

US Patent & Trademark Office

Patent Public Search | Text View

United States Patent	12393107
Kind Code	B2
Date of Patent	August 19, 2025
Inventor(s)	Kamijo; Satoru et al.

Camera mounting structure

Abstract

To provide a camera mounting structure that can protect a camera attached to the front of the body from bouncing stones or the like. In a camera mounting structure applied to a saddled vehicle with a body having a front to which a camera is attached, the camera is disposed at a position on the saddled vehicle below a headlamp and above a front fender. The camera is attached to a bracket fixed to the body. A yaw rotation shaft that allows a swinging motion in a yaw direction relative to the body is provided to the bracket. A pitch rotation shaft that allows a swinging motion in a pitch direction of the camera is provided to the bracket.

Inventors:	Kamijo; Satoru (Tokyo, JP), Inada; Kyosuke (Tokyo, JP), Hosokawa; Ko (Tokyo, JP)
Applicant:	Honda Motor Co., Ltd. (Tokyo, JP)
Family ID:	1000008765300
Assignee:	HONDA MOTOR CO., LTD. (Tokyo, JP)
Appl. No.:	18/277491
Filed (or PCT Filed):	March 31, 2021
PCT No.:	PCT/JP2021/013826
PCT Pub. No.:	WO2022/208721
PCT Pub. Date:	October 06, 2022

Prior Publication Data

Document Identifier	Publication Date
US 20240126151 A1	Apr. 18, 2024

Publication Classification

Int. Cl.: G03B17/56 (20210101); B62J45/41 (20200101); B62J45/423 (20200101); F16M11/12 (20060101)

U.S. Cl.:

CPC G03B17/561 (20130101); B62J45/41 (20200201); B62J45/423 (20200201); F16M11/123 (20130101);

Field of Classification Search

CPC: B60R (11/04); H04N (13/239)

References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
6762790	12/2003	Matko	396/428	F16M 11/10
12035023	12/2023	Kim	N/A	F16M 13/02
2014/0375805	12/2013	Gau	348/148	H04N 23/51
2015/0365603	12/2014	Wahl et al.	N/A	N/A
2019/0283659	12/2018	Moerbe	N/A	N/A
2020/0017164	12/2019	Saeki	N/A	N/A
2021/0061389	12/2020	Kawamura et al.	N/A	N/A

FOREIGN PATENT DOCUMENTS

Patent No.	Application Date	Country	CPC
2004-175128	12/2003	JP	N/A
2013-164869	12/2012	JP	N/A
2016-505450	12/2015	JP	N/A
2017-171223	12/2016	JP	N/A
209-39759	12/2018	JP	N/A
2020-6876	12/2019	JP	N/A
2020-500766	12/2019	JP	N/A
WO 2019/224957	12/2018	WO	N/A

OTHER PUBLICATIONS

Gil et al, "Motorcycles That See: Multifocal Stereo Vision Sensor for Advanced Safety Systems in Tilting Vehicles." Sensors 18, No. 1 (Jan. 19, 2018): 1-34. <https://doi.org/10.3390/s18010295> (Year: 2018). cited by examiner

International Search Report (PCT/ISA/210) issued in PCT/JP2021/013826, dated May 25, 2021. cited by applicant

Japanese Office Action for Japanese Application No. 2023-510016, dated Mar. 5, 2024, with an English translation. cited by applicant

Primary Examiner: Rhodes, Jr.; Leon W

Background/Summary

FIELD

(1) The present invention relates to a camera mounting structure, and in particular relates to a camera mounting structure for attaching a camera to the front of the body of a saddled vehicle.

BACKGROUND

(2) There is conventionally known configuration in which a camera that captures images of the space in front of the body of a saddled vehicle is attached to the front of the body for auto cruise running, automatic brake control and the like.

(3) Patent Literature 1 discloses configuration of a motorcycle including a front cowl that supports a headlamp and also, as a cover, extends to the sides of a power unit, in which configuration a pair of left and right cameras are embedded at positions which are on the left and right sides of a front fender covering the upper front of the front wheel, and are on the lower side of the front cowl.

CITATION LIST

Patent Literature

(4) Patent Literature 1: JP-2020-6876-A

BRIEF SUMMARY

Technical Problem

(5) However, the cameras in the configuration of Patent Literature 1 are disposed at the positions close to the road surface, and there is a possibility that the cameras are influenced by bouncing stones or the like from the road surface.

(6) An object of the present invention is to solve the problem of the conventional technology described above, and provide a camera mounting structure that can protect a camera attached to the front of the body from bouncing stones or the like.

Solution to Problem

(7) In order to achieve the object, the present invention has a first feature that in a camera mounting structure applied to a saddled vehicle (1) with a body having a front to which a camera (30) is attached, the camera (30) is disposed at a position on the saddled vehicle (1) below a headlamp (7) and above a front fender (11).

(8) In addition, the present invention has a second feature that the camera (30) is attached to a bracket (40) fixed to the body.

(9) In addition, the present invention has a third feature that a yaw rotation shaft (44) that allows a swinging motion in a yaw direction relative to the body is provided to the bracket (40).

(10) In addition, the present invention has a fourth feature that a pitch rotation shaft (41) that allows a swinging motion in a pitch direction of the camera (30) is provided to the bracket (40).

(11) Furthermore, the present invention has a fifth feature that the camera (30) is rubber-mounted on the bracket (40).

Advantageous Effects

(12) According to the first feature, since in the camera mounting structure applied to the saddled vehicle (1) with the body having the front to which the camera (30) is attached, the camera (30) is disposed at a position on the saddled vehicle (1) below the headlamp (7) and above the front fender (11), the camera is disposed at a position apart from the road surface, and the camera can be protected from bouncing stones or the like.

(13) According to the second feature, since the camera (30) is attached to the bracket (40) fixed to the body, attachment/detachment work of the camera becomes easier.

(14) According to the third feature, since the yaw rotation shaft (44) that allows a swinging motion

in the yaw direction relative to the body is provided to the bracket (40), it becomes possible to adjust the angle of the camera in the yaw direction.

(15) According to the fourth feature, since the pitch rotation shaft (41) that allows a swinging motion of the camera (30) in the pitch direction is provided to the bracket (40), it becomes possible to adjust the angle of the camera in the pitch direction.

(16) According to the fifth feature, since the camera (30) can be rubber-mounted on the bracket (40), the camera can be protected from vibrations at the time of running.

Description

BRIEF DESCRIPTION OF DRAWINGS

(1) FIG. 1 is a front view of a motorcycle to which a camera mounting structure according to one embodiment according to the present invention is applied.

(2) FIG. 2 is a partially enlarged view of FIG. 1.

(3) FIG. 3 is a perspective view depicting a state where a camera is mounted on the body.

(4) FIG. 4 is a perspective view depicting a state where the camera is removed from a bracket.

DETAILED DESCRIPTION

(5) Hereinbelow, a preferred embodiment of the present invention is explained in detail with reference to the figures. FIG. 1 is a front view of a motorcycle 1 to which a camera mounting structure according to one embodiment according to the present invention is applied. The motorcycle 1 is a saddled vehicle that runs with drive force of a power unit P being transferred to the rear wheel. A bottom bridge 15 that supports a pair of left and right front forks 10 is fixed at the lower end of a steering stem that is swingably journaled to a head pipe provided at the front end of the body frame. A steering handlebar 4 extending in the vehicle width direction is attached to the upper end of the steering stem, and handlebar covers 5 are disposed in front of the steering handlebar 4. A front cowl 3 that supports headlamps 7 and a windshield 2 is disposed in front of the head pipe. A pair of left and right front flasher lamps 6 are attached to the front cowl 3.

(6) A front fender 11 that covers the upper front of a front wheel WF is attached to the front fork 10. A guard pipe 8 that protects the space around the front cowl 3 is disposed below the headlamps 7, and a pair of left and right auxiliary lamps 9 are disposed below the guard pipe 8. A radiator 12 is disposed in front of the power unit P, and a pair of left and right step bars 13 on which a driver places her/his feet are disposed on the sides of the power unit P.

(7) A camera 30 (dot hatching portion) according to the present invention is disposed in an opening provided through the front cowl 3 at a position below the headlamps 7 and above the front fender 11.

(8) FIG. 2 is a partially enlarged view of FIG. 1. The camera 30 used for auto cruise running or automatic brake control is housed in an opening 3a of the front cowl 3 provided below the headlamps 7. The opening 3a is provided at a position below the headlamps 7 and above the bottom bridge 15 and the guard pipe 8.

(9) FIG. 3 is a perspective view depicting a state where the camera 30 is mounted on the body. In addition, FIG. 4 is a perspective view depicting a state where the camera 30 is removed from a bracket 40. The camera 30 has a horizontally-long shape in which cooling fins 32 are disposed between a pair of left and right lenses 31 that are apart from each other in the vehicle width direction. The camera 30 is attached to the bracket 40 made of a sheet-like metal or the like. The bracket 40 is supported by a yaw rotation shaft 44 that allows a swinging motion in the yaw direction relative to the body, and is configured to allow a yaw adjustment mechanism 43 to adjust the angle in the yaw direction.

(10) In addition, the camera 30 is supported by pitch rotation shafts 41 that allow a swinging motion in the pitch direction relative to the bracket 40, and is configured to allow a pitch

adjustment mechanism **42** to adjust the angle in the pitch direction. The pitch rotation shafts **41** are disposed across rubber members **50**. In addition, rubber members **51** are interposed between the bracket **40** and the camera **30**, and rubber members **52** are interposed between the bracket **40** and the body. Due to these rubber members, the camera **30** can be rubber-mounted on the body, and the camera **30** can be protected from vibrations at the time of running.

(11) As described above, since the camera **30** is disposed at a position on the motorcycle **1** below the headlamps **7** and above the front fender **11** in the camera mounting structure according to the present embodiment, the camera is disposed at a position apart from the road surface, and the camera can be protected from bouncing stones or the like. In addition, since the camera **30** is attached to the bracket **40** fixed to the body, attachment/detachment work of the camera becomes easier. In addition, since the yaw rotation shaft **44** that allows a swinging motion in the yaw direction relative to the body is provided to the bracket **40**, it becomes possible to adjust the angle of the camera in the yaw direction. Furthermore, since the pitch rotation shafts **41** that allow a swinging motion of the camera **30** in the pitch direction are provided to the bracket **40**, it becomes possible to adjust the angle of the camera in the pitch direction.

(12) Note that the mode of the motorcycle, the shape and structure of the camera, the shape and structure of the bracket, the arrangement of the yaw rotation shaft and pitch rotation shafts, the arrangement of the rubber members and the like are not limited to those in the embodiment described above, but can be changed in various manners. The camera mounting structure according to the present invention can be applied not only to motorcycles, but also to saddled three-wheeled vehicles, four-wheeled vehicles and the like.

REFERENCE SIGNS LIST

(13) **1**: Motorcycle (saddled vehicle) **3**: Front cowl **3a**: Opening **7**: Headlamp **11**: Front fender **30**: Camera **40**: Bracket **41**: Pitch rotation shaft **44**: Yaw rotation shaft

Claims

1. A camera mounting structure applied to a saddled vehicle with a body having a front to which a camera is attached, wherein the camera is attached to a bracket, wherein the camera is disposed at a position on the saddled vehicle below a headlamp and above a front fender, wherein the bracket includes a pitch adjustment mechanism that allows a swinging motion in a pitch direction, wherein the pitch adjustment mechanism is disposed rearward from a guard pipe, and wherein the guard pipe and the pitch adjustment mechanism are overlapped as viewed from vehicle front.
2. The camera mounting structure according to claim 1, wherein the pitch adjustment mechanism is located frontward of the body from the camera.
3. The camera mounting structure according to claim 1, wherein the bracket is located below the camera.
4. The camera mounting structure according to claim 1, wherein the camera includes a pair of left and right lenses apart from each other in a vehicle width direction.
5. The camera mounting structure according to claim 1, wherein the camera includes a yaw adjustment mechanism that allows a swinging motion in a yaw direction relative to the body.
6. A camera mounting structure applied to a saddled vehicle with a body having a front to which a camera is attached, wherein the camera includes a pair of left and right lenses, wherein the camera is disposed at a position on the saddled vehicle below a headlamp and above a front fender, wherein the camera is attached to a bracket including a yaw adjustment mechanism that allows a swinging motion in a yaw direction relative to the body, wherein the bracket includes a pitch adjustment mechanism that allows a swinging motion in a pitch direction, wherein the camera is located above a guard pipe, and wherein the guard pipe overlaps the bracket as viewed from vehicle front.
7. A camera mounting structure applied to a saddled vehicle with a body having a front to which a

camera is attached, wherein the camera is attached to a bracket which has a function of adjusting a posture of the camera, wherein the camera is disposed at a position on the saddled vehicle below a headlamp and above a front fender, wherein the camera is located above a guard pipe, and wherein the guard pipe overlaps the bracket as viewed from vehicle front.

8. A camera mounting structure applied to a saddled vehicle with a body having a front to which a camera is attached, wherein the saddled vehicle includes a headlamp and a front cowl disposed in front of a head pipe, and a guard pipe that protects the front cowl and is disposed below the headlamp, wherein the camera is disposed on a bracket fixed to the body at a position of the saddled vehicle below the headlamp and above a front fender, and wherein the guard pipe overlaps the bracket as viewed from vehicle front.
