliary mirror piece **20**, and an engaging unit **30**.

(13) The positioning seat **10** is adapted for mounting over the exterior rear-view mirror **100**, and has an external housing wall **11**, an external housing rim **12**, a hook set **13**, and a receiving groove unit **14**. The external housing rim **12** extends transversely from the external housing wall **11** and is adapted to surround the frame rim portion **103**. The hook set **13** extends from one side of the external housing rim **12** and is adapted to engage removably the frame rim portion **103** of the main mirror frame **101**. The receiving groove unit **14** is formed on another side of the external housing rim **12** opposite to the hook set **13**. More specifically, the hook set **13** of the positioning seat **10** has two resilient hooks **131** that are spaced apart from each other along a transverse direction (X) and that are adapted to engage removably the frame rim portion **103** of the main mirror frame **101**, and each of the resilient hooks **131** is C-shaped. Referring to FIGS. **3**, **6** and **7**, the receiving groove unit **14** of the positioning seat **10** has a top wall **141**, two side walls **142**, a connecting subunit **143**, and an engaging groove **144**. The two side walls **142** are connected transversely between the top wall **141** and the external housing rim **12**. The top wall **141**, the external housing rim **12**, and the sidewalls **142** cooperatively define the engaging groove **144**. The top wall **141** has two guiding grooves **147** that are adjacent to the engaging groove **144**. The connecting subunit **143** is adjacent to the engaging groove **144**, and includes a first connecting member **145** that is formed on the external housing rim **12**, and two second connecting members **146** that are respectively formed on the side walls **142** of the external housing frame **12**. In this embodiment, each of the first connecting member **145** and the second connecting members **146** of the receiving groove unit **14** is a hole that is in spatial communication with the engaging groove **144**.

(14) The auxiliary mirror piece **20** is mounted on the positioning seat **10** and adapted to be disposed at a lateral side of the main mirror **102**.

(15) Referring to FIGS. **3**, **4**, **6** and **7**, the engaging unit **30** is detachably mounted to the receiving groove unit **14** and has an insertion member **31**, a cover plate **32**, and an engaging subunit **33**. The insertion member **31** engages removably the engaging groove **144**. The cover plate **32** is connected to the insertion member **31**, and is adapted to engage removably the frame rim portion **103** of the main mirror frame **101**. The engaging subunit **33** is connected to at least one of the insertion member **31** and the cover plate **32**. The insertion member **31** of the engaging unit **30** has two slide members **311** that are respectively engaged with the guiding grooves **147**. The cover plate **32** of the engaging unit **30** includes a main plate body **321**, an upper rib **322** that protrudes from the main body **321**, and two side ribs **323** that protrude from the main body **321** and that are connected transversely to said upper rib **322**. Each of said ribs **323** having a notch **324** that is adapted to

engage an edge of the frame rim portion **103** of the main mirror frame **101** of the exterior rear-view mirror **100**. The notches **324** of the side ribs **323** are adjacent to the upper rib **322**. The engaging subunit **33** is matchingly engaged with the connecting subunit **143**. In this embodiment, the engaging subunit **33** of the engaging unit **30** includes a first engaging member **331**, and two second engaging members **332**. The first engaging member **331** extends from the insertion member **31** and engages removably the first connecting member **145**. The two second engaging members **332** extend from the cover plate **32** and engage respectively and removably the second connecting members **146**. In this embodiment, each of the first engaging member **331** and the second engaging members **332** of the engaging unit **30** is hook-shaped and made of a resilient material. The first engaging member **331** of the engaging unit **30** is disposed between the slide members **331**.

(16) When mounting the towing mirror assembly to the exterior rear-view mirror **100**, the auxiliary mirror piece **20** is first placed within the positioning seat **10**. At this state, the engaging unit **30** is not yet mounted to the receiving groove unit **14**. Next, the positioning seat **10** is mounted over the exterior rear-view mirror **100** with the auxiliary mirror piece **20** in place so that the auxiliary mirror piece **20** can be mounted on the positioning seat **10** and disposed at a lateral side of the main mirror **102**. During this stage, the resilient hooks **131** engage the frame rim portion **103** of the main mirror frame **101** to secure the positioning seat **10** with the exterior rear-view mirror **100**.

(17) Next, the insertion member **31** of the engaging unit **30** engages the engaging groove **144** of the receiving groove unit **14**, while the slide members **311** engages the guiding grooves **147** in a sliding action until the notches **324** of the side ribs **323** of the engaging unit **30** engage the edge of the frame rim portion **103**, the first engaging member **331** of the engaging unit **30** engages the first connecting member **145**, and the two second engaging members **332** of the engaging subunit **33** of the engaging unit **30** respectively engage the second connecting members **146**. At this point, the engaging unit **30** has been successfully mounted to the positioning seat **10** with the cover plate **32** being coupled to the edge of the frame rim portion **103**.

(18) In this embodiment, the positioning seat **10** is mounted over the exterior rear-view mirror **100**, the auxiliary mirror piece **20** is mounted in the external housing wall **11** of the positioning seat **10**, and the engaging unit **30** is detachably mounted to the receiving groove **14**. This allows the towing mirror assembly to be easily mounted to the exterior rear-view mirror **100**.

(19) In summary, the towing mirror according to the present disclosure has the advantages of having a simple and easy-to-assemble structure and low manufacturing costs, thereby achieving the object of the disclosure.

(20) In the description above, for the purposes of explanation, numerous specific details have been set forth in order to provide a thorough understanding of the embodiment(s). It will be apparent, however, to one skilled in the art, that one or more other embodiments may be practiced without some of these specific details. It should also be appreciated that reference throughout this specification to “one embodiment,” “an embodiment,” an embodiment with an indication of an ordinal number and so forth means that a particular feature, structure, or characteristic may be included in the practice of the disclosure. It should be further appreciated that in the description, various features are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of various inventive aspects; such does not mean that every one of these features needs to be practiced with the presence of all the other features. In other words, in any described embodiment, when implementation of one or more features or specific details does not affect implementation of another one or more features or specific details, said one or more features may be singled out and practiced alone without said another one or more features or specific details. It should be further noted that one or more features or specific details from one embodiment may be practiced together with one or more features or specific details from another embodiment, where appropriate, in the practice of the disclosure.

(21) While the disclosure has been described in connection with what is(are) considered the

exemplary embodiment(s), it is understood that this disclosure is not limited to the disclosed embodiment(s) but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

Claims

1. A towing mirror assembly adapted to be mounted to an exterior rear-view mirror, the exterior rear-view mirror having a main mirror frame and a main mirror that is mounted in the main mirror frame, the main mirror frame having a frame rim portion, said towing mirror assembly comprising: a positioning seat adapted for mounting over the exterior rear-view mirror, and having an external housing wall, an external housing rim that extends transversely from said external housing wall and that is adapted to surround the frame rim portion, a hook set that extends from one side of said external housing rim and that is adapted to engage removably the frame rim portion of the main mirror frame, and a receiving groove unit that is formed on another side of said external housing rim opposite to said hook set, said receiving groove unit having an engaging groove, and a connecting subunit that is adjacent to said engaging groove; an auxiliary mirror piece mounted on said positioning seat and adapted to be disposed at a lateral side of the main mirror; and an engaging unit detachably mounted to said receiving groove unit, and having an insertion member that engages removably said engaging groove, a cover plate that is connected to said insertion member and that is adapted to engage removably the frame rim portion of the main mirror frame, and an engaging subunit that is connected to at least one of said insertion member and said cover plate, said engaging subunit being matchingly engaged with said connecting subunit.
2. The towing mirror assembly as claimed in claim 1, wherein: said receiving groove unit of said positioning seat further has a top wall, and two side walls that are connected transversely between said top wall and said external housing rim, said top wall, said external housing frame, and said sidewalls cooperatively defining said engaging groove; said connecting subunit including a first connecting member that is formed on said external housing frame, and two second connecting members that are respectively formed on said side walls of said external housing rim; and said engaging subunit of said engaging unit includes a first engaging member that extends from said insertion member and that engages removably said first connecting member, and two second engaging members that extends from said cover plate and that engage respectively and removably said second connecting members.
3. The towing mirror assembly as claimed in claim 2, wherein each of said first connecting member and said second connecting members of said receiving groove unit is a hole, and each of said first engaging member and said second engaging members of said engaging unit is hook-shaped and made of a resilient material.
4. The towing mirror assembly as claimed in claim 2, wherein: said top wall of said receiving groove unit of said positioning seat has two guiding grooves that are adjacent to said engaging groove; and said insertion member of said engaging unit has two slide members that are respectively engaged with said guiding grooves.
5. The towing mirror assembly as claimed in claim 4, wherein said first engaging member of said engaging unit is disposed between said slide members.
6. The towing mirror assembly as claimed in claim 1, wherein said hook set of said positioning seat has two resilient hooks that are spaced apart from each other and that are adapted to engage removably the frame rim portion of the main mirror frame, each of said resilient hooks is C-shaped.
7. The towing mirror assembly as claimed in claim 1, wherein said cover plate of said engaging unit includes a main plate body, an upper rib that protrudes from said main plate body, and two side ribs that protrude from said main plate body and that are connected transversely to said upper rib,

each of said side ribs having a notch that is adapted to engage an edge of the frame rim portion, said notches of said side ribs being adjacent to said upper rib.