



पेटेंट कार्यालय, भारत सरकार

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(पेटेंट नियमावली का नियम 74) | (Rule 74 of The Patents Rules)

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पेटेंटी / Patentee : MARUTI SUZUKI INDIA LIMITED

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प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित AN ASSEMBLY OF ENGINE MOUNTING BRACKET WITH PROTECTOR FOR AVOIDING TWISTING OF THE PROTECTOR नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख फरवरी 2022 के नौवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled AN ASSEMBLY OF ENGINE MOUNTING BRACKET WITH PROTECTOR FOR AVOIDING TWISTING OF THE PROTECTOR as disclosed in the above mentioned application for the term of 20 years from the 9th day of February 2022 in accordance with the provisions of the Patents Act,1970.



Signature and name of Controller of Patents

अनुदान की तारीख : 12/02/2026
Date of Grant :

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, फरवरी 2024 के नौवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।
Note. - The fees for renewal of this patent, if it is to be maintained, will fall / has fallen due on 9th day of February 2024 and on the same day in every year thereafter.

FORM 5
THE PATENTS ACT, 1970
(39 of 1970)
&
THE PATENTS RULES, 2003
DECLARATION AS TO INVENTORSHIP
(See section 10(6) and rule 13(6))

1. APPLICANT(S)

NAME	NATIONALITY	ADDRESS
MARUTI SUZUKI INDIA LIMITED	INDIAN	1 Nelson Mandela Road, Vasant Kunj, New Delhi-110070, India

hereby declare that the true and first inventor(s) of the invention disclosed in the complete specification filed in pursuance of our Application No.: _____ dated **09/02/2022** titled **“AN ASSEMBLY OF ENGINE MOUNTING BRACKET WITH PROTECTOR FOR AVOIDING TWISTING OF THE PROTECTOR”** is/are

2. INVENTOR(S)

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3. DECLARATION TO BE GIVEN WHEN THE APPLICATION IN INDIA IS FILED BY THE APPLICANT(S) IN THE CONVENTION COUNTRY: -

~~I/We the applicant(s) in the convention country hereby declare that our right to apply for a patent in India is by way of assignment from the true and first inventor(s).~~

4. STATEMENT (to be signed by the additional inventor(s) not mentioned in the application form) **NIL**

To,
The Controller of Patents
The Patent Office at Delhi

<p>FORM 2</p> <p>THE PATENTS ACT 1970</p> <p>39 OF 1970</p> <p>&</p> <p>THE PATENT RULES 2003</p> <p>COMPLETE SPECIFICATION</p> <p>(SEE SECTIONS 10 & RULE 13)</p>		
<p>1. TITLE OF THE INVENTION</p> <p>AN ASSEMBLY OF ENGINE MOUNTING BRACKET WITH PROTECTOR FOR AVOIDING TWISTING OF THE PROTECTOR</p>		
<p>2. APPLICANTS (S)</p>		
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<p>3. PREAMBLE TO THE DESCRIPTION</p> <p>COMPLETE SPECIFICATION</p> <p>The following specification particularly describes the invention and the manner in which it is to be performed</p>		

AN ASSEMBLY OF ENGINE MOUNTING BRACKET WITH PROTECTOR FOR AVOIDING TWISTING OF THE PROTECTOR

TECHNICAL FIELD

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[0001] The present subject matter described herein, relates to a structure of a protector for avoiding twisting of the protector. More particularly, the present invention relates to an engine mounting bracket structure assembly with protector provided to avoid twisting of the protector.

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BACKGROUND

[0002] Background description includes information that may be useful in understanding the present subject matter. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

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[0003] Generally, an engine is mounted on an engine mount bracket which is welded with a cross member connected to a chassis of a vehicle. Further in the vehicle, a part of the propeller shaft is placed below the engine mount bracket. The engine mount bracket and the propeller shaft are at the bottom of the vehicle and face the ground. In case of physical breakdown of the propeller shaft, there is a chance that an end propeller shaft may touch the ground which may further damage the propeller shaft and may lead to breakdown of the vehicle. In order to avoid such situation, a protector bracket is provided in conventional vehicles and the protector bracket is bolted with the engine mount bracket, the purpose of the protector bracket is to hold the propeller shaft in case of breakdown. However, the conventional protector is prone to twist during assembly. Further, there is limited space between the propeller shaft and the protector, and twisting of the protector decreases the clearance between the propeller shaft and the protector which leads to increase in vibrations. Further, in case the clearance

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between the propeller shaft and the protector is eliminated, the propeller shaft comes in contact with the protector, which leads to noise and breakdown of the propeller shaft.

5 **[0004]** Therefore, there is a need to provide a protector which does not twist during assembly of the protector with the engine mount bracket.

OBJECTS OF THE DISCLOSURE

10 **[0005]** In view of the foregoing limitations inherent in the state of the art, some of the objects of the present disclosure, which at least one embodiment herein satisfy, are listed herein below.

15 **[0006]** It is an object of the present disclosure to propose a protector with an engine mounting bracket structure assembly for avoiding twisting or anti-rotational movement.

20 **[0007]** It is another object of the present disclosure to propose a protector with an engine mounting bracket structure assembly that reduces the vibration in the engine.

25 **[0008]** It is yet another object of the present disclosure to propose a protector with an engine mounting bracket structure assembly with increased strength.

[0009] It is still yet another object of the present disclosure to propose a protector with an engine mounting bracket structure assembly that reduces both low and high frequency vibrations.

[0010] It is still yet another object of the present disclosure to propose a protector with an engine mounting bracket structure assembly that increase tolerance of the structure.

5 [0011] These and other objects and advantages of the present invention will be apparent to those skilled in the art after a consideration of the following detailed description taken in conjunction with the accompanying drawings in which a preferred form of the present invention is illustrated.

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SUMMARY

[0012] This summary is provided to introduce concepts related to avoiding twisting of protector of the vehicle chassis. The concepts are further described below in the detailed description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

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[0013] The present disclosure relates a protector structure to secure a propeller shaft of a vehicle. The protector structure includes two top portions wherein one end of the each of the two top includes a hole and a lug, wherein the lug is perpendicular to the top portion and upward to a top surface of the top portion, wherein the another end of the each of the top portion is extended downward and form a U shape structure, wherein beads are provided at a connection of the side surface and a bottom surface of the U shape structure.

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[0014] In an aspect, the holes are provided for mounting the protector structure with an engine mount bracket.

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[0015] In an aspect, the lugs are house in holed provided on an engine mount bracket, and wherein the lugs act as locator during assembly of the protector structure with the engine mount bracket.

[0016] In an aspect, the protector structure is a strip type elongated shape protector providing leverage effect to the structure.

5 [0017] Accordingly in an aspect, the solution is provided in the form of an assembly of an engine mounting bracket structure with a protector to secure a propeller shaft. The assembly includes an engine mount bracket that comprises a top rectangular curved region, a first side extending outwardly part away from the top rectangular curved region in outward direction and a second side extending outwardly part away from the top rectangular curved region in outward direction, wherein each of the first and the second extending outwardly parts includes a hole and an anti-rotational slot. The assembly also includes the protector that comprises two top portions wherein one end of the each of the two top includes a hole and a lug, wherein the lug is perpendicular to the top portion and upward to a top surface of the top portion, wherein the another end of the each of the top portion is extended downward and form a U shape structure, wherein beads are provided at a connection of the side surface and a bottom surface of the U shape structure, wherein when the protector is assembled with the engine mount bracket the lugs are housed in the anti-rotational slots and the holes provided on the structure are aligned with the holes provided on the first and second extending outwardly parts.

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[0018] Other objects, features and advantages of the present disclosure will become apparent from the following detailed description. It should be understood, however, that the detailed description and the specific examples, while indicating specific embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

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BRIEF DESCRIPTION OF DRAWINGS

5 [0019] While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter that is regarded as forming the present subject matter, it is believed that the present disclosure will be better understood from the following description taken in conjunction with the accompanying drawings, where like reference numerals designate like structural and other elements, in which:

10 [0020] FIG. 1 is a top view of an engine mounting bracket, in accordance with an embodiment of the prevent invention;

[0021] FIG. 2 is a perspective view of a protector, in accordance with an embodiment of the prevent invention;

15 [0022] FIG. 3 is an assembly of the engine mounting bracket with the protector, in accordance with an embodiment of the prevent invention;

DETAILED DESCRIPTION

20 [0023] The detailed description of various exemplary embodiments of the disclosure is described herein with reference to the accompanying drawings. It should be noted that the embodiments are described herein in such details as to clearly communicate the disclosure. However, the amount of details provided herein is not intended to limit the anticipated variations of embodiments; on the contrary, the intention is to cover all modifications, 25 equivalents, and alternatives falling within the spirit and scope of the present disclosure as defined by the appended claims.

30 [0024] It is also to be understood that various arrangements may be devised that, although not explicitly described or shown herein, embody the principles of the present disclosure. Moreover, all statements herein reciting

principles, aspects, and embodiments of the present disclosure, as well as specific examples, are intended to encompass equivalents thereof.

5 [0025] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of example embodiments. As used herein, the singular forms “a”, “an”, and “the” are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms “comprises”, “comprising”, “includes”, “consisting” and/or “including” when used
10 herein, specify the presence of stated features, integers, steps, operations, elements and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components and/or groups thereof.

15 [0026] It should also be noted that in some alternative implementations, the functions/acts noted may occur out of the order noted in the figures. For example, two figures shown in succession may, in fact, be executed concurrently or may sometimes be executed in the reverse order, depending upon the functionality/acts involved.

20 [0027] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which example embodiments belong. It will be further understood that terms, e.g., those
25 defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

30 [0028] Referring to FIG. 1, illustrates an engine mounting bracket structure (100). The engine mounting bracket structure (100) comprising a top rectangular curved region (124) with flanges (122) having a first hole (102)

and a second hole (104) onto the top rectangular sheet plate acting as datum holes. The top rectangular curved region (124) defines a first side extending outwardly part (120) away from the top rectangular curved region (124) in outward direction and a second side extending outwardly part (118) away from the top rectangular curved region (124) in outward direction provided to join with the vehicle chassis (cross-member). The first extending outwardly part (120) and the second extending outwardly part structure (118) having a first anti-rotation slot (106) and a second anti-rotation slot (108). A side bolt (114) is provided on the side wall of the rectangular curved region of the engine mounting bracket structure (110) that fix the assembly to lower leg of the engine mount. The engine mounting bracket (100) configured with a protector (200).

[0029] In an embodiment of the invention the engine mounting bracket structure (100) made from a single sheet material using a stamping process.

[0030] Referring to FIG. 2, disclosed a protector (200) to secure a propeller shaft. The protector structure (200) includes two top portions (202, 206) wherein one end of the each of the two top portions (202, 206) includes a hole (212) and a lug (204). The lug (204) is perpendicular to the top portion (202) and upward to a top surface of the top portion (202). The end of the each of the top portions (202, 206) is extended downward and form a U shape structure. Further, wherein beads (218, 220) are provided at a connection of the side surface (210) and a bottom surface (216) of the U shape structure.

[0031] In an embodiment, the holes (212, 214) are provided for mounting the protector structure (200) with an engine mount bracket (100).

[0032] In an embodiment, the lugs (204, 208) are housed in holes provided on an engine mount bracket (100), and wherein the lugs (204, 208) act as

locator during assembly of the protector structure (200) with the engine mount bracket (100).

5 [0033] In an embodiment, the protector structure (200) is a strip type elongated shape protector providing leverage effect to the structure.

10 [0034] Referring to FIG. 3, disclosed an assembly (300) of engine mounting bracket structure with protector for avoiding twisting of the protector. The assembly (300) comprising an engine mounting bracket (332) configured on a vehicle chassis. The engine mounting bracket defines a top rectangular curved region (328) with flanges (320) having a first hole (318) and a second hole (322) as datum holes. The engine mounting bracket (332) defines a first side extending outwardly part (310) away from the top rectangular curved region (328) in outward direction and a second side extending outwardly part (314) away from the top rectangular curved region (328) in outward direction provided to join with the vehicle chassis. The first extending outwardly part (310) and the second extending outwardly part (314) structure having a first anti-rotation slot (106) and a second anti-rotation slot (108). The assembly having a protector (200). The first anti-rotation slot (106) and the second anti-rotation slot (108) are configured with the protector lugs (204, 208). The protector (324) comprising a U-shaped region (302) with extending part in perpendicular direction from circumference region. The U-shaped region (302) with extending part having a first inward lug (204) accommodate on a first arm (304) and a second inward lug (208) accommodate on a second arm (330). The U-shaped extending part (302) in perpendicular direction is provided to join with the top rectangular curved region (328) by fixing with an anti-rotation slot and a lug of the top rectangular curved region (328) and the U-shaped extending part (302).

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30 [0035] In an embodiment, the first anti-rotation slot (106) is configured to the first lug (204) of the first arm (304) of U-Shaped extending part (302) at one end and the second anti-rotation slot (108) is configured to the second

lug (208) of the second arm (330) of U-Shaped extending part (302) at another end. The arrangement of the lugs (204, 208) of the protector with the anti-rotation slots (106, 108) helps in locating protector (200) and avoid twisting of protector (200) while assembling the protector (200) to the engine mount bracket (100).

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[0036] In an embodiment of the invention, the protector (200) accommodates with the engine mount bracket (100) to protect slip yoke type propeller shaft in case of any unforeseen failure. In case, the slip yoke type propeller shaft transfers power to vehicle driveshaft to move or allows the vehicle shaft to flex when going over rough, uneven terrain. Further, the function of the protector (200) is to guard slip yoke propeller shaft in case of any unforeseen failure. The protector (200) is bolted to the engine mounting bracket (100) with the nut and bolt and design used for extended strip type due to tight layout constraint. The first anti-rotation slot (106) configured to the first lug (204) of the first arm of U-Shaped extending part at one end and the second anti-rotation slot (108) configured to the second lug (208) of the second arm of U-shaped extending part at another end to assemble the protector (200) to the engine mounting bracket (100) and this configuration avoids the twisting which is observed in the protector (200) while bolting. The twisting of the protector (200) with the engine mount bracket (100) configuration reduces clearance of the propeller shaft with the protector (200) which is unacceptable.

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[0037] In an embodiment, the configuration jammed the top rectangular curved region with U-Shaped extending part (302) to avoid twisting of the U-shaped region extending part (302).

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[0038] In an embodiment, a hollow space located at a base of U-Shaped extending part (302) for maintaining a predetermined distance between the outer surface of the top rectangular curved region (328) and the inner surface of U-Shaped extending part (302).

[0039] In an embodiment, the top rectangular curved region (328) of the engine mounting bracket (332) and the protector (324) interlock each other in torquing direction.

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[0040] In an embodiment, the tolerance of the protector assembly with the engine mounting bracket is increases on the vehicle chassis allows the shaft to flex when going over rough, uneven terrain.

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[0041] In an embodiment, a strip type elongated shape protector is providing leverage effect for strengthening to the assembly of the engine mounting bracket (332) and the protector (324).

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[0042] In an embodiment, a side bolt (326) is provided on the side wall of the rectangular curved region of the engine mounting bracket structure (332) that fix the assembly to lower leg of the engine mount.

TECHNICAL ADVANTAGES

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[0043] The present disclosure proposes an assembly of engine mounting bracket structure with protector for avoiding twisting to the protector.

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[0044] The present disclosure proposes an assembly of engine mounting bracket structure with protector that increased the clearance of propeller shaft with protector.

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[0045] The present disclosure proposes an assembly of engine mounting bracket structure with protector that increase the tolerance of the protector with the engine mounting bracket the vehicle chassis.

[0046] Furthermore, each of the appended claims defines a separate invention, which for infringement purposes is recognized as including equivalents to the various elements or limitations specified in the claims.

Depending on the context, all references below to the “invention” may in some cases refer to certain specific embodiments only. In other cases, it will be recognized that references to the “invention” will refer to subject matter recited in one or more, but not necessarily all, of the claims.

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[0047] Groupings of alternative elements or embodiments of the invention disclosed herein are not to be construed as limitations. Each group member can be referred to and claimed individually or in any combination with other members of the group or other elements found herein. One or more members
10 of a group can be included in, or deleted from, a group for reasons of convenience and/or patentability. When any such inclusion or deletion occurs, the specification is herein deemed to contain the group as modified thus fulfilling the written description of all groups used in the appended claims.

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[0048] Furthermore, those skilled in the art can appreciate that the terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the present disclosure. It will be appreciated that several of the above-disclosed and
20 other features and functions, or alternatives thereof, may be combined into other systems or applications. Various presently unforeseen or unanticipated alternatives, modifications, variations, or improvements therein may subsequently be made by those skilled in the art without departing from the scope of the present disclosure as encompassed by the following claims.

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[0049] The claims, as originally presented and as they may be amended, encompass variations, alternatives, modifications, improvements, equivalents, and substantial equivalents of the embodiments and teachings
disclosed herein, including those that are presently unforeseen or unappreciated, and that, for example, may arise from applicants/patentees
30 and others.

5 [0050] While the foregoing describes various embodiments of the present disclosure, other and further embodiments of the present disclosure may be devised without departing from the basic scope thereof. The scope of the present disclosure is determined by the claims that follow. The present disclosure is not limited to the described embodiments, versions or examples, which are included to enable a person having ordinary skill in the art to make and use the invention when combined with information and knowledge available to the person having ordinary skill in the art.

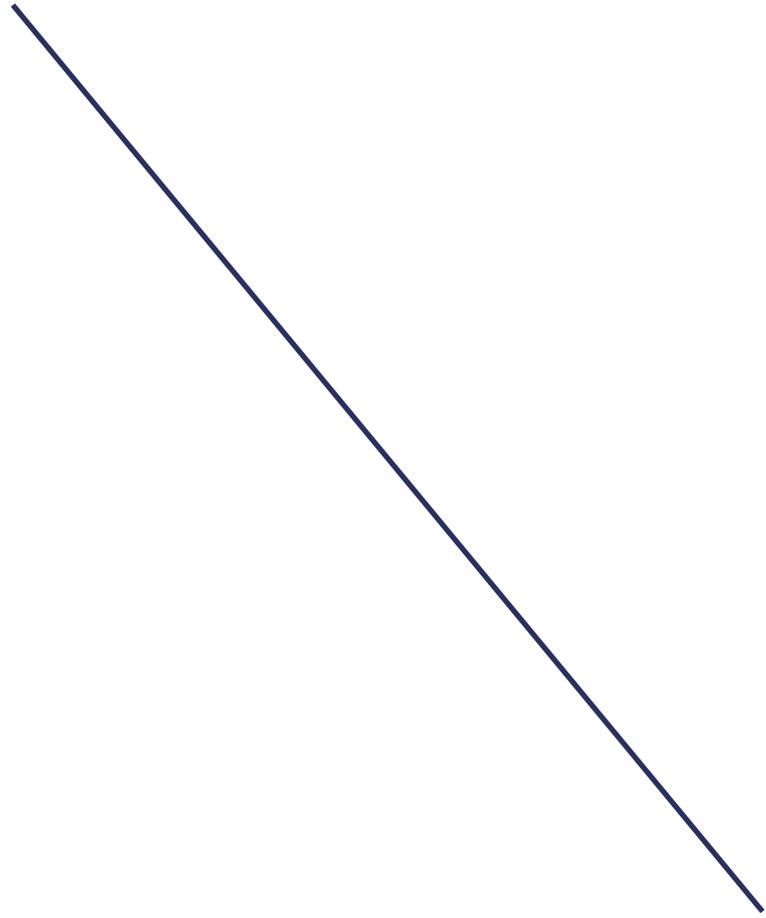
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[0051] List of Reference numerals of the present invention as disclosed in fig. 3

- 300: An engine mounting bracket structure assembly with protector
- 302: U-shaped extending part
- 15 304: a first arm of U-shaped extending part
- 306: lug fixed with anti-rotation slot of second arm of U-shaped extending part
- 308: lug fixed with anti-rotation slot of first arm of U-shaped extending part
- 20 310: First side extending outwardly part
- 312: a first hole
- 314: Second side extending outwardly part
- 316: a second hole
- 318: first hole of the top rectangular curved region
- 25 320: Flanges of the top rectangular curved region
- 322: second hole the top rectangular curved region
- 324: Protector
- 326: side bolt
- 328: top rectangular curved region
- 30 330: a second arm of U-shaped extending part
- 332: An engine mounting bracket

[0052] List of Reference numerals of the present invention as disclosed in
fig. 2

- 5 200: Protector structure
- 202: Top portion
- 204: Lug
- 206: Top portion
- 208: Lug
- 210: Side surface
- 10 212: A hole
- 214: A hole
- 216: Bottom surface
- 218: beads
- 15 220: beads



We Claim:

1. A protector structure (200) to secure a propeller shaft of a vehicle, the protector structure (200) comprising:
5 two top portions (202, 206) wherein one end of the each of the two top portions includes a hole (212) and a lug (204),
 wherein the lug (204) is perpendicular to the top portion (202) and upward to a top surface of the top portion (202),
 wherein the another end of the each of the top portion (202, 206) is
10 extended downward and form a U shape structure,
 wherein beads (218, 220) are provided at a connection of the side surface (210) and a bottom surface (216) of the U shape structure.
2. The protector structure (200) as claimed in claim 1, wherein the holes (214)
15 are provided for mounting the protector structure (200) with an engine mount bracket (100).
3. The protector structure (200) as claimed in claim 1, wherein the lugs (204, 208) are housed in holes (106, 108) provided on the engine mount bracket (100), and wherein the lugs (204, 208) act as locator during assembly of the
20 protector structure (200) with the engine mount bracket (100).
4. The protector structure (200) as claimed in claim 1, wherein the protector structure (200) is a strip type elongated shape protector providing leverage
25 effect to the structure.
5. An assembly (300) of an engine mounting bracket (332) structure with a protector (324) to secure a propeller shaft, the assembly (300) comprising:
 an engine mount bracket (332) that comprises
30 a top rectangular curved region (328), a first side extending outwardly part (310) away from the top rectangular curved region

(328) in outward direction and a second side extending outwardly part (314) away from the top rectangular curved region (328) in outward direction,

5 wherein each of the first and the second extending outwardly parts (310, 314) includes a hole (312, 316) and an anti-rotational slot (106, 108); and

the protector (200) comprising:

two top portions (202, 206) wherein one end of the each of the two top includes a hole (212) and a lug (204),

10 wherein the lug (204) is perpendicular to the top portion and upward to a top surface of the top portions (202, 206),

wherein the another end of the each of the top portions (202, 206) is extended downward and form a U shape structure,

15 wherein beads (218, 220) are provided at a connection of the side surface (210) and a bottom surface (216) of the U shape structure, wherein when the protector (200) is assembled with the engine mount bracket (100) the lugs (204, 208) are housed in the anti-rotational slots (106, 108) and the holes (212, 214) provided on the protector structure (200) are aligned with the holes (312, 316)
20 provided on the first and second extending outwardly parts (310, 328) of the engine mount bracket (332).

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6. The assembly (300) as claimed in claim 1, wherein the protector structure (200) is a strip type elongated shape protector (200) providing leverage effect to the structure.

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ABSTRACT

AN ASSEMBLY OF ENGINE MOUNTING BRACKET WITH PROTECTOR FOR AVOIDING TWISTING OF THE PROTECTOR

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The present disclosure relates a protector structure (200) to secure a propeller shaft of a vehicle. The protector structure (200) includes two top portions (202, 206) wherein one end of the each of the two top includes a hole (212) and a lug (204), wherein the lug is perpendicular to the top portion (202) and upward to a top surface of the top portion (202), wherein the another end of the each of the top portion (202) is extended downward and form a U shape structure, wherein beads (218, 220) are provided at a connection of the side surface (210) and a bottom surface (216) of the U shape structure.

15 Reference figure: FIG. 2

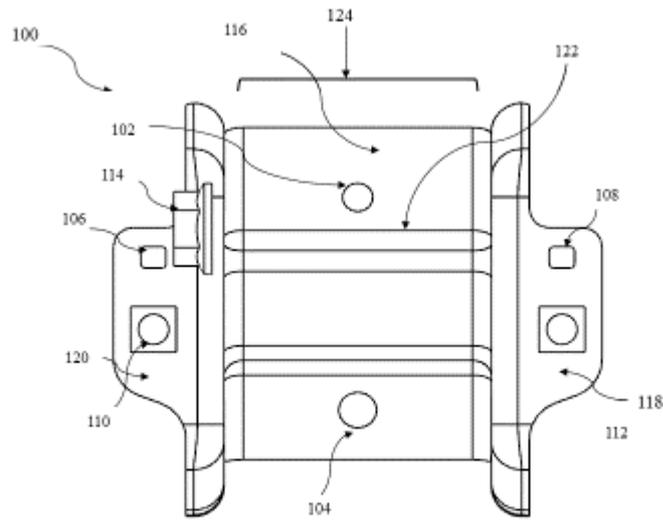


Fig. 1

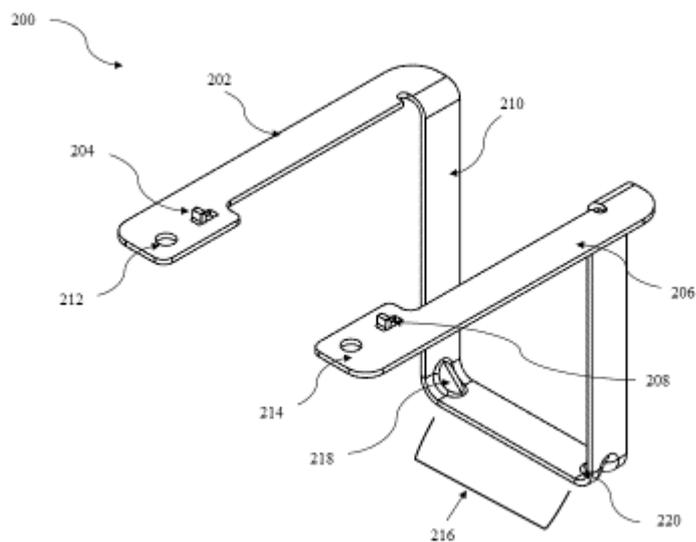


Fig. 2

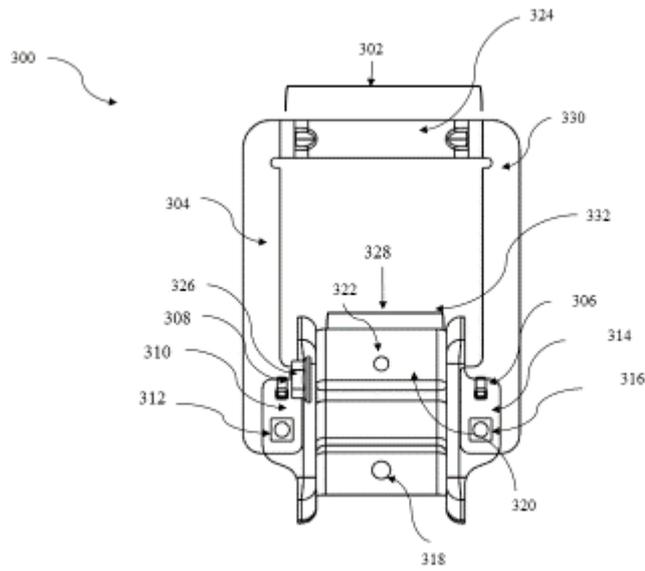


Fig. 3