United States Patent Application Publication	20250263138
Kind Code	A1
Publication Date	August 21, 2025
Inventor(s)	KRUSE; Patrick W. et al.

WIND NOISE REDUCTION GARNISH

Abstract

A vehicle comprising having a vehicle body including a lower side, a rear quarter window and a rear spoiler garnish, the vehicle defining an inner passenger compartment; a D-pillar garnish configured to be mounted on the vehicle body between the rear spoiler garnish and the lower side of the vehicle, the D-pillar garnish including an outer garnish body having a first predetermined curvature portion; and an inner garnish body. The rear spoiler garnish includes an outer rear spoiler garnish and an inner rear spoiler garnish, the inner rear spoiler garnish having a second predetermined curvature portion. A gap is defined between a rear edge of the outer garnish body and a lower edge of the rear spoiler garnish, and the first predetermined curvature portion and the second predetermined curvature portion defining a convoluted flow path through the gap.

Inventors: **KRUSE; Patrick W. (Marysville, OH), WHEELAND; Jeffrey D. (Radnor, OH), ROSE; David J. (West Mansfield, OH), TAKEMOTO; Hirofumi (Dublin, OH), BARE; Liza G. (Powell, OH), KIMBRELL; Austin (Powell, OH), WILLIAMS; Nigel (Raymond, OH)**

Applicant: **Honda Motor Co., Ltd.** (Tokyo, JP)

Family ID: **1000007694915**

Appl. No.: **18/581706**

Filed: **February 20, 2024**

Publication Classification

Int. Cl.: **B62D35/00** (20060101)

U.S. Cl.:

CPC **B62D35/008** (20130101); **B62D35/007** (20130101);

Background/Summary

BACKGROUND

1. Field of the Disclosure

[0001] The present disclosure relates to a vehicle garnish assembly and, more particularly, to a garnish panel assembly creating a labyrinth path adjacent a rear spoiler.

2. Description of Related Art

[0002] Many automobiles and other motorized vehicles include panels that enhance the appearance and/or functionality of the vehicle body. These panels are referred to as garnish panels or simply a "garnish." Garnish panels are often placed at the edges of body panels, for example adjacent spoilers or openings. High-speed air flowing over a small gap between the spoiler and the garnish may cause air from the open cavity behind the garnish to vent through the small gap due to a negative pressure differential created between the stagnant air behind the garnish and the high-speed air on the outside of the garnish. This venting effect may create a wind noise that can cause a disturbance to passengers within the cabin.

[0003] There is a need in the art for an improved garnish assembly to minimize any wind noise and thus reduce the passenger disturbance.

SUMMARY OF THE INVENTION

[0004] The disclosure herein is directed to a vehicle garnish assembly configured to reduce wind noise. The disclosed garnish assembly achieves this reduction of the wind noise due to a combination of 1) a chamfer feature that impedes the air within the open cavity behind the garnish from venting through the small gap and 2) the D-pillar and rear spoiler garnish panels defining a curvy, labyrinth flow path so as to slow the high-speed air as it flows over the small gap. These features in combination greatly reduce the speed of air through the gap to thereby eliminate or significantly reduce wind noise produced during vehicle travel.

[0005] In one aspect, the disclosure provides a vehicle comprising a vehicle body including a lower side, a rear quarter window and a rear spoiler garnish, the vehicle defining an inner passenger compartment. A D-pillar garnish is configured to be mounted on the vehicle body between the rear spoiler garnish and the lower side of the vehicle, the D-pillar garnish including an outer garnish body having a first predetermined curvature portion and an inner garnish body. The rear spoiler garnish includes an outer rear spoiler garnish and an inner rear spoiler garnish, the inner rear spoiler garnish having a second predetermined curvature portion. A gap is defined between a rear edge of the outer garnish body and a lower edge of the rear spoiler garnish. The first predetermined curvature portion and the second predetermined curvature portion define a convoluted flow path through the gap.

[0006] In a further aspect, a garnish panel for a vehicle comprises an outer garnish body having a main body portion, a middle leg portion and a terminal end portion; and an inner garnish body disposed adjacent the outer garnish body, the inner garnish body having a main body portion, a first leg portion, a second leg portion and a terminal end portion. The middle leg portion of the outer garnish body includes a curved portion having a first predetermined curvature and the first leg portion of the inner garnish body includes a curved portion having a second predetermined curvature complimentary to the first predetermined curvature of the middle leg portion such that middle leg portion of the outer garnish body nests within the first leg portion of the inner garnish body.

[0007] A garnish assembly for a vehicle is also provided in another aspect of the disclosure, the vehicle including a lower side, a rear quarter panel window, and a rear hatch, and the vehicle defining an inner passenger compartment, The garnish assembly comprises a rear spoiler garnish configured to be mounted on the vehicle above the rear hatch, the rear spoiler garnish including an

outer rear spoiler garnish and an inner rear spoiler garnish; and a D-pillar garnish configured to be mounted on the vehicle between the rear spoiler garnish and the lower side of the vehicle, the D-pillar garnish including an outer garnish body and an inner garnish body. A gap is defined between the rear spoiler garnish and the D-pillar garnish and the rear spoiler garnish and the D-pillar garnish define a flow path through the gap including at least one curved section.

[0008] Other systems, methods, features and advantages of the disclosure will be, or will become, apparent to one of ordinary skill in the art upon examination of the following figures and detailed description. It is intended that all such additional systems, methods, features and advantages be included within this description and this summary, be within the scope of the disclosure, and be protected by the following claims.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The disclosure can be better understood with reference to the following drawings and description. The components in the figures are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the disclosure. Moreover, in the figures, like reference numerals designate corresponding parts throughout the different views.

[0010] FIG. **1**A is a schematic side view of a portion of a vehicle generally illustrating a D-pillar garnish and adjacent vehicle panels.

[0011] FIG. **1**B is a schematic rear view of a vehicle generally illustrating the D-pillar garnish and rear spoiler garnish.

[0012] FIG. **2**A is a schematic cross section taken generally along line **2-2** in FIG. **1** of a D-pillar garnish arrangement and an adjacent rear spoiler garnish, according to the prior art.

[0013] FIG. **2**B is a perspective view of the prior art D-pillar garnish arrangement shown in FIG. **2**A.

[0014] FIG. **3**A is a schematic cross-section taken generally along line **2-2** in FIG. **1** of a garnish assembly and an adjacent rear spoiler garnish according to an exemplary embodiment of the disclosure.

[0015] FIG. **3**B is a perspective view of the garnish assembly shown in FIG. **3**A.

[0016] FIG. **4** is a perspective view of a garnish assembly according to an exemplary embodiment of the disclosure.

DETAILED DESCRIPTION

[0017] The disclosure herein is directed to a vehicle including a vehicle body defining a structural periphery of the vehicle. As shown in the accompanying figures and discussed in greater detail below, the vehicle includes a garnish panel configured to be mounted on the vehicle body. The garnish panel may be configured to be mounted on any suitable portion of the vehicle body. In some exemplary embodiments, the garnish arrangement is configured to be mounted in a D-pillar region of the vehicle body. The D-pillar region of a vehicle is a known region of a vehicle body defining the rear most vertical roof support structure or “pillar” that generally extends between a rear quarter panel window and a tailgate of a four-door vehicle with a rear hatch. Examples of such vehicles may include sport utility vehicles (SUV's), wagons, cross-overs, and other vehicles of similar constructions.

[0018] Referring to FIGS. **1**A and **1**B, a vehicle including a D-pillar garnish and a rear spoiler is shown generally by reference numeral **100**. Vehicle **100** includes a lower side end **102**, an opposing forward end (not shown), a rear quarter panel window **104**, and an outer garnish panel **106** located proximate the rear quarter panel window **104** and a rear hatch **107** of vehicle **100**. A rear spoiler garnish **108** is also shown above the rear hatch **107**.

[0019] As illustrated in the cross sections of FIGS. **2**A and **2**B, the garnish panel **106** is disposed

below the rear spoiler garnish **108** and, as known in the art, a small gap G is defined therebetween. The gap is generally on the order of 0.5 to 8 mm in width. On the exterior of the vehicle **100**, an outer surface **108***a* of the rear spoiler garnish **108** is generally flush with an outer surface **106***a* of the garnish panel **106**, as shown best in FIG. **2**B. The interior passenger compartment **116** of the vehicle is located inward from an inner garnish panel **106***b*. The rear spoiler **108** also includes an inner rear spoiler garnish **108***b* disposed inward from the outer surface **108***a*.

[0020] As illustrated in FIG. **2**A, when the vehicle **100** is in motion, the wind or air will be travelling over the vehicle **100** in the direction of airflow arrow A. High-speed air flowing over the gap G between the rear spoiler **108** and the garnish panel **106** creates a negative pressure differential between the stagnant low pressure air behind the garnish panel **106** and the high-speed air flowing on the outside of the garnish panel **106** in the direction of arrow A. This causes the outside air to attempt to enter through the gap G, as shown by airflow arrow B, while air from within the passenger compartment **116** behind the garnish panel **106** is attempting to vent through the gap G. This turbulent flow of air may result in a wind noise area WN that is unpleasant for occupants of the vehicle.

[0021] To address this concern caused by the flow of air through the gap G, an exemplary embodiment of the disclosure herein provides a D-pillar garnish or garnish panel with a chamfer, as shown generally in FIG. **3**A by reference numeral **200**. Garnish panel **200** includes an outer garnish body **202** and an inner garnish body **203** having a chamfer **204** extending rearward from an upper portion of the inner garnish body **203**. Referring also to FIGS. **1**B and **4**, the garnish panel **200** defines an elongate member extending from an upper edge **220** proximate the roof panel of the vehicle **100**′ to a lower edge **222** generally corresponding in height to the lower edge of the rear quarter panel window **104**. The garnish panel **200**, including the outer garnish body **202** and the inner garnish body **203**, can be molded from a plastic material, such as ABS or AEPDS or ASA, and the like, however one skilled in the art will understand that other materials and production methods could of course be used.

[0022] The outer garnish body **202** includes a main body portion **202***a* extending vertically along the exterior of the vehicle **100**′. Extending from an upper edge of the main body portion **202***a* is a middle leg portion **202***b* defining a curvature having an angle θ.sub.1 of approximately 95 to 155 degrees that directs air flow along the middle leg portion **202***b* from a primarily horizontal direction to a primarily vertical direction. A terminal end portion **202***c* extends from the end of the middle leg portion **202***b* and directs the airflow in a substantially horizontal direction.

[0023] The inner garnish body **203** includes a main body portion **203***a* extending vertically substantially parallel to the main body portion **202***a* of the outer garnish body **202***a*. Extending from an upper edge of the main body portion **203***a* is a first leg portion **203***b* also defining a curvature having an angle θ.sub.1 of approximately 95 to 155 degrees that is complimentary to that of the middle leg portion **202***b* of the outer garnish body **202** such that the middle leg portion **202***b* nests within the first leg portion **203***b*. A second leg portion **203***c* extends on a first end from the upper portion of the first leg portion **202***b* and a terminal end portion **203***d* extends vertically downward from an opposing second end of the second leg portion **203***c*. Hence, the second leg portion **203***c* is a connecting section between the first leg portion **203***b* and the terminal end portion **203***d* and serves to space one from the other. The second leg portion **203***c* also defines a substantially horizontal uppermost surface **210** of the inner garnish body **203** and the chamfer **204** extending rearwardly from the surface **210**.

[0024] As shown best in FIGS. **3**B and **4**, the chamfer **204** defines a declining surface as it extends rearward from the uppermost surface **210**. Moreover, the terminal edge of the chamfer is spaced below the terminal end portion **202***c* of the outer garnish body **202** by a distance “d”. More particularly, a terminal end of the chamfer **204** is offset from a top surface of the terminal end portion **202***c* of the outer garnish body **202** by a minimum height of approximately 1.5 mm. This offset spacing created by the chamfer **204** inhibits the outflow of air from behind the garnish panel

200 and thereby reduces the air turbulence leading to wind noise through the gap G. The chamfer **204** may also define an inner pocket or hook **214** at an upper end of the first leg portion **203***b* of the inner garnish body **203**.
[0025] The rear spoiler **208** in the exemplary embodiment includes an outer rear spoiler garnish **206** and an inner rear spoiler garnish **212**. The outer rear spoiler garnish **206** has substantially the same configuration as that known in the prior art in order to maintain the same aesthetic appeal of the vehicle. The inner rear spoiler garnish **212**, however, includes a first leg portion **212***a* defining a curvature having an angle θ.sub.2 of approximately 95 to 155 degrees. Extending from the first leg portion **212***a* is a second leg portion **212***b* extending substantially vertical upwards to the roof of the vehicle. The inner rear spoiler garnish **212***a* together with the garnish panel **200** define a curvy, labyrinth flow path having at least one curved section for the passage of air through the gap G.
[0026] In the exemplary embodiment disclosed herein, air behind the garnish panel **200** does not readily escape through the gap G between the rear spoiler garnish **208** and the garnish panel **200**. Rather, the chamfer **204** and the terminal end portion **202***c* of the outer garnish body assist in impeding this passageway, causing air to flow through the labyrinth formed by outer garnish body **202** and inner rear spoiler garnish **212**. The air is thus drawn along a tortuous pathway in order to escape from behind garnish panel **200**. The air still flows from the higher pressure behind garnish panel **500** toward the lower pressure outside the vehicle. However, because the air must exit through this tortuous pathway of the labyrinth seal, the air escapes at slower speeds, reducing or eliminating the wind noise that is unpleasant for occupants of the vehicle.
[0027] Thus, as explained in detail above, garnish panel **200** and rear spoiler garnish **208** utilizes a combination of a convoluted flow path and a chamfer **204** in order to provide an improved garnish system that minimizes wind noise and thus reduces the disturbance to passengers within the vehicle. One skilled in the art will recognize, however, that these features could of course be used independently from one another to also achieve a reduction of the wind noise to some extent.
[0028] While various embodiments of the disclosure have been described, the description is intended to be exemplary, rather than limiting and it will be apparent to those of ordinary skill in the art that many more embodiments and implementations are possible that are within the scope of the disclosure. Accordingly, the disclosure is not to be restricted except in light of the attached claims and their equivalents. Also, various modifications and changes may be made within the scope of the attached claims.

Claims

1. A vehicle comprising: a vehicle body including a lower side, a rear quarter window and a rear spoiler garnish, the vehicle defining an inner passenger compartment; a D-pillar garnish configured to be mounted on the vehicle body between the rear spoiler garnish and the lower side of the vehicle, the D-pillar garnish including: an outer garnish body having a first predetermined curvature portion; and an inner garnish body; wherein the rear spoiler garnish includes an outer rear spoiler garnish and an inner rear spoiler garnish, the inner rear spoiler garnish having a second predetermined curvature portion; wherein a gap is defined between a rear edge of the outer garnish body and a lower edge of the rear spoiler garnish; wherein the first predetermined curvature portion and the second predetermined curvature portion define a convoluted flow path through the gap.
2. The vehicle according to claim 1, wherein the inner garnish body includes a chamfer.
3. The vehicle according to claim 2, wherein the chamfer defines a sloped surface.
4. The vehicle according to claim 1, wherein the outer garnish body includes a main body portion, a middle leg portion and a terminal end portion.
5. The vehicle according to claim 1, wherein the inner garnish body includes a main body portion, a first leg portion, a second leg portion and a terminal end portion, the second leg portion including a chamfer defining a sloping surface adjacent the terminal end portion of the outer garnish body.

6. The vehicle according to claim 5, wherein a top surface of the chamfer is offset from a top surface of the terminal end portion of the outer garnish body by a distance of at least approximately 1.5 mm.
7. The vehicle according to claim 1, wherein the inner rear spoiler garnish includes a first leg portion and a second leg portion.
8. A garnish panel for a vehicle, comprising: an outer garnish body having a main body portion, a middle leg portion and a terminal end portion; an inner garnish body disposed adjacent the outer garnish body, the inner garnish body having a main body portion, a first leg portion, a second leg portion and a terminal end portion; wherein the middle leg portion of the outer garnish body includes a curved portion having a first predetermined curvature; wherein the first leg portion of the inner garnish body includes a curved portion having a second predetermined curvature complimentary to the first predetermined curvature of the middle leg portion such that middle leg portion of the outer garnish body nests within the first leg portion of the inner garnish body.
9. The garnish panel according to claim 8, wherein the main body portion of the outer garnish body is substantially parallel with the main body portion of the inner garnish body.
10. The garnish panel according to claim 9, wherein the second leg portion is disposed between the first leg portion and the terminal end portion of the inner garnish body such that the first leg portion is spaced away from the terminal end portion.
11. The garnish panel according to claim 10, wherein the second leg portion of the inner garnish body includes an uppermost surface and a chamfer surface sloping rearward and downward from the uppermost surface.
12. The garnish panel according to claim 11, wherein the chamfer surface defines an inner pocket at an upper end of the first leg portion of the inner garnish body.
13. The garnish panel according to claim 12, wherein the sloping chamfer surface terminates below an upper surface of the terminal end portion of the outer garnish body so as to define an offset surface having a predetermined height.
14. A garnish assembly for a vehicle, the vehicle including a lower side, a rear quarter panel window, and a rear hatch, and the vehicle defining an inner passenger compartment, the garnish assembly comprising: a rear spoiler garnish configured to be mounted on the vehicle above the rear hatch, the rear spoiler garnish including an outer rear spoiler garnish and an inner rear spoiler garnish; a D-pillar garnish configured to be mounted on the vehicle between the rear spoiler garnish and the lower side of the vehicle, the D-pillar garnish including an outer garnish body and an inner garnish body; wherein a gap is defined between the rear spoiler garnish and the D-pillar garnish; wherein the rear spoiler garnish and the D-pillar garnish define a flow path through the gap including at least one curved section.
15. The garnish assembly according to claim 14, wherein the D-pillar garnish includes an outer garnish body and an inner garnish body, the outer garnish body having a first predetermined curvature portion; and wherein the rear spoiler garnish includes an outer rear spoiler garnish and an inner rear spoiler garnish, the inner rear spoiler garnish having a second predetermined curvature portion; wherein the first predetermined curvature portion and the second predetermined curvature portion define the flow path through the gap.
16. The garnish assembly according to claim 15, wherein the outer garnish body includes a main body portion, a middle leg portion and a terminal end portion, the middle leg portion including the first predetermined curvature portion.
17. The garnish assembly according to claim 16, wherein the inner garnish body includes a main body portion, a first leg portion, a second leg portion and a terminal end portion, the first leg portion including the second predetermined curvature portion, the second predetermined curvature being complimentary to the first predetermined curvature of the middle leg portion such that middle leg portion of the outer garnish body nests within the first leg portion of the inner garnish body.

18. The garnish assembly according to claim 17, wherein the second leg portion of the inner garnish body includes an uppermost surface and a chamfer surface, the chamfer surface sloping rearward and downward toward the terminal end portion of the outer garnish body.

19. The garnish assembly according to claim 18, wherein a top of the chamfer surface is offset from a top surface of the terminal end portion of the outer garnish body by a height of at least approximately 1.5 mm.

20. The garnish assembly according to claim 19, wherein the chamfer surface defines an inner pocket at an upper end of the first leg portion of the inner garnish body.