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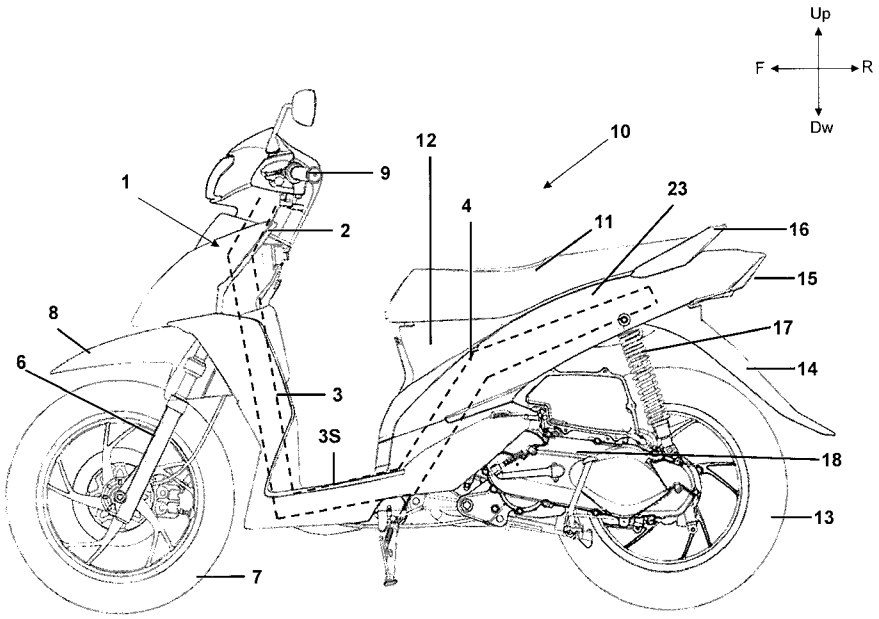


Fig. 1

(57) Abstract: The present invention relates to an air cleaner system (22) comprising of an air cleaner intake (20) for a two wheeled vehicle (10). The air cleaner intake (20) is located in such a manner in which entry of dust, water and mud splashes is minimized and neither is there a necessity to compromise with the space or size of the utility box (12). The air cleaner intake (20) is placed above the air cleaner system (22) and is connected by a connecting element (24). The air cleaner inlet (20) is disposed in an area between either of the side tubes (4, 5) and the side panel LH (23).

[Continued on next page]

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AN AIR INTAKE SYSTEM FOR A TWO-WHEELED VEHICLE

FIELD OF INVENTION

[0001] The present invention relates to an air induction system for an internal combustion engine and more particularly to an air intake passage for said air induction system.

BACKGROUND OF INVENTION

[0002] Generally, an internal combustion engine is functionally connected to a rear wheel of a vehicle to provide a forward motion to it. The internal combustion engine comprises of a cylinder bore where the combustion occurs to provide the needed power for the forward motion of the vehicle. The internal combustion (IC) engine, among other components, has a cylinder on top of which a cylinder head is mounted, and receives a reciprocating piston from the bottom. On combustion of the air-fuel mixture, the piston transfers the energy generated during combustion to a crankshaft through a connecting rod thereby driving the crankshaft. In this way, the reciprocatory motion of the piston is converted to rotary motion of the crankshaft. The crankshaft rotation then in turn powers the vehicle.

[0003] However, for this whole process to occur an ample amount of filtered air is required. Mostly, the air content comprises of water vapor or dust and other impurities which may cause poor engine combustion efficiency, or even cause damage to the vehicle engine. Thus, the intake structures for the internal combustion engine include an air filter to eliminate the impurity, after which filtered air is introduced into the vehicle engine for combustion.

[0004] Typically, cleaned air is guided in a carburetor through an intake tube, and the air introduced into the carburetor is then mixed therein with a fuel, the mixture being supplied to the engine for combustion. Most engines include air cleaner systems for screening the air before it enters the engine. These air cleaner systems normally

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comprise of a filter element positioned within the engine's air intake passage. The filter element is frequently positioned in a passage having an air inlet opening through which atmospheric air is induced in the system.

[0005] A typical two-wheeled scooter type step through vehicle has its air cleaner system disposed beneath the side panels and/or the utility box. The air inlet opening provided for such air cleaner system is generally disposed over its surface, be it on the sides in a direction of vehicle travel or opposite to it, or at an upper or lower portion of the surface of the air cleaner system. Thus, the air inlet opening provided at such locations is very close to ground and highly prone to a direct entry dirt, water and mud splashes. In a known art, the entry position of the air cleaner intake is further shifted to an upper portion of the air cleaner system, high enough where effect of the mud splash, dirt and water is further minimized. In such an arrangement, the air intake opening is attached to the utility box with a space engraved in the utility box to create a space for the air cleaner intake to be attached to that portion. In such an arrangement of air cleaner intake, the utility box's size and shape is severely compromised. Hence, it is desired to have an air intake system which minimizes the entry of mud splash, dirt and water inside the air intake passage without compromising with the utility box size.

BRIEF DESCRIPTION OF DRAWINGS

[0006] The detailed description of the present subject matter is described with reference to the accompanying figures. Same numbers are used throughout the drawings to reference like features and components.

[0007] Figure **1** illustrates a left side view of an exemplary vehicle, in accordance with an embodiment of the present subject matter.

[0008] Figure **2** illustrates a top view of the exemplary two-wheeled vehicle comprising of a utility box and frame assembly according to a known prior art.

[0009] Figure **3** illustrates a left side view of frame structure made using carbon fiber and resin materials comprising of an air cleaner system with an air cleaner intake in accordance with an embodiment of the present subject matter.

[00010] Figure **4** illustrates an exploded view of a side panel, air cleaner intake, utility box and the frame structure in accordance with an embodiment of the present subject matter.

[00011] Figure **5** illustrates a side view of the air cleaner system connected to the air cleaner intake in accordance with an embodiment of the present subject matter.

[00012] Figure **6** illustrates a side view of the air cleaner system connected to the air cleaner intake in a full load condition of a rear suspension of the exemplary two-wheeled vehicle in accordance with an embodiment of the present subject matter.

[00013] Figure **7** illustrates an exploded view of the air cleaner intake of the air cleaner system in accordance with an embodiment of the present subject matter.

DETAILED DESCRIPTION

[00014] Typically, vehicles with a step-through type frame assembly include a head tube and a main frame. The vehicle may have the internal combustion engine, which is mounted to the frame assembly. Typically, the engine being the power unit is swingably connected to the main frame. Also, the power unit is coupled to the drive wheel, which is generally the rear wheel. Generally, the internal combustion engine comprises of a cylinder bore where the combustion occurs to provide the needed power for the forward motion of the vehicle. The internal combustion (IC) engine, among other components, comprises of a cylinder on top of which a cylinder head is mounted. The cylinder head is mounted to accommodate and receive the to-and-fro motion of the piston reciprocating from the bottom in an upward direction. On combustion of the air-fuel mixture, the piston transfers the energy generated during combustion to a crankshaft through a connecting rod thereby driving the crankshaft. In this way, the reciprocatory motion of

the piston is converted to rotary motion of the crankshaft which in turn powers the vehicle.

[00015] However, the air being sent to the internal combustion engine for combustion needs to be filtered since the air drawn in from the atmosphere comprises of water vapor or dust and other impurities which may cause poor engine combustion efficiency, or even cause damage to the vehicle engine. Therefore, an air filter is provided for the intake structures of the internal combustion engine to eliminate the impurity, after which filtered air is introduced into the vehicle engine for combustion.

[00016] Generally, an air intake tube guides the clean air in a carburetor, and the air introduced into the carburetor is then mixed therein with a fuel, the mixture being supplied to the engine for combustion. Mostly, an air cleaner system is introduced before the internal combustion engine for filtering the air before it enters the engine. These air cleaner systems normally comprise of a filter element positioned within the engine's air intake passage, wherein the filter element is frequently positioned in a passage having an air inlet opening through which atmospheric air is induced in the system.

[00017] Mostly, in a typical two-wheeled scooter type step through vehicle the air cleaner system is disposed beneath the side panels and/or the utility box. Generally, the air inlet opening provided for such air cleaner system is disposed over its surface, be it on either side of the system either in direction of vehicle travel or opposite to it, or at an upper or lower portion of the surface of the air cleaner system. This in turn results in the air cleaner intake being placed very close to the ground and highly prone to a direct entry dirt, water and mud splashes.

[00018] In one of the known arts, the direct entry of mud splash, dust and water was tried to be minimized by shifting the entry position of the air intake passage to an upper portion of the air cleaner system. In such an arrangement, the air cleaner intake is attached to the utility box with an opening engraved in the utility box to create space for the air intake opening to be attached. In such an arrangement of the air cleaner intake, the utility box's size and shape is severely compromised.

[00019] Hence, an objective of the present subject matter is to provide an air cleaner system for a two-wheeled vehicle. The air cleaner system is employed with an air cleaner intake to allow air into the system, which is filtered before being sent to the internal combustion engine for combustion. According to one aspect of the present subject matter, the air cleaner intake is to be located at such a position where the direct entry of mud splashes, dirt and water is stopped from entering the air cleaner system.

[00020] According to additional aspect, the air cleaner intake is to be located in such a way which does not comprises with the space and size provided in the utility box.

[00021] In an embodiment, an air cleaner system employed with an air cleaner intake for a two-wheeled vehicle is provided. The vehicle comprises of a main frame assembly made using carbon fiber and resin materials. The main frame assembly comprises of a head tube formed at a front portion of the vehicle. The main frame assembly further comprises of a main tube extending in a downward and rearward fashion from the head tube. The main tube further extends in a straight horizontal manner from an intermediate portion to form a step through structure. In an embodiment, a pair of side tubes extend from the step through portion of the main tube in an upward rearwardly manner. The couple of side tubes further extend parallel in a rearward horizontal direction being placed in a vehicle widthwise direction to form a side tube LH and a side tube RH. Furthermore, the vehicle comprises of a side panel LH and side panel RH enabled to cover and protect the side tubes and the vehicle structure from sides.

[00022] In an embodiment, the vehicle further comprises of a utility box provided between the pair of side tubes, placed beneath the seat assembly. The internal combustion engine is swingably connected to the main frame at the rearmost portion of the step through structure. Further the vehicle comprises of an air cleaner system placed below the side tube LH in an area adjacent to a front portion of the rear wheel.

[00023] In an embodiment, an air cleaner intake is provided for the air cleaner system to allow induction of air from the atmosphere to the system. In an embodiment,

the air cleaner intake is attached to the side tube LH and is placed above the air cleaner system. The air cleaner intake is attached on a left-hand portion of the side tube LH disposed in an area between side tube LH and side panel LH, such that it is located much above the ground minimizing any kind of mud splash, dust or water entry and nor does it compromises with the space and size provided for the utility box.

[00024] In an embodiment, the air cleaner intake is a box-like structure with an opening provided for air entry facing the side panel LH. The air entry direction is not in a vehicle travel direction or opposite to it, but is rather in a vehicle width direction such that the air follows a substantial U-shaped serpentine direction to enter the system through the gap between side panel LH and the vehicle frame structure near the rear wheel. This in turn helps in further minimizing of direct entry of mud splash, dust and water. In an embodiment, the opening which is provided in the air cleaner intake comprises of grills embedded in it placed close to each other. The grills placed in the air cleaner intake prevent the direct entry of mud or dust from entering the system and allow only air to enter through the spaces provided between them.

[00025] In an embodiment, the air cleaner intake is connected to the air cleaner system through a connecting element which is a bellow like structure (hereinafter mentioned as bellow), which acts as a passage of air from the air cleaner inlet to the air cleaner system. The bellow which acts as a connecting element for the present subject matter serves as a passage between air cleaner intake and air cleaner system, and eliminates the gap between the air cleaner system and air cleaner intake which is attached to the side tube LH above the air cleaner system. The bellow being a stretchable element keeps the connection between air cleaner intake and air cleaner system intact even when the suspension is in action in case of bumps or potholes and the air cleaner system experiences a reciprocation motion along with it. In an embodiment, during an extreme suspension action the bellow is held to the air cleaner intake and air cleaner system through a pair of clips.

[00026] Thus, the present subject matter provides an air cleaner intake for an air cleaner system placed in such a location at which the direct entry of mud splash, dust

and water is minimized. The air cleaner system described above provides an advantage of better access of air cleaner inlet during servicing and maintenance. In furtherance to it the present subject matter does not comprise with the space and size provided to the utility box. Furthermore, the present subject matter also provides a connecting element between the air cleaner inlet and air cleaner system which is held intact and provides a passage for air even during extreme actions of suspension of the vehicle.

[00027] The aforesaid and other advantages of the present subject matter would be described in greater detail in conjunction with the figures in the following description.

[00028] Arrows provided in the top right corner of each figure depicts direction with respect to the vehicle, wherein an arrow F denotes front direction, an arrow R indicated R direction, an arrow Up denotes upward direction, an arrow Dw denoted downward direction, an arrow Rh denotes right side, an arrow Lh denoted left side, as and where applicable.

[00029] Fig. 1 illustrates a left side view of an exemplary scooter type vehicle (**10**) in accordance with an embodiment of the present subject matter. The vehicle comprises of a main frame assembly (**1**) made of carbon fiber and resin material and is conventionally an underbone chassis frame which provides a generally open central area to permit "step-through" mounting by a rider. Typically, the frame assembly (**1**) comprises of a head tube (**2**), a main tube (**3**), and a pair of side tube LH (**4**) and side tube RH (**5**) (only one shown). The head tube (**2**) is disposed towards the front portion, wherein the main tube (**3**) extends downwardly and rearwardly from the head tube (**2**) forming a flat horizontal step-through portion (**3S**). The other end of the main tube (**3**) is connected with the pair of side-tubes (**4, 5**) through a bracket (not shown).

[00030] The head tube (**2**) is configured to rotatably support a steering tube (not shown) and further connected to the front suspension system (**6**) at the lower end. A handlebar support member (not shown) is connected to an upper end of the steering tube (not shown) and supports a handlebar assembly (**9**). The upper portion of a front wheel (**7**) is covered by a front fender (**8**). The pair of side-tubes (**4, 5**) extend from the other

end of the main tube (**3**) being disposed parallel on either side of the vehicle (**10**) width direction. Each of the said side tube (**4, 5**) extends from the main tube (**3**) in an upward inclined fashion and gradually after a certain length extends rearward in a substantially horizontal and parallel fashion being placed in the vehicle widthwise direction. A plurality of cross pipes (not shown) is secured in between the pair of side-tubes (**4, 5**) at selected intervals to support vehicular attachments including a utility box (**12**), a seat assembly (**11**) and a fuel tank assembly (not shown). The vehicle furthermore, comprises of a side panel LH (**23**) and side panel RH (not shown) which covers the side tubes (**4, 5**) and covers the vehicle (**10**) structure from the sides.

[00031] Generally, the utility box (**12**) is supported between the the side tube LH (**4**) and side tube RH (**5**) so as to be disposed below the seat (**11**). A fuel tank assembly (not shown) may be disposed on between the rear portions of the pair of the side-tubes (**4, 5**). The vehicle (**10**) further comprises of a rear wheel (**13**) covered by a rear fender (**14**) with a tail light (**15**) disposed above it and a support bar (**16**) place above the tail light (**15**) at the end of the seat assembly (**11**). The rear wheel (**13**) is supported towards the rear side of the main frame (**1**) by an internal combustion (IC) engine (shown in Fig. 4) which is horizontally coupled swingably to the rear of the frame assembly (**1**) of the two-wheeled vehicle (**10**) through a rear suspension system (**17**). The IC engine (shown in Fig. 4) transfers the drive directly to the rear wheel (**13**) as it is coupled directly to it through a continuously variable transmission (CVT) system (**18**). The vehicle further comprises of an air cleaner assembly (shown in Fig. 4) to provide filtered air to the IC engine (shown in Fig. 4) for combustion.

[00032] Fig. **2** illustrates a top view of the exemplary two-wheeled vehicle (**10**) as shown in Fig. 1, in accordance with an embodiment of the present subject matter. The present subject matter does not require any cutout portion to be crated in the utility box (**12**), nor is the air cleaner intake (**20**) attached to the utility box (**12**), thus overcoming the problems associated with the vehicles known in the existing art. The present figure depicts the utility box (**12**) to be placed between the side tube LH (**4**) and side tube RH (**5**). The vehicle further comprises of a fuel tank (**19**) surrounded by rear portion of the

utility box (**12**) from front and by the side tube RH (**5**) and side tube LH (**4**) from the sides.

[00033] Fig. **3** illustrates a left side view of the main frame assembly (**1**) of the exemplary two-wheeled vehicle (10) as shown in Fig. 1, in accordance with an embodiment of the present subject matter. The air cleaner system (**22**) is placed below the side tube LH (**4**) in an area adjacent to the front portion of the rear wheel (**13**). In an embodiment, the main frame assembly (**1**) is installed with the air cleaner intake (**20**) attached on the side tube LH (**4**). The air inlet (**20**) is disposed substantially above the air cleaner system (**22**). A stretchable connecting element such as a bellow (**24**) like structure (hereinafter connecting element to be refereed as bellow) connects the air cleaner intake (**20**) to the air cleaner system (**22**) to provide a passage of air to travel from the air cleaner intake (**20**) to the air cleaner system (**22**). The air cleaner inlet (**20**) being attached on the left side of the side tube LH (**4**) such that the available space for utility box (**12**) is not compromised or sacrificed.

[00034] Fig. **4** illustrates an exploded view of the side panel LH (**23**) and the side tube LH (**4**) of the exemplary two-wheeled vehicle (**10**) as shown in Fig. 1, in accordance with an embodiment of the present subject matter. In an embodiment, the air cleaner intake (**20**) is attached on the left-hand side of the side tube LH (**4**) such that no cut out section or space needs to be provided on the utility box (**12**) for disposal of the air cleaner intake (**20**), eliminating any space or size constraint previously available. The air cleaner intake (**20**) attached on the side tube LH (**4**) is disposed between side tube LH (**4**) and side panel LH (**23**). In an embodiment, the air cleaner intake (**20**) is placed above the air cleaner system (**22**) being attached to the side tube LH (**4**). The bellow (**24**) connects the air cleaner intake (**20**) to the air cleaner system (**22**) such that it acts as a passage of air and does not leaves any space or gap between the air cleaner intake (**20**) and the air cleaner system (**22**) even though it is placed above the air cleaner system (**22**). In an embodiment, the opening of the air cleaner intake (**20**) is facing the side panel LH (**23**) such that the direction of the air entering in is in substantial U-shaped serpentine like manner. Such a direction also helps is further minimizing the entry of

mud splash, dust and water. The air cleaner intake (**20**) being attached to the side tube LH (**4**) also helps in easy servicing and maintenance of the part since it is easily accessible by removing the side panel LH (**23**).

[00035] Fig. **5** illustrates a side view of the air cleaner system (**22**) of the exemplary two-wheeled vehicle (**10**) as shown in Fig. 1, in accordance with an embodiment of the present subject matter. The air cleaner intake is (**20**) is connected to the air cleaner system (**22**) through the bellow (**24**) such that passage of air is maintained during all times. The opening (**25**) provided in the air cleaner intake (**20**) is in a vehicle width direction facing towards the side panel LH (**4**). In an embodiment, a pair of clips (**26, 27**) helps the bellow to be attached to the air cleaner intake (20) and the air cleaner system (**22**) during all times.

[00036] Fig. **6** illustrates a side view of the air cleaner system (**22**) being attached to the air cleaner intake (**20**) in a full load condition of the exemplary two-wheeled vehicle (**10**) as shown in Fig. 1, in accordance with an embodiment of the present subject matter. In an embodiment, the bellow (**24**) connects the air cleaner intake (**20**) and the air cleaner system (**22**) at all times. Even when the rear suspension is in action during extreme conditions, the bellow (**24**) being a stretchable member compresses, yet is connected to the air cleaner system (**22**) and air cleaner intake (**20**) in an intact fashion maintaining the passage of air flow. The pair of clips (**26, 27**) holds and keeps the connection intact to the air cleaner system (**22**) and the air cleaner intake (**20**) during all conditions.

[00037] Fig. 7 illustrates an exploded view of the air cleaner intake (**20**) of the exemplary two-wheeled vehicle (**10**) shown in Fig. 1, in accordance with an embodiment of the present subject matter. In an embodiment, the air cleaner intake (**20**) comprises of a box-like structure in which the first element (**20F**) is attached to the side tube LH and the second element (**20S**) is attached over the first element (**20F**). The second element (**20S**) comprises of a grill (**28**) like elements placed in a vertical and parallel manner close to each other. The grills (**28**) placed in the second element (**20S**) of the air cleaner intake (**20**) help is preventing entry of dust and mud splashes inside the

air cleaner intake. The mud splashes and dust collide with the grill (**28**) and never enter the air cleaner intake (**20**).

[00038] Thus, the present subject matter provides an air cleaner system (**22**) with an air inlet opening (**20**) which minimizes the entry of dust, mud splash and water and is located in such a fashion which does not compromises with the space or size of the utility box. The air cleaner inlet (**20**) being attached to the side tube LH (**4**) such that it is disposed between side panel LH (**23**) and side tube LH (**4**) ensures a minimal entry of mud or water. The opening (**25**) provided for entrance of air in the air cleaner inlet (**20**) and the grills (**28**) placed further reduce the entry of mud and dust. Furthermore, the air intake system described above provides an advantage of better access of air cleaner inlet during servicing and maintenance.

[00039] It is to be understood that the aspects of the embodiments are not necessarily limited to the features described herein. Many modifications and variations of the present subject matter are possible in the light of above disclosure. Therefore, within the scope of claims of the present subject matter, the present disclosure may be practiced other than as specifically described.

I/We claim:

1. A two-wheeled vehicle (10) comprising:

   a main frame assembly (1) comprising a head tube (2) formed at a front portion of said vehicle (10) and a main tube (3) extending in a downward and rearwardly direction from said head tube (2) to form a step through structure (3S);

   a side tube LH (4) and side tube RH (5) extending in an upward and rearwardly direction from said step through structure (3S), and wherein said side tube LH (4) and said side tube RH (5) further extend gradually in a substantial parallel and horizontal manner being placed along a widthwise direction of said two-wheeled vehicle (10) ;

   a front wheel (7) and a rear wheel (13) supported by said main frame assembly (1) providing motion to said vehicle (10);

   an internal combustion engine (29) swingably attached to rearmost portion of said step through structure (3S) of said main tube (3);

   an air cleaner system (22) being placed below said side tube LH (4) in an area adjacent a front portion of said rear wheel (13) to provide filtered air for combustion to said internal combustion engine (29); and

   an air cleaner intake (20) providing an entrance for air to said air cleaner system (22), said air cleaner intake (20) being connected to said air cleaner system (22) through a connecting element (24), wherein said air cleaner intake (20) is placed at a pre-determined distance above said air cleaner system (22) preventing entry of dust and water into said air cleaner system (22).

2. The two-wheeled vehicle (10) as claimed in claim 1, wherein said side tube LH (4) is covered by a side panel LH (23).

3. The two-wheeled vehicle (10) as claimed in claim 1, wherein said air cleaner intake (20) being placed above said air cleaner system (22) is attached to a left hand portion of said side tube LH (4) and is disposed between said side tube LH (4) and said side panel LH (23).

4. The two-wheeled vehicle (10) as claimed in claim 1, wherein said air cleaner intake (20) comprises of an opening (25) allowing entrance for air therein.

5. The two-wheeled vehicle (10) as claimed in claim 1, wherein said opening (25) provided in said air cleaner intake (20) is formed along a vehicle width direction being disposed on left hand portion of said air cleaner intake (20) facing said side panel LH (23).

6. The two-wheeled vehicle (10) as claimed in claim 1, wherein said air cleaner intake (20) is a box-like structure comprising of a first element (20F) and a second element (20S).

7. The two-wheeled vehicle (10) as claimed in claim 1, wherein said first element (20F) is attached to left hand portion of said side tube LH (4) and said second element (20S) being placed over said first element (20F) comprises of said opening (25) allowing entrance or air in said air cleaner intake (20).

8. The said two-wheeled vehicle (10) as claimed in claim 1, wherein said opening (25) provided in said air cleaner intake (20) comprises of a series of grills (28) formed in a horizontal manner parallel to each other preventing entry of mud and dust through space provided therein.

9. The two-wheeled vehicle (10) as claimed in claim 1, wherein said connecting element (24) being a bellow-like structure maintains passage of air and connection between said air cleaner intake (20) and said air cleaner system (22) during a no load and a full load condition of said two-wheeled vehicle.

10. The two-wheeled vehicle (10) as claimed in claim 1, wherein said connecting element (24) is attached to said air cleaner intake (20) and said air cleaner assembly (20) by a pair of clips (26, 27).

11. The two-wheeled vehicle (10) as claimed in claim 1, wherein said main frame assembly (1) is made of carbon fiber and resin materials.

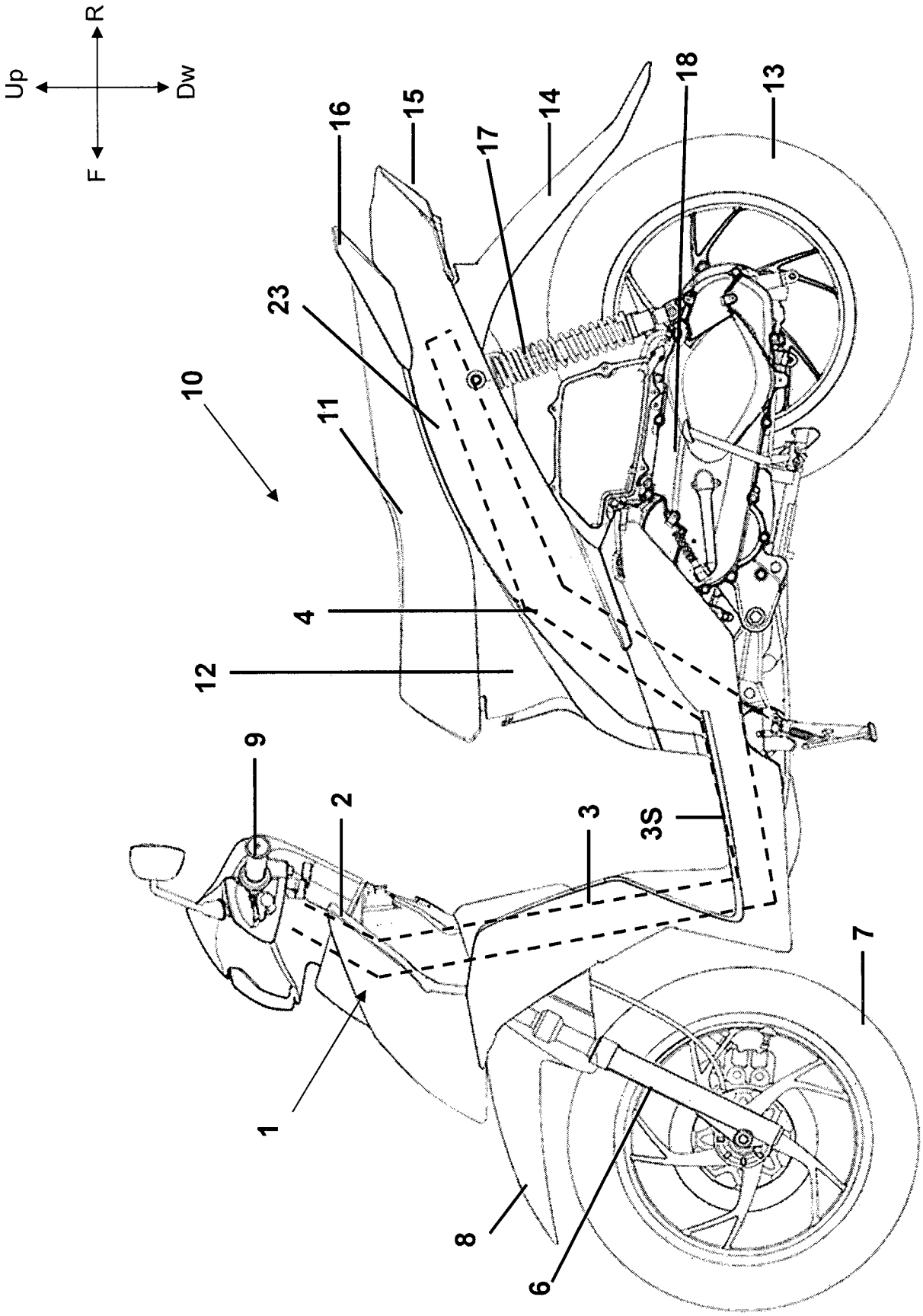


Fig. 1

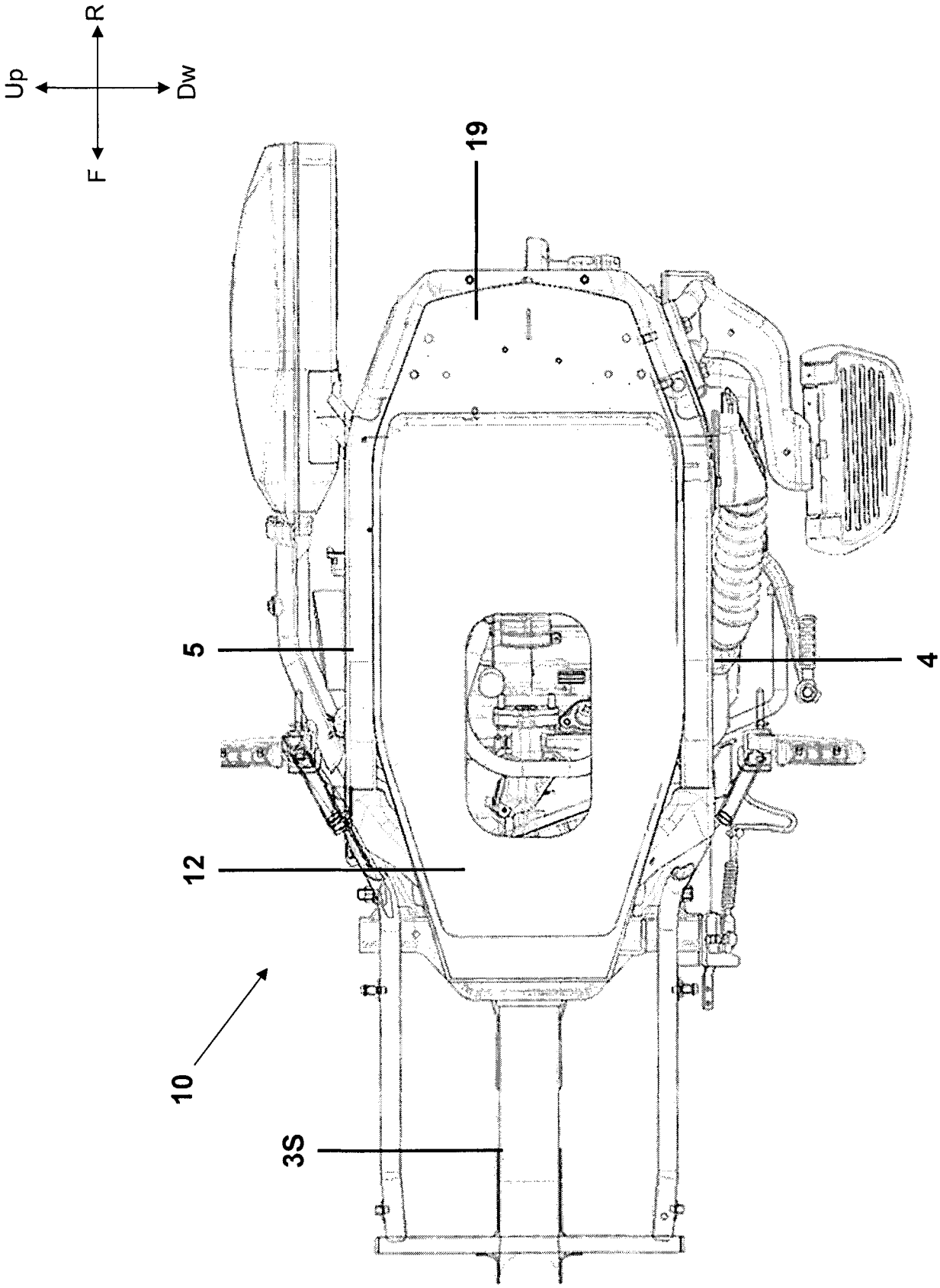


Fig. 2

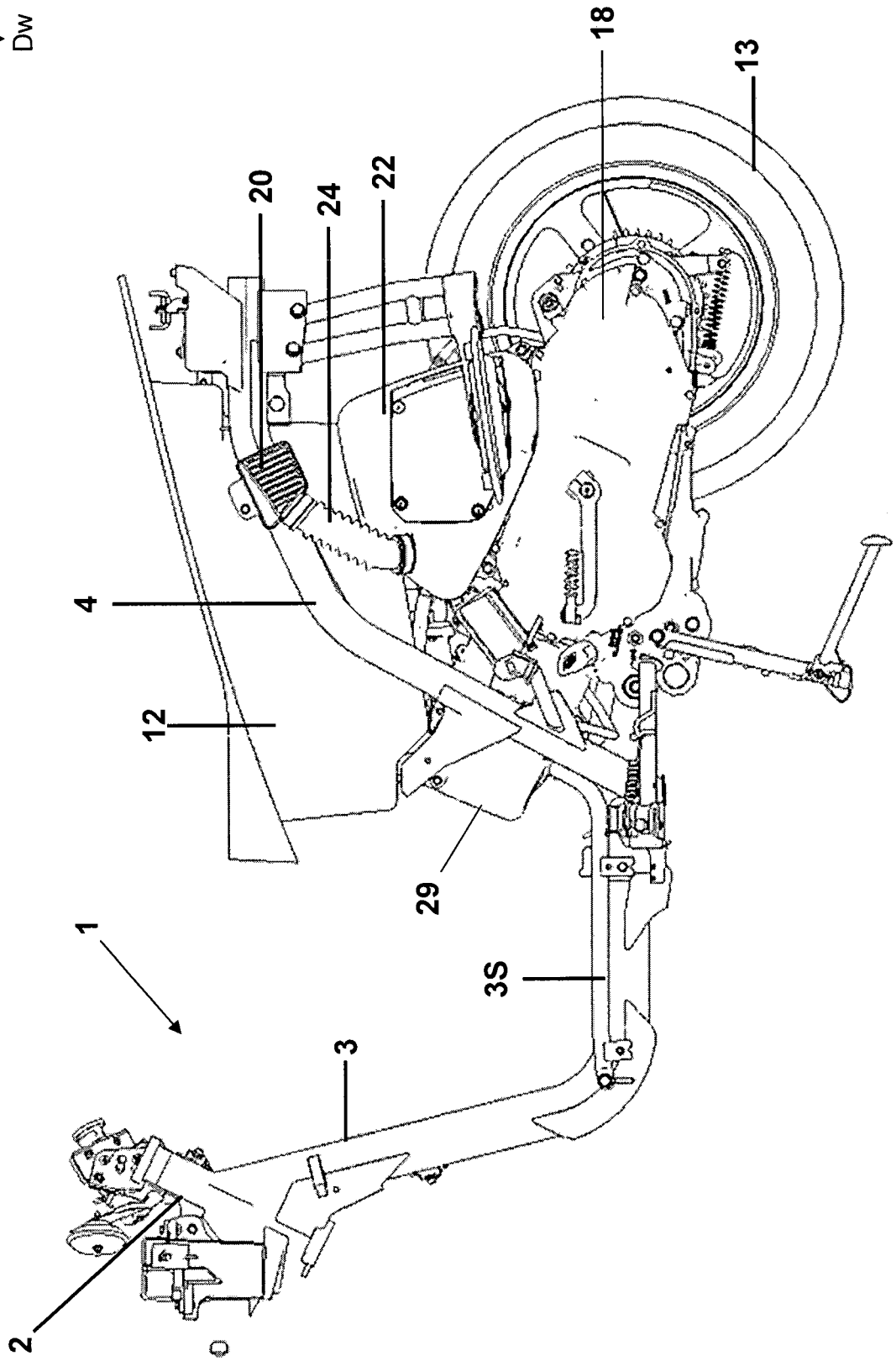


Fig. 3

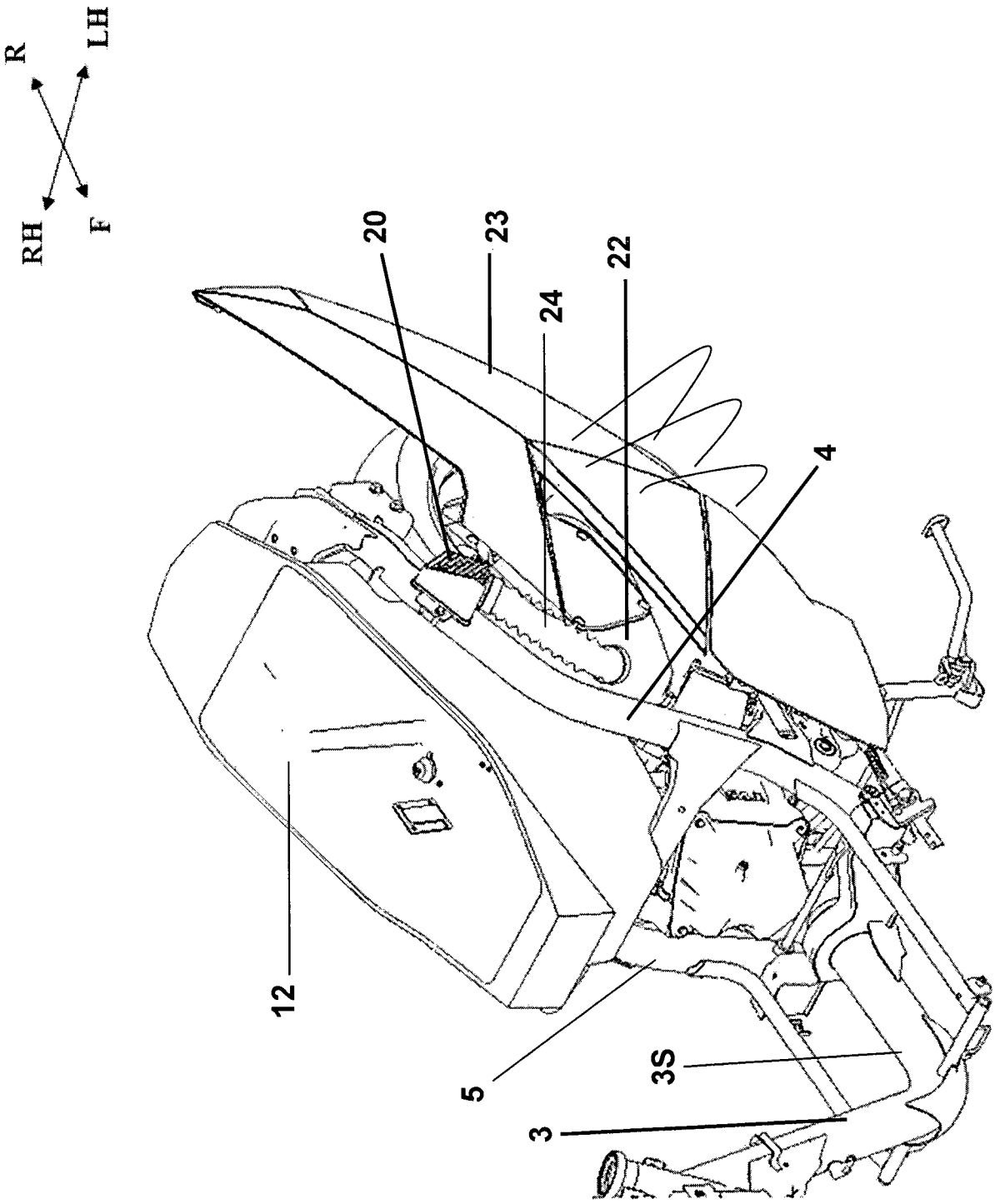
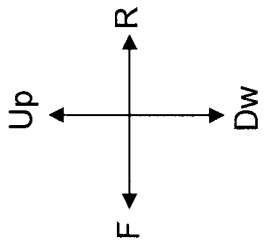


Fig. 4



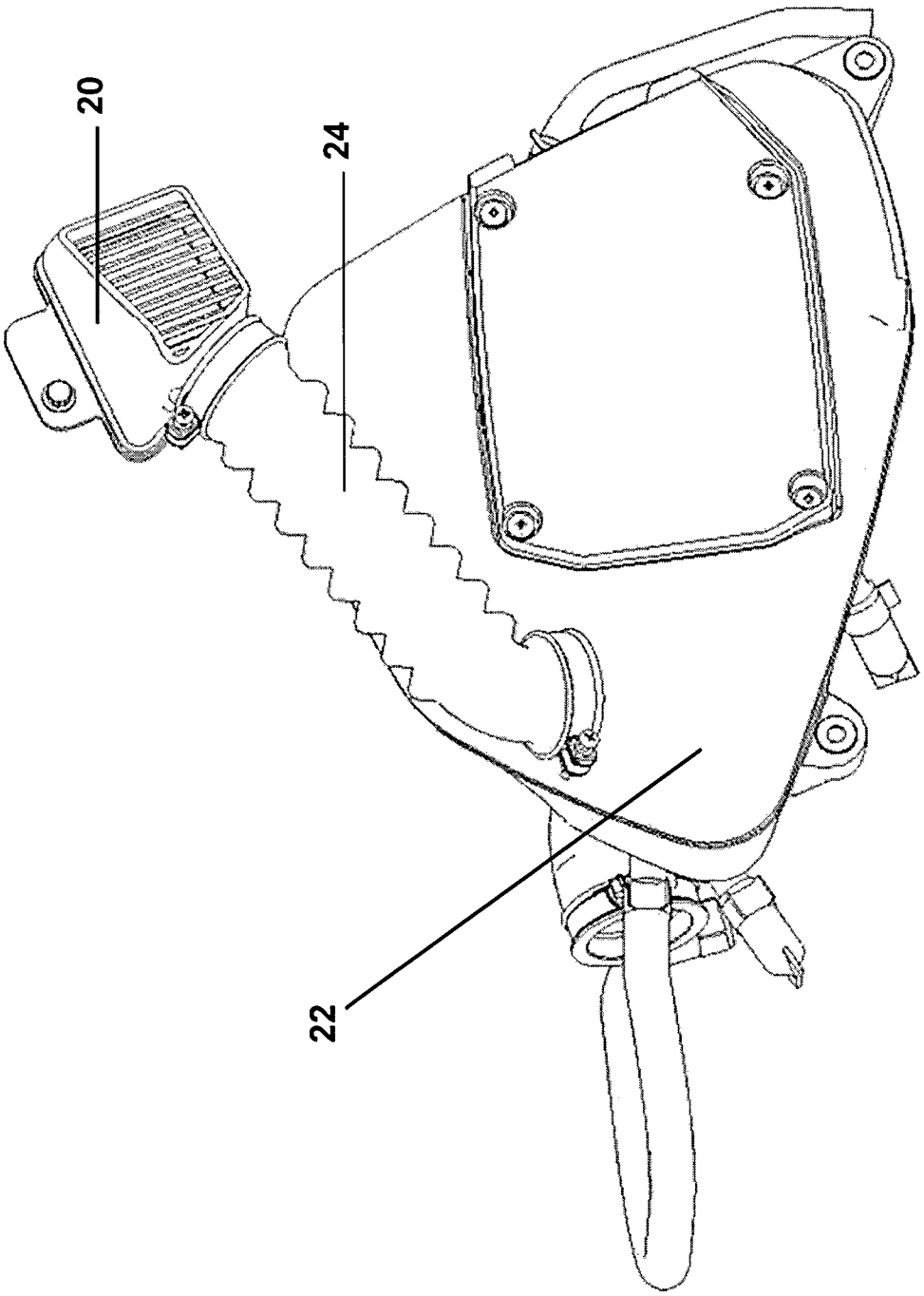
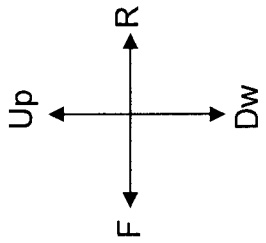


Fig. 5



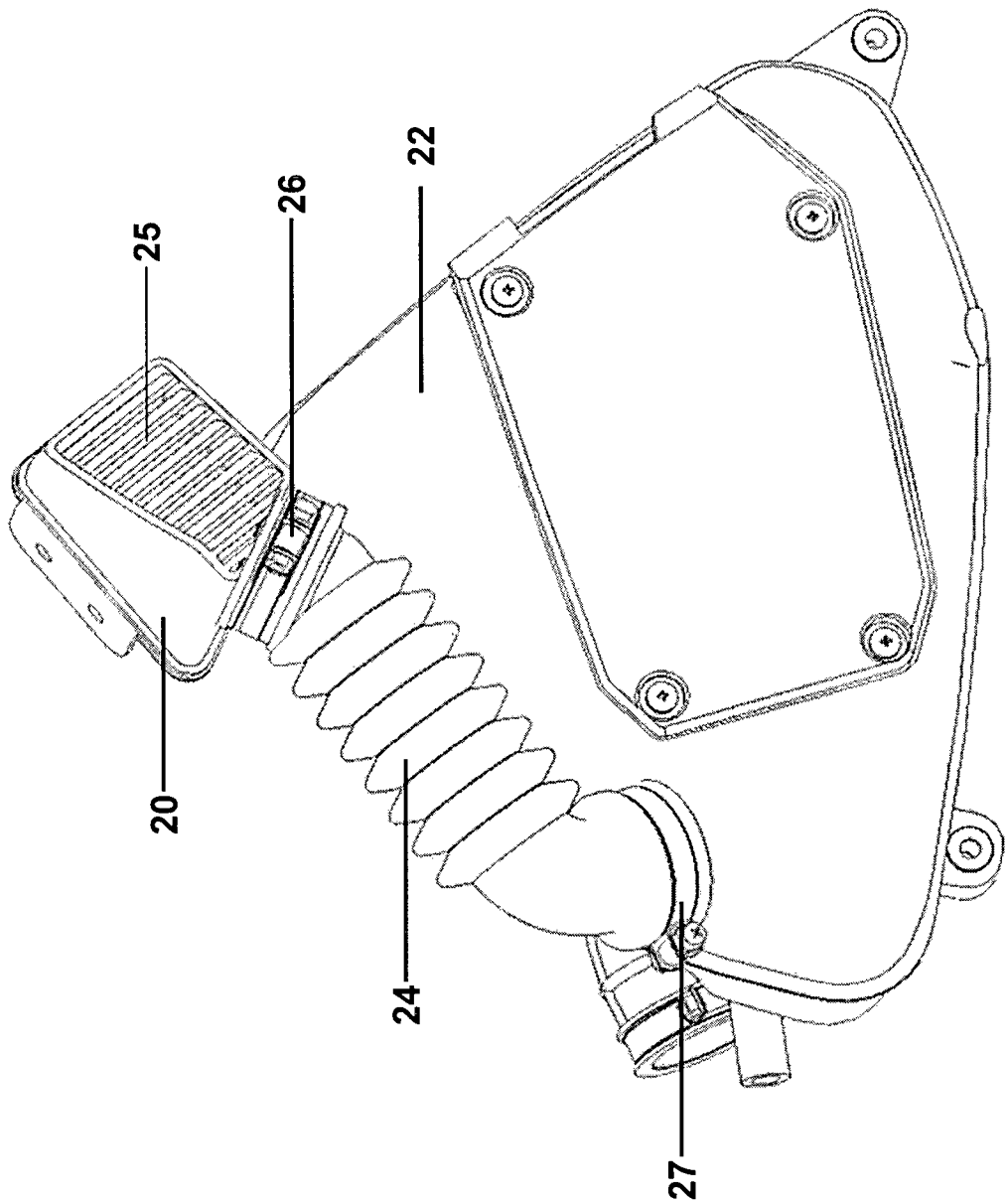
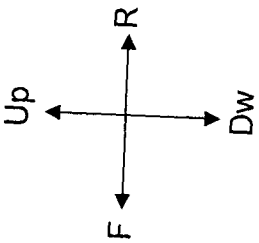


Fig. 6



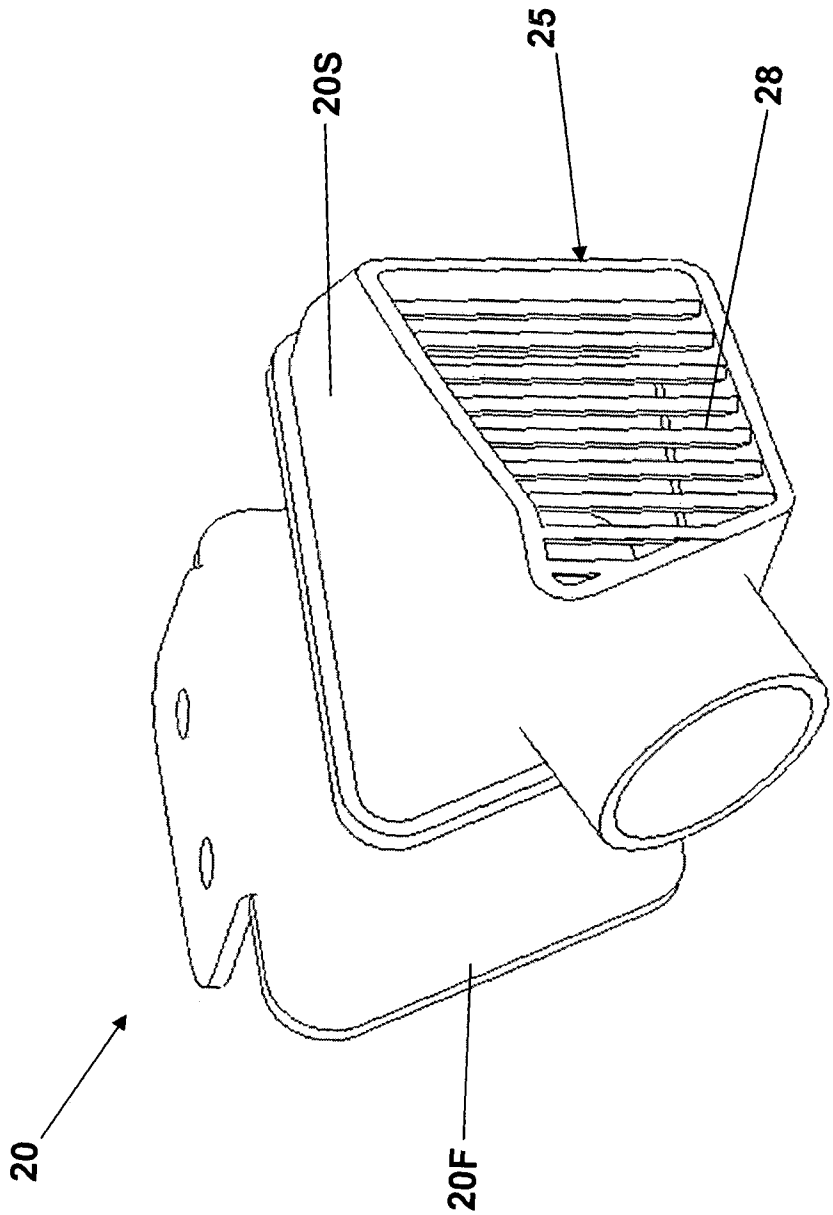


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2017/000839

A. CLASSIFICATION OF SUBJECT MATTER
F02M35/10 Version=2017.01

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F02M35/10

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patseer, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	IN/2038/DELNP/2003(HONDA GIKEN KOGYO KABUSHIKI KAISHA), 03 APRIL 2009, (Pages 6,16,17; Claims 1,5; Figures 1-12)	1-11
Y	US 20150101558 A1, (HONDA MOTOR CO., LTD.), 16 April 2015, (Paragraphs [0008],[0011],[0059],Figures 1-3)	1-11

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
01-11-2017	01-11-2017
Name and mailing address of the ISA/ Indian Patent Office Plot No.32, Sector 14,Dwarka,New Delhi-110075 Facsimile No.	Authorized officer Pratap Chandra Barad Telephone No. +91-1125300200

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2017/000839

Citation	Pub.Date	Family	Pub.Date
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US 20150101558 A1	16-04-2015	US 9328703 B2	03-05-2016