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(54) **A GROUNDING ELEMENT**

GRUNDIERUNGSELEMENT

ÉLÉMENT DE MISE À LA TERRE

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Patents, GP 117kv
151 87 Södertälje (SE)

(56) References cited:
WO-A2-2007/133410
DE-U1- 20 102 063
US-A- 601 707
US-A- 601 707
US-A- 3 058 764

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Description

TECHNICAL FIELD

[0001] The present invention relates to a grounding element. In particular the present invention relates to a grounding element for use in a vehicle.

BACKGROUND

[0002] In a vehicle such as a truck or a bus a grounding element is typically provided. The grounding element serves as a terminal for the electrical system of the vehicle. The grounding element is usually provided in the frame of the vehicle and the frame acts as a conductor connected to a terminal of the battery of the vehicle.

[0003] When mounting a grounding element it is desired to provide a grounding element having good electrical properties and which at the same time is easy to mount.

[0004] Conventional grounding elements are for example described in WO 2007028882 and EP0575259, which describe grounding elements for railways. For vehicles it is common to punch a hole in the frame, polish the hole and apply a screw. DE20102063U U1 shows a grounding element according to the preamble of claim 1. Existing solutions for vehicles is cumbersome and expensive. Also in the future higher demands will be put on performance for grounding elements for less resistance and more robust fixation.

[0005] Hence there exists a need for an improved grounding element for a vehicle.

SUMMARY

[0006] It is an object of the present invention to provide an improved grounding element for a vehicle, in particular for a heavy vehicle such as a truck or a bus.

[0007] This object and others are obtained by the grounding element as set out in the claims.

[0008] Thus, a grounding element is provided for providing a ground terminal in a vehicle. The grounding element is formed by an electrically conducting sleeve having a generally conical shape and an insert also having a generally conical shape formed by a material being harder than the sleeve.

[0009] The invention also extends to a vehicle comprising a grounding element according to the above.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present invention will now be described in more detail by way of nonlimiting examples and with reference to the accompanying drawings, in which:

- Fig. 1a is view of a sleeve of a grounding element,
- Fig. 1b is a view an insert for a grounding element,
- Fig. 1c is a view of a sleeve interacting with an insert forming a grounding element, and
- Fig. 2 is a combined cross sectional and side view of a grounding element.

DETAILED DESCRIPTION

[0011] In Fig. 1a sleeve 1 for a grounding element 3 is shown. The sleeve 1 comprises flanges 1a connected to a support part 1b. The sleeve 1 is preferably made of a conducting material with relatively soft properties enabling the sleeve to expand in a lateral direction. The sleeve 1 can for example be made of copper, in particular tinned copper.

[0012] The sleeve has a generally conical shape to fit in a hole made in a frame of a vehicle. The flanges 1a provides for the conical shape whereby the sleeve 1 can be inserted into a hole having a conical shape as is typically the case when a hole has been punched without being subsequently polished. The support part, besides providing a connection to the flanges 1a constitutes an electrical terminal to which grounding can take place.

[0013] In Fig. 1b an insert 2 to be threaded or otherwise inserted into the sleeve 1 is shown. The insert 2 has a generally conical shape to match the shape of the sleeve 1 and a hole in the frame of a vehicle. The insert 2 is preferably made of a material harder than the sleeve 1 and can be made of steel. The outer side of the insert has a structure adapted to lock into the sleeve. For example the outside can be rugged or threaded. The inside of the insert is formed to receive a tool adapted to insert the insert into the sleeve. For example the inside may have smooth walls or threaded walls depending on the tool used for inserting the insert 2. In particular a tool for mounting blind rivets can be used for inserting the insert 2.

[0014] In Fig. 1c the grounding element 3 is shown during assembly with the insert 2 being inserted into the sleeve 1.

[0015] In Fig. 2, the grounding element 3 is shown mounted into a hole 5 of a frame 4 of a vehicle. The top section of Fig. 2 is a cross sectional view showing the position of the sleeve 1 and insert 2 when mounted by a mounting tool into the hole 5. The inside 6 of the insert 2 may be hollow or threaded. The bottom part of Fig. 2 is a view from the side of the other half of the grounding element mounted in the hole 5. The hole 5 can in one example be conical. A conical shape of a hole 5 can for example be the result if the hole is punched in the frame 4.

[0016] Using the grounding element as described herein will result in a lower component cost compared to existing methods of providing a grounding element. Also the contact area will be larger which in turn will improve the electrical properties of the grounding element.

[0017] Furthermore, the grounding element can be pre assembled when assembling the frame of a vehicle thereby reducing the risk of corrosion because the assembly can take place prior to applying paint.

[0018] The assembly time is very fast due to few com-

ponents and only one tool being required to be used once for each grounding element to be applied to a frame. The grounding element is possible to use in a punched hole having a conical shape thereby eliminating the need for polishing or boring or similar procedures. A standard tool can be used to assemble the grounding element.

Claims

1. A grounding element (3) for providing a ground terminal in a vehicle, comprising a sleeve (1) having a generally conical shape formed by an electrically conducting material and an insert (2) having a generally conical shape formed by a material being harder than the sleeve (1), wherein the insert (2) has an outer surface adapted to lock into the sleeve (1), **characterized in that**
the insert (2) and the sleeve (1) are arranged to cooperate with their respective radially decreasing and axially tapering extension, the extensions facing each other during assembly of the grounding element (3), with the extensions radially decreasing and axially tapering in opposite axial direction.

2. The grounding element according to claim 1, **characterized in that** the sleeve is made of a copper material, in particular tinned copper.

3. The grounding element according to any of claims 1 - 2, **characterized in that** the insert (2) has an inside (6) formed to receive a tool for mounting blind rivets.

4. The grounding element according to any of claims 1 - 3, **characterized in that** the sleeve (1) has a support part (1b) forming the ground terminal.

5. The grounding element according to any of claims 1 - 4, **characterized in that** the sleeve (1) comprises flanges (1a).

6. The grounding element according to claim 5, **characterized in that** the flanges (1a) are connected to the support part (1b).

7. The grounding element according to any of claims 1 - 6, **characterized in that** the outer surface of the insert is rugged or threaded.

8. A vehicle having a frame (4) provided with a grounding element according to any of claims 1 - 7.

Patentansprüche

1. Erdungselement (3) zum Bereitstellen einer Erdungsklemme in einem Fahrzeug, umfassend eine Hülle (1), die im Wesentlichen eine konische Form aufweist, die aus einem elektrisch leitenden Material ausgebildet ist, und einen Einsatz (2), der eine im Wesentlichen konische Form aufweist und der aus einem Material ausgebildet ist, das härter ist als die Hülle (1),
wobei der Einsatz (2) eine äußere Oberfläche aufweist, die dazu eingerichtet ist in die Hülle (1) einzurasten,
dadurch gekennzeichnet, dass
der Einsatz (2) und die Hülle (1) derart eingerichtet sind, dass sie mit ihrem jeweils radial abnehmenden und axial sich verjüngenden Fortsatz zusammenwirken, wobei die Fortsätze während des Zusammenbauens des Erdungselements (3) einander gegenüber liegend angeordnet sind, wobei die Fortsätze in axial gegensätzlicher Richtung radial abnehmen und sich axial verjüngen.

2. Erdungselement nach Anspruch 1, **dadurch gekennzeichnet, dass** die Hülle aus Kupfermaterial, insbesondere aus verzinntem Kupfer, hergestellt ist.

3. Erdungselement nach einem der Ansprüche 1-2, **dadurch gekennzeichnet, dass** der Einsatz (2) eine Innenseite (6) aufweist, die dazu ausgebildet ist ein Werkzeug zum Anbringen von Blindnieten aufzunehmen.

4. Erdungselement nach einem der Ansprüche 1-3, **dadurch gekennzeichnet, dass** die Hülle (1) ein unterstützendes Teil (1b) aufweist, das die Erdungsklemme ausbildet.

5. Erdungselement nach einem der Ansprüche 1-4, **dadurch gekennzeichnet, dass** die Hülle (1) Flansche (1a) umfasst.

6. Erdungselement nach Anspruch 5, **dadurch gekennzeichnet, dass** die Flansche (1a) mit dem unterstützenden Teil (1b) verbunden sind.

7. Erdungselement nach einem der Ansprüche 1-6, **dadurch gekennzeichnet, dass** die äußere Oberfläche des Einsatzes rau oder mit einem Gewinde ausgebildet ist.

8. Fahrzeug, das einen Rahmen (4) aufweist, der ein Erdungselement nach einem der Ansprüche 1-7 umfasst.

Revendications

1. Elément de mise à la masse (3) pour réaliser une borne de masse dans un véhicule, comprenant un manchon (1) ayant une forme globalement conique constitué par un matériau électriquement conducteur et un insert (2) ayant une forme globalement

conique constitué par un matériau qui est plus dur que celui du manchon (1),
dans lequel :

l'insert (2) a une surface extérieure adaptée de façon à se verrouiller dans le manchon (1),
caractérisé en ce que :
l'insert (2) et le manchon (1) sont agencés de façon à coopérer avec leur extension décroissant radialement et s'effilant axialement respective, les extensions se faisant mutuellement face durant l'assemblage de l'élément de mise à la masse (3), les extensions décroissant radialement et s'effilant axialement dans une direction axiale opposée.

2. Elément de mise à la masse selon la revendication 1, **caractérisé en ce que** le manchon est réalisé en un matériau en cuivre, et, en particulier, en cuivre étamé.

3. Elément de mise à la masse selon l'une quelconque des revendications 1 à 2, **caractérisé en ce que** l'insert (2) comporte un intérieur (6) formé de façon à recevoir un outil pour monter des rivets borgnes.

4. Elément de mise à la masse selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** le manchon (1) comporte une partie de support (1b) constituant la borne de masse.

5. Elément de mise à la masse selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** le manchon (1) comprend des brides (1a).

6. Elément de mise à la masse selon la revendication 5, **caractérisé en ce que** les brides (1a) sont reliées à la partie de support (1b).

7. Elément de mise à la masse selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** la surface extérieure de l'insert est rugueuse ou filetée.

8. Véhicule comportant un châssis (4) muni d'un élément de mise à la masse selon l'une quelconque des revendications 1 à 7.

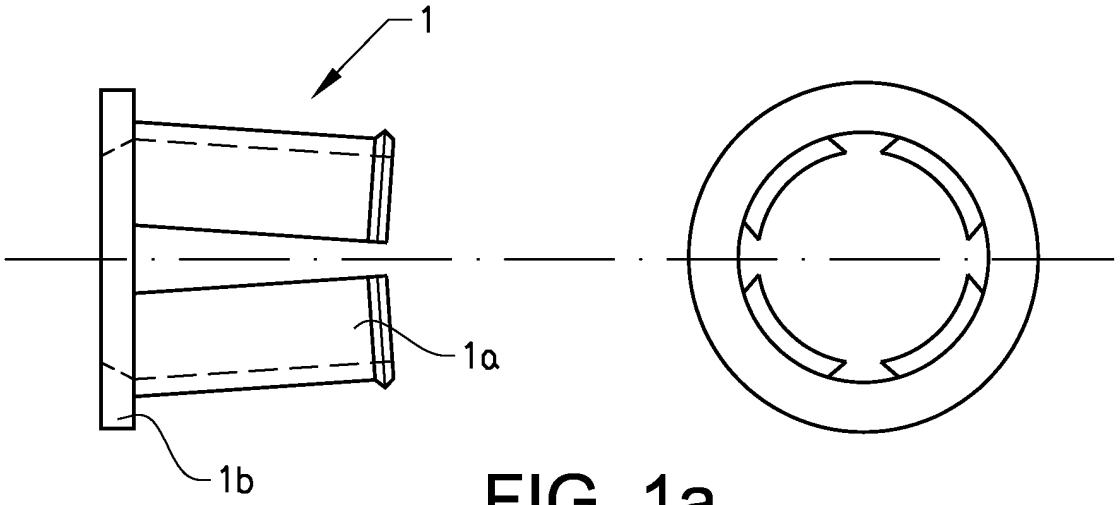

FIG. 1a

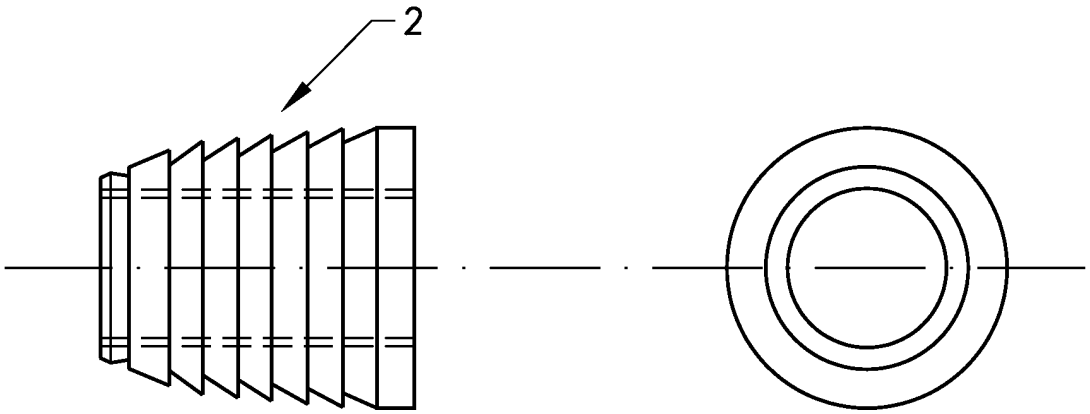

FIG. 1b

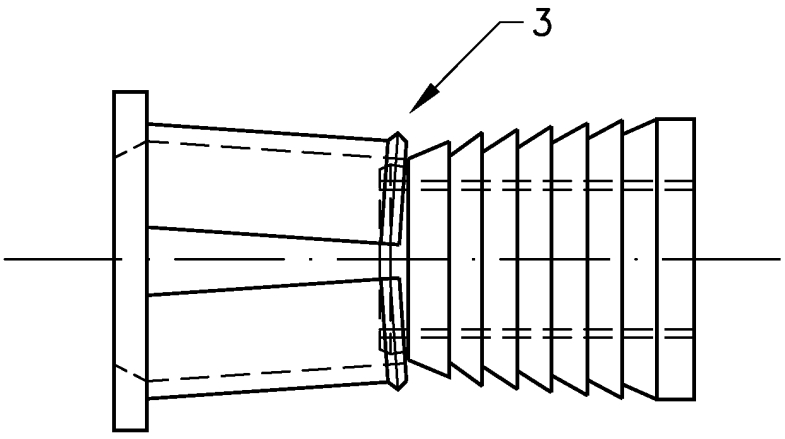

FIG. 1c

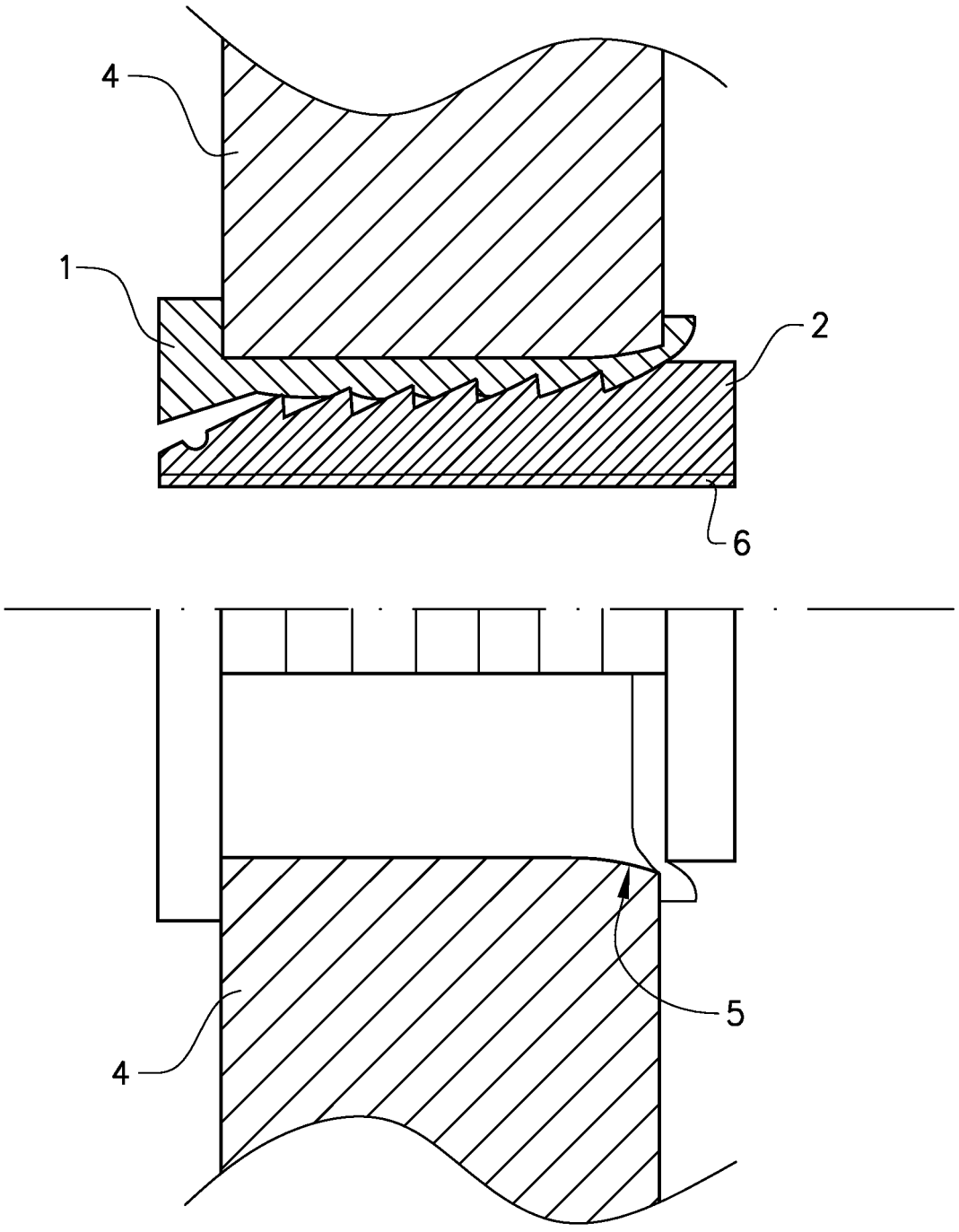

FIG. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2007028882 A **[0004]**
- EP 0575259 A **[0004]**
- DE 20102063 U **[0004]**