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(54) Title: UNIVERSAL FUEL FILLING PIPE FOR VEHICLES

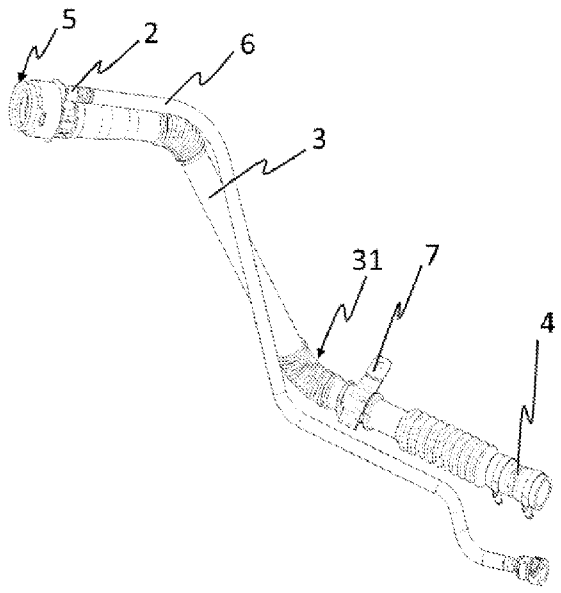

Figure – 3

(57) Abstract: A universal fuel filler pipe (1) enabling filling of fuel tanks (A) of all kinds of vehicles with fuel via its standardized structure, and thus eliminating additional design and analysis costs, and it is characterized in that; it comprises: a filler pipe (3) used for conveying fuel into the fuel tank (A) and having a flexible structure, a filler head (2) enabling discharge of fuel into said filler pipe (3) through a filling nozzle (B), and a retainer (5) mounted on said filler head (2) for ensuring sealing, and in which the filling nozzle (B) is placed for filling fuel.

[Continued on next page]

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UNIVERSAL FUEL FILLING PIPE FOR VEHICLES

Technical Field

The invention relates to filler pipes for filling fuel into fuel tanks of vehicles.

The invention particularly relates to universal fuel filler pipes which can be used in all kinds of vehicles by being adapted universally via their standardized structures, and accordingly eliminate additional design and analysis costs.

State of the Art

All kinds of fuels used as energy source in vehicles are stored in specially designed tanks. Fuel tanks that may have various sizes and shapes according to the characteristics of vehicles are filled with fuel by means of filler pipes, one example of which is given in the Japanese Patent Document No. JP2015116901, entitled: "Filler pipe and fuel tank connection embodiment." Nowadays, low carbon steel, stainless steel, and plastic pipes manufactured by blow moulding are used in fuel filler pipes.. Each one of these filler pipes are specially designed for each kind of vehicle. As a result, developing a new product causes loss of time and money. On the other hand, the costs increase even more, since metal and blow moulded plastic fuel filler pipes are required to meet stringent emission levels.

In fuel filler pipes, standardization is quite limited due to blow moulded plastic pipes. As a result, a production method enabling easier mounting as an alternative to expensive blow moulding plastic pipes and metal designs having significant welding points is needed in the automotive sector. Besides, there is a need for a method to provide a universal product that can be standardized and used in many kinds of vehicles, and reduce development period and costs.

As a result, the need for universal fuel filler pipes which can be used in all kinds of vehicles by being adapted universally via their standardized structures, and accordingly eliminate additional design and analysis costs, and the inadequacy of the prior art solutions have necessitated an improvement in the related technical field.

Purpose of the Invention

The invention relates to a fuel filler pipe, which meets the above said requirements, eliminates all of the drawbacks, and brings some additional advantages.

The main purpose of the invention is to provide a fuel filler pipe standardized by means of a filler head, filler pipe, and a retainer, which is mounted on said filler head, and in which the filling gun is placed during fuel filling. In this way, the need for making a different design for each vehicle is eliminated and development period and costs are reduced. The developed structure can be used in other projects with small investments. This simple structure also facilitates mounting and thus reduces mounting time and labour. Moreover, since it would be produced for all vehicles, it can be produced in high amounts and therefore with low cost.

Another purpose of the invention is to ensure sealing with a sealing component positioned between the retainer and the filler head.

Another purpose of the invention is to enable easy mounting and demounting by means of providing the connection of the retainer with the filler head via flexible tabs.

Another purpose of the invention is to adjust the distance between the retainer and the filler head by means of a spacer used in between, and fix the sealing component.

Another purpose of the invention is to facilitate fixing operation and mounting by means of the supports formed between the retainer and the filler head.

Another purpose of the invention is to improve durability especially against the abrasive impact during insertion and removal of the filling gun by means of producing the retainer using metal material. Moreover, the task of transferring possible static loads arising from the fuel filling gun to the vehicle body is also fulfilled.

Another purpose of the invention is to produce the filler head using plastic material so as to reduce production costs.

Another purpose of the invention is to ensure that the filler pipe can change shape easily by means of the grooves formed on the filler pipe. In this way, while the other parts stay same, the length and the shape of the filler pipe can be changed for adaptation to various vehicles. This also contributes to the universal structure and reduces design costs. Moreover, since the grooved structure would

make extending, narrowing, and stretching etc. movements in case of an accident, possible leakage would be prevented.

Another purpose of the invention is to allow discharge of vapour formed in the fuel tank through the ventilating hose coming from the fuel tank and the vent port found on the filler head.

Another purpose of the invention is to allow fixing of the filler pipe to the vehicle in desired form and prevent its shaking/vibration by means of using clamp-form brackets.

The structural and characteristic features of the invention and all of its advantages shall be understood better with the figures and the detailed description given below in reference to the figures, and therefore, the assessment should be made by taking into account the said figures and detailed explanations.

Figures for Better Understanding of the Invention

For better understanding of the embodiment of the present invention and its advantages with its additional components, it should be evaluated together with below described figures.

Figure – 1: is the general view of the fuel filler pipe of the invention, in connected state with the fuel tank.
Figure – 2: is the demounted view of the fuel filler pipe according to the invention.
Figure – 3: is the general view of the fuel filler pipe of the invention alone.
Figures – 4a, 4b: are the close and exploded views of the filler head end of the fuel filler pipe according to the invention.
Figures – 4c, 4d: are the views of the filler head and the retainer found in the fuel filler pipe according to the invention, in demounted and assembled states.
Figures – 5a, 5b: are the views of the filler head end of the fuel filler pipe according to the invention, from two different sections.
Figures – 6a, 6b: are the views of the bracket found in the fuel filler pipe according to the invention, alone and in mounted state.
Figures – 7a, 7b: are the section views of the fuel filler pipe according to the invention, in which two different filling guns are connected.

Parts References

1	Fuel Filler Pipe
2	Filler Head
21	Vent Port
22	Spacer
23	O-ring
24	Hard Snap
25	Support
3	Filler Pipe
31	Corrugation
4	Connection
5	Retainer
51	Crash Ring
52	Snap Slots
53	Thread
6	Vent Tube
7	Bracket
A	Fuel Tank
B	Filling Nozzle

Detailed Description of the Invention

Figure 1 shows the general view of the fuel filler pipe (1) of the invention, in connected state with the fuel tank (A). In general, the fuel filler pipe (1) consisting of a filler pipe (3) used for conveying fuel into the fuel tank (A) and having a flexible structure, a filler head (2) enabling discharge of fuel into the filler pipe (3) through a filling nozzle (B), and a retainer (5) mounted on said filler head (2) and in which the filling nozzle (B) is placed for filling fuel, enables filling of fuel tanks (A) of all kinds of vehicles with fuel via its standardized structure, and thus eliminates additional design and analysis costs.

Figure 2 shows the demounted view of the fuel filler pipe (1) according to the invention. The filler pipe (3) with flexible structure is positioned between the filler head (2) and the fuel tank (A), and its connection with the fuel tank (A) is made by a rubber hose connection (4). The filler pipe (3) and the filler head (2) are preferably connected to each other by spin welding method. The filler head (2) is designed according to SAE J1114 standards. Figure 3 shows the general view of the fuel filler pipe (1) of the invention alone. The vent tube (6) is positioned along the filler pipe, and it is used for

discharging air, vapour etc. substances found in the fuel tank (A). The corrugations (31) formed on the filler pipe (3) allow extension and contraction of the filler pipe (3) and provides extra flexibility. The corrugated (31) filler pipe (3) can be produced with more complex slopes and curves compared to traditional pipes produced by blow moulding method. If desired, the corrugated (31) filler pipe (3) can be produced in a multilayered structure in order to be suitable with worldwide emission requirements and meet the requirements of LEVIII standards. Preferably, the clamp-shaped brackets (7) are used for fixing of the filler pipe (3) and enable its mounting in the vehicle in suitable forms. Figures 6a and 6b give the views of the bracket (7) alone and in mounted state, respectively.

Figure 4a shows the close-up view of the filler head (2) end of the fuel filler pipe (1). The vent tube (6) is connected to the filler head (2) through the vent port (21). In addition to allowing connection of the vent tube (6) to the filler head (2), the vent port (21) also enables ventilation. A crash ring (51) designed so as to encircle the retainer (5) also strengthens the connection between the filler head (2) and the retainer (5). The retainer (5) is shown in Figure 4b, in which the exploded view of the filler head (2) end of the fuel filler pipe (1) is given. An O-ring (23) positioned between the retainer (5) and the filler head (2) ensures sealing. A spacer (22) ensures fixing of the O-ring (23) as well as maintaining the distance between the retainer (5) and the filler head (2) by being positioned therein.

Figures 4c and 4d show the views of the filler head (2) and the retainer (5) found in the fuel filling line in demounted and assembled states. The hard snaps (24) formed on the filler head (2) are inserted into the snap slots (52) formed on the crash ring (51) so that both pieces are locked to each other and fixed. In another embodiment, the hard snaps (24) are formed on the crash ring (51) and the snap slots (52) are formed on the filler head (2) in order to perform the same task. This kind of connection ensures resistance against high amounts of loads without breaking. In a preferred embodiment, the retainer (5) and the crash ring (51) are combined with each other at one end via welding method, and the filler head (2) is inserted into the space formed therein. Preferably, the supports (25) formed on the filler head (2) perform the guiding function during coupling of the retainer (5) and the filler head (2), and strengthen the connection by providing tightness.

Figures 5a and 5b show the views of the filler head (2) end of the fuel filler pipe (1) from two different sections. Threads (53) formed on the retainer (5) allow insertion of the filling nozzle (B). In this way, the filling nozzle (B) can be fixed without applying a force, and this brings convenience during filling. Figures 7a and 7b show the section views of the fuel filler pipe (1), in which two different filling guns (B) are connected.

In a preferred embodiment of the invention; the retainer (5) is made of metal. In this way, its durability against abrasive impacts especially during the insertion and removal of the filling nozzle (B) is

improved. Moreover, the task of transferring possible static loads arising from the filling nozzle (B) to the vehicle body is fulfilled. The filler head (2) is made of plastic material so as to reduce production costs and enable impermeable welded connection with the filler pipe (3). This also enables production of the filler head (2) and the vent port (21) in critical forms.

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CLAIMS

1. A universal fuel filler pipe (1) enabling filling of fuel tanks (A) of all kinds of vehicles with fuel via its standardized structure, and thus eliminating additional design and analysis costs, and it is characterized in that; it comprises:

- a filler pipe (3) used for conveying fuel into the fuel tank (A) and having a flexible structure,
- a filler head (2) enabling discharge of fuel into said filler pipe (3) through a filling nozzle (B), and
- a retainer (5) mounted on said filler head (2) for ensuring sealing, and in which the filling nozzle (B) is placed for filling fuel.

2. The fuel filler pipe (1) according to Claim 1, characterized in that; it comprises at least one corrugation (31) formed on said filler pipe (3) in order to allow its extension and contraction.

3. The fuel filler pipe (1) according to Claim 1, characterized in that; it comprises a crash ring (51) encircling said retainer (5) and strengthening its connection with the filler head (2).

4. The fuel filler pipe (1) according to Claims 1 or 3, and it is characterized in that; it comprises:

- at least one hard snap (24) formed on any of said crash ring (51) or filler head (2),
- at least one snap slot (52) formed on the other one of said crash ring (51) or filler head (2), and on which the hard snap (24) can be engaged.

5. The fuel filler pipe (1) according to Claim 1, characterized in that; it comprises at least one O-ring (23) ensuring sealing between said retainer (5) and the filler head.

6. The fuel filler pipe (1) according to Claim 5, characterized in that; it comprises at least one spacer (22) ensuring fixing of the O-ring (23) and maintaining the distance between said retainer (5) and the filler head (2) by being positioned therein.

7. The fuel filler pipe (1) according to Claim 1, characterized in that; it comprises a plurality of supports (25) formed on at least one of the retainer (5) or the filler head (2) and providing guiding function and tightness during coupling of the retainer (5) and the filler head (2).

8. The fuel filler pipe (1) according to Claim 1, characterized in that; a vent tube (6) allowing discharge of air, vapour etc. substances found in said fuel tank (A).

9. The fuel filler pipe (1) according to Claims 1 or 8, and it is characterized in that; it comprises a vent port (21) allowing connection of the vent tube (6) to the filler head (2) and providing ventilation.

10. The fuel filler pipe (1) according to Claim 1, characterized in that; it comprises a connection (4) allowing connection of said filler pipe (3) to the fuel tank (A).

11. The fuel filler pipe (1) according to Claim 1, characterized in that; it comprises at least one bracket (7) used for fixing of said filler pipe (3).

12. The fuel filler pipe (1) according to Claim 1, characterized in that; it comprises a thread (53) formed on said retainer (5) and allowing insertion of the filling nozzle (B).

13. The fuel filler pipe (1) according to Claim 1, characterized in that; said retainer (5) is metal.

14. The fuel filler pipe (1) according to Claim 1, characterized in that; said filler head (2) is plastic.

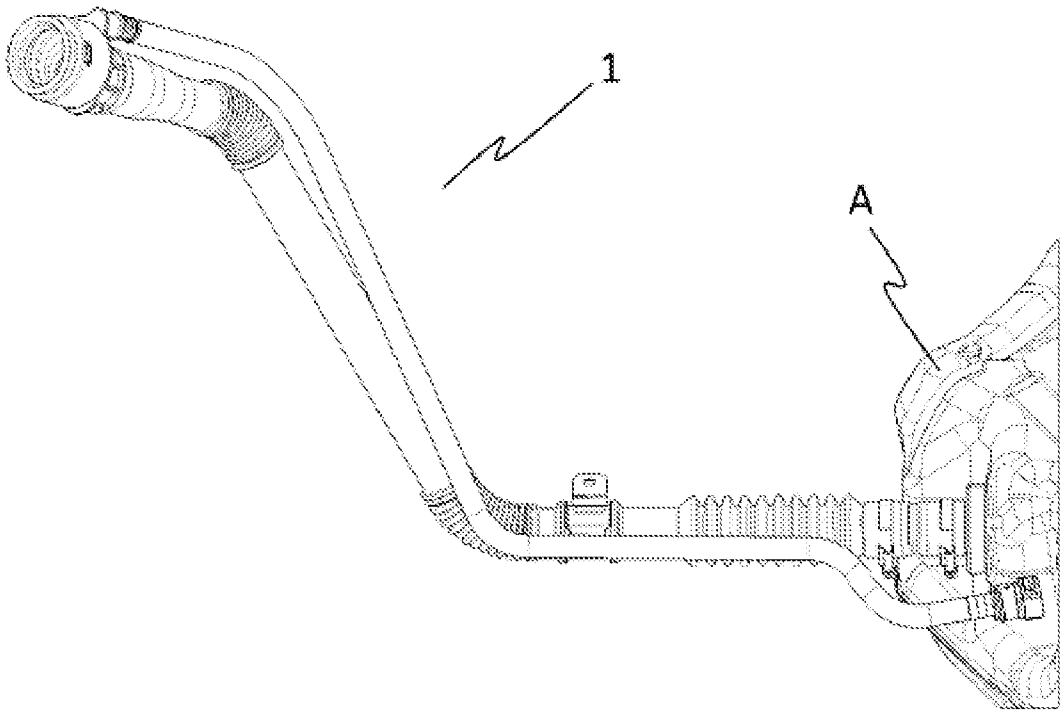

Figure – 1

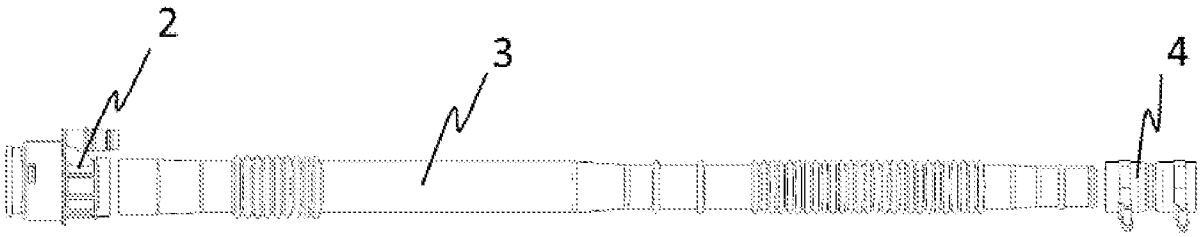

Figure – 2

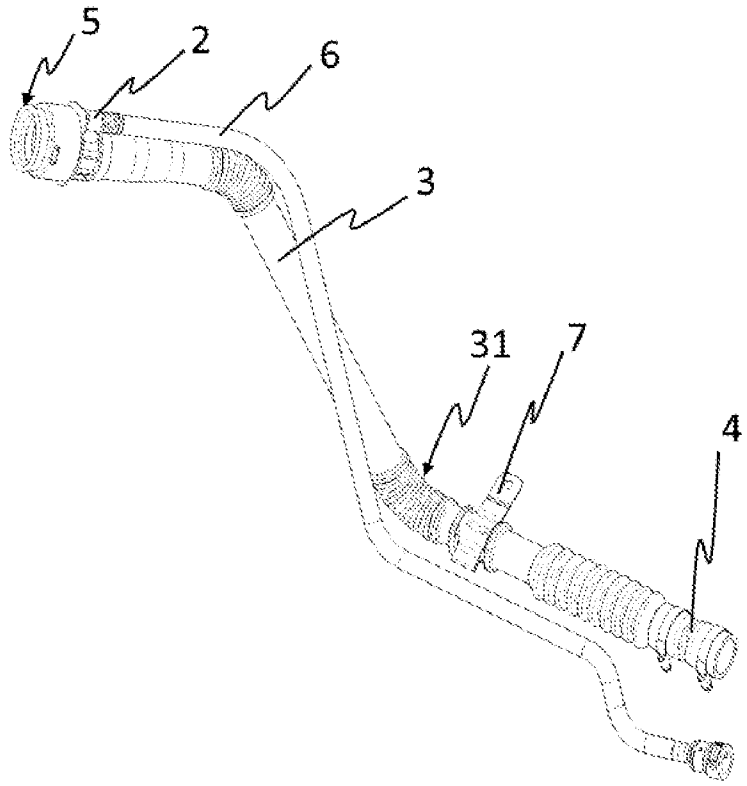

Figure – 3

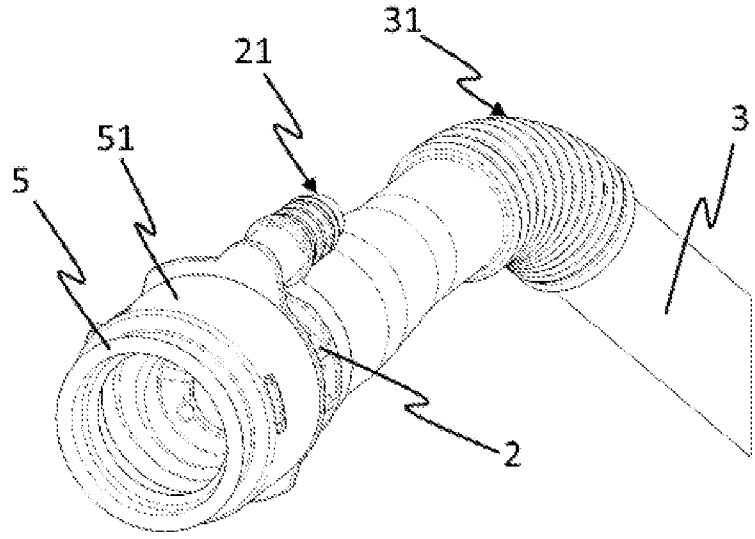

Figure – 4a

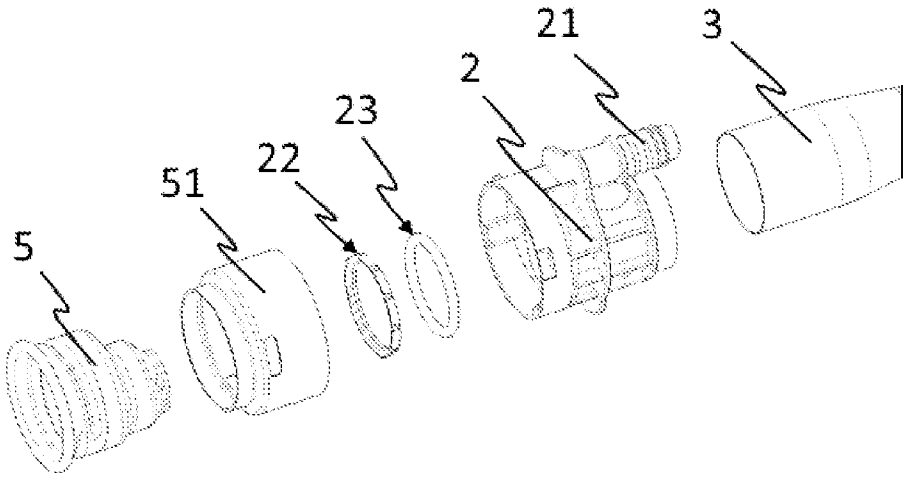

Figure – 4b

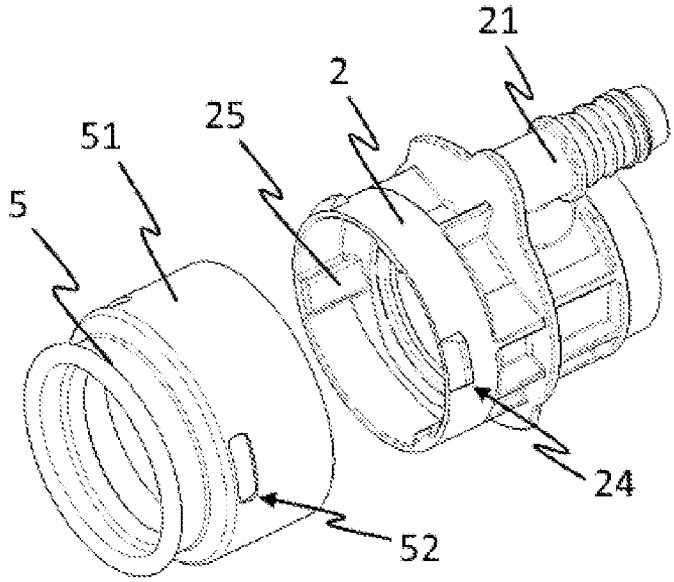

Figure – 4c

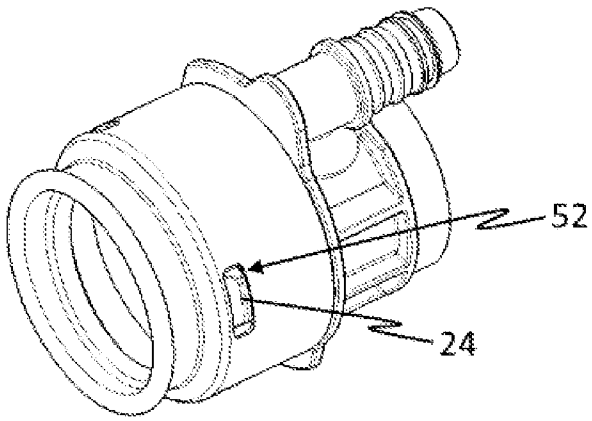

Figure – 4d

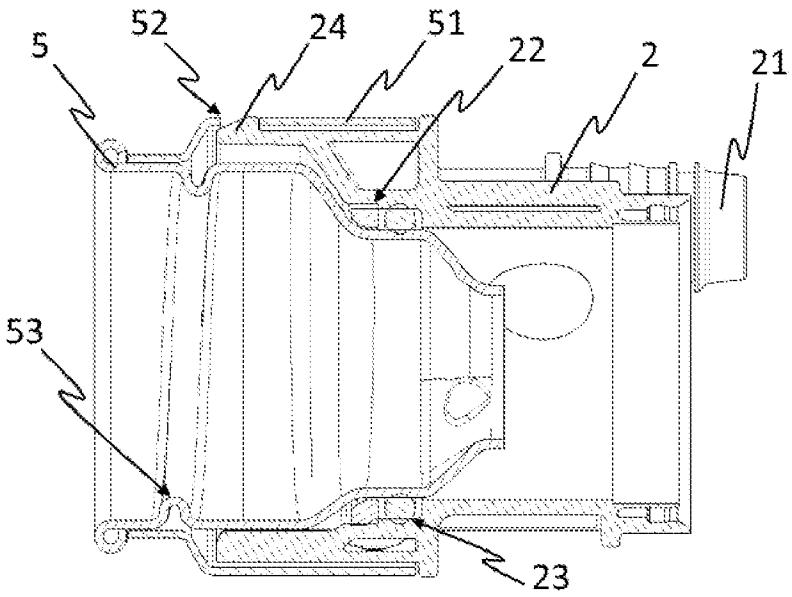

Figure – 5a

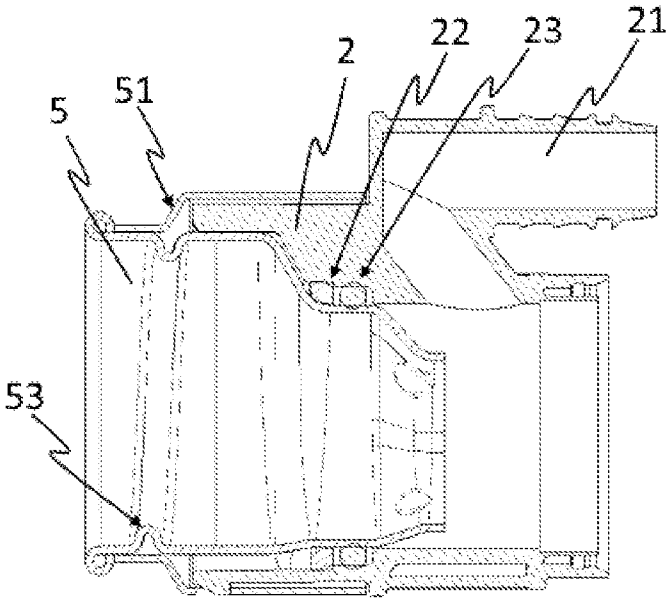

Figure – 5b

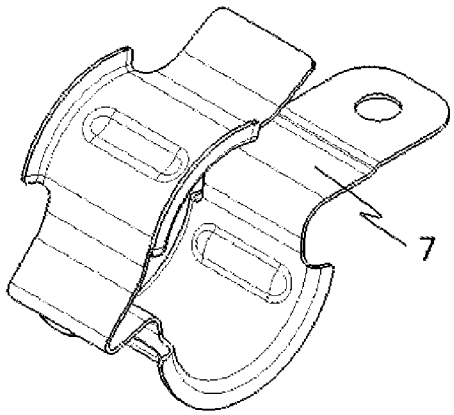

Figure – 6a

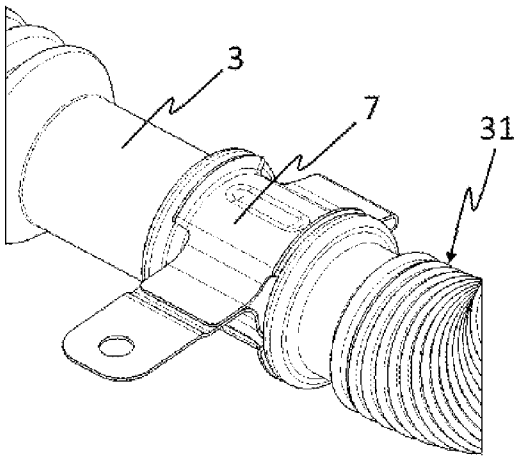

Figure – 6b

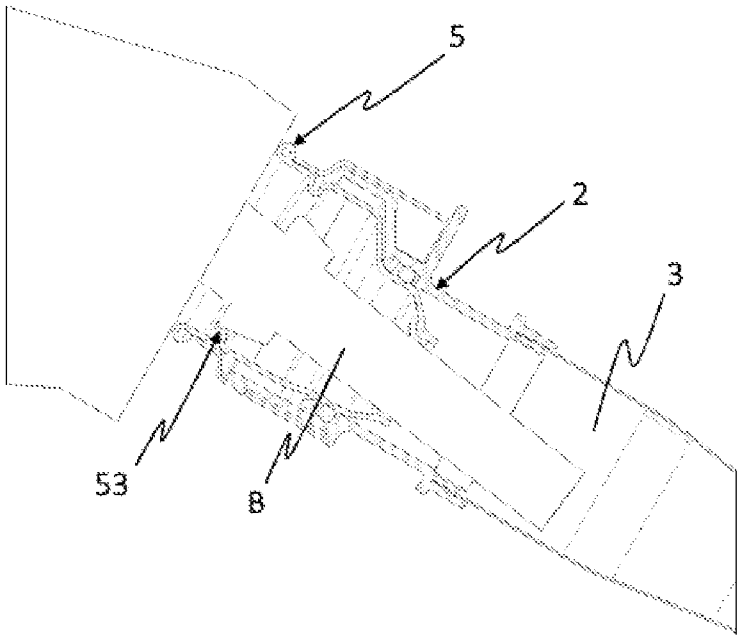

Figure – 7a

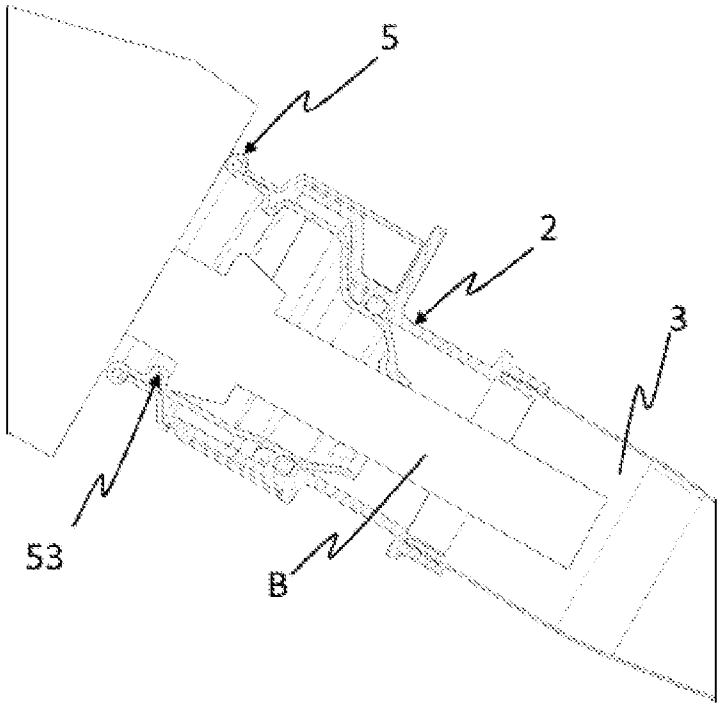

Figure – 7b

INTERNATIONAL SEARCH REPORT

International application No
PCT/TR2016/050133

A. CLASSIFICATION OF SUBJECT MATTER
INV. B60K15/04
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)
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 practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/012374 A1 (YASUDA ZENICHI [JP] ET AL) 18 January 2007 (2007-01-18) paragraphs [0027], [0044]; figures 1,5	1-14
X	EP 2 832 570 A1 (NOBEL PLASTIQUES [FR]) 4 February 2015 (2015-02-04) paragraph [0012]; figures 1,6	1-14
X	EP 1 852 297 A1 (FORD GLOBAL TECH LLC [US]; FORD OTOMOTIV SANAYI AS [TR]) 7 November 2007 (2007-11-07) figure 2	1,11
X	EP 2 752 326 A1 (VERITAS AG [DE]) 9 July 2014 (2014-07-09) figure 1	1,9

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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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 August 2016	30/08/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Revilla, Xavier

INTERNATIONAL SEARCH REPORT

International application No
PCT/TR2016/050133

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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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/TR2016/050133

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