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Declarations under Rule 4.17:

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

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(54) Title: JIGS AND FIXTURES OF CNG CONTAINERS FOR MOTOR VEHICLES

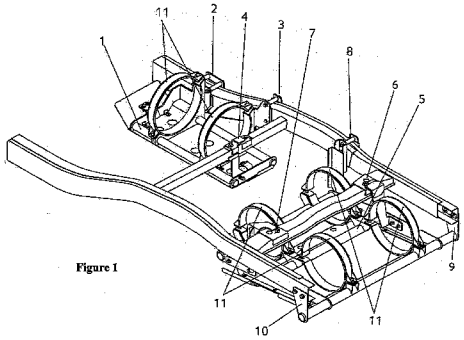


Figure 1

(57) Abstract: This is to the search for create the specific components for holding CNG container system on motor vehicles and emphasizes on its advantages in any aspects for the worthiness and safety to the owners of vehicles.

JIGS AND FIXTURES OF CNG CONTAINERS FOR MOTOR VEHICLES

Field of the Invention

The invention of CNG container jigs and fixtures for motor vehicles is based on the knowledge fields of mechanical engineering and product design.

Related Background Art

For purpose of responding to Thai Government's policy which campaigns for using the alternative energy after facing the crisis of unstable oil price due to the external factors which are beyond the reasonable control. The compressed natural gas or CNG is an alternative energy that is accepted by the owners of motor vehicles, both domestically and internationally. Therefore, the jigs and fixtures of CNG containers for motor vehicles are developed and invented by significantly emphasizing on the convenient and fast installation and maintenance, including the driver's safety and economy. Moreover, it allows the country to save a large money by reducing the import of CNG setting equipment. This also provides the added value for the motor vehicle industry in Thailand so it increases the money flow in the country and allows the country to have the growth and development by relying on the existing resources and potential by the way of self-reliance.

Description and Object of the Invention

This invention is for developing the form of installation using the techniques and equipment designed for making the specific jigs and fixtures of CNG containers for motor vehicles. The equipment will be mounted to the vehicle's frame and the gas container supporting set and it will be locked by the couplings. Drilling the vehicle's frame for mounting the equipment is avoided since the vehicle's frame has been passed the process of EDP (Electrophoretically Deposited Paint) in the factory under the automobile standard for rust-proof. Drilling the said frame may cause the consequent impact. Spraying or coating paint can cover only on its surface, not reach its inner area so any rust may occur at the hole slip. In addition, the equipment can be directly installed at the bottom of the vehicle without removing the carrier so it is convenient and fast for installation. In addition, the risks of scratches or mark on the carrier can be reduced.

Disclosure of the Invention

This is the invention of components for holding CNG system which are sorted out by the coupling components and the gas container set to be systematically installed. These components shall be tested for the user's safety.

Processes for Assembling Single Container Set and Vehicle Frame:

1. Put two sets of couplings together: enclose them with the frame and set its side holes in the same position as the holes on the vehicle frame; enclose another two couplings with the frame from the outside; thread the screw through the couplings and screw case and tighten it with nuts;
2. Put the couplings together and take it to cover the crossbeam mounted on the frame and set its holes in the same position; put the lower coupling under the crossbeam; thread screw up through the hole and tighten it with two nuts;
3. Check the tension of all screws after assembling.

Processes for Assembling Double Container Set and Vehicle Frame:

1. Put two sets of couplings together; hold the right and left sides of the central set with crossbeam on the frame by covering the coupling sets on the frame; set its holes in the same position as the holes on the crossbeam; insert the reinforce plate in the crossbeam of the frame; set all holes in the same position and thread the screw through the holes;
2. Install the front bracket set of the container holding set to be mounted at the right side; put the coupling set to the vehicle's frame and set all holes in the same position; thread screws through the couplings and screw cases, both upper and lower screws;
3. Enclose the couplings of the right and left holding set with both sides of frame; set all holes in the same position and hold them with screws and nuts;
4. Check the tension of all screws after assembling.

Best Mode for Carrying out the Invention

As described in the section "Disclosure of the Invention".

Claims

1. The jigs and fixtures of gas container, including the single container supporting set (1), the couplings for locking the single container supporting set at the front of frame (2), at the back of frame (3) and at the area of crossbeam (4), the container fastener (11);

2. The jigs and fixtures of gas container, including the double container supporting set (5), the couplings for locking the double container supporting set at the front of frame (8), the back of the right side (9) and the back of the left side (10) and on the right side of crossbeam (6), on the left (7), the container fastener (11);

3. The jigs and fixtures for the triple container set as per the claims 1 and 2; to be used as the structure for holding the gas containers directly installed in motor vehicles;

4. The form and method for installing the single container supporting set in the frame, locked by the couplings as per the claim 1;

5. The form and method for installing the double container supporting set in the frame, locked by the couplings as per the claim 2;

6. The form and method for installing the triple container supporting set in the frame, locked by the couplings as per the claim3.

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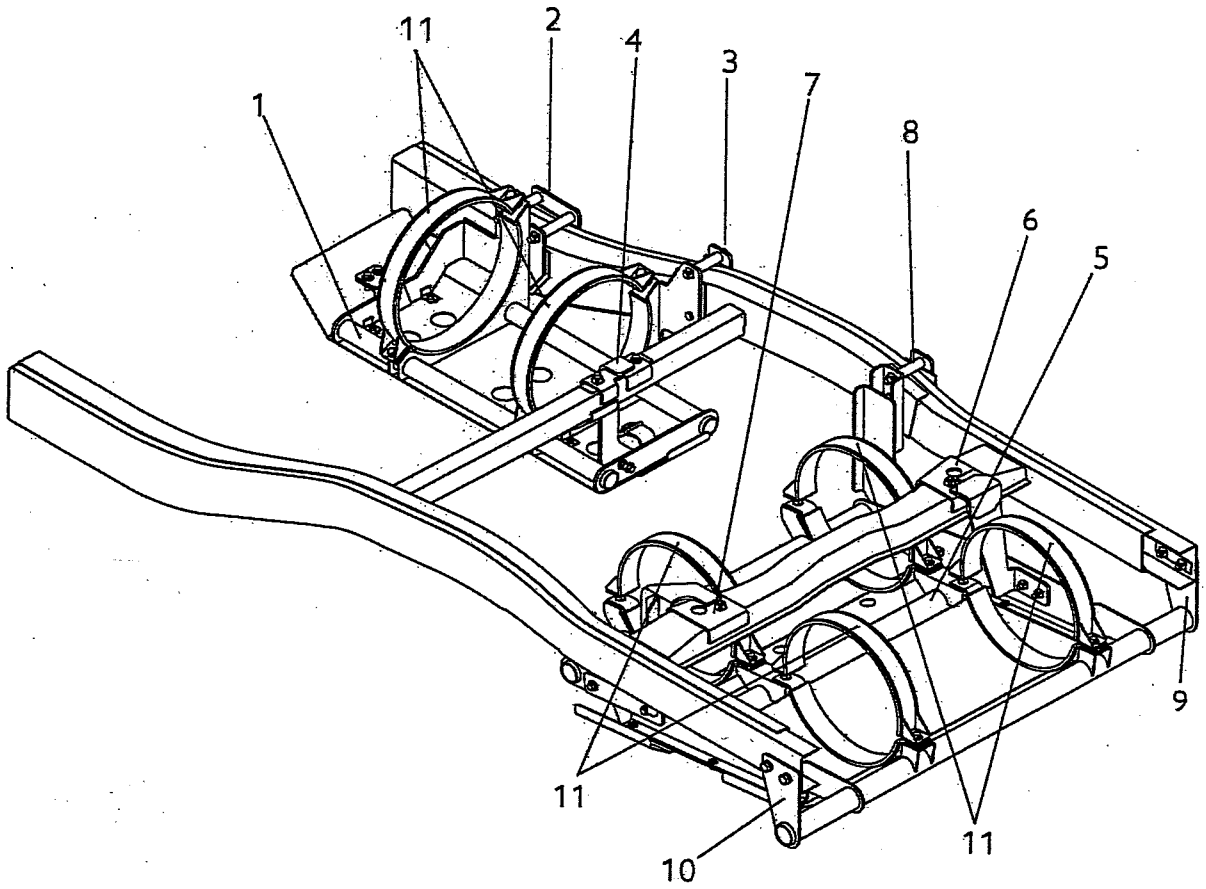


Figure 1

INTERNATIONAL SEARCH REPORT

International application No
PCT/TH2010/000029

A. CLASSIFICATION OF SUBJECT MATTER
INV. B60K15/07 F17C13/08
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F17C B60K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	US 2009/152043 A1 (LEE SANGKYU [KR]) 18 June 2009 (2009-06-18) the whole document	1-6
X,P	US 2010/045018 A1 (KONDO KEIICHI [JP] ET AL) 25 February 2010 (2010-02-25) the whole document	1-6
X	WO 2006/057765 A2 (FORD GLOBAL TECH LLC [US]; IJAZ MUJEEB [US]; LEANHARDT DALE [US]; VEEN) 1 June 2006 (2006-06-01) the whole document	1,3,4,6

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 November 2010	06/12/2010
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Nicol, Boris

INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X,P	US 2010/051625 A1 (DANDALIDES JAMES W [US] ET AL) 4 March 2010 (2010-03-04) the whole document	1,3,4,6

INTERNATIONAL SEARCH REPORT

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