Claims

[Claim 1]

A grounding shoe that is provided in a vehicle so as to face a grounding rail provided on a track, the grounding shoe comprising:

a collector unit that has an electroconductive body; and

a holding part that fixes the collector unit by holding a first end of the electroconductive body in such a manner that the collector unit can be energized as well as attached/detached, and that is mounted in the vehicle, and that is in contact with the electroconductive body.

[Claim 2]

The grounding shoe according to claim 1,

wherein the collector unit further has a rubber body that covers the electroconductive body while the first end and a second end of the electroconductive body are exposed, and

wherein the holding part holds a first end of the rubber body as well as the electroconductive body.

[Claim 3]

The grounding shoe according to claim 2,

wherein the rubber body has regulating means by which the rubber body is regulated not to be pulled out of

the holding part.

[Claim 4]

The grounding shoe according to claim 3,

wherein the regulating means has a protruding portion that is provided in the rubber body and is fitted into a hole portion provided in the holding part.

[Claim 5]

The grounding shoe according to any one of claims 1 to 4,

wherein the holding part has resistance reducing means that reduces contact resistance between a contact portion and the electroconductive body and that is provided in the contact portion which is in contact with the first end of the electroconductive body.

[Claim 6]

The grounding shoe according to claim 5,

wherein the resistance reducing means is a groove portion that is formed in the contact portion of the holding part, and that has grooves formed in a direction different from a direction from the first end of the electroconductive body to the second end.

[Claim 7]

The grounding shoe according to any one of claims 2 to 6,

wherein the rubber body, which covers the

electroconductive body while the first and second ends of the electroconductive body are exposed, includes a stepped portion is provided in the first end of the rubber body held by the holding part, and a portion of the rubber body close to the side of a track has a thickness dimension in a travelling direction of the vehicle smaller than that of the stepped portion, and

wherein the surface of the holding part is flush with the surface of the rubber body, the surfaces facing the travelling direction.

[Claim 8]

The grounding shoe according to any one of claims 1 to 7,

wherein, in the electroconductive body held by the holding part, the first end of the electroconductive body is thinner than the second end.

[Claim 9]

The grounding shoe according to any one of claims 2 to 8,

wherein the rubber body is made of electroconductive rubber, covering the electroconductive body while the first and second ends of the electroconductive body are exposed.

[Claim 10]

The grounding shoe according to any one of claims 2

to 9,

wherein the rubber body, which covers the electroconductive body while the first and second ends of the electroconductive body are exposed, has a thickness dimension in the travelling direction of the vehicle, which gradually decreases from the first end of the rubber body held by the holding part to a second end of the rubber body.

[Claim 11]

The grounding shoe according to any one of claims 2 to 10,

wherein the holding part is provided with a chamfered portion configured when an edge portion is chamfered which is in contact with the rubber body that covers the electroconductive body while the first and second ends of the electroconductive body are exposed, and

wherein the rubber body is provided with a contact portion that is positioned to face the chamfered portion, and that corresponds to the shape of the chamfered portion.

[claim 12]

The grounding shoe according to any one of claims 2 to 11, further comprising:

a rigidity reinforcing member that is provided in the collector unit, and increases the rigidity of the bending of the collector unit in the travelling direction

of the vehicle.

[Claim 13]

The grounding shoe according to claim 12,

wherein the rigidity reinforcing member is a metal plate that is in contact with a surface of the collector unit, the surface facing at least one of the front and the rear in the travelling direction of the vehicle.

[Claim 14]

The grounding shoe according to claim 12,

wherein the rigidity reinforcing member is a metal wire that is provided inside the rubber body so as to extend from the first end of the rubber body held by the holding part to the second end, the rubber body covering the electroconductive body while the first and second ends of the electroconductive body are exposed.

[Claim 15]

A vehicle provided with the grounding shoe according to anyone of claims 1 to 14.

CLAIMS

Claim 1

A grounding shoe that is provided in a vehicle so as to face a grounding rail provided on a track, the grounding shoe comprising:

a collector unit that has an electroconductive body; and

a holding part that fixes the collector unit by holding a first end of the electroconductive body in such a manner that the collector unit can be energized as well as attached/detached, and that is mounted in the vehicle, and that is in contact with the electroconductive body.,

wherein the collector unit further has a rubber body that covers the electroconductive body while the first end and a second end of the electroconductive body are exposed, and

wherein the holding part holds a first end of the rubber body as well as the electroconductive body.

Claim 2

The grounding shoe according to claim 1,

wherein the rubber body has regulating means by which the rubber body is regulated not to be pulled out of the holding part.

Claim 3

The grounding shoe according to claim 2,

wherein the regulating means has a protruding portion that is provided in the rubber body and is fitted into a hole portion provided in the holding part.

Claim 4

The grounding shoe according to any one of claims 1, 2, and 3,

wherein the holding part has resistance reducing means th

at reduces contact resistance between a contact portion and th e electroconductive body and that is provided in the contact p ortion which is in contact with the first end of the electroco nductive body.

Claim 5

The grounding shoe according to claim 4,

wherein the resistance reducing means is a groove portion that is formed in the contact portion of the holding part, and that has grooves formed in a direction different from a direct ion from the first end of the electroconductive body to the se cond end.

Claim 6

The grounding shoe according to any one of claims 1, 2, a nd 3,

wherein the rubber body, which covers the electroconducti ve body while the first and second ends of the electroconducti ve body are exposed, includes a stepped portion is provided in the first end of the rubber body held by the holding part, and a portion of the rubber body close to the side of a track has a thickness dimension in a travelling direction of the vehicle smaller than that of the stepped portion, and

wherein the surface of the holding part is flush with the surface of the rubber body, the surfaces facing the travelling direction.

Claim 7

The grounding shoe according to any one of claims 1, 2, a nd 3,

wherein, in the electroconductive body held by the holdin g part, the first end of the electroconductive body is thinner than the second end.

Claim 8

The grounding shoe according to any one of claims 1, 2, and 3,

wherein the rubber body is made of electroconductive rubber, covering the electroconductive body while the first and second ends of the electroconductive body are exposed.

Claim 9

The grounding shoe according to any one of claims 1, 2, and 3,

wherein the rubber body, which covers the electroconductive body while the first and second ends of the electroconductive body are exposed, has a thickness dimension in the traveling direction of the vehicle, which gradually decreases from the first end of the rubber body held by the holding part to a second end of the rubber body.

Claim 10

The grounding shoe according to any one of claims 1, 2, and 3,

wherein the holding part is provided with a chamfered portion configured when an edge portion is chamfered which is in contact with the rubber body that covers the electroconductive body while the first and second ends of the electroconductive body are exposed, and

wherein the rubber body is provided with a contact portion that is positioned to face the chamfered portion, and that corresponds to the shape of the chamfered portion.

Claim 11

The grounding shoe according to any one of claims 1, 2, and 3 further comprising:

a rigidity reinforcing member that is provided in the collector unit, and increases the rigidity of the bending of the

collector unit in the travelling direction of the vehicle.

Claim 12

The grounding shoe according to claim 11,

wherein the rigidity reinforcing member is a metal plate that is in contact with a surface of the collector unit, the surface facing at least one of the front and the rear in the travelling direction of the vehicle.

Claim 13

The grounding shoe according to claim 11,

wherein the rigidity reinforcing member is a metal wire that is provided inside the rubber body so as to extend from the first end of the rubber body held by the holding part to the second end, the rubber body covering the electroconductive body while the first and second ends of the electroconductive body are exposed.

Claim 14

A grounding shoe that is provided in a vehicle so as to face a grounding rail provided on a track, the grounding shoe comprising:

a collector unit that has an electroconductive body; and

a holding part that fixes the collector unit by holding a first end of the electroconductive body in such a manner that the collector unit can be energized as well as attached/detached, and that is mounted in the vehicle, and that is in contact with the electroconductive body,

wherein the holding part has resistance reducing means that reduces contact resistance between a contact portion and the electroconductive body and that is provided in the contact portion which is in contact with the first end of the electroconductive body, and

wherein the resistance reducing means is a groove portion

that is formed in the contact portion of the holding part, and that has grooves formed in a direction different from a direct ion from the first end of the electroconductive body to the se cond end.

Claim 15

A vehicle provided with the grounding shoe according to a ny one of claims 1, 2, 3, and 14.

Claim 16

a collector unit of a grounding shoe that is provided in a vehicle so as to face a grounding rail provided on a track, the collector unit comprising:

an electroconductive body which is fixed by a first end t hereof being held by a holding part mounted in the vehicle in such a manner that the electroconductive body is capable of be ing energized as well as attached/detached, and which is in co ntact with the holding part;

a rubber body which covers the electroconductive body while th e first end and a second end of the electroconductive body are exposed and of which a first end is hold by the holding part.

Claim 17

The collector unit according to claim 16,

wherein the rubber body has regulating means by which the rubber body is regulated not to be pulled out of the holding p art.

Claim 18

The collector unit according to claim 17,

wherein the regulating means has a protruding portion tha t is provided in the rubber body and is fitted into a hole por tion provided in the holding part.

Claim 19

The collector unit according to any one of claims 16 to 18,

wherein the rubber body, which covers the electroconductive body while the first and second ends of the electroconductive body are exposed, includes a stepped portion is provided in the first end of the rubber body held by the holding part, and a portion of the rubber body close to the side of a track has a thickness dimension in a travelling direction of the vehicle smaller than that of the stepped portion, and

wherein the surface of the holding part is flush with the surface of the rubber body, the surfaces facing the travelling direction.

Claim 20

The collector unit according to any one of claims 16 to 18,

wherein, in the electroconductive body held by the holding part, the first end of the electroconductive body is thinner than the second end.

Claim 21

The collector unit according to any one of claims 16 to 18, wherein the rubber body is made of electroconductive rubber.

Claim 22

The collector unit according to any one of claims 16 to 18, wherein the rubber body has a thickness dimension in the travelling direction of the vehicle, which gradually decreases from the first end of the rubber body held by the holding part to a second end of the rubber body.

Claim 23

The collector unit according to any one of claims 16 to 18,

wherein the rubber body is provided with a contact portion,
wherein the contact portion is positioned to face a chamfered portion being provided on the holding part and being configure d when an edge portion is chamfered which is in contact with t he rubber body, and
wherein the contact portion corresponds to the shape of the ch amfered portion.

Claim 24

The collector unit according to any one of claims 16 to 18,
wherein a rigidity reinforcing member is provided, and
wherein the rigidity reinforcing member increases the rigidity of the bending in the travelling direction of the vehicle.

Claim 25

The collector unit according to claim 24,
wherein the rigidity reinforcing member is a metal plate that is in contact with a surface of the rubber body, the surface f acing at least one of the front and the rear in the travelling direction of the vehicle.

Claim 26

The collector unit according to claim 24,
wherein the rigidity reinforcing member is a metal wire that i s provided inside the rubber body so as to extend from the fir st end of the rubber body held by the holding part to the seco nd end.