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(54) Split hinge

(57) The present invention relates to a hinge for vehicle doors or swing doors in particular for light industrial vehicles, **characterized in that** it is made of various parts that can be easily assembled with each other.

The hinge according to the present invention allows to optimize the vehicle harnessing operations in the assembly line because it can be easily disassembled after the painting operations, allowing the removal of the door or swing door in order to be able to get into the vehicle in an easier way.

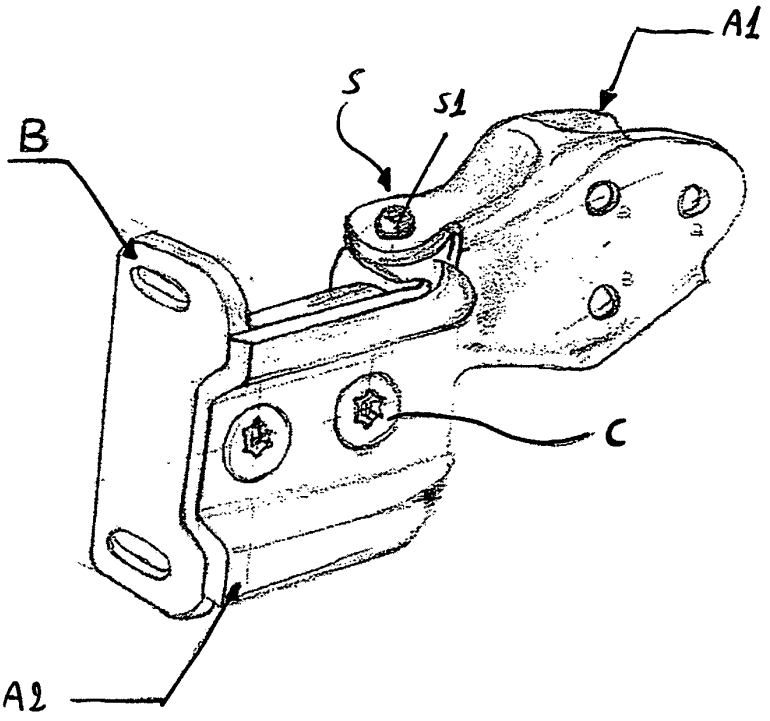

Fig. 1

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Description

[0001] The present invention refers to a split hinge for vehicle doors, swing doors and the like.

[0002] In particular, in the automotive field hinges suitable for fixing vehicle swing doors to the bodywork fixed parts are known.

[0003] More in detail, in the work vehicle field, in particular of average or light industrial vehicles such as vans and the like, hinges are also used to connect to the bodywork the swing doors that close the rear part of the vehicle.

[0004] At present, pre-assembled hinges are known and commonly used and include a part on the bodywork side and a part on the door side. However, the use of such hinges leaves space to some drawbacks in particular in the assembly line during the assembly step, namely harness, of the vehicle along the assembly and painting line.

[0005] In particular, according to what is known in the art, the hinge is provided already assembled and is fixed on the door using connection means such as screws or bolts, through special slots made in the hinge element on the door side, afterwards the door is fixed on the vehicle associating the hinge element on the vehicle side to the vehicle body shell in correspondence to the door compartment.

[0006] Only when the door is assembled on the vehicle, the whole body shell goes through all the cataphoresis and painting circuit, arrives at the harness line and at this point, the present hinge cannot be disassembled to remove the door from the vehicle body shell.

[0007] Therefore, a drawback still unsolved by the hinges of the type known consists in the impossibility of assembling and disassembling the door from the vehicle after the painting.

[0008] Therefore the main task of the present invention is to provide a hinge suitable to overcome the drawbacks left unsolved by the hinges of the type known.

[0009] In the scope of this task, the aim of the present invention is in particular to provide a hinge which allows the quick assembling and disassembling of the door from the vehicle body shell.

[0010] This task and these and other purposes that are explained below are achieved by a hinge for vehicle doors or swing doors especially for vehicles, that is **characterized in that** it is made by various parts that can be easily assembled.

[0011] In particular, the hinge according to the present invention is **characterized in that** it includes at least two parts articulated between them by means of a cylindrical articulated joint, and at least a further element decoupleable from them and suitable for being directly connected to the vehicle door.

[0012] Further characteristics and advantages of the present invention will become more apparent in light of the following detailed description, that is merely illustrative and not limitative and is shown in the figures that are attached hereto, in which:

figure 1 shows a perspective view of the hinge according to the present invention;

figure 2 shows a different perspective view of the same hinge of figure 1;

figure 3 shows a section view according to the A-A plane of a detail of the hinge according to the present invention.

[0013] According to a preferred embodiment of the present invention illustrated in the mentioned figures, and in particular in figures 1 and 2, the hinge according to the present invention includes a first hinge element A suitable for being connected to the vehicle body shell by means of first connection means to the body shell.

[0014] Said first hinge element A is in its turn made by a first shaped plate A1 suitable for being directly connected, by means of said first connection means, to the vehicle body shell, and by a second shaped plate A2. The two shaped plates A1 and A2 are interconnected by a hinge or cylindrical articulated joint S, which includes a pivot S1 whose axis defines the axis of rotation of the cylindrical hinge, namely the axis of relative rotation of the two plates A1 and A2. The pivot S1 holds the two plates A1 and A2 which are inserted on said pivot by means of appropriate clearance holes according to what is known in the art.

[0015] Said first connection means of the first shaped plate A1 to the body shell may in particular include one or more clearance holes suitable for allowing screws or similar components to be inserted.

[0016] With particular reference to figure 1, the second plate A2 is then suitable for being connected, by means of second connection means, to a bracket B which is in its turn suitable for being connected to the vehicle door by means of fastening slots F appropriately present and suitable to accommodate retaining means of the type known such as screws, pivots or bolts.

[0017] Said second connection means which connect said bracket B with said second shaped plate A2 may suitably include one or more clearance holes b obtained on said bracket B and suitable to accommodate screws or pivots C, shown for example in figure 3.

[0018] Such screws or pivots will have a hexagon in relief to guarantee the disassembling after painting. Such screws or pivots can be considered as "temporary", because they will be replaced by flathead screws with thread braking during the re-assembling.

[0019] According to a preferred embodiment of the hinge according to the present invention, said screws or pivots C suitable for fixing said bracket B to the second shaped plate A2 may preferably be made by torx screws, preferably flathead torx screws. In order to allow the housing of the torx screws in correspondence of said clearance holes b on said bracket B, on said second shaped plate A2 there is the same number of clearance holes. Such holes and screws are crucial to guarantee

the realignment of the hinge / door after the disassembling.

[0020] Again, according to the preferred embodiment of the invention shown in the figures, in particular in figure 3, which shows a cross section, said bracket B and said second shaped plate A2 have a non-flat profile, preferably trapezoidal, with a central splay defining a groove which facilitates the alignment for the repositioning of the parts in the assembling step. Therefore the cross profile of bracket B is suitable to be inserted and to perfectly match with the profile of the second plate A2.

[0021] Thanks to the presence of bracket B which is firmly connected to the vehicle door, the disassembling of the vehicle door or of the swing door from the vehicle body shell before the vehicle harnessing step, can be very easily done, by operating exclusively on the screws C, therefore leaving bracket B assembled on the door and disconnecting the bracket itself from the second plate A2, and then from the rest of the hinge which remains connected to the vehicle. This possibility given by the present invention allows to carry out the cataphoresis and painting steps, with all the bodywork parts, doors included, assembled to the vehicle, while it is possible to disassemble the doors from the vehicle body shell in preparation for the harnessing steps, only by operating on the screws C.

[0022] At the end of the harnessing steps, the doors can be reassembled and can be easily find aligned thanks to the cross trapezoidal profiles of bracket B and of second plate A2.

[0023] Therefore it has been shown that the split hinge according to the present invention achieves the purpose and the objects proposed.

[0024] In particular, it has been illustrated how the hinge according to the present invention allows to have a part that can be directly assembled to the vehicle body shell and a decoupleable bracket which can be fixed to the vehicle door or swing door so that the door disassembling after the painting step and before the harnessing step of the vehicle proves to be extremely simplified.

[0025] Again, the hinge according to the present invention is perfectly interchangeable with the non-decoupleable hinges of the type known, therefore it can be employed also as a spare part.

[0026] It will be apparent to the person skilled in the art that various modifications can be conceived and reduced to practice without departing from the scope of the present invention.

[0027] Therefore the scope of the claims is not limited to the illustrations of the preferred embodiments shown in the description as an example, but rather the claims include all the patentable novelties deriving from the present invention, including all the equivalent embodiments for a person skilled in the art.

Claims

1. Hinge suitable for connecting a vehicle door or a swing door or a door to the fixed part or body shell of a vehicle, of the type including two parts (A1, A2) articulated by means of a cylindrical articulated joint (S), **characterized in that** it comprises at least a further element (B) decoupleably connected to one of said parts (A1, A2).

2. Hinge according to the previous claim, **characterized in that** said two parts articulated with each other are moulded in a shaped plate, in particular being a first shaped plate (A1) suitable for being connected to the body shell of said vehicle and a second shaped plate (A2) suitable for being connected to said decoupleable element (B).

3. Hinge according to the previous claim, **characterized in that** said further element (B) is a bracket suitable for being connected to the swing door or door of said vehicle.

4. Hinge according to one or more of the previous claims, **characterized in that** said bracket (B) is a right angle bracket and has one or more slots (F) for the connection to the door of said vehicle.

5. Hinge according to one or more of the previous claims, **characterized in that** it includes in addition first connection means (a) suitable for connecting said first plate (A1) to the vehicle, and second connection means (b, C) suitable for connecting said second plate (A2) to said decoupleable bracket (B).

6. Hinge according to the previous claim, **characterized in that** said first connection means include one or more clearance holes (a) obtained on said first plate (A1) and suitable to accommodate appropriate fastening screws.

7. Hinge according to one ore more of the previous claims, **characterized in that** said second connection means include one or more clearance holes (b) obtained on said bracket (B), one or more clearance holes obtained on said second plate (A2) and which are positioned so that they are aligned to said holes (b) on said bracket (B) when the hinge is assembled, and one or more screws (C).

8. Hinge according to the previous claim, **characterized in that** said screws (C) are preferably flathead torx screws.

9. Hinge according to one or more of the previous claims, **characterized in that** said second shaped plate (A2) and said decoupleable bracket (B) have similar profiles in cross section, so that they perfectly

match when coupled.

10. Hinge according to the previous claim, **characterized in that** said cross profiles are trapezoidal profiles.

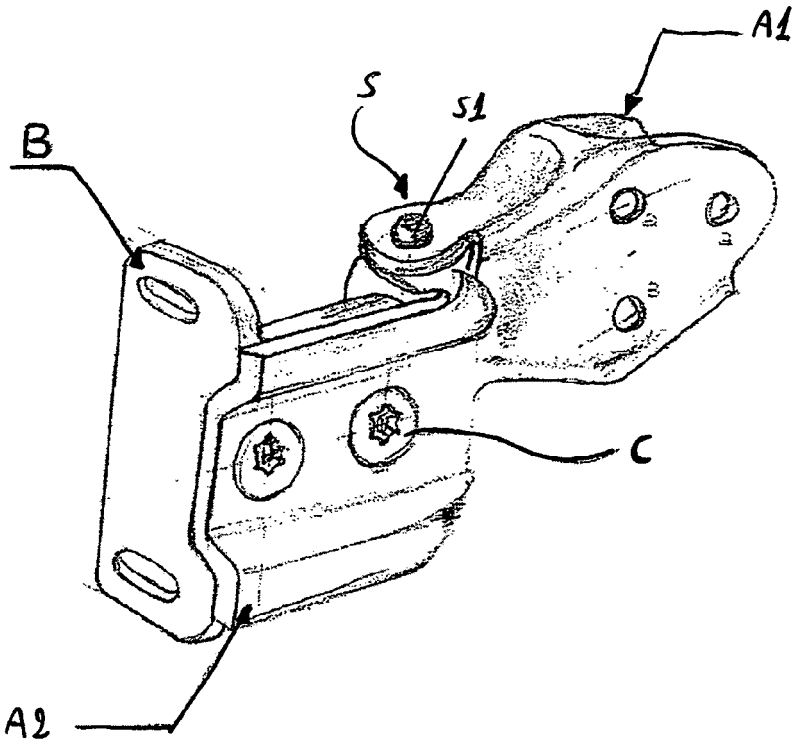

Fig. 1

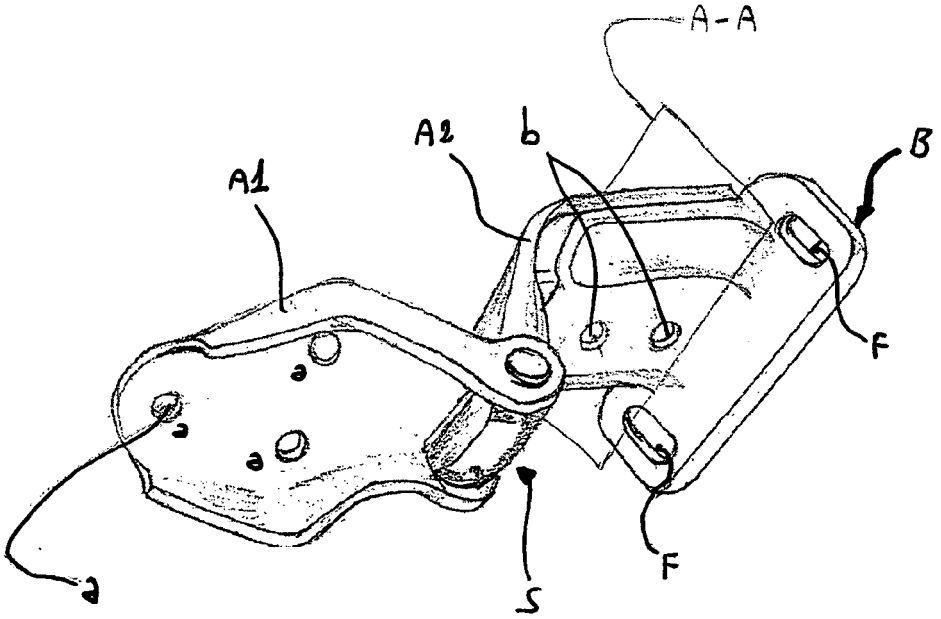

Fig. 2

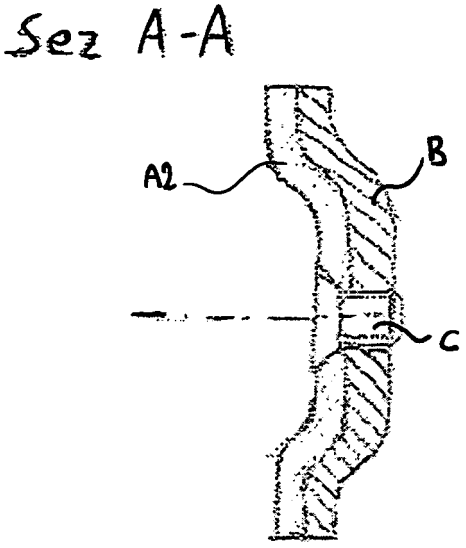

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 08 42 5770

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 297 314 A (BENDER FREDERICK F [US] ET AL) 29 March 1994 (1994-03-29) * column 1, lines 47-52; figures 1-3,16 * -----	1-10	INV. E05D7/12
A	DE 40 34 599 A1 (DAIMLER BENZ AG [DE]) 6 February 1992 (1992-02-06) * column 5, lines 22-45; figures 3,4 * -----	6,8	

TECHNICAL FIELDS SEARCHED (IPC)

E05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 March 2009	Witasse-Moreau, C

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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30-03-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5297314 A	29-03-1994	NONE	
DE 4034599 A1	06-02-1992	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82