

Colombia



डिजाइन व्यापार
नैर्भाौगोलिक उपदर्शन



सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
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MINISTRY OF COMMERCE & INDUSTRY
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एवं व्यापार चिह्न की ओर से प्रमाणपत्र हस्ताक्षर व जारी करने के लिए प्राधिकृत अधिकारी हूँ,
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I, the undersigned, being an officer duly authorized to sign and issue the certificate on
behalf of the Controller General of Patents, Designs and Trademarks in accordance with the
provisions of Section 73(3) of the Patents Act, 1970, hereby certify that annexed hereto is
a true copy of the document(s) as filed in connection with the following Patent Application:

(a) आवेदन संख्या/a) Application Number: 202141005417

(b) फाइल करने की तारीख/b) Date of Filing: 09/02/2021

अनुरोधित दस्तावेज़(जों) का नाम:

Name of the document(s) requested: Complete Specification

यह पेटेंट अधिनियम, 1970 की धारा 147(1) के अधीन मुझमें निहित शक्तियों के तहत जारी
किया गया है/This certificate is issued under the powers vested in me U/S 147(1) of The Patents

this 31st day of December 2021

नियंत्रक पेटेंट व डिजाइन/Controller of Patents and Designs
(प्राधिकृत हस्ताक्षरी/Authorised Signatory)

FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 APPLICATION FOR GRANT OF PATENT (See section 7, 54 and 135 and sub-rule (1) of rule 20)				(FOR OFFICE USE ONLY)			
				Application No.			
				Filing date:			
				Amount of Fee paid:			
				CBR No:			
				Signature:			
1. APPLICANT'S REFERENCE/ IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)							
2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]							
Ordinary(✓)			Convention()			PCT-NP()	
Divisional ()	Patent of Addition ()	Divisional ()	Patent of Addition()	Divisional ()	Patent of Addition()		
3A. APPLICANT(S)							
Name in Full		Nationality	Country of Residence	Address of the Applicant			
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				Street			
				City			
				State			
				Country			
				Pin code			
3B. CATEGORY OF APPLICANT [Please tick (✓) at the appropriate category]							
Natural Person ()			Other than Natural Person				
			Small Entity ()	Startup ()	Others (✓)		
4. INVENTOR(S) [Please tick(✓) at the appropriate category]							
Are all the inventor(s) same as the applicant(s) named above		Yes ()			No (✓)		
If "No", furnish the details of the inventor(s)							
Name in Full		Nationality	Country of Residence	Address of the Inventor			

CHINNIWAKKAM RAMESH ASWINKUMAR	Indian	India	House No. Street City State Country Pin code	TVS Motor Company Limited, "Chaitanya", No. 12, Khader Nawaz Khan Road, Nungambakkam, Chennai – 600006
MOHAN SUDARSHAN	Indian	India		
MANICKAM SUBASH	Indian	India		
BALAJI RAVICHANDRAN VIGNESH	Indian	India		
DEEPAK NAGARAJU	Indian	India		

5. TITLE OF THE INVENTION

A FRAME ASSEMBLY

6. AUTHORISED REGISTERED PATENT AGENT(S)

IN/PA No.

Name

Mobile No.

7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA

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8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION

Country	Application Number	Filing date	Name of the applicant	Title of the invention	IPC (as classified in the convention country)

9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY(PCT)

International application number	International filing date

10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION ORIGINAL (FIRST) APPLICATION

Original (first) application No.	Date of filing of original (first) application

11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT

Main application/patent No.	Date of filing of main application

12. DECLARATIONS

(i) Declaration by the inventor(s)

(In case the applicant is an assignee: the inventor(s) may sign herein below or the applicant may upload the assignment or enclose the assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period).

I/We, the above named inventor(s) is/are the true & first inventor(s) for this Invention and declare that the applicant(s) herein is/are my/our assignee or legal representative.

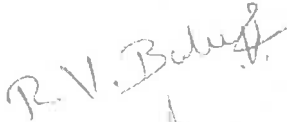
(a) Date

(b) Signature(s)

(c) Name(s)

1. *C.R. Aswinkumar*

CHINNIWAKKAM RAMESH ASWINKUMAR

- | | | |
|----|---|-----------------------------|
| 2. |  | MOHAN SUDARSHAN |
| 3. |  | MANICKAM SUBASH |
| 4. |  | BALAJI RAVICHANDRAN VIGNESH |
| 5. |  | DEEPAK NAGARAJU |

(ii) Declaration by the applicant(s) in the convention country

(In case the applicant in India is different than the applicant in the convention country:

the applicant in the convention country may sign herein below or applicant in India may upload the assignment from the applicant in the convention country or enclose the said assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period)

I/We, the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative:

- (a) Date
- (b) Signature(s)
- (c) Name(s) of the signatory

(iii) Declaration by the applicant(s)

I/We the applicant(s) hereby declare(s) that: -

- I am/We are in possession of the above-mentioned invention.
- The ~~provisional~~/complete specification relating to the invention is filed with this application.
- ~~The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.~~
- There is no lawful ground of objection(s) to the grant of the Patent to me/us.
- ~~I am/we are the true & first inventor(s).~~
- ~~I am/we are the assignee or legal representative of true & first inventor(s).~~
- ~~The application or each of the applications, particulars of which are given in Paragraph 8, was the first application in convention country/countries in respect of my/our invention(s).~~

my/our invention(s).

- I/We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.
- My/our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph 9.
- The application is divided out of my/our application particulars of which is given in Paragraph 10 and pray that this application may be treated as deemed to have been filed on ~~DDMMYYYY~~ under section 16 of the Act.
- The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph 11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

(a) Form 2

Item	Details	Fee	Remarks
Complete/ ~~provisional~~ specification) #	No. of pages - 38		Remarks
No. of Claim(s) -	No. of claim-29 and No. of pages - 7		
Abstract	No. of pages - 1		
No. of Drawing(s) -	No. of drawings - 11 and No. of pages - 9		

~~#In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are required to be mentioned here.~~

~~(b) Complete specification (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).~~

~~(c) Sequence listing in electronic form~~

~~(d) Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).~~

~~(e) Priority document(s) or are quest to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.~~

~~(f) Translation of priority document/Specification/International Search Report/International Preliminary Report on Patentability.~~

~~(g) Statement and Undertaking on Form 3~~

~~(h) Declaration of Inventorship on Form 5~~

~~(i) Power of Authority~~

~~(j).....~~

Total fee ₹ /-in Cash/Banker's Cheque /Bank Draft bearing No.....

Date.....on..... Bank.

I/We hereby declare that to the best of my/our knowledge, information and belief the fact and matters slated herein are correct and I/We request that a patent may be granted to me/us for the said invention.

Dated this 9th day of February 2021

Signature: (Digitally signed by)
Name: : Chandan Chavan
Head IP
TVS Motor Company Ltd.

To,
The Controller of Patents
The Patent Office, at.....

Note: -

- * Repeat boxes in case of more than one entry.
- * To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
- * Name of the inventor and applicant should be given in full, family name in the beginning.
- * Strike out the portion which is/are not applicable.
- * For fee: See First Schedule.

FORM 2

THE PATENTS ACT, 1970

(39 of 1970)

&

The Patents Rules, 2003

COMPLETE SPECIFICATION

(See Section 10 and Rule 13)

A FRAME ASSEMBLY

TVS MOTOR COMPANY LIMITED,

(AN INDIAN COMPANY)

at: "Chaitanya", No. 12, Khader Nawaz Khan Road, Nungambakkam, Chennai –
600006, Tamil Nadu, India.

The following specification particularly describes the invention and the manner in
which it is to be performed.

TECHNICAL FIELD

[0001] The present subject matter relates to a vehicle. More particularly, to a frame assembly of a vehicle.

5

BACKGROUND

[0002] Typically, a frame assembly includes a mainframe extending rearward and obliquely downward from a head pipe. A front wheel is mounted to the head pipe via a front fork. A rear wheel is mounted to the pivot frame via a swing arm. The mainframe, which receives a force applied by the front and rear wheels, is required to
10 have a high bending stiffness and an optimal twisting stiffness.

[0003] The above information disclosed in this Background section is only for enhancement of understanding of the background of the disclosure and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

15

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The present invention is described with reference to an exemplary embodiment of frame assembly for a saddle-type multi-wheeled vehicle. This invention is implementable in two-wheeled vehicles/three-wheeled vehicles or four-
20 wheeled vehicles. The same numbers are used throughout the drawings to reference like features and components. Further, the inventive features of the invention are set forth in the appended claims.

[0005] Non-limiting and non-exhaustive embodiments of the invention are described with reference to the following figures, wherein like reference numerals
25 refer to like parts throughout the various views unless otherwise specified. It should be appreciated that the following figures may not be drawn to scale.

[0006] Descriptions of certain details and implementations follow, including a description of the figures, which may depict some or all of the embodiments described below, as well as a discussion of other potential embodiments or implementations of
30 the inventive concepts presented herein. An overview of embodiments of the invention

is provided below, followed by a more detailed description with reference to the drawings.

[0007] **Figure 1a** illustrates a side view of a vehicle, as per embodiment, in accordance with one example of the present subject matter.

- 5 [0008] **Figure 1b** illustrates a side view and a localized perspective view of a frame assembly (101), as per embodiment, in accordance with one example of the present subject matter.

[0009] **Figure 2** illustrates an exploded view and a perspective localized view of the frame assembly (101) where few parts are omitted from the figure, as per
10 embodiment, in accordance with one example of the present subject matter

[00010] **Figure 3** illustrates a perspective view of the frame assembly (101), where few parts are omitted from the figure, and localized enlarged views of the junction box (105) and the front stiffener member (203) of the frame assembly (101) as per embodiment, in accordance with one example of the present subject matter.

- 15 [00011] **Figure 4** illustrates a side view with an enlarged localized view of a first receiving portion of the junction box (105) and a cut section views across A-A', and B-B' axis where few parts are omitted from the figure, as per embodiment, in accordance with one example of the present subject matter.

[00012] **Figure 5** illustrates a perspective view and side view of a rear suspension
20 mounting member (202), as per embodiment, in accordance with one example of the present subject matter.

[00013] **Figure 6** illustrates a perspective view of the frame assembly (101) where few parts are omitted from the figure, and a localized view of the bridge gusset (201), as per embodiment, in accordance with one example of the present subject matter.

- 25 [00014] **Figure 7** illustrates a localized side view and a top cut section view of the frame assembly (101) across a C-C' axis where few parts are omitted from the figure, as per embodiment, in accordance with one example of the present subject matter.

[00015] **Figure 8** illustrates a right side perspective view of the frame assembly (101) where few parts are omitted from the figure, as per embodiment, in accordance
30 with one example of the present subject matter.

[00016] Figure 9 illustrates a flow chart depicting a method of manufacturing a frame assembly, as per embodiment, in accordance with one example of the present subject matter.

DETAILED DESCRIPTION

5 [00017] In the following description, numerous details are set forth to provide a thorough understanding of the embodiments. One skilled in the relevant art will recognize, however, that the techniques described herein can be practiced without one or more of the specific details, or with other methods, components, materials, etc. In other instances, well-known structures, materials, or operations are not shown or
10 described in detail to avoid obscuring certain aspects.

[00018] A frame assembly forms the skeleton of the saddle type vehicle. The frame assembly includes a head pipe and a main tube. The main tube is extending downwards and rearwards from said head pipe. Typically, to dampen the vibration and shock transmitted to a frame assembly, a suspension system is provided. The suspension
15 system isolates the shocks and improves riding comfort. The selection and configuration of the rear suspension system depends on the intended use of the vehicle, as well as its weight and dimensions. The suspension system includes a mono-shock system which can be a direct mount type or a linkage type. The mono-shock suspension system uses a single suspension unit, rather than the usual two, at the rear of the
20 vehicle. The linkage type mono-shock suspension unit is mounted typically in line with the central plane of the vehicle. More specifically, a lower end portion of the mono-shock suspension unit is attached to a bracket welded to a cross member joining a left and right swing arm member in front of a rear-wheel through a linkage mechanism, while an upper-end portion of the mono-shock suspension unit is attached to a bracket
25 connected to the mainframe of a frame assembly. Importantly, the mainframe is a spline of the frame assembly and configured to have a bend that is subjected to stress under various driving conditions.

[00019] In addition to that, the attachment points of mono-shock suspension unit between the mainframe and the swingarm are subjected to side loads due to braking,
30 acceleration, and cornering. Therefore, these portions have to withstand significant loading and stress. In known arts, to enhance the stiffness and strength of the frame

assembly and the attachment points of the mono-shock suspension unit, plurality of reinforcement brackets and pipes are employed to meet the loading requirements. However, this adversely affects the overall layout of the vehicle including the location of an air cleaner, a fuel tank, and electrical components making it difficult to achieve
5 a compact vehicle layout. This also adversely affects the mounting points of an air cleaner, a fuel tank, and electrical components on the frame assembly which further leads to an undesirable increase in the size of the vehicle in a lateral direction.

[00020] Therefore, it is a challenge for a design engineer to improve the stiffness & strength of the frame assembly without increasing the overall weight of the vehicle
10 that permits reliable attachment points for the mono-shock suspension unit and still achieve a compact vehicle layout.

[00021] To this end, according to one embodiment, it is an object of the present invention to provide a lightweight, compact and cost-effective frame assembly with improved stiffness & strength of the frame assembly to achieve desirable dynamic
15 handling performance of the vehicle.

[00022] According to the present subject matter to attain the above-mentioned objectives, as per a first characteristic of the present invention, a frame assembly comprises of a head pipe, a first frame member, said first frame member extending rearwardly from said head pipe, one or more down frame member, said down frame
20 member extending downwardly from said head pipe, a junction box, said junction box being configured to receive said first frame member, one or more second frame member, said second frame member extending downwardly from said junction box, a pair of left and right seat rails extending rearwardly from said junction box.

[00023] In addition to the first characteristic, a second characteristic of the present
25 invention is a frame assembly, wherein a rear suspension mounting member is connected to said junction box and said one or more second frame member.

[00024] In addition to the first characteristic, a third characteristic of the present invention is a frame assembly, configured with a bridge gusset, said bridge gusset being connected to said pair of seat rails, and to said rear suspension mounting
30 member.

[00025] In addition to the first and second characteristic, a fourth characteristic of the present invention is a frame assembly, configured with a front stiffener member, said front stiffener member being attached to said junction box and said one or more second frame member.

- 5 [00026] In addition to the first characteristic, a fifth characteristic of the present invention is a frame assembly, wherein said junction box comprises of a gusset plate LH and a gusset plate RH.

- [00027] In addition to the first characteristic, a sixth characteristic of the present invention is a frame assembly, wherein each seat rail of said pair of seat rails includes
10 a neutral axis, and wherein a top surface of said rear suspension mounting member vertically extends above said neutral axis.

- [00028] In addition to the first characteristic, a seventh characteristic of the present invention is a frame assembly, wherein said junction box includes a first receiving portion having a substantially circular cross-section capable of receiving a congruent
15 cross section frame member.

[00029] In addition to the first characteristic, an eight characteristic of the present invention is a frame assembly, wherein said junction box includes a middle portion having a substantially rectangular cross-section.

- [00030] In addition to the first characteristic, a ninth characteristic of the present
20 invention is a frame assembly, wherein said junction box includes a rear portion having a truncated rectangular cross-section being configured to receive a plurality of frame members in a top region and a bottom region.

- [00031] In addition to the first and second characteristic, a tenth characteristic of the present invention is a frame assembly, wherein said rear suspension mounting member
25 includes a first extending arm, a second extending arm, and an intermediate top surface, said intermediate top surface connects said first extending arm and said second extending arm, wherein one or more mounting hole is provided on said first extending arm and on said second extending arm, a first flange extending outwardly along a length of said first extending arm and a second flange extending outwardly along a
30 length of said second extending arm, and wherein said first flange and said second flange extends vertically above said one or more mounting hole.

[00032] In addition to the first and third characteristic, an eleventh characteristic of the present invention is a frame assembly, wherein said bridge gusset includes a central portion, a left side portion, and a right side portion, said left side portion and said right side portion extending outwardly from said central portion, said central portion
5 includes a cut-out, said cut-out being configured to receive said rear suspension mounting member, and a connection portion, said connection portion being configured to receive a portion of said junction box.

[00033] In addition to the first and eighth characteristic, a twelfth characteristic of the present invention is a frame assembly, wherein said left side member and said right
10 side member is connected to said pair of left and right seat rails.

[00034] In addition to the first and fourth characteristic, a thirteenth characteristic of the present invention is a frame assembly, wherein said front stiffener member includes a central region, said central region being configured to have one or more holes, and a left side flange, and a right side flange, wherein said left side flange and
15 said right side flange extend sideways from said central region, wherein said left side flange and said right side flange comprise one or more profiles capable of joining to one or more frame components.

[00035] In addition to the first and thirteenth characteristic, a fourteenth characteristic of the present invention is a frame assembly, wherein said left side flange
20 and said right side flange includes a top profile connecting a bottom portion of said junction box.

[00036] In addition to the first and thirteenth characteristic, a fifteenth characteristic of the present invention is a frame assembly, wherein said left side flange and said right side flange includes a center relief for accommodating connection between said
25 junction box and said second frame member.

[00037] In addition to the first and thirteenth characteristic, a sixteenth characteristic of the present invention is a frame assembly, wherein said left side flange and said right side flange include a bottom profile for connecting a top zone of said second frame member.

30 [00038] A seventeenth characteristic of the present invention is a junction box for a frame assembly of a saddle-type vehicle, wherein said junction box comprises of a

gusset plate LH, a gusset plate RH, a first receiving portion formed in a front junction of said gusset plate LH, and said gusset plate RH, a second receiving portion formed in a bottom junction of said gusset plate LH and said gusset plate RH, said second receiving portion includes a second frame receiving recess, a first seat rail receiving recess formed on said gusset plate RH, and a second seat rail receiving recess formed on said gusset plate LH.

[00039] In addition to the seventh characteristic, an eighteenth characteristic of the present invention is a frame assembly, wherein said junction box includes a front receiving portion having a substantially circular cross-section being configured to receive a first frame member.

[00040] In addition to the seventeenth characteristic, a nineteenth characteristic of the present invention is a frame assembly, wherein said junction box includes a middle portion having a substantially rectangular cross-section.

[00041] In addition to the seventeenth characteristic, a twentieth characteristic of the present invention is a frame assembly, wherein said junction box includes a portion having a truncated rectangular cross-section capable of receiving a plurality of frame members in a top region and a bottom region.

[00042] A twenty-first characteristic of the present invention is rear suspension mounting member, said rear suspension mounting member comprising a substantially U-shaped body having a first extending arm, a second extending arm, and an intermediate top surface connecting said first extending arm and said second extending arm, wherein one or more mounting hole is provided on said first extending arm and on said second extending arm, a first flange extending outwardly along a length of said first extending arm and a second flange extending outwardly along a length of said second extending arm, and wherein said first flange and said second flange extends vertically above said one or more mounting hole.

[00043] A twenty-second characteristic of the present invention is a bridge gusset comprising a central portion, a left side portion, and a right side portion, said left side portion and said right side portion extending outwardly from said central portion, said central portion comprising a cut-out, said central portion being configured to receive

a rearwardly connecting frame member and a connection portion capable of receiving a forwardly connecting frame member.

[00044] A twenty-third characteristic of the present invention is a front stiffener member comprising a central region being configured to have one or more holes, a left side flange, and a right side flange, wherein said left side flange and said right side flange extends sideways from said central region, said left side flange and said right side flange includes a top profile, a bottom profile, and a bottom portion.

[00045] A twenty-fourth characteristic of the present invention is a saddle-type vehicle comprising a frame assembly having a head pipe, a first frame member extending rearwardly from said head pipe, one or more down frame extending downwardly from said head pipe, a junction box capable of receiving said first frame member, one or more second frame member extending downwardly from said junction box, a pair of seat rails extending rearwardly from said junction box, a rear suspension mounting member connected to said junction box, and said one or more second frame member, a bridge gusset connecting said pair of seat rails, said bridge gusset attached to said rear suspension mounting member, and a front stiffener member attached to said junction box and said one or more second frame member; an air cleaner disposed rearwardly of said rear suspension mounting member, wherein said air cleaner is mounted to an air cleaner mounting hole of said junction box; a battery holder disposed forwardly of said rear suspension mounting member, wherein said battery holder is mounted to a battery holder mounting hole of said junction box.

[00046] In addition to the twenty-fourth characteristic, a twenty-fifth characteristic of the present invention is a saddle-type vehicle, wherein said rear suspension mounting member comprises one or more mounting holes for mounting a shock absorber, wherein said one or more mounting holes are disposed rearwardly of said air cleaner mounting hole and said battery holder mounting hole when seen from a side of said vehicle.

[00047] In addition to the twenty-fourth characteristic, a twenty-sixth characteristic of the present invention is a saddle-type vehicle, wherein said frame assembly comprises a pair of left and right downwardly extending second frame members

attached to said junction box, wherein a tray being configured to receive one or more electronic components being disposed over a top surface of said junction box.

[00048] A twenty-seventh characteristic of the present invention is a method of manufacturing of a frame assembly, wherein said method comprises the steps of
5 Constructing a junction box; and joining one or more frame members to said junction box.

[00049] In addition to the twenty-seventh characteristic, a twenty-eighth characteristic of the present invention is a method of manufacturing of a frame assembly, wherein constructing said junction box comprises steps of forming a gusset
10 plate LH and a gusset plate RH; and joining said formed gusset plate LH and said gusset plate RH.

[00050] In addition to the twenty-eighth characteristic, a twenty-ninth characteristic of the present invention is the method of manufacturing of a frame assembly, wherein said joining one or more frame members to said junction box comprises steps of
15 joining a first frame member and second frame member to said junction box; joining a pair of seat rails to said junction box; joining a rear suspension mounting bracket to said junction box and said second frame member; joining a bridge gusset to said junction box and said pair of seat rails; and joining a front stiffener to said junction box and said, second frame member.

20 [00051] The present subject matter is further described with reference to accompanying figures. It should be noted that the description and figures merely illustrate the principles of the present subject matter. Various arrangements may be devised that, although not explicitly described or shown herein, encompass the principles of the present subject matter. Moreover, all statements herein reciting
25 principles, aspects, and examples of the present subject matter, as well as specific examples thereof, are intended to encompass equivalents thereof.

[00052] The foregoing disclosure is not intended to limit the present disclosure to the precise forms or particular fields of use disclosed. As such, it is contemplated that various alternate embodiments and/or modifications to the present disclosure, whether
30 explicitly described or implied herein, are possible in light of the disclosure. Having thus described embodiments of the present disclosure, a person of ordinary skill in the

art will recognize that changes may be made in form and detail without departing from the scope of the present disclosure. Thus, the present disclosure is limited only by the claims.

[00053] In the foregoing specification, the disclosure has been described with
5 reference to specific embodiments. However, as one skilled in the art will appreciate, various embodiments disclosed herein can be modified or otherwise implemented in various other ways without departing from the spirit and scope of the disclosure. Accordingly, this description is to be considered as illustrative and is for the purpose of teaching those skilled in the art the manner of making and using various
10 embodiments of the disclosure. It is to be understood that the forms of the disclosure herein shown and described are to be taken as representative embodiments. Equivalent elements, materials, processes or steps may be substituted for those representatively illustrated and described herein. Moreover, certain features of the disclosure may be utilized independently of the use of other features, all as would be apparent to one
15 skilled in the art after having the benefit of this description of the disclosure. Expressions such as “including”, “comprising”, “incorporating”, “consisting of”, “have”, “is” used to describe and claim the present disclosure are intended to be construed in a non-exclusive manner, namely allowing for items, components or elements not explicitly described also to be present. Reference to the singular is also
20 to be construed to relate to the plural.

[00054] Further, various embodiments disclosed herein are to be taken in the illustrative and explanatory sense, and should in no way be construed as limiting of the present disclosure. All joinder references (e.g., attached, affixed, coupled, connected, etc.) are only used to aid the reader's understanding of the present
25 disclosure, and may not create limitations, particularly as to the position, orientation, or use of the systems and/or methods disclosed herein. Therefore, joinder references, if any, are to be construed broadly. Moreover, such joinder references do not necessarily infer that two elements are directly connected to each other.

[00055] Additionally, all numerical terms, such as, but not limited to, “first”,
30 “second”, “third”, “primary”, “secondary”, “main” or any other ordinary and/or numerical terms, should also be taken only as identifiers, to assist the reader's

understanding of the various elements, embodiments, variations and/or modifications of the present disclosure, and may not create any limitations, particularly as to the order, or preference, of any element, embodiment, variation and/or modification relative to, or over, another element, embodiment, variation and/or modification.

5 [00056] It will also be appreciated that one or more of the elements depicted in the drawings/figures can also be implemented in a more separated or integrated manner, or even removed or rendered as inoperable in certain cases, as is useful in accordance with a particular application. Additionally, any signal hatches in the drawings/figures should be considered only as exemplary, and not limiting, unless otherwise specifically
10 specified.

[00057] The embodiments of the present invention will now be described in detail with reference to the accompanying drawings.

[00058] **Figure 1a** illustrates a side view of a vehicle, as per embodiment, in accordance with one example of the present subject matter. **Figure 1b** illustrates a side
15 view and a localized perspective view of a frame assembly (101), as per embodiment, in accordance with one example of the present subject matter. For sake of brevity, figure 1a and figure 1b will be discussed together. The invention will be described by taking a saddle-type two-wheeled vehicle as an example through the specification. As indicated in Figure 1a, this saddle type two-wheeled vehicle (100) (hereinafter
20 “vehicle”) has, for example, the frame assembly (101) to support different parts of said vehicle (100).

[00059] As illustrated in figure 1b, the frame assembly (101) includes a head pipe (102), one or more down frame member (110), a first frame member (103), a second frame member (104), a junction box (105), and a pair of left and right seat rails (106L,
25 106R).

[00060] As per the illustrated embodiment shown in figure 1a, the head pipe (102) supports a steering shaft (not shown) rotatably in a certain range. In an upper portion of the head pipe (102), a handlebar (117) is rotatably integrally connected to the steering shaft (not shown). The handlebar (117) is used to steer the vehicle (100) and
30 is connected to a front wheel (118) through the steering shaft (not shown). An upper portion of the front wheel (118) is covered by a front fender (119) which prevents mud

and water from getting deflected towards the steering shaft (not shown). Further, a front fork assembly (120) is supported partially on the front fender (119) and is connected to the front wheel (118). In a front portion of the frame assembly (101) a fuel tank (121) is arranged immediately behind the handlebar (117) and is disposed over an internal combustion engine, hereinafter 'engine' (122). A seat (123) is placed behind the fuel tank (121). The seat (123) includes a front rider portion and rear pillion portion. For the safety of the rider and in conformance with the traffic rules, a headlamp unit (116) and a turn signal lamp unit (115) is provided in a front portion of the vehicle (100). The headlamp unit (116) and the turn signal lamp unit (115) are housed in a headlamp housing assembly (124). Further, suspension systems are provided for comfortable steering of the vehicle (100) on the road. The front fork assembly (120), which forms the front suspension system, serves as a rigidity component just like the frame assembly (101). The front fork assembly (120) is clamped to the head pipe (102) through an upper bracket (114a) and a lower bracket (114b) and is capable of being moved to the left and right. Further, a rear suspension assembly (108) is operatively connected to the frame assembly (101). As per preferred embodiment, the rear suspension assembly (108) is of direct mount mono-shock configuration that uses a single shock absorber (108A). As per the illustrated embodiment, one end of the single shock absorber (108A) is attached to the junction box (105), while the other end of the single shock absorber (108A) is attached to a swing arm (111). The engine (122) is mounted to the frame assembly (101). The engine (122) is equipped with an exhaust system that includes an exhaust pipe (not shown) connected to the engine (122) and a muffler (not shown) connected to the exhaust pipe. The muffler (not shown) extends rearwards along the right side of a rear-wheel (113). Power from the engine (122) is transmitted to the rear wheel (113) through a transmission assembly (not shown), to drive and rotate the rear wheel (113). Particularly, the speed change is achieved by the operation of a gear shift linkage assembly (112) which is operatively connected to a gear shift shaft (not shown). Thus, power from the engine (122) is transmitted to the rear wheel (113) rotatably supported at a rear end of a swing arm (111). A rear fender (109) for covering an upper side of the rear wheel (113) is mounted to a rear portion of the frame assembly (101) to prevent

mud and water splashed by the rotating rear wheel (113) from entering the muffler, the engine (122) and other parts disposed of close by.

[00061] As per the illustrated embodiment shown in figure 1b, the first frame member (103) extends rearwardly from the head pipe (102) along the longitudinal direction (L-L') of the vehicle (100). Further, the second frame member (104) includes a pair of left and right second frame members (104L, 104R). The pair of left and right second frame members (104L, 104R) extend obliquely downward from the junction box (105). A down frame member (110) is extending downwardly from the head pipe (102). Furthermore, the pair of left and right seat rails (106L, 106R) are extending rearwardly from the junction box (105). As per preferred embodiment, the pair of left and right seat rails (106L, 106R) are welded to the junction box (105). The pair of left and right seat rails (106L, 106R) are connected to the pair of left and right second frame members (104L, 104R) through a pair of left and right cross members (107L, 107R).

[00062] Figure 2 illustrates an exploded view and a perspective localized view of the frame assembly (101) where few parts are omitted from the figure, as per embodiment, in accordance with one example of the present subject matter. As per the illustrated embodiment, the junction box (105) is made of two equal halves of gusset plate LH (105L) and a gusset plate RH (105R). As per an additional embodiment, the gusset plate LH (105L) and the gusset plate RH (105R) are configured to have one or more mounting holes (105AH, 105BH). As per the illustrated embodiment, the mounting holes (105AH, 105BH) include air cleaner mounting holes (105AH) and battery mounting holes (105BH). The junction box (105) connects the first frame member (103), the pair of left and right second frame members (104L, 104R), and the pair of left and right seat rails (106L, 106R). Further, the frame assembly (101) includes a bridge gusset (201), a rear suspension mounting member (202), and a front stiffener member (203). As per preferred embodiment, the bridge gusset (201) is attached to the rear suspension mounting member (202) and connects the pair of left and right seat rails (106L, 106R). Further, the front stiffener member (203) is attached to the junction box (105) and the pair of left and right second frame members (104L, 104R).

[00063] **Figure 3** illustrates a perspective view of the frame assembly (101), where few parts are omitted from the figure, and localized enlarged views of the junction box (105) and the front stiffener member (203) of the frame assembly (101) are shown as per an embodiment, in accordance with one example of the present subject matter. The front stiffener member (203) is configured to have a central region (203A), a left side flange (203L), and a right side flange (203R). The left side flange (203L) and the right side flange (203R) extend sideways from the central region (203A). The central region (203A) is configured to have one or more holes (203H). As per the illustrated embodiment, the central region (203A) has two holes. The left side flange (203L) and said right side flange (203R) comprises one or more profiles capable of joining to one or more frame components. As per preferred embodiment, the left side flange (203L) and the right side flange (203R) include a top profile (203LT, 203RT) connecting a bottom portion (105BJ) of said junction box (105). The left side flange (203L) and said right side flange (203R) include a center relief (203LC, 203RC) for accommodating connection between the junction box (105) and the pair of left and right second frame members (104L, 104R). The left side flange (203L) and said right side flange (203R) include a bottom profile (203LB, 203RB) for connecting a top zone (104LT) of said pair of left second frame member (104L), and a top zone (not shown) of right second frame member (104R).

[00064] **Figure 4(a)** illustrates a side view with an enlarged localized view of the first receiving portion of the junction box (105) and cut section views across A-A', and B-B' axis where few parts are omitted from the figure, as per embodiment, in accordance with one example of the present subject matter. As per preferred embodiment, the junction box (105) includes a first receiving portion (105F), a middle portion (105M), and a second receiving portion (105S). Further, a first receiving portion (105F) is formed towards a front junction of said gusset plate LH (105L) and said gusset plate RH (105R). The first receiving portion (105F) is configured to have a substantially circular cross-sectional profile. The circular profile is configured to receive the first frame member (103) (as shown in figure 2) having a congruent cross-section. The middle portion (105M) of the junction box (105) is configured with a substantially rectangular cross-section as shown in figure 4 (b). The second receiving

portion (105S) is formed in a bottom junction of said gusset plate LH (105L) and said gusset plate RH (105R). The second receiving portion (105S) is configured with a truncated and substantially polygonal cross-section as shown in figure 4(c). The truncated cross-section is capable of receiving a plurality of frame members in a top region and a bottom region. As per the illustrated embodiment, the bottom region of the second receiving portion (105S) is configured to have a second frame receiving recess (105B). The second frame receiving recess (105B) is configured to receive the pair of left and right second frame members (104L, 104R) (as shown in figure 2). Further, a top region of the second receiving portion (105S) is configured to have a first seat rail receiving recess (105LR) formed on said gusset plate RH (105R) and a second seat rail receiving recess (105RR) formed on said gusset plate LH (105L).

[00065] Figure 5 illustrates a perspective view and side view of a rear suspension mounting member (202), as per embodiment, in accordance with one example of the present subject matter. The rear suspension mounting member (202) is configured to have a substantially inverted U – shaped body. The U shaped body includes a first extending arm (202A), a second extending arm (202B), and an intermediate top surface (202C). The intermediate top surface (202C) connects the first extending arm (202A) and the second extending arm (202B) forming the inverted U profile. The first extending arm (202A) and the second extending arm (202B) are configured to have one or more mounting hole (202AH, 202BH). As per the illustrated embodiment, the first extending arm (202A) and the second extending arm (202B) are having one mounting hole. Further, a first flange (202AF) extends outwardly along the length of the first extending arm (202A), and a second flange (202BF) extends outwardly along the length of the second extending arm (202B). Importantly, as per preferred embodiment, the first flange (202AF) and the second flange (202BF) extend vertically above one or more mounting hole (202AH, 202BH). Each seat rail of the pair of seat rails (106L, 106R) comprises a neutral axis (E-E'), and wherein a per an embodiment, a top surface (202C) of said rear suspension mounting member (202) vertically extends above said neutral axis (E-E').

[00066] Figure 6 illustrates a perspective view of the frame assembly (101) where few parts are omitted from the figure, and a localized view of the bridge gusset (201),

as per embodiment is shown, in accordance with one example of the present subject matter. The bridge gusset (201) is configured to have a central portion (201A), a left side portion, and a right portion (201L, 201R). The left side portion (201L) and the right side portion (201R) extending outwardly from the central portion (201A). The central portion (201A) is provided with a cut-out (201C). The cut-out (201C) is capable of receiving the rear suspension mounting member (202). Further, one or more mounting holes provided in the rear suspension mounting member (202) for mounting a single shock absorber unit (108A) (as shown in figure 1), are disposed rearwardly of said air cleaner mounting holes (105AH) (as shown in figure 2) and said battery holder mounting holes (105BH) when seen from a side of said vehicle (100). Further, the bridge gusset (201) is configured to have a connection portion (201B). The connection portion (201B) is capable of receiving a portion of the junction box (105). The central portion (201A) is connected to the left side portion (201L) and the right side portion (201R). As per the illustrated embodiment, the left side portion (201L) and the right side portion (201R) are connected to a pair of left and right seat rails (106L, 106R).

[00067] Figure 7 illustrates a localized side view and a top cut section view of the frame assembly (101) across a C-C' axis where few parts are omitted from the figure, as per embodiment, in accordance with one example of the present subject matter. The air cleaner (701) and the battery holder (702) are attached to the junction box (105). More specifically, the battery holder (702) is disposed at least partially forwardly of the rear suspension mounting member (202) in front to rear direction of the vehicle (100). Further, the air cleaner (701) is disposed rearwardly of the rear suspension mounting member (202) in front to rear direction of the vehicle (100).

[00068] Figure 8 illustrates a right side perspective view of the frame assembly (101) where few parts are omitted from the figure, as per embodiment, in accordance with one example of the present subject matter. One or more electronic component (not shown) is disposed over the top portion of the junction box (105). As per the illustrated embodiment, a tray (801) is detachably attached to the top portion of the junction box (105). The plurality of electronic components (not shown) is positioned on the tray (801).

[00069] Figure 9 illustrates a flow chart depicting a method of manufacturing a frame assembly, as per embodiment, in accordance with one example of the present subject matter. The method of manufacturing the frame assembly comprises steps of constructing a junction box (105) at step (S101), and at step (S102) joining the frame members to the junction box to form the frame assembly. The method of constructing a junction box includes sub-steps of forming a gusset plate LH and a gusset plate RH (step S101A) and at step (S101B) joining the formed gusset plate LH and the gusset plate RH. More specifically, the gusset plate LH and the gusset plate RH is joined at a front end and a rear end thereof. This forms a first receiving portion and a second receiving portion configured to receive a first frame member and a second frame member respectively. Subsequent to step (S101B), At step (S102), joining one or more frame members to said junction box includes sub-steps of joining the first frame member and the second frame member to said junction box (S102A). More specifically, the first receiving portion is configured to receive said first frame member, and said second receiving portion is configured to receive one or more-second frame member. At step (S102B) pair of seat rails is joined to said junction box. Specifically, the pair of left and right seat rails are joined to said gusset plate LH and said gusset plate RH. At step (S102C) joining a front end of a rear suspension mounting member to said gusset plate LH and said gusset plate RH and joining a top surface of rear suspension mounting member to a bridge gusset. At step (S102D), joining the bridge gusset to said gusset plate LH and said gusset plate RH at a front end thereof and pair of said seat rails sideways thereof. At step (S102E) joining a front stiffener to said gusset plate LH and said gusset plate RH at a top end thereof, and to said one or more second frame member at a bottom end thereof.

25 [00070] According to the above architecture, one of the primary efficacies of the present invention is the compact frame assembly. The junction box includes a plurality of attachment points. The attachment points are configured to receive two or more devices including battery, air cleaner device thereby eliminating plurality of mounting structure required to mount two or more devices. This permits maximum space utilization to accommodate other parts based on the user's customized needs.

[00071] According to the above architecture, one of the primary efficacies of the present invention is the improved lightweight frame assembly. The junction box eliminates the bend in the mainframe member thereby reduces the length and the stress in the mainframe member. Therefore, eliminates the need for a plurality of reinforced structure required to strengthen the construction of the frame assembly. This reduces the overall weight of the frame assembly.

[00072] According to the above architecture, one of the primary efficacies of the present invention is the reliable mounting of the mono-shock absorber. The mono-shock absorber is attached directly to the junction box through the rear suspension mounting member and the bridge gusset which reinforces the attachment point to resist the loads encountered during different riding/driving conditions. Further, the junction box has a good overall rigidity and high strength due to predetermined shape including a rectangular cross-section at the middle. Further, top surface of the junction box enables mounting of the tray member which provides improved access feature during serviceability. Since a plurality of electronic components is located on the top portion of the junction box, the above-mentioned configuration provides ease of accessibility during a diagnostic test of the vehicle.

[00073] The above-described embodiments, and particularly any "preferred" embodiments, are possible examples of implementations and merely set forth for a clear understanding of the principles of the invention. It will be apparent to those skilled in the art that changes in form, connection, and detail may be made therein without departing from the spirit and scope of the invention.

List of Reference

100 - Vehicle	30 105 - Junction box
25 101 - Frame assembly	105B - Second frame receiving recess
102 - Head pipe	105F - First receiving portion
103 - First frame member	105M - Middle portion
104L, 104R - a pair of left and right second frame member	105R - Second receiving portion

	105L - Gusset plate LH		114a - Upper bracket
	105LR - First seat rail receiving recess	25	114b - Lower bracket
	105LS - Second receiving portion		115 - Turn signal lamp unit
5	105R - Gusset plate RH		116 - Head lamp unit
	105RR - Second seat rail receiving recess		117 - Handlebar
	105AH - Air cleaner mounting holes	30	118 - Front wheel
	105BH - Battery holder mounting		119 - Front fender
10	holes		120 - Front fork assembly
	105BJ - Bottom portion of junction box		121 - Fuel tank
	106L, 106R - a pair of left and right seat rails		122 - Engine
15	107L, 107R - a pair of left and right cross members	35	123 - Seat
	108 - Rear suspension assembly		124 - Headlamp housing assembly
	108A - Single shock absorber		201 - Bridge gusset
	109 - Rear fender		201A - Central portion
20	110 - Down frame member	40	201B - Connection portion
	111 - Swing arm		201C - Cut-out
	112 - Gear shift linkage assembly		201L - Left side portion
	113 - Rear wheel		201R - Right side portion
			202 - Rear suspension mounting member
			202A - First extending arm

202AF - First flange

202AH - Mounting hole

202B - Second extending arm

202BF - Second flange

5 202BH- Mounting hole

202C - Intermediate top surface

203 - Front stiffener member

203A - Central region

203L - Left side flange

10 203R - Right side flange

203H - One or more holes

203LT, 203RT - Top profile of Left
side and right side flange

203LC, 203RC - Centre relief

15 701 - Air cleaner

702 - Battery holder

801 - Tray

20

25

We Claim:

1. A frame assembly (101) comprising:
 - a head pipe (102),
 - a first frame member (103), said first frame member (103) extending rearwardly from said head pipe (102),
 - one or more down frame member (110), said down frame member (110) extending downwardly from said head pipe (102),
 - a junction box (105), said junction box (105) being configured to receive said first frame member (103),
 - one or more second frame member (104), said second frame member (104) extending downwardly from said junction box (105), and
 - a pair of left and right seat rails (106L, 106R) extending rearwardly from said junction box (105).
2. The frame assembly (101) as claimed in claim 1, wherein said frame assembly includes a rear suspension mounting member (202), said rear suspension mounting member (202) being connected to said junction box (105) and said one or more second frame member (104).
3. The frame assembly (101) as claimed in claim 1, wherein said frame assembly includes a bridge gusset (201), said bridge gusset (201) being connected to said pair of left and right seat rails (106L, 106R), and to said rear suspension mounting member (202).
4. The frame assembly (101) as claimed in claim 1 or claim 2, wherein said frame assembly includes a front stiffener member (203), said front stiffener member (203) attached to said junction box (105) and said one or more second frame member (104).
5. The frame assembly (101) as claimed in claim 1, wherein said junction box (105) comprises a gusset plate LH (105L) and a gusset plate RH (105R).
6. The frame assembly (101) as claimed in claim 1, wherein each seat rail of said pair of seat rails (106L, 106R) comprises a neutral axis (E-E'), and

wherein a top surface of said rear suspension mounting member (202) vertically extends above said neutral axis (E-E').

7. The frame assembly (101) as claimed in claim 1, wherein said junction box (105) includes a first receiving portion (105F) having a substantially circular cross-section capable of receiving a congruent cross section frame member.

8. The frame assembly (101) as claimed in claim 1, wherein said junction box (105) includes a middle portion (105M) having a substantially rectangular cross-section.

9. The frame assembly (101) as claimed in claim 1, wherein said junction box (105) includes a rear portion (105R) having a truncated rectangular cross-section being configured to receive a plurality of frame members in a top region and a bottom region.

10. The frame assembly (101) as claimed in claim 2, wherein said rear suspension mounting member (202) includes

a first extending arm (202A),

a second extending arm (202B), and

an intermediate top surface (202C), said intermediate top surface (202C) connects said first extending arm (202A) and said second extending arm (202B),

wherein one or more mounting hole (202AH, 202BH) being provided on said first extending arm (202A) and on said second extending arm (202B),

a first flange (202AF) extending outwardly along a length of said first extending arm (202A) and a second flange (202B) extending outwardly along a length of said second extending arm (202B), and

wherein said first flange (202A) and said second flange (202B) extends vertically above said one or more mounting hole (202AH, 202BH).

11. The frame assembly (101) as claimed in claim 3, wherein said bridge gusset (201) includes

a central portion (201A),

- a left side portion (201L), and
a right side portion (201R), said left side portion (201L), and said right side portion (201R) extending outwardly from said central portion (201A),
said central portion (201A) comprising a cut-out (201C) being
5 configured to receive said rear suspension mounting member (202), and
a connection portion (201B), said connection portion (201B) being
configured to receive a portion of said junction box (105).
12. The frame assembly (101) as claimed in claim 8, wherein said left side member (201L) and said right side member (201R) are connected to said pair
10 of left and right seat rails (106L, 106R).
13. The frame assembly (101) as claimed in claim 4, wherein said front stiffener member (203) includes
a central region (203A), said central region (203A) being configured to
have one or more holes (203H), and
15 a left side flange (203L), and
a right side flange (203R),
wherein said left side flange (203L) and said right side flange (203R) extends sideways from said central region (203A),
wherein said left side flange (203L) and said right side flange
20 (203R) comprises one or more profiles capable of joining to one or more
frame components.
14. The frame assembly (101) as claimed in claim 13, wherein said left side flange (203L) and said right side flange (203R) includes a top profile (203LT, 203RT) connecting a bottom portion of said junction box (105).
- 25 15. The frame assembly (101) as claimed in claim 13, wherein said left side flange (203L) and said right side flange (203R) includes a center relief (203LC, 203RC) for accommodating connection between said junction box (105) and said second frame member (104).
16. The frame assembly (101) as claimed in claim 13, wherein said left side
30 flange (203L) and said right side flange (203R) includes a bottom profile

(203LB, 203RB) for connecting a top zone (104RT, 104LT) of said second frame member (104).

17. A junction box (105) for a frame assembly (101) of a saddle-type vehicle (100), said junction box (105) comprising:

- 5 a gusset plate LH (105L),
- a gusset plate RH (105R),
- a first receiving portion (105F) formed in a front junction of said gusset plate LH (105L), and said gusset plate RH (105R),
- a second receiving portion (105S) formed in a bottom junction of said
- 10 gusset plate LH (105L) and said gusset plate RH (105R), said second receiving portion (105S) includes
- a second frame receiving recess (105B),
- a first seat rail receiving recess (105LR) formed on said gusset plate RH (105R), and
- 15 a second seat rail receiving recess (105RR) formed on said gusset plate LH (105L).

18. The junction box (105) for a frame assembly (101) of a saddle-type vehicle (100), as claimed in claim 17, wherein said junction box (105) includes a front receiving portion (105F) having a substantially circular cross-section being

20 configured to receive a first frame member (103).

19. The junction box (105) for a frame assembly (101) of a saddle-type vehicle (100), as claimed in claim 17, wherein said junction box (105) includes a middle portion (105M) having a substantially rectangular cross-section.

20. The junction box (105) for a frame assembly (101) of a saddle-type vehicle (100), as claimed in claim 17, wherein said junction box (105) includes a

25 portion (105R) having a truncated rectangular cross-section capable of receiving a plurality of frame members in a top region and a bottom region.

21. A rear suspension mounting member (202), said rear suspension mounting member (202) comprising: a substantially U-shaped body having a first

30 extending arm (202A), a second extending arm (202B) and an intermediate top surface (202C) connecting said first extending arm (202A) and said

second extending arm (202B), wherein one or more mounting hole (202BH) is provided on said first extending arm (202A) and on said second extending arm (202B), a first flange (202AF) extending outwardly along a length of said first extending arm (202A) and a second flange (202BF) extending outwardly along a length of said second extending arm (202B), and wherein said first flange (202AF) and said second flange (202BF) extend vertically above said one or more mounting hole (202BH).

22. A bridge gusset (201) comprising a central portion (201A), a left side portion (201L) and a right side portion (201R), said left side portion (201L) and said right side portion (201R) extending outwardly from said central portion (201A), said central portion (201A) comprising a cut-out (201C), said central portion being configured to receive a rearwardly connecting frame member and a connection portion (201B) capable of receiving a forwardly connecting frame member.

23. A front stiffener member (203) comprising :
a central region (203A) being configured to have one or more holes (203H),
a left side flange (203L), and a right side flange (203R), wherein said left side flange (203L) and said right side flange (203R) extends sidewardly from said central region (203A), said left side flange (203L) and said right side flange (203R) includes a top profile (203LT, 203RT), a bottom profile (203LB, 203RB).

24. A saddle-type vehicle (100) comprising:
a frame assembly (101) having a head pipe (102),
a first frame member (103) extending rearwardly from said head pipe (102),
one or more down frame (110) extending downwardly from said head pipe (102),
a junction box (105) capable of receiving said first frame member (103),
one or more second frame member (104) extending downwardly from said junction box (105),

a pair of seat rails (**106R, 106L**) extending rearwardly from said junction box (**105**),

a rear suspension mounting member (**202**) connected to said junction box (**105**), and said one or more second frame member (**104**),

5 a bridge gusset (**201**) connecting said pair of seat rails (**106R, 106L**), said bridge gusset (**201**) attached to said rear suspension mounting member (**203**), and

a front stiffener member (**203**) attached to said junction box (**105**) and said one or more second frame member (**104**);

10 an air cleaner (**701**) disposed rearwardly of said rear suspension mounting member (**202**), wherein said air cleaner (**701**) being mounted to an air cleaner mounting hole (**105AH**) of said junction box (**105**);

a battery holder (**702**) disposed forwardly of said rear suspension mounting member (**202**), wherein said battery holder (**702**) being mounted to
15 a battery holder mounting hole (**105BH**) of said junction box (**105**).

25. The saddle-type vehicle as claimed in claim 24, wherein said rear suspension mounting member (**202**) comprises one or more mounting holes (**202AH, 202BF**) for mounting a shock absorber (**108**), wherein said one or more mounting holes (**202AH, 202BH**) are disposed rearwardly of said air cleaner mounting hole (**105AH**) and said battery holder mounting hole (**105BH**)
20 when seen from a side of said vehicle (**100**).

26. The saddle-type vehicle (**100**) as claimed in claim 24, wherein said frame assembly (**101**) comprises a pair of left and right downwardly extending second frame members (**104L, 104R**) attached to said junction box (**105**),
25 wherein a tray (**801**) being configured to receive one or more electronic components being disposed over a top surface of said junction box (**105**).

27. A method of manufacturing of a frame assembly, wherein said method comprises the steps of:

Constructing a junction box (Step **S101**); and

30 Joining one or more frame members to said junction box (Step **S102**).

28. The method of manufacturing of a frame assembly as claimed in claim 27,
wherein constructing said junction box comprises steps of
forming a gusset plate LH and a gusset plate RH (Step **S101A**); and
joining said formed gusset plate LH and said gusset plate RH (Step **S101B**).

5 29. The method of manufacturing of a frame assembly as claimed in claim 27,
wherein said joining one or more frame members to said junction box
comprises steps of :

Joining a first frame member and second frame member to said junction box
(Step **S102A**);

10 Joining a pair of seat rails to said junction box (Step **S102B**);

Joining a rear suspension mounting bracket to said junction box and said
second frame member (Step **S102C**);

Joining a bridge gusset to said junction box and said pair of seat rails (Step
S102D); and

15 Joining a front stiffener to said junction box and said second frame member
(Step **S102E**).

20 **Dated this 9th day February of 2021**

(DIGITALLY SIGNED)

Chandan Chavan

Head IP

25 TVS Motor Company Limited

ABSTRACT

A FRAME ASSEMBLY

5 The present invention is related to a frame assembly (101). The frame assembly (101) includes a junction box (105) being configured to receive said first frame member (103), a second frame member (104), and a pair of left and right seat rails (106L, 106R). The junction box (105) includes a plurality of attachment points. The attachment points are configured to receive two or more devices including battery, air cleaner device thereby
10 eliminates plurality of mounting structure required to mount two or more devices. This reduces the overall weight of the frame assembly (101).

< To be published with Fig.1>

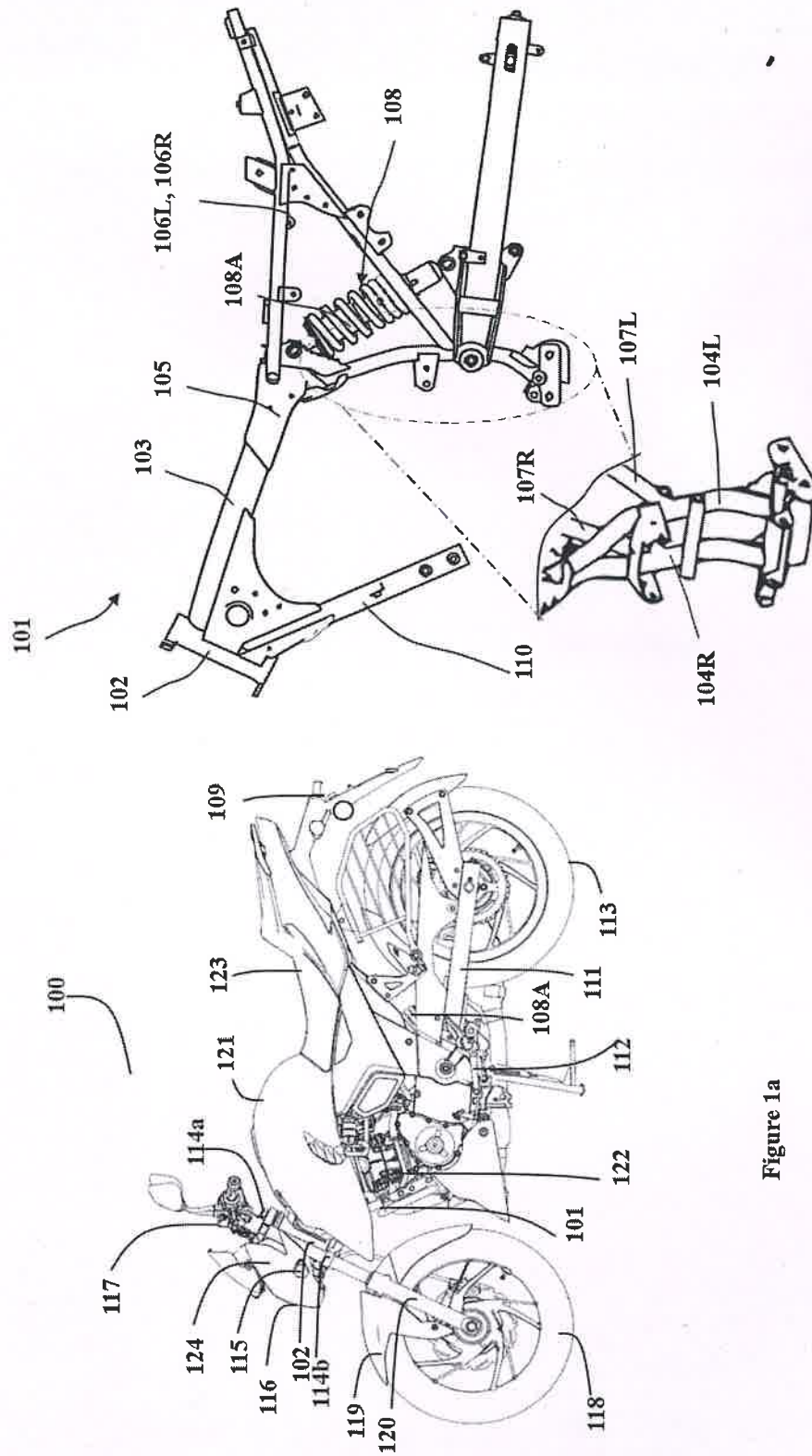


Figure 1a

L' ← → L

Figure 1b

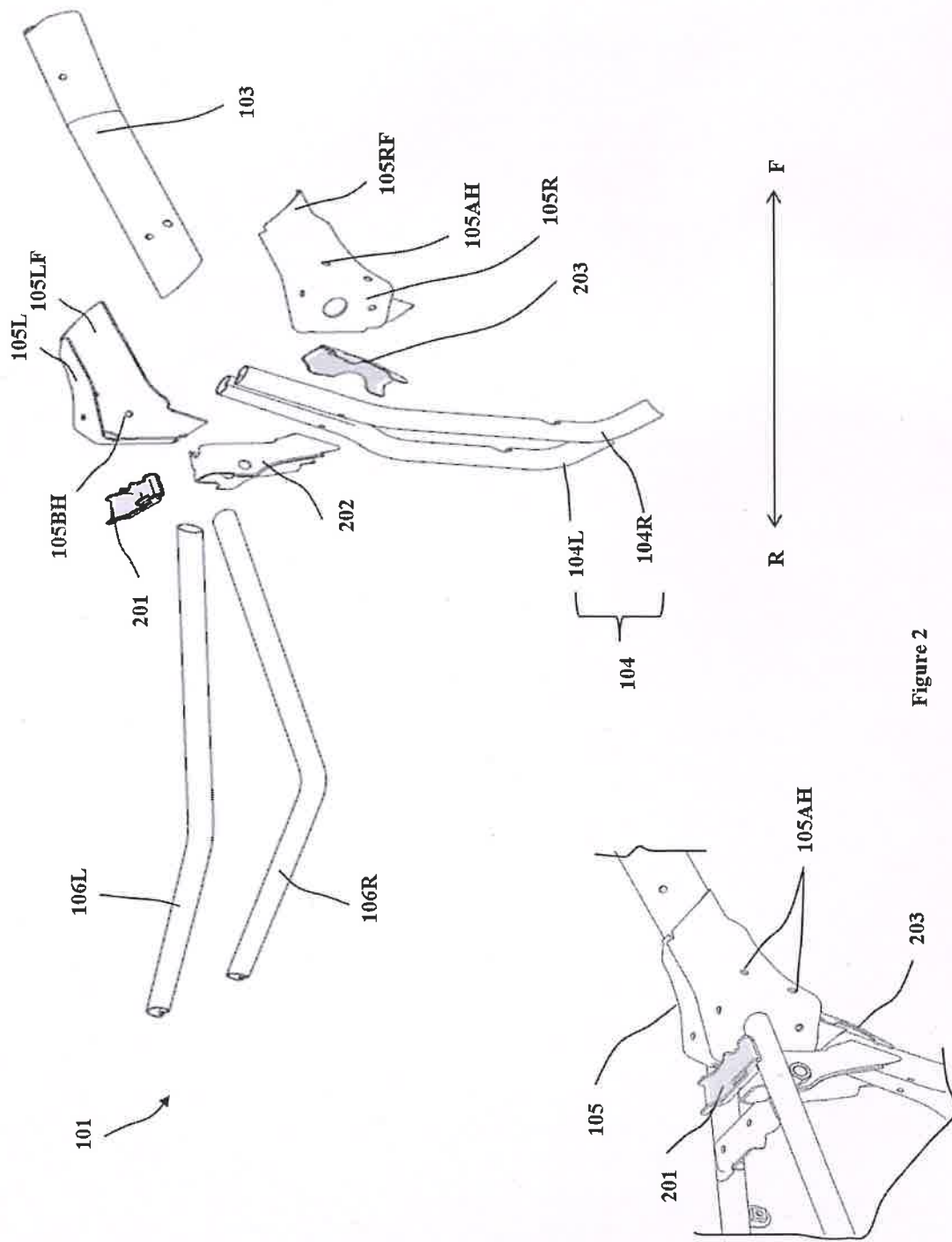


Figure 2

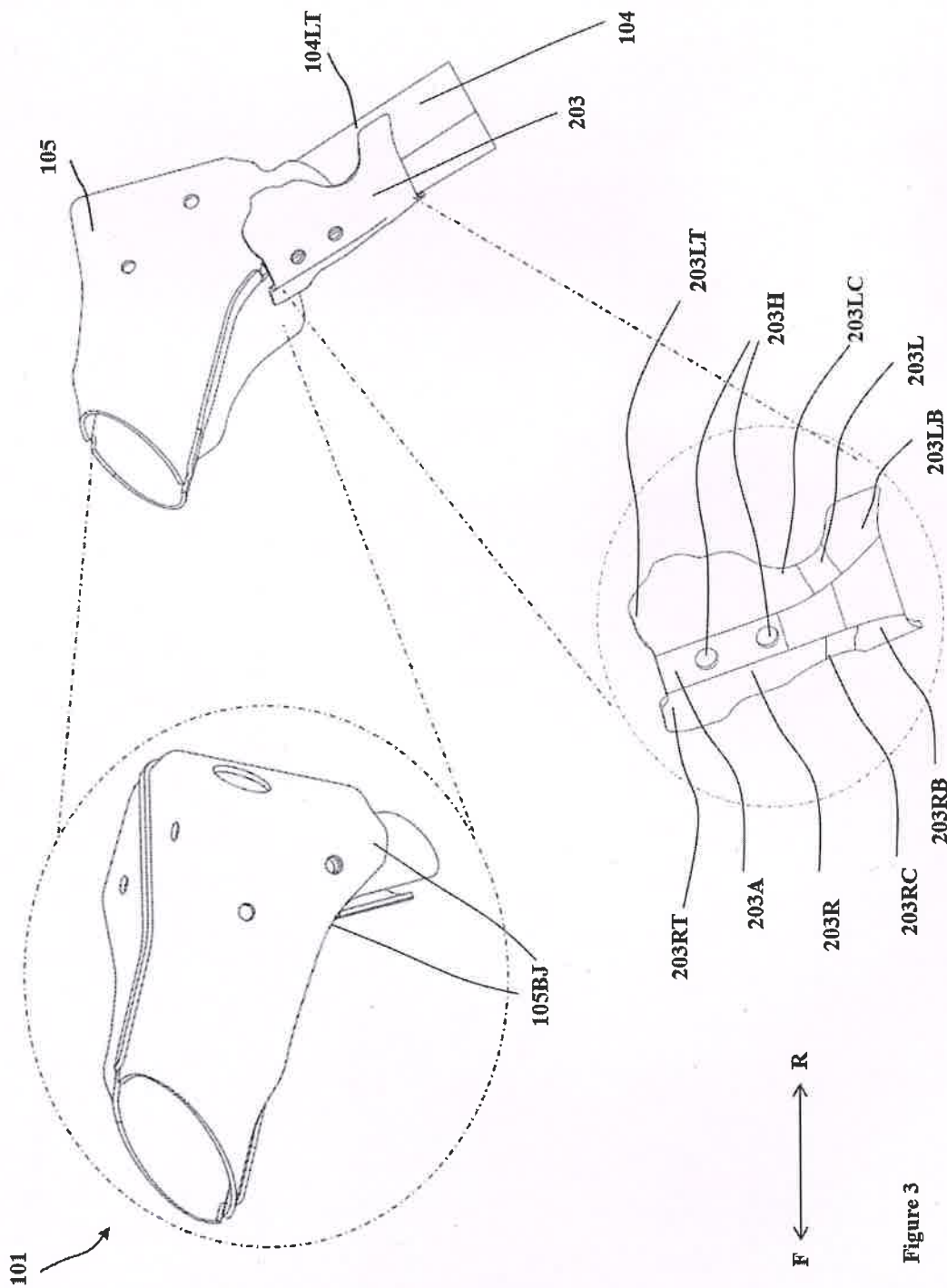


Figure 3

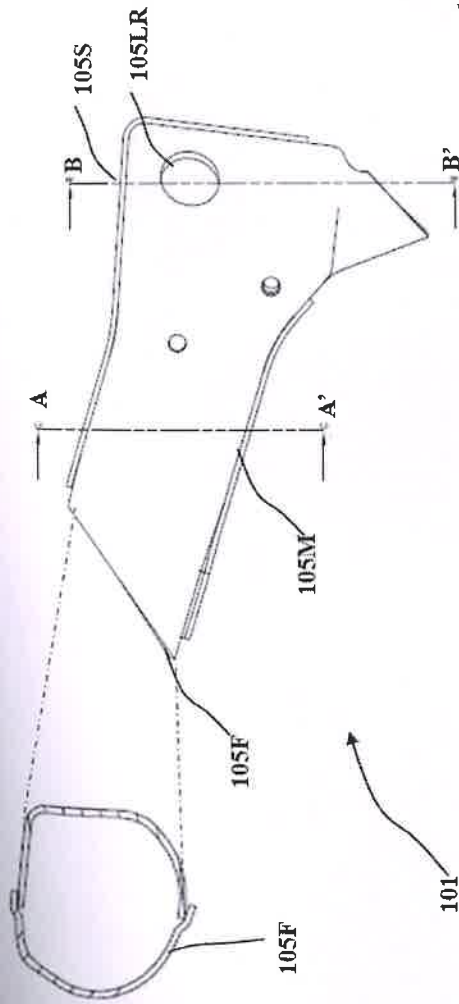


Figure 4(a)

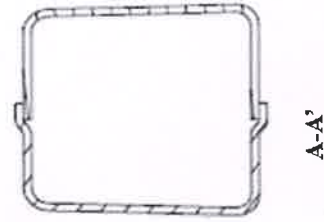


Figure 4(b)

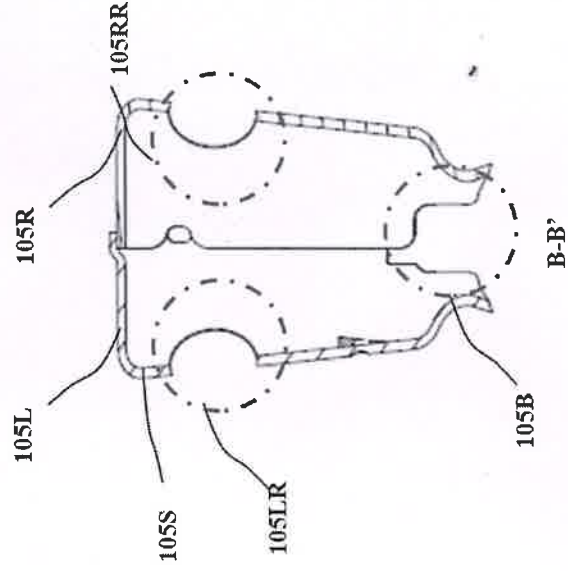


Figure 4(c)

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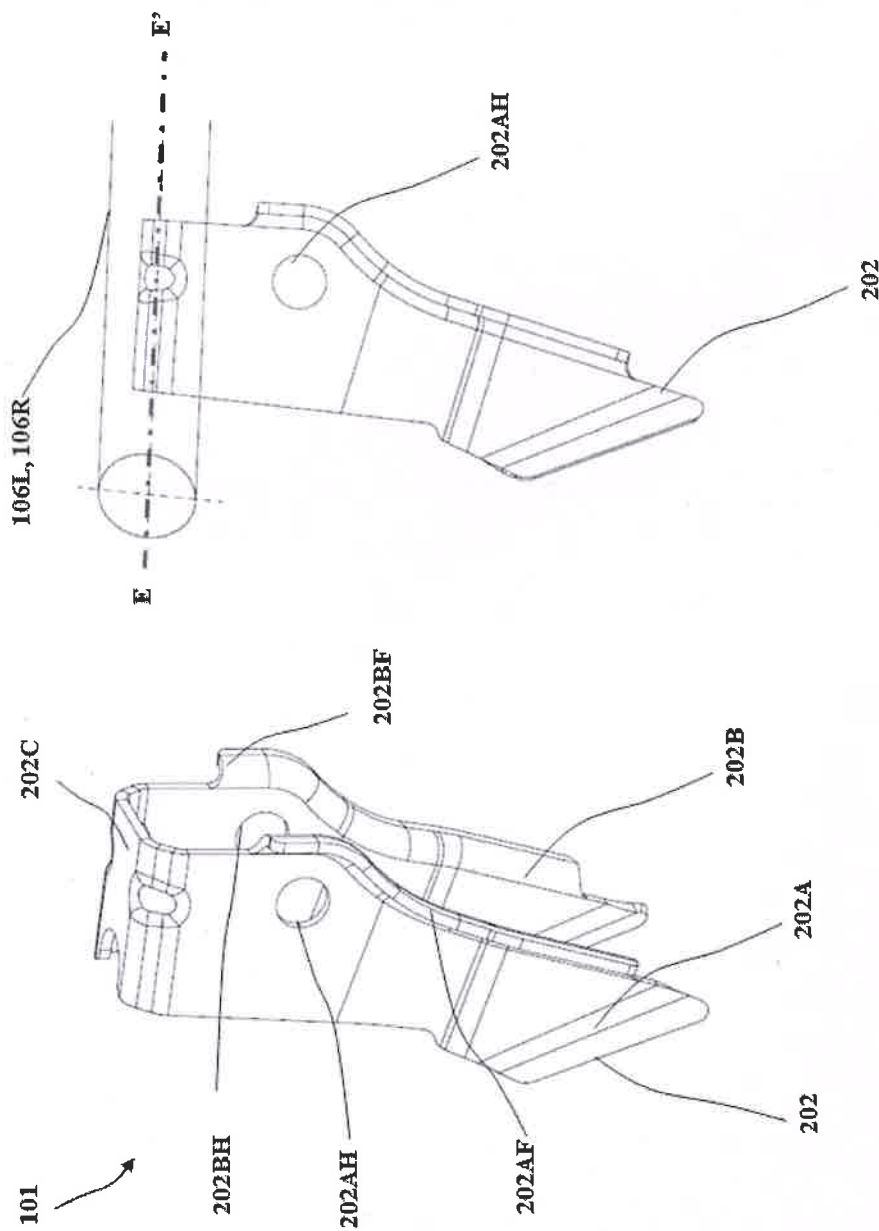


Figure 5

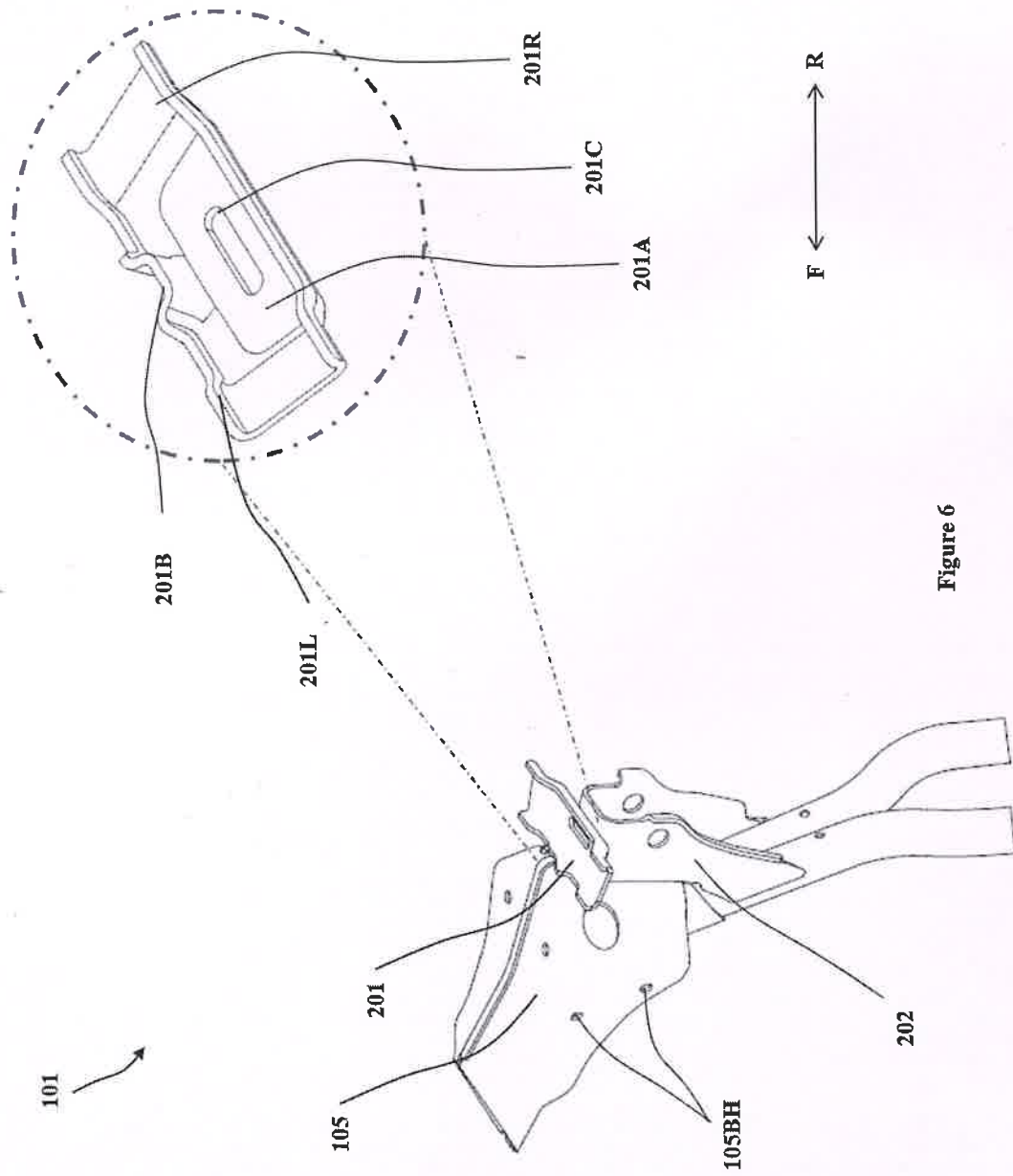


Figure 6

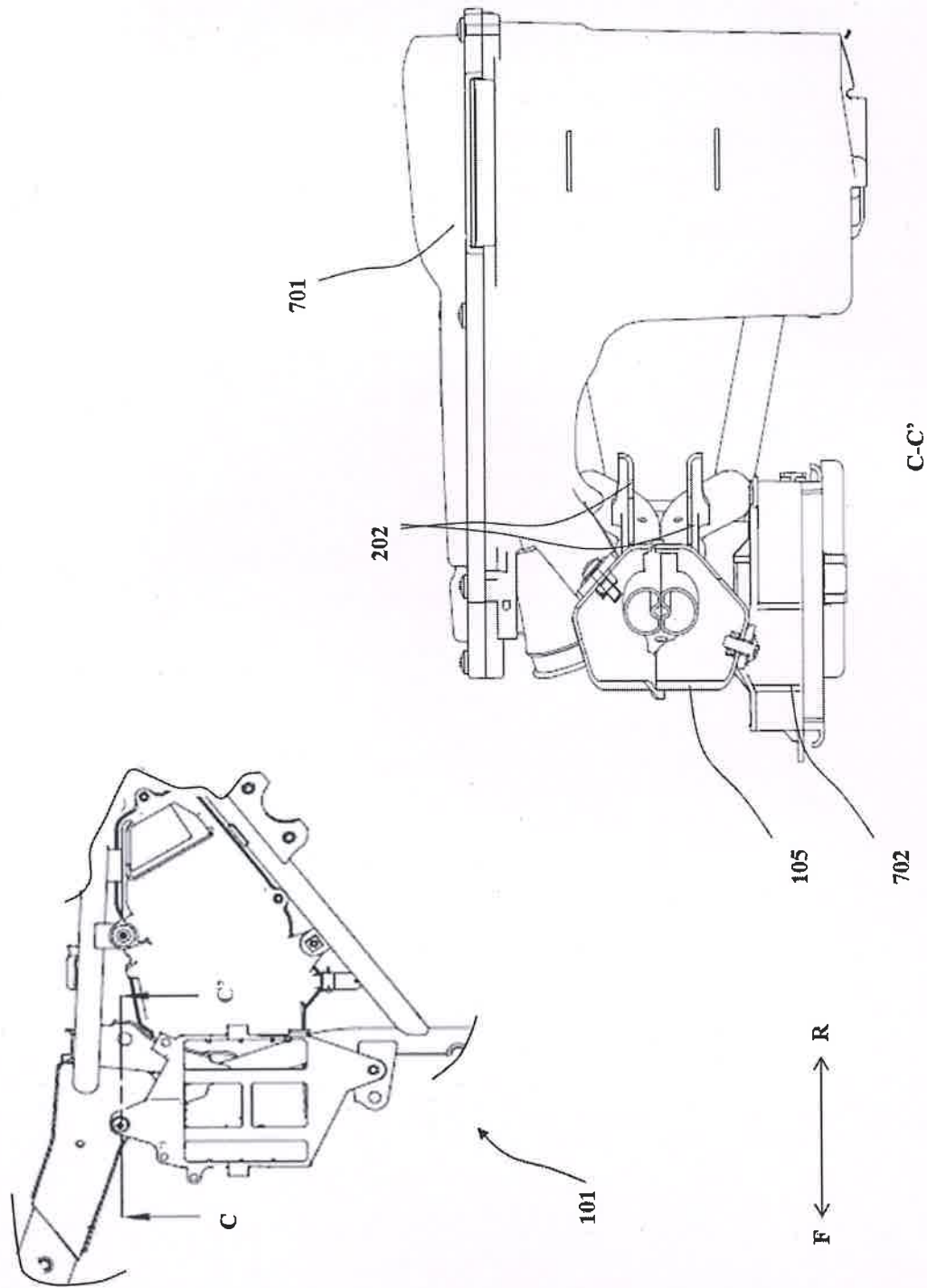


Figure 7

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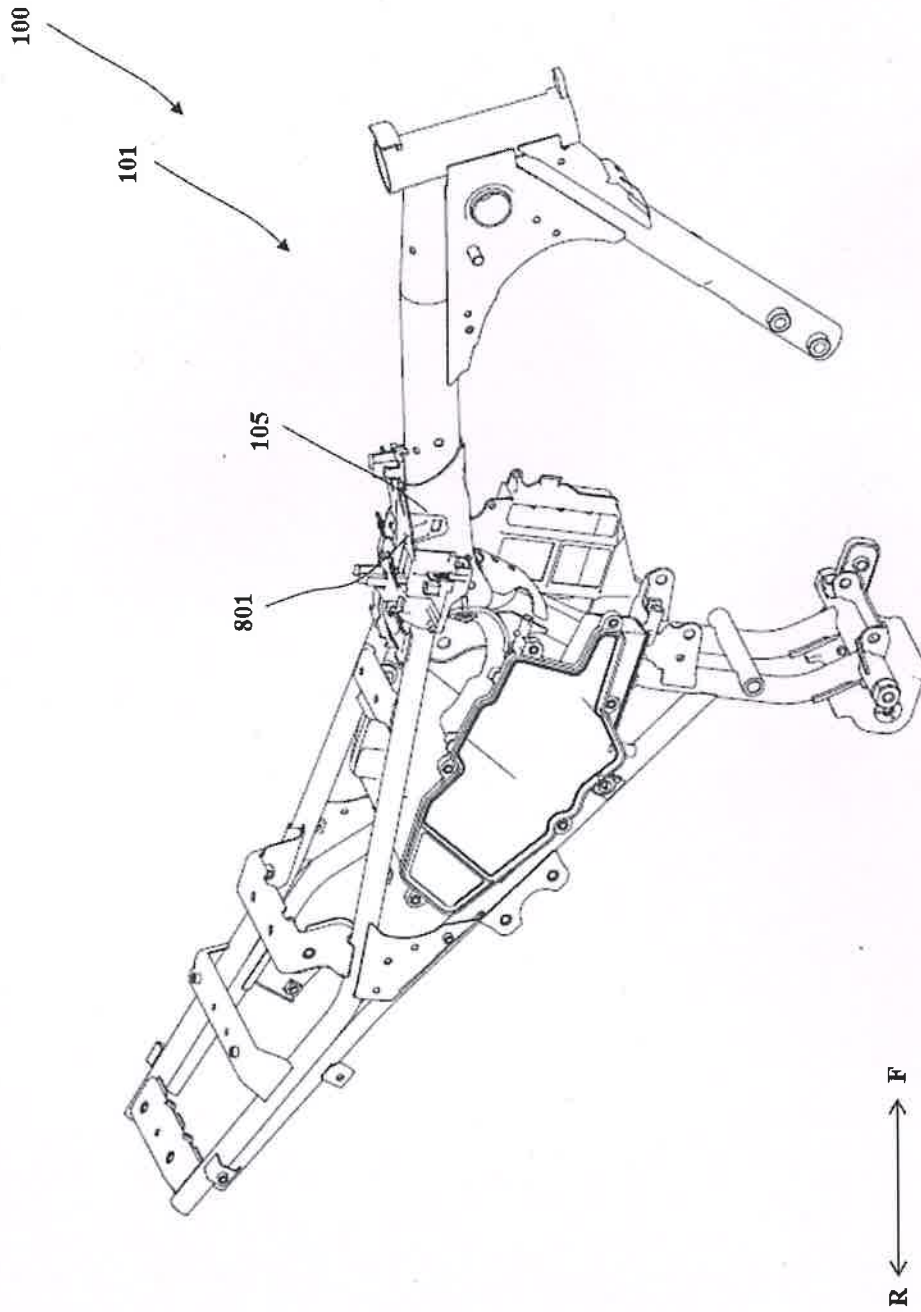


Figure 8

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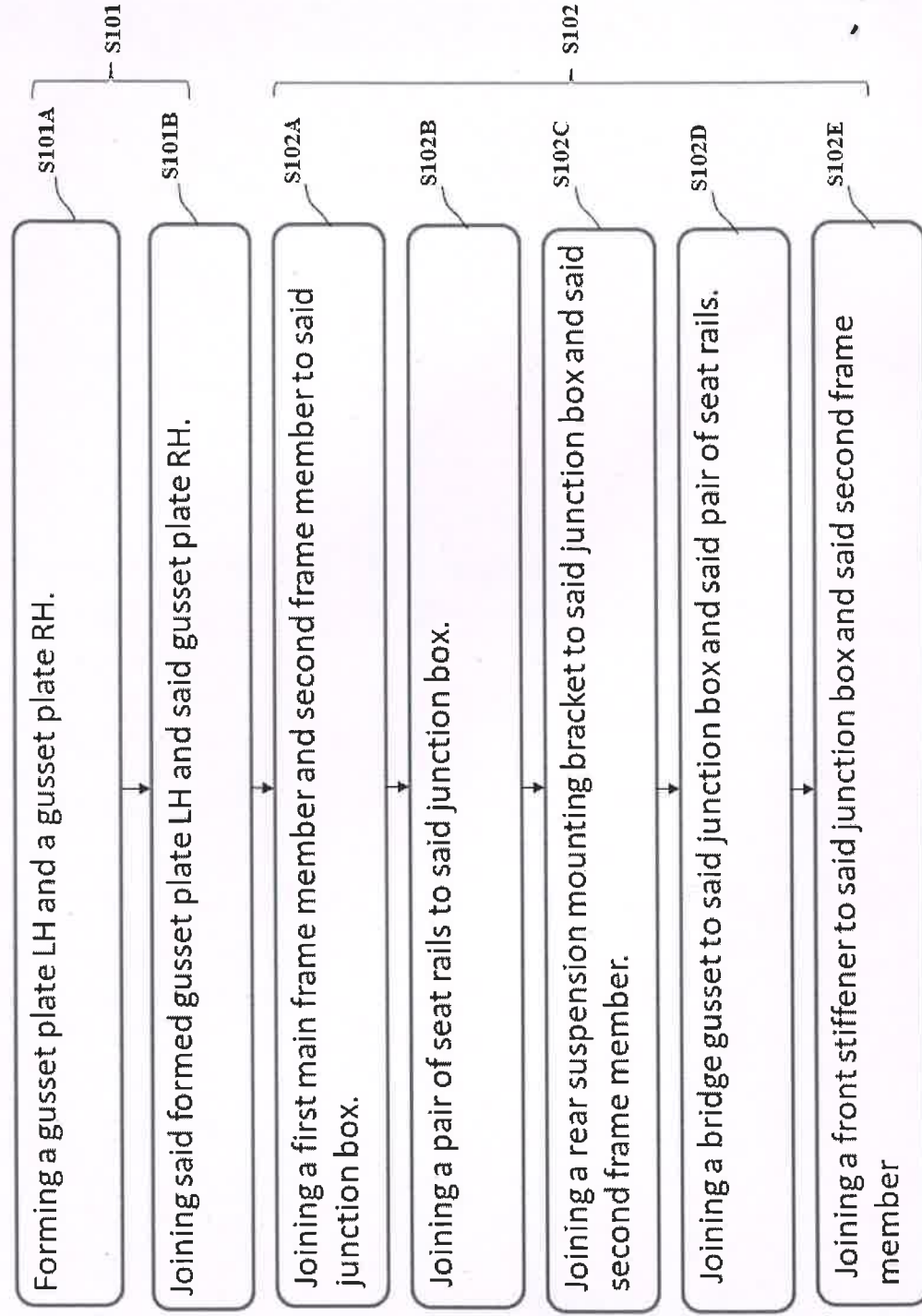


Figure 9

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