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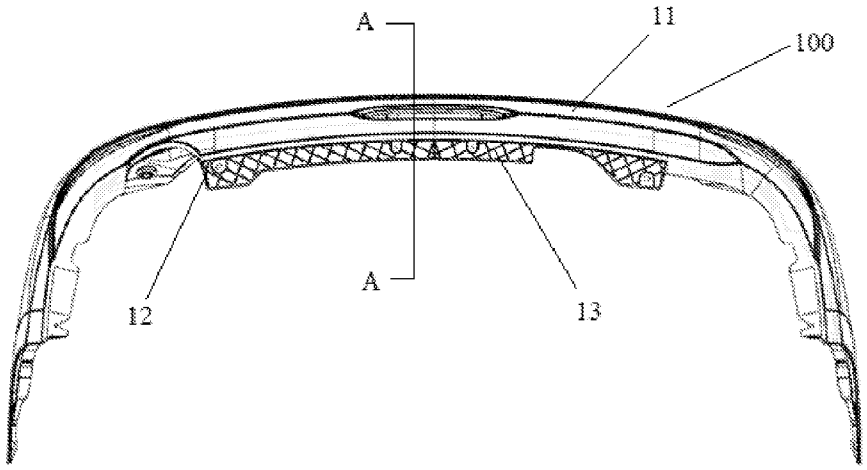


Figure 2

(57) Abstract: A vehicle exterior part comprises a longitudinal wall (11) configured to be fixed to a structural part of the vehicle; a flange (12) arranged on the longitudinal wall (11) and protruding from the longitudinal wall (11), preferably substantially perpendicular to the longitudinal wall (11); and a reinforcement structure is provided on the flange (12). By arranging a reinforcement structure, preferably formed by the reinforcing ribs, on the flange of the exterior part, the strength and rigidity of the entire flange can be increased, and defects of poor appearance due to deformation that occurs in the middle region of the exterior part, where no connection points between the exterior part and the structural part are available, can be avoided. The modality and rigidity of the vehicle exterior part are both improved.

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[Continued on next page]

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A Vehicle Exterior Part

Field of the Invention

The invention relates to the field of vehicle manufacturing, and more particularly, to a vehicle exterior part.

Background of the Invention

In currently existing models, the bottom of an exterior part is generally fitted to a sheet metal bracket or a sheet metal at the bottom of the body of a vehicle via a fastener. However, due to reasons of arrangement, for instance certain models may place a spare tire underneath the body chassis, thus resulting in the impossibility of providing a joint point for an exterior part to be connected to the body in the region of the spare tire. In the case of a bumper that has a relatively large dimension in the Y direction, the bottom of an exterior part cannot be completely fixed onto the body with only fastening points on the two sides of the exterior part, and it is prone to cause wave-shaped deformation in the middle region of the bottom of the exterior part, affecting the acceptability of the vehicle and also resulting in poor appearance and affecting customer experience. More importantly, the modality and rigidity of the bottom region of the exterior part cannot meet customer demands either.

Summary of the Invention

The objective of the invention is to provide a vehicle exterior part so as to solve the technical problems in the prior art especially due to the arrangement of a spare tire underneath the body chassis. Thus it is

impossible to provide a connecting point for an exterior part to be connected to a structural part in the middle region, thereby causing the middle region of the bottom of the exterior part prone to deformation.

The invention adopts the following solution to solve the above technical problem:

A vehicle exterior part is provided, comprising: a longitudinal wall configured to be fixed to a structural part of the vehicle, characterized in that, it further comprises a flange arranged on the longitudinal wall and protruding from the longitudinal wall, preferably substantially perpendicular to the longitudinal wall, wherein a reinforcement structure is provided on the flange.

According to a preferred embodiment, the flange is arranged substantially along the longitudinal direction of the longitudinal wall in a region where the longitudinal wall has no connection with the structural part.

According to another embodiment, the reinforcement structure is formed by reinforcing ribs arranged on the flange and protruding from the flange, preferably perpendicular to the flange.

Advantageously, the reinforcing ribs are arranged in a mesh structure on the flange.

According to another embodiment, the flange is further provided with a covering edge, arranged at an outermost side of the reinforcing ribs and protruding from the flange, preferably perpendicular to the flange.

The flange extends obliquely while protruding from the longitudinal wall.

The reinforcement structure and/or the covering edge are formed integrally with the flange.

According to a preferred embodiment, the vehicle exterior part is rear bumper and the structural part of the vehicle is a vehicle body

The invention, by arranging a reinforcement structure, preferably formed by the reinforcing ribs, on the flange of the exterior part, increases the strength and rigidity of the entire flange, and avoids defects of poor appearance due to deformation that occurs in the middle region of the exterior part, where no connection points between the exterior part and the structural part are available. In summary, the invention provides a vehicle exterior part where the modality and rigidity are both improved.

Description of the Drawings

Figure 1 is a top view of a vehicle exterior part according to a preferred embodiment of the invention, observed from the top of the back of the vehicle, which also shows the movement trajectory of a spare tire when it is removed from the body;

Figure 2 is a bottom view of the vehicle exterior part of Figure 1, observed from below;

Figure 3 is a sectional view along the sectional line A-A as shown in Figure 2; and

Figure 4 is a partial, enlarged schematic view of the vehicle exterior part as shown in Figure 2.

Detailed Description of the Invention

A preferred embodiment of the invention is provided and described

in detail below in conjunction with the accompanying drawings, so as to allow a better understanding of the functions and features of the invention.

As shown in Figure 1, the vehicle exterior part is a rear bumper 100 of vehicle according to a preferred embodiment of the invention. The rear bumper 100 is mounted at the back of the vehicle. It has not only a decorating function, but also a function of absorbing and mitigating external impacts and protecting the body of the vehicle and the safety of passengers. As shown in Figure 1, the rear bumper 100 comprises: a longitudinal wall 11 extending substantially in a transversal direction at the back of the vehicle, and a bottom flange 12 protruding from a bottom of the longitudinal wall 11, obliquely downward at the same time of extending towards the advancing direction of the vehicle. A spare tire will be placed underneath the body chassis for certain models. When the spare tire needs to be removed, a movement trajectory of the spare tire as shown in Figure 1 will be created. However, it is required that there is sufficient safety gap between the spare tire and the surrounding parts during the course of the removal so as to ensure that the spare tire can be successfully removed. In the meantime, because of the arrangement of the spare tire, the bottom flange 12 of the rear bumper 100 can be fixed to the body only through fixation points 16 of both ends, and the middle region cannot be fixed to the body. Therefore, deformation of the rear bumper 100 in the middle region can be easily caused.

Therefore, according to the vehicle rear bumper 100 provided by the invention, the bottom flange 12 is arranged substantially along the longitudinal direction of the longitudinal wall 11 in a region where the longitudinal wall 11 has no connection with the body. Moreover, a reinforcement structure especially formed by reinforcing ribs is specifically designed at the bottom of the bottom flange 12, as shown in

Figure 2. By arranging the reinforcement structure formed by reinforcing ribs 13 on the bottom flange 12 of the rear bumper 100, the strength and rigidity of the entire bottom flange 12 is increased, thus avoiding defects of poor appearance due to deformation that occurs in the middle region of the bottom of the rear bumper.

According to the preferred embodiment, multiple reinforcing ribs 13 are arranged in the manner of a crisscrossing mesh at the bottom of the bottom flange, thus significantly increasing the modality and rigidity of the vehicle rear bumper in the region.

According to a preferred embodiment of the invention, the mesh-like reinforcing ribs 13 should be arranged as densely as possible, provided that the strength of the mold is not affected. It can be understood that the denser the arrangement is, the higher the strength of the bottom of the rear bumper will be.

According to the preferred embodiment, the bottom flange 12 further comprises covering edges 14, 14' extending vertically at the outermost sides of the bottom mesh-like reinforcing ribs 13, as shown in Figure 3. In this embodiment, the covering edge 14 is located on the outer side of the body, performing the functions of both reinforcing and covering, preventing the mesh-like reinforcing ribs 13 from being exposed to the exterior and affecting aesthetics. The covering edge 14' is located on the inner side of the body, performing only the function of reinforcing, and not covering.

According to the preferred embodiment, the reinforcing ribs 13 and the covering edges 14, 14' are formed integrally with the bottom flange 12.

For certain models, as shown in Figure 4, the bottom flange 12 also

has a notch 15 opening towards the advancing direction of the vehicle. The covering edge 14' has a corresponding form in the region of the notch. When the spare tire needs to be taken out from underneath the body, the notch can provide a certain maneuvering space for the spare tire, preventing interference between the spare tire and the bottom flange. But it can be understood that this is only presented as an example instead of a limitation. For other models, the notch may not be arranged on the bottom flange 12, or even if a notch is present, it may not necessarily be at the same location.

What has been described above is merely a preferred embodiment of the invention, and is not to limit the scope of the invention. The embodiment of the invention described above can be subject to various modifications. All simple, equivalent modifications and embellishments made based on the contents of the claims and the specification of the invention fall within the scope of protection of the claims of the invention. What has not been described in detail in the invention is conventional technology.

Claims

1. A vehicle exterior part (100), comprising: a longitudinal wall (11) configured to be fixed to a structural part of the vehicle, characterized in that, it further comprises a flange (12) arranged on the longitudinal wall (11) and protruding from the longitudinal wall (11), preferably substantially perpendicular to the longitudinal wall, wherein a reinforcement structure is provided on the flange (12).

2. The vehicle exterior part (100) of claim 1, wherein the flange (12) is arranged substantially along the longitudinal direction of the longitudinal wall (11) in a region where the longitudinal wall (11) has no connection with the structural part.

3. The vehicle exterior part (100) of any one of the previous claim, wherein the reinforcement structure is formed by reinforcing ribs (13) arranged on the flange (12) and protruding from the flange (12), preferably perpendicular to the flange (12).

4. The vehicle exterior part (100) of the previous claim, wherein the reinforcing ribs (13) are arranged in a mesh structure on the flange (12).

5. The vehicle exterior part (100) of any one of the previous claims, wherein the flange (12) is further provided with a covering edge (14, 14'), arranged at an outermost side of the reinforcing ribs (13) and protruding from the flange (12), preferably perpendicular to the flange (12).

6. The vehicle exterior part (100) of any one of the previous claims, wherein the flange (12) extends obliquely while protruding from the longitudinal wall (11).

7. The vehicle exterior part (100) of any one of the previous claims,

wherein the reinforcement structure and/or the covering edge (14, 14') are formed integrally with the flange (12).

8. The vehicle exterior part (100) of any one of the previous claims, wherein the vehicle exterior part (100) is rear bumper and the structural part of the vehicle is a vehicle body.

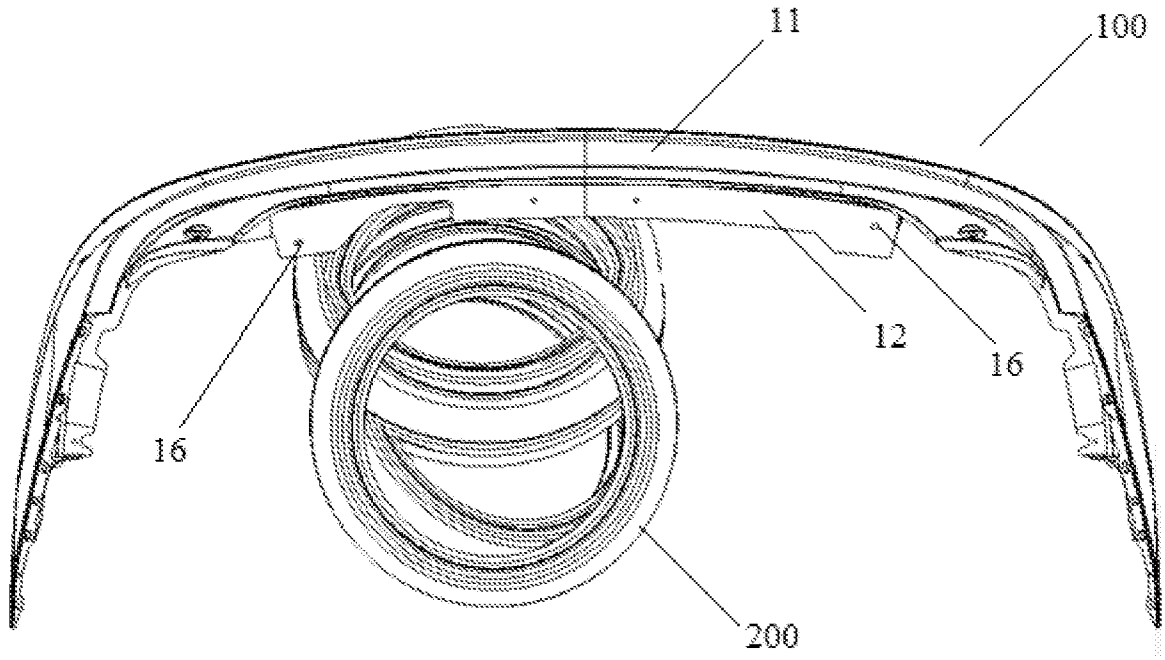


Figure 1

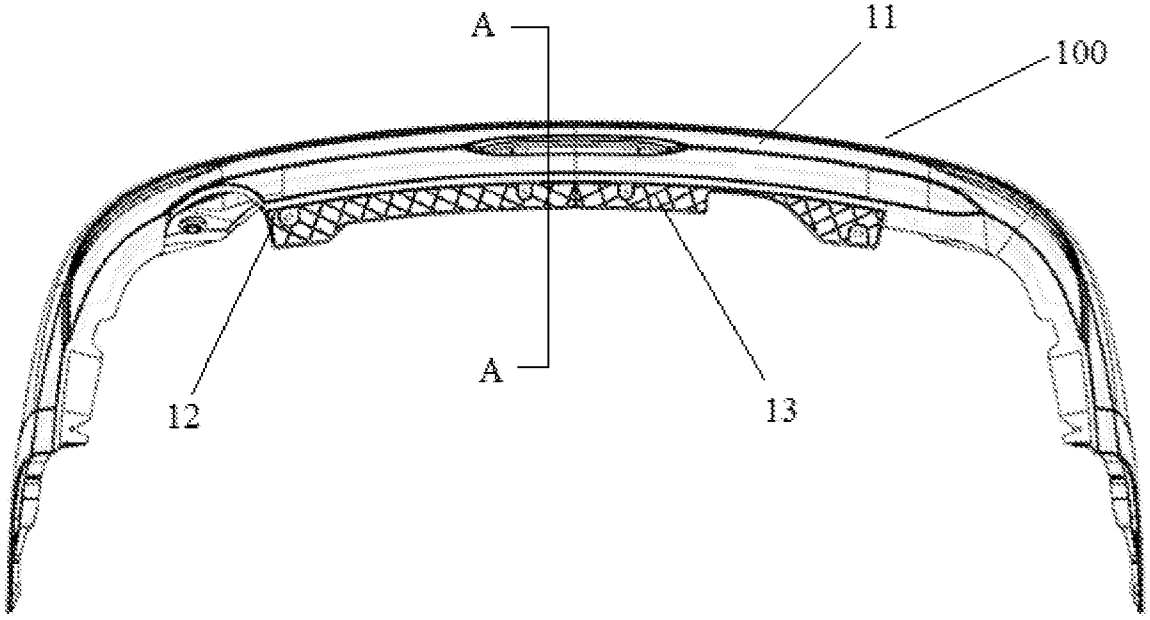


Figure 2

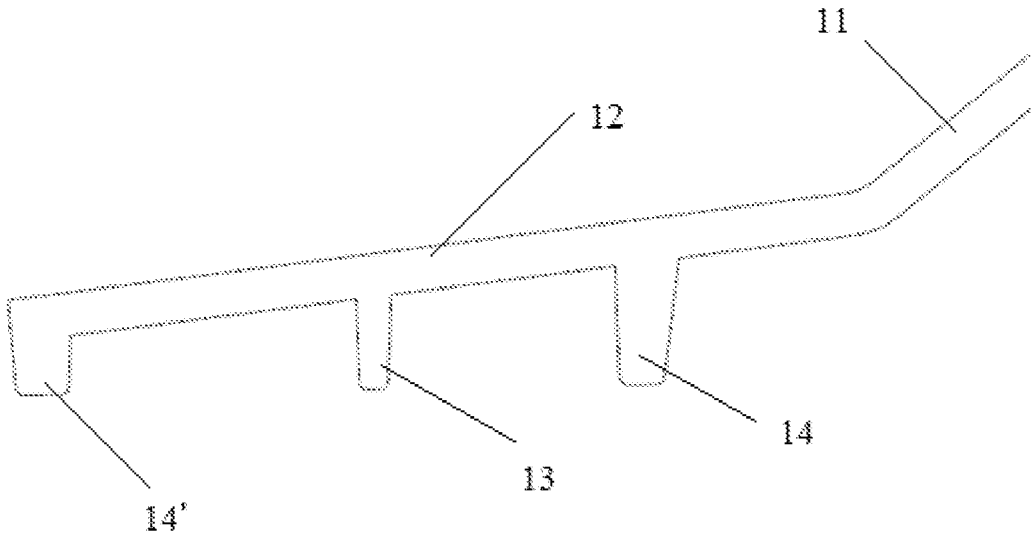


Figure 3

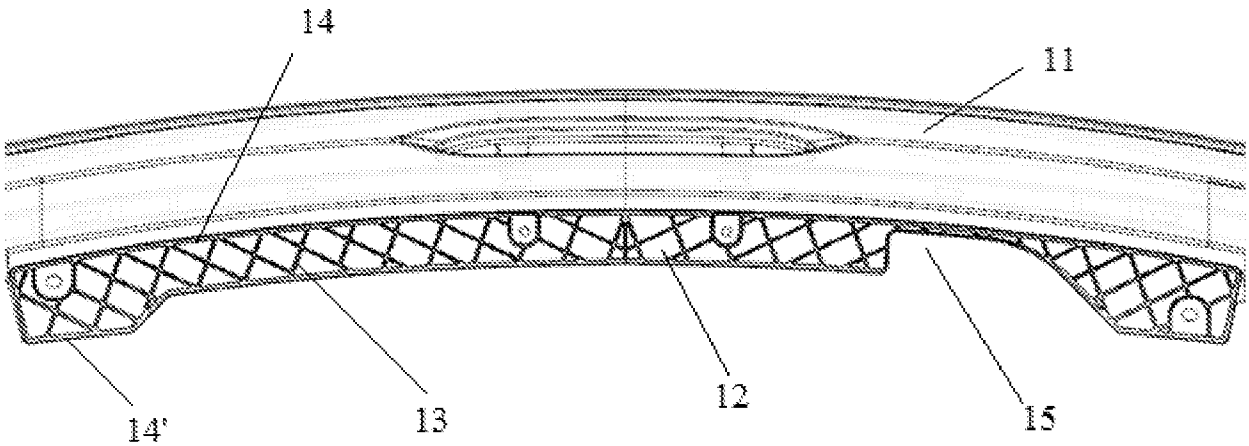


Figure 4

INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

B62D 25/08(2006.01)i; B60R 19/04(2006.01)i

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)

B62D; B60R

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)

CNTXT;CNABS;VEN;CNKI: bumper,spare,tire/tyre/wheel, reinforc+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 204713216 U (GUANGZHOU AUTOMOBILE GROUP CO LTD) 21 October 2015 (2015-10-21) figs.1-12,description paragraphs 17-41	1-8
X	KR 20130008676 A (HYUNDAI MOTOR CO LTD) 23 January 2013 (2013-01-23) abstract,figs.1-4, description paragraphs 21-45	1-8
A	CN 1824544 A (MAZDA MOTOR) 30 August 2006 (2006-08-30) the whole document	1-8
A	CN 204998625 U (MIANYANG HUARUI AUTOMOTIVE LLC) 27 January 2016 (2016-01-27) the whole document	1-8
A	WO 2013082261 A1 (SHAPE CORP) 06 June 2013 (2013-06-06) the whole document	1-8
A	EP 3173274 A1 (MITSUBISHI MOTORS CORP) 31 May 2017 (2017-05-31) the whole document	1-8

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

* Special categories of cited documents:

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 April 2018	**28 April 2018**

Name and mailing address of the ISA/CN	Authorized officer
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 204713216 U	21 October 2015	None	
KR 20130008676 A	23 January 2013	None	
CN 1824544 A	30 August 2006	JP 2006232153 A	07 September 2006
CN 204998625 U	27 January 2016	None	
WO 2013082261 A1	06 June 2013	None	
EP 3173274 A1	31 May 2017	JP 2017094885 A	01 June 2017