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AERODYNAMIC FAIRING FOR A CARGO BODY

Abstract

An aerodynamic fairing for a cargo body is adapted to decrease drag generated by the moving cargo body. The fairing has a top wall providing a surface for guiding air thereover; and members extending away from the top wall, with bottom parts of the members, distant to the top wall, providing a mounting surface to mount the fairing to the cargo body. The fairing can be mounted to the cargo body using brackets allowing the fairing to expend and contract freely and to span over the whole width of the cargo body. The top fairing is economical to produce, being potentially made of extruded material.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION [0001] This application relates to and is a Continuation-In-Part application claiming priority under 35 U.S.C. §0 120 from U.S. patent application Ser. No. 18/656,255, filed May 6, 2024, under 35 U.S.C. § 111, entitled AERODYNAMIC APPARATUSES FOR TRAILER, relates to and is a Continuation application claiming priority under 35 U.S.C. § 120 from U.S. patent application Ser. No. 17/532,892, filed Nov. 22, 2021, under 35 U.S.C. §0 111, published May 25, 2023 under publ. No. US2023/0159113A1, entitled AERODYNAMIC APPARATUSES FOR TRAILER, the specifications of which are hereby incorporated herein by reference in its entirety. This application further relates to and is a non-provisional application claiming priority under 35 U.S.C. §0 119(e) and 37 C.F.R. § 1.78(a) for a priority claim to earlier-filed provisional application, Ser. No. 63/735,402, filed Dec. 18, 2024, under 35 U.S.C. §0 111, entitled AERODYNAMIC FAIRING FOR A CARGO BODY, the specification of which is hereby incorporated herein by reference in its entirety.

BACKGROUND
(a) Field
[0002] The subject matter of the present invention relates to an end-of-trailer fairing that improves aerodynamic performance of the trailer. More particularly, the present application involves a fairing that features a specific geometric shape that includes a leading curved portion and a trailing curved portion that meet at a point of tangency.
(b) Related Prior Art
[0003] Trailers towed by trucks and similar apparatuses for transporting cargo can be large, unwieldy, and include geometries which invite inefficiencies during travel. One aspect of these inefficiencies concerns the aerodynamics of the trailer. In an effort to improve trailer aerodynamics, trailers have been built, supplemented, or retrofitted with trailer skirts (or side skirts), devices affixed to the underside which limit air circulating in the empty space between the trailer's axles. By reducing the amount of airflow in this space, drag caused by turbulence is reduced and permits the trailer to be towed more efficiently, increasing the gas mileage and performance of the vehicle and its cargo. Other ways of improving aerodynamic performance of the trailer involves the provision of fairings to the end of the trailer. The fairings modify the airflow around or behind of the end of the trailer to reduce drag. It is known to produce fairings that have a curved outer surface that extend from the leading edge of the fairing to the tailing edge of the fairing. These curved fairings change the airflow about the end of the trailer to reduce dragging force. Although capable of reducing some dragging force at the end of the trailer, additional fairing designs that can stabilize the airflow wake structure behind the trailer are desirable. As such, there remains room for variation and improvement within the art.
[0004] Furthermore, the existing top fairings present problems in relation with rain management. The shape of the existing top fairings prevents water to travel along the top surface of the trailers, to reach the rain gutters located at the rear edge of the top surface of the trailers for the rain to be drained without being projected to following vehicles. Therefore, nowadays, owners must select between in improvement to the drag of the trailer trough a top fairing or having a rain gutter for managing water on top of the trailer. There is therefore need for improvement with that respect.
[0005] Furthermore, with the presence of trailers having corrugations on the side, there is a need

for an improvement in the side fairings being able to better marry the side surface and guide air along the side surface of the trailer toward the rear of the trailer, and that without a portion of the air getting under the side fairings, or having complicated solution in term of installation or of construction of the side fairings.

[0006] There is therefore a need for improvements in this field, including or not features for rain management.

SUMMARY

[0007] In some aspects, the techniques described herein relate to a top fairing for a trailer including: a surface for guiding air thereover, including a flange; a leading surface having a leading radius, the leading surface being joined to the flange and extending in a rearward direction; and a tailing surface having a tailing radius, the tailing surface in continuity to the leading surface in the rearward direction; and openings disposed in the flange for managing water through the flange.

[0008] In some aspects, the techniques described herein relate to a top fairing, wherein the flange and the leading surface are joining each other with a root angle of between 8 degrees and 16 degrees.

[0009] In some aspects, the techniques described herein relate to a top fairing, wherein the flange is a serrated flange.

[0010] In some aspects, the techniques described herein relate to a top fairing, wherein the flange has a depth perpendicular to its longitudinal orientation, and wherein the openings have funnel-shape walls extending through full depth of the flange.

[0011] In some aspects, the techniques described herein relate to a top fairing, wherein the openings extend into the leading surface.

[0012] In some aspects, the techniques described herein relate to a top fairing, wherein flange has a thickness, and the openings have a height greater than the flange.

[0013] In some aspects, the techniques described herein relate to a top fairing, wherein the tailing surface includes a cantilever portion.

[0014] In some aspects, the techniques described herein relate to a top fairing, including a support structure, and wherein the cantilever portion is rearward from the support structure.

[0015] In some aspects, the techniques described herein relate to a top fairing, wherein the top fairing includes a bridge portion frontward from the cantilever portion, wherein the bridge portion has clearance under while providing support to the tailing surface.

[0016] In some aspects, the techniques described herein relate to a top fairing, further includes side walls including a bar opening and a slot, a bar extending through the side walls, and a pair of brackets to be mounted to a top surface of the trailer, each one of the brackets being adapted to be secured to an extremity of the bar and including a wing interfacing with the slot distant from the bar to secure the top fairing against rotation.

[0017] In some aspects, the techniques described herein relate to a top fairing, wherein the brackets are adapted to be secured to corner members of the trailer.

[0018] In some aspects, the techniques described herein relate to a top fairing, wherein the bar has a transversal coordinate according to its axis, wherein the top fairing has a chord length measured from a leading edge of the leading surface to a tailing edge of the tailing surface, wherein the leading surface and the tailing surface join with each other at a meeting location, and wherein transversal coordinates of the meeting location and of the bar are within 10% of the chord length from each other.

[0019] In some aspects, the techniques described herein relate to a top fairing, wherein the top fairing has a chord measured from a leading edge of the leading surface to a tailing edge of the tailing surface, wherein the leading surface and the tailing surface join with each other at a meeting location, and wherein transversal coordinates of center of curvature of the leading radius, of center of curvature of the tailing radius and of meeting location are within 20% of the chord length from each other.

[0020] In some aspects, the techniques described herein relate to trailer with fairing including a fairing adapted to manage water.
[0021] In some aspects, the techniques described herein relate to a trailer with fairing, wherein the fairing includes side fairing mounted to side surfaces of the trailer.
[0022] In some aspects, the techniques described herein relate to a trailer with fairing, wherein the side surfaces include corrugations, and wherein each one of the side fairings includes a side-fairing flange, a side-fairing leading surface, and notches extending into the side-fairing flange and the side fairing leading surface, wherein the notches provide clearance for the corrugations to fill when the flange abuts the side surface of the trailer.
[0023] In some aspects, the techniques described herein relate to a fairing kit for decreasing drag, and a pair of top-fairing brackets adapted to mount the top fairing to a top surface of the trailer.
[0024] In some aspects, the techniques described herein relate to a fairing kit, further including side fairings and side-fairing brackets adapted to mount the side fairings to side surfaces of the trailer.
[0025] In some aspects, the techniques described herein relate to a fairing kit, wherein the side fairing brackets include a surface-contacting portion adapted to abut the side surfaces, and a fairing-mounting portion adapted for the side fairings to be mounted thereto, wherein the fairing mounting portion is adapted to be distant from the side surfaces.
[0026] In some aspects, the techniques described herein relate to a top fairing for a trailer including: a surface for guiding air thereover, including a flange; a leading surface having a leading radius, the leading surface being joined to the flange and extending in a rearward direction with a root angle between the flange and the leading surface of between **8** degrees and **16** degrees; and a tailing surface having a tailing radius, the tailing surface in continuity to the leading surface in the rearward direction, wherein the top fairing includes essentially the flange, the leading surface and the tailing surface in continuity to each according to essentially two radii for guiding air thereover.
[0027] Preload on forward portion of fender to ensure pressure on the roof to prevent vibrations and rattles. In some aspects, the techniques described herein relates to the structures of aerodynamic fairings that can be made through extrusion, wherein the aerodynamic fairings may be mounted to a cargo body either on the top as a top fairing or on the side as a side fairing, and wherein the mounted aerodynamic fairing decreases drag over the cargo body resulting from displacement thereof.
[0028] In some aspects, the description herein relates to an aerodynamic fairing for a body of a cargo container, including: a top wall providing an airflow leading surface, extending from a leading edge to a tailing edge, in a transversal direction of the aerodynamic fairing, and from a first extremity to a second extremity in a longitudinal direction along a longitudinal axis; a first member extending from the top wall away from the leading airflow surface, the first member providing a bottom wall extending distant to the top wall that provides a mounting surface to abut directly or indirectly against the cargo body, wherein, from where the top wall is joining the first member to the leading edge, the top wall includes a front portion that is cantilevered, and wherein the aerodynamic fairing features a profile according to a plane perpendicular to the longitudinal axis, the profile being substantially constant over most of its length spanning between the first extremity and the second extremity.
[0029] In some aspects, the description herein relates to an aerodynamic fairing, wherein, from where the top wall is joining the first member to the tailing edge, the top wall includes a rear portion that is a cantilevered.
[0030] In some aspects, the description herein relates to an aerodynamic fairing, wherein the first member is a compound member.
[0031] In some aspects, the description herein relates to an aerodynamic fairing, further including a second member that couples the top wall to the first member.
[0032] In some aspects, the description herein relates to an aerodynamic fairing, wherein the first member extends perpendicular to the top wall where the first member joins the top wall.

[0033] In some aspects, the description herein relates to an aerodynamic fairing, wherein the first member extends oblique to the top wall where the first member joins the top wall.
[0034] In some aspects, the description herein relates to an aerodynamic fairing, wherein the first member extends oblique to the mounting surface with at least a portion of the first member that is sloped frontwards, and further including a second member that extends oblique to the mounting surface with at least a section of the second member that is being sloped rearwards.
[0035] In some aspects, the description herein relates to an aerodynamic fairing, wherein the mounting surface defines a mounting plane, and wherein the top wall crosses the mounting plane frontwards to the first member.
[0036] In some aspects, the description herein relates to an aerodynamic fairing, wherein the top wall has a first average thickness frontwards to the first member, and a second average thickness rearwards to the first member, wherein the first average thickness is smaller than the second average thickness.
[0037] In some aspects, the description herein relates to an aerodynamic fairing, wherein the front portion of the top wall is shorter than the rear portion of the top wall.
[0038] In some aspects, the description herein relates to an aerodynamic fairing, further including a second member, wherein the bottom wall joins the first member to the second member, thereby defining a closed cell.
[0039] In some aspects, the description herein relates to an aerodynamic fairing, wherein the first member and the second member are extending along parallel planes.
[0040] In some aspects, the description herein relates to an aerodynamic fairing, further including a second member extending from the top wall, wherein the mounting surface defines a mounting plane, and wherein the leading airflow surface has an apex relative to the mounting surface located between wherein the first member and the second member are joining the top wall.
[0041] In some aspects, the description herein relates to an aerodynamic fairing, including a front edge and a rear edge, and wherein the top wall is a unitary body spanning between the front edge, the rear edge, the first extremity and the second extremity.
[0042] In some aspects, the description herein relates to an aerodynamic fairing, including a first component and a second component that when secured together form the aerodynamic fairing.
[0043] In some aspects, the description herein relates to an aerodynamic fairing, wherein the first component includes at least one channel and the second component includes at least one prong for inserting into the at least one channel to secure the first component to the second component.
[0044] In some aspects, the description herein relates to an aerodynamic fairing, further including a filling material adhered to the top wall about the first member.
[0045] In some aspects, the description herein relates to an aerodynamic fairing, wherein the aerodynamic fairing is made predominantly of at least one of polymer and of a composite material.
[0046] In some aspects, the description herein relates to an aerodynamic fairing, wherein at least one of the top wall and the first member has a thickness of at most 10 mm.
[0047] In some aspects, the description herein relates to an aerodynamic fairing, wherein an area of the profile of the aerodynamic fairing delimited within the leading airflow surface, a mounting plane in which extends the mounting surface, and lines perpendicular to the mounting plane joining the mounting plane to the leading airflow surface has a dimension of at about 3000 mm2 and 5000 mm2.
[0048] In some aspects, the description herein relates to an aerodynamic fairing assembly to be mounted to a body of a cargo container, including: a) a aerodynamic fairing including: i) a top wall providing an airflow leading surface extending from a leading edge to a tailing edge in a transversal direction, and from a first extremity to a second extremity in a longitudinal direction along a longitudinal axis; and ii) a first member extending from the top wall away from the leading airflow surface, the first member providing a bottom wall extending distant to the top wall that provides a mounting surface to abut directly or indirectly against the cargo body; b) an end bracket for

mounting the aerodynamic fairing to the body of the cargo container, the end bracket including: i) a mounting portion for securing to the body of the cargo container; ii) a bordering portion for bordering at least part of the bottom wall of the aerodynamic fairing therebetween and the body of the cargo container; and iii) at least two raised portions abutting the aerodynamic fairing distant to the distant to the first member between the leading edge and the tailing edge.

[0049] In some aspects, the description herein relates to an aerodynamic fairing assembly, further including a longitudinal bracket secured to the end bracket.

[0050] In some aspects, the description herein relates to an aerodynamic fairing mounted to a body of a cargo container, the aerodynamic fairing including: a top wall providing an airflow leading surface extending from a leading edge to a tailing edge in a transversal direction of the aerodynamic fairing, and from a first extremity to a second extremity in a longitudinal direction of the aerodynamic fairing along a longitudinal axis; a first member extending from the top wall away from the leading airflow surface, the first member providing a bottom wall extending distant to the top wall that provides a mounting surface to abut directly or indirectly against the body of the cargo container, wherein, from where the top wall is joining the first member to the leading edge, the top wall includes a front portion that is a cantilevered and biased to abut against the cargo container, wherein the aerodynamic fairing when mounted to the body of the cargo container, has the bottom wall and the leading edge abutting against the cargo container.

[0051] Features and advantages of the subject matter hereof will become more apparent in light of the following detailed description of selected embodiments, as illustrated in the accompanying figures. As will be realized, the subject matter disclosed and claimed is capable of modifications in various respects, all without departing from the scope of the claims. Accordingly, the drawings and the description are to be regarded as illustrative in nature and not as restrictive and the full scope of the subject matter is set forth in the claims.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0052] Further features and advantages of the present disclosure will become apparent from the following detailed description, taken in combination with the appended drawings, in which:

[0053] FIG. **1** is a side view of a trailer with fairings mounted thereto;

[0054] FIG. **2**, is a rear view of the trailer of FIG. **1**;

[0055] FIG. **3** is a perspective view of the rear portion of the trailer of FIG. **1**;

[0056] FIG. **4** is a perspective view of a top fairing with a bracket assembled therewith in accordance with an embodiment;

[0057] FIG. **5** is an exploded view of the top fairing of FIG. **4** and alternative brackets and securing components depicted;

[0058] FIG. **6** is a perspective view of the rear top portion of a trailer with a top fairing mounted thereto in accordance with an embodiment;

[0059] FIG. **7** is a side view of the top fairing of FIG. **6** mounted to the top surface of a trailer comprising a rain gutter;

[0060] FIGS. **8** and **9** are perspective views of the during its installation, respectively before being mounted to the sides of the trailer and depicting the bracket being secured to the sides of the trailer;

[0061] FIG. **10** is a side view of a top fairing in accordance with an embodiment;

[0062] FIG. **11** is a side view of a side fairing in accordance with an embodiment;

[0063] FIG. **12** is a cross-section view according to a transversal plane of the side fairing of FIG. **11** mounted to mounting brackets;

[0064] FIG. **13** is an exploded perspective view of a side fairing and mounting brackets associated therewith adapted to install the side fairing to a side surface of the trailer in accordance with an

embodiment;
[0065] FIG. **14** is a perspective view of an embodiment of a side fairing comprising notches, the side fairing being mounted to the side surface of a trailer comprising corrugations;
[0066] FIGS. **15** and **16** are respectively a perspective view and a close-up view of a front portion of a top fairing showing a single water inlet in accordance with an embodiment;
[0067] FIGS. **17** and **18** are respectively a perspective view and a close-up view of a front portion of a top fairing showing a single water inlet in accordance with another embodiment;
[0068] FIGS. **19** and **20** are respectively a perspective view and a close-up view of a front portion of a top fairing showing a single water inlet in accordance with another embodiment;
[0069] FIG. **21** is a perspective view a top fairing with another embodiment;
[0070] FIG. **22** is a perspective view of a top fairing in accordance with an embodiment;
[0071] FIG. **23** is a side view of the top fairing of FIG. **22**;
[0072] FIG. **24** is a perspective view of a rear portion of trailer, and of a top fairing mounted thereto as a top fairing in accordance with an embodiment;
[0073] FIG. **25** is side view of a leading portion of the top fairing of FIG. **22** with automotive double-sided tape applied thereto in accordance with an embodiment;
[0074] FIG. **26** is side view of a central portion of the top fairing of FIG. **22** in accordance with an embodiment;
[0075] FIG. **27** is side view of a tailing portion of the top fairing of FIG. **22** in accordance with an embodiment;
[0076] FIG. **28** is a bottom perspective view of a portion of an extremity the top fairing of FIG. **22** in accordance with an embodiment;
[0077] FIG. **29** is a bottom perspective view of a portion of an extremity the top fairing of FIG. **22** with proper double-sided tape applied thereto in accordance with an embodiment;
[0078] FIG. **30** is a perspective view of a bracket for mounting a top fairing to a mounting surface of a trailer in accordance with an embodiment;
[0079] FIG. **31** is a top view of a portion of the bracket of FIG. **30** in accordance with an embodiment;
[0080] FIG. **32** is a perspective view of a portion of a trailer and of an extremity of a top fairing mounted thereto with a bracket in accordance with an embodiment;
[0081] FIG. **33** is a side view of a top fairing mounted to a mounting surface using other brackets in accordance with an embodiment;
[0082] FIG. **34** is a perspective view of a central portion of an extremity of a top fairing with a bracket mounted thereto ready to be screwed to a mounting surface in accordance with an embodiment;
[0083] FIG. **35** is a side view of a top fairing in accordance with an embodiment;
[0084] FIG. **36** is a side view of a top fairing in accordance with an embodiment;
[0085] FIG. **37** is a side view of a top fairing mounted to a trailer in accordance with an embodiment;
[0086] FIG. **38** is a side view of a top fairing with an open cell in accordance with an embodiment;
[0087] FIG. **39** is a closeup side view of the leading end of the top fairing of FIG. **36** according to identification-**39**-in FIG. **36**;
[0088] FIG. **40** is a side view of a top fairing in accordance with an embodiment;
[0089] FIG. **41** is a side view of a top fairing with a single compound member in accordance with an embodiment;
[0090] FIG. **42** is a side view of a top fairing with open cells in accordance with an embodiment;
[0091] FIG. **43** is a side view of a two-piece top fairing in accordance with an embodiment;
[0092] FIG. **44** is a side view of a two-piece top fairing in accordance with an embodiment;
[0093] FIG. **45** is a side view of three-piece top fairing in accordance with an embodiment;
[0094] FIG. **46** is a side view of a top fairing with cells embedded in the top wall in accordance

with an embodiment;
[0095] FIG. **47** is a top perspective exploded view of a top fairing and brackets used to mount the top fairing to a trailer in accordance with an embodiment;
[0096] FIG. **48** is a bottom perspective view of a top fairing and brackets used to mount the top fairing to a trailer in accordance with an embodiment;
[0097] FIG. **49** is a side view of the top fairing and the end bracket of FIG. **48**;
[0098] FIG. **49**A is a close-up side view of the top fairing and the end bracket of FIG. **49**;
[0099] FIG. **50** is a perspective bottom view of a top fairing adapted to be mounted using liquid adhesive in accordance with an embodiment;
[0100] FIG. **51** is a perspective bottom view of a top fairing and an end bracket adapted to be mounted using liquid adhesive in accordance with an embodiment;
[0101] FIG. **52** is a perspective view of a trailer with a top fairing mounted thereto with brackets in accordance with an embodiment;
[0102] FIG. **53** is a close-up perspective view of the trailer, the top fairing and the end bracket depicted on FIG. **52**;
[0103] FIG. **54** is a perspective partially exploded view of a portion of a top fairing mounted to a trailer and a cap closing openings of the top fairing in accordance with an embodiment;
[0104] FIG. **55** is a perspective partially exploded view of a portion of a top fairing mounted to a trailer and caps closing top openings of the top fairing in accordance with an embodiment;
[0105] FIG. **56** is a side view of a top fairing mounted to a side rail of a trailer with a bracket in accordance with an embodiment;
[0106] FIG. **57** is a cross-section side view of a top fairing in accordance with an embodiment;
[0107] FIG. **58** is a side view of a top fairing with no filling material in accordance with an embodiment;
[0108] FIG. **59** is a side view of the top fairing of FIG. **58** with filling material;
[0109] FIG. **60** is a side view of another top fairing with filling material in accordance with an embodiment; and
[0110] FIG. **61** is a side view of the top fairing of FIG. **60** with filling material.
[0111] It will be noted that throughout the appended drawings, like features are identified by like reference numerals.

DETAILED DESCRIPTION

[0112] The realizations will now be described more fully hereinafter with reference to the accompanying figures, in which realizations are illustrated. The foregoing may, however, be embodied in many different forms and should not be construed as limited to the illustrated realizations set forth herein.
[0113] With respect to the present description, references to items in the singular should be understood to include items in the plural, and vice versa, unless explicitly stated otherwise or clear from the text. Grammatical conjunctions are intended to express any and all disjunctive and conjunctive combinations of conjoined clauses, sentences, words, and the like, unless otherwise stated or clear from the context. Thus, the term “or” should generally be understood to mean “and/or” and so forth.
[0114] Recitation of ranges of values and of values herein or on the drawings are not intended to be limiting, referring instead individually to any and all values falling within the range, unless otherwise indicated herein, and each separate value within such a range is incorporated into the specification as if it were individually recited herein. The words “about,” “approximately,” or the like, when accompanying a numerical value, are to be construed as indicating a deviation as would be appreciated by one of ordinary skill in the art to operate satisfactorily for an intended purpose. Ranges of values and/or numeric values are provided herein as examples only, and do not constitute a limitation on the scope of the described realizations. The use of any and all examples, or exemplary language (“e.g.,” “such as,” or the like) provided herein, is intended merely to better

illuminate the exemplary realizations and does not pose a limitation on the scope of the realizations. No language in the specification should be construed as indicating any unclaimed element as essential to the practice of the realizations.

[0115] In the following description, it is understood that terms such as “first”, “second”, “top”, “bottom”, “above”, “below”, and the like, are words of convenience and are not to be construed as limiting terms.

[0116] The terms “top”, “up”. “upper”. “bottom”, “lower”, “down”, “vertical”, “horizontal”, “interior” and “exterior” and the like are intended to be construed in their normal meaning in relation with normal installation of the product, with normal orientation of the components being depicted on FIG. **1**.

[0117] Referring to FIGS. **1** to **3**, the present invention provides for a fairing **110** a back of the trailer **112** that improves aerodynamic performance of the trailer **112** to reduce drag on the trailer **112** when a truck (not depicted, located at the front of the trailer) is hauling the trailer **112**. The fairing **110** comprises a top fairing **168** that is attached to the top surface **136** of the trailer **112**, or the fairing **110** may be a side fairing **170** attached to the side surface **134** of the trailer **112**. Typically, the trailer **112** is provided with side fairings **170** on both of its side surfaces **134**, and with a top fairing **168** on its top surface **136**. The fairing **110** features a leading airflow surface **114** that has a leading radius. The leading airflow surface **114** meets a tailing airflow surface **120** at a meeting location **122** (see FIG. **10**), and a common tangent line **124** (see FIG. **10**) extends through the meeting location **122** and is tangent to both the leading airflow surface **114** and the tailing airflow surface **120** at this point. The fairing **110** is designed for the air to travel over the leading airflow surface **114** and to follow the tailing airflow surface **120** to result in an optimal reduction of drag on resulting from air led to the rear of the trailer **112** during transport.

[0118] FIGS. **1** to **3** illustrate a trailer **112** adapted to be hauled by a truck that features at its rear portion fairings **110** in accordance with an exemplary embodiment. The combination of the truck and trailer **112** extends in a longitudinal direction **144** which is the general direction of travel as the truck hauls the trailer **112** forward. The fairings **110** are designed to deflect airflow in an optimal manner around the back of the trailer **112** so that drag on the trailer **112** during travel is optimally reduced. The geometric design of the fairing **110** includes features that result in this optimal reduction of drag. Although three fairings **110** are shown at the back end of the trailer **112**, it is to be understood that the trailer **112** may be outfitted with only one or with two of the fairings **110** in other exemplary embodiments. The fairings **110** are preferably located proximate to the terminal end **174** of the trailer **112**, secured to the trailer **112**, and are forward of the terminal end **174** in the longitudinal direction **144**. In some instances, the fairings **110** may extend rearward of the terminal end **174** in the longitudinal direction **144**. The fairings **110** are located near the terminal end **174** of the trailer **112** because they are designed to affect the flow of air at the back end of the trailer **112** and behind the trailer **112** during travel. Additional fairings (not shown), not specifically discussed herein, can be employed e.g., at the bottom of the trailer **112** or in other locations on the trailer **112** as desired for combined effect on drag of the trailer **112**.

Top Fairing

[0119] With additional reference to FIGS. **4** to **10**, the top fairing **168** is located at the back end of the trailer **112** so that it is closer to the back terminal end **174** of the trailer **112** than to the front terminal end of the trailer **112**. The top fairing **168** may be spaced some amount forward of the back terminal end **174** in the longitudinal direction **144**, may terminate right at the back terminal end **174**, or may extend slightly rearward from the back terminal end **174** in the longitudinal direction **144**. The top fairing **168** extends almost all the way across the top surface **136** in the lateral direction **146** of the trailer **112** so as to extend about both the right and left side surfaces **134**.

[0120] FIG. **7** is a side view of the back end of the trailer **112** with the top fairing **168** positioned onto the top surface **136** of the trailer **112**. The top fairing **168** has a leading airflow surface **114** that is forward of a tailing airflow surface **120** in the longitudinal direction **144**. The top fairing **168**

is typically made of an unibody component mounted to the top surface **136** secured with fixing components to the top surface **136**. The leading airflow surface **114** and the tailing airflow surface **120** may be constant or may vary along the width of the top fairing **168**. In other words, the leading airflow surface **114** and the tailing airflow surface **120** may be measured according to longitudinal planes (e.g., plane **135**, FIG. **6**) characterized by their transversal coordinate relative to a reference, e.g., the side edge of the trailer **112**. The leading airflow surface **114** and the tailing airflow surface **120** may be constant or vary as they are measured at different transversal coordinates. As such, it is to be understood, as used herein, that the leading airflow surface **114** and the tailing airflow surface **120** discussed herein may be measured according to any transversal coordinate over the width of the top fairing **168**. It is further to be understood that as used herein, when discussing the orientation of the surfaces **114**, **120** with respect to angles, radii, locations, ranges, etc. the portion of the surfaces **114**, **120** that are being measured or discussed are the outer surfaces of the leading airflow surface **114** and the tailing airflow surface **120** and not interior portions, if any, of these surfaces **114**, **120**. The surfaces **114**, **120** can be made of plastic and may be manufactured according to a first embodiment through a thermal plastic forming process, or according to another embodiment made of extruded plastic, the latter being characterized in constant characteristics of the surfaces **114**, **120** over the width of the top fairing **168**.

[0121] The leading airflow surface **114** has a leading edge **160** that is the forward most portion of the leading airflow surface **114** in the longitudinal direction **144**. Forward of the leading edge **160** is an anchoring flange **142**. The leading airflow surface **114** is oriented, from the anchoring flange **142** parallel to the top surface **136**, with a root angle **116** that is typically from **8** to **16** degrees, and more preferably from **12** to **16** degrees, and preferably about **14.4** degrees. The root angle **116** is oriented rearward in the longitudinal direction **144**. The root angle **116** is measured relative to the top surface of the anchoring flange **142**, itself parallel to the side surface **134**. In this regard, an angle of zero (0) degree refer to a surface parallel to the top surface **136**, and a root angle **116** that is of one- hundred and eighty (180) degrees refers to a leading airflow surface **114** that would be normal to the top surface **136** at the leading edge **160**. The leading airflow surface **114** is curved at a set amount so that the entire leading airflow surface **114** has a single leading radius **127**. The leading radius **127** is in the range from 500 millimeters to 900 millimeters. In more preferred embodiments, the leading radius **127** is from 700 millimeters to 800 millimeters, and preferably about 760 millimeters.

[0122] The leading airflow surface **114** ends at a meeting location **122** where it meets the tailing airflow surface **120**. The tailing airflow surface **120** is a curved surface that extends from the meeting location **122** to a tailing edge **121**. The tailing edge **121** is about or rearward to the terminal end **174** in the longitudinal direction **144**. In the embodiment shown, the tailing airflow surface **120** is curved at a set amount so that the entire tailing airflow surface **120** has a single tailing radius **128**. The tailing radius **128** is in the range from 500 millimeters to 1800 millimeters. In more preferred embodiments, the tailing radius **128** is from 800 millimeters to 1600 millimeters, and preferably about 900 millimeters.

[0123] The leading airflow surface **114** and the tailing airflow surface **120** are oriented with respect to one another so that they share a common tangent line **124** that is about the apex (i.e., within the top 5% of the height of the top fairing **168**, and preferably within 2.5% of its height) and about the center (i.e. within the range of 30% to 70% of the transversal length **145** measured from the leading edge **160** to the tailing edge **121**, and preferably within the 40% to 60% of the transversal length **145**). The meeting location **122** is the point of engagement between the leading airflow surface **114** and the tailing airflow surface **120** and in so far as the common tangent line **124** is common to both of these surfaces **114**, **120**. This arrangement affords airflow off of the leading airflow surface **114** to channel against the tailing airflow surface **120** with no disruption. The orientation and leading radius **127** of the leading airflow surface **114** and of the tailing airflow surface **120** results in a geometry of the top fairing **168** that causes an air flow to travel downward over the top fairing **168**

around the rear of the trailer **112** to reduce dragging force while the truck is hauling the trailer **112** to improve its fuel efficiency.

[0124] The leading air flow surface **114** is spaced from the top surface **136** so that a gap **152** is present and the portion of the top fairing **168** that is below the leading air flow surface **114** is not in engagement with the top surface **136**.

[0125] The anchoring flange **142** is attached, typically glued with double-face automotive tape, to the top surface **136**. According to an embodiment, the anchoring flange **142** is glued over the width of the anchoring flange **142** (from about one side edge to about the other side edge of the top surface **136**) with sections of double-sided tape spaced with sections free of tape; the latter providing a gap of the thickness of the double-sided tape for water to flow toward a rain gutter at the rear end of the top surface **136** of the trailer **112**.

[0126] The installation of the top fairing **168** involves a bar **126** that extends between the top surface **136** and the surfaces **114**, **120**, and that extends sideways between the side wall **132** of the top fairing **168** to be secured to a mounting bracket **178** at both ends. The bar **126** can extend over the whole width of the top fairing **168**, and can be secured to the top fairing **168** at locations to reinforce the top fairing against deformation and/or vibration. The bar **126** can be a separate component from the top fairing **168**, or may be permanently assembled to the surfaces **114**, **120**.

[0127] It is to be understood that the bar **126** can be a component that is separate from the leading airflow surface **114** and the tailing airflow surface **120**, The bar **126** may be alternatively integral to the top fairing **168**. The bar **126** may be a single bar. The bar **126** may alternatively be made of a plurality of bar sections, either or not joined to each other. The bar **126** may be made of the same material than the portion of the top fairing **168** defining the leading airflow surface **114** and the tailing airflow surface **120**. The bar **126** may alternatively be made or of a different material than the surfaces **114**, **120**. Typically, the bar **126** presents more rigidity than the surface **114**, **120**.

[0128] The bar **126** is shown attached to the top surface **136** through the brackets **178** secured to the top of the trailer **112** on opposite sides in the lateral direction **146** (depicted on FIG. **6**), and more precisely close enough to the side edges of the trailer **112** to have the bolts securing the brackets **178** to the trailer **112** not penetrating in the interior compartment of the trailer **112**. The bar **126** is secured to brackets **178**, and an interface between an extending wing **176** and a slot **172** present in the side walls **132** exerts the anchoring flange **142** downward. A top wing **166** of the brackets **178**, presenting itself as an inward folding of a top portion of the brackets **178**, complete the interface of the top fairing **168** with the brackets **178**. The top wings **166** participate in preventing rotation of the top fairing **168**. The described mounting of the top fairing **168** provides some side clearance for transversal adjustment of the top fairing **168**. Accordingly, a single bar **126** provides the required strength to attach the top fairing **168** to the top surface **136**.

[0129] As discussed, the use of the bar **126** allows the side walls **132**, and consequently the leading airflow surface **114** and the tailing airflow surface **120**, to be secured to the trailer **112** without having to drill holes through the top surface **136**, which could result in rain or contaminants entering the compartment of the trailer **112**. In this manner, the compartment of the trailer **112** is made more secure by the use of the side-mounted brackets **178** and the bar **126** to retain the top fairing **168** to the trailer **112**. Although described as utilizing a single tubular bar **126** to secure the top fairing **168**, which provides advantages over alternatives, more than one bar or a bar of another shape may be used in other embodiments.

[0130] According to realizations, the tailing air flow surface **120** is adapted for a cantilevered portion to cover a rain gutter located at the rear end of the top surface **136**. The tailing airflow surface **120** may be adjusted to adapt rain gutters of different dimensions.

[0131] The side walls **132** have a rear edge **138** distant from the tailing edge **121**. The rear edge **138** defines a clearance under a cantilevered portion of the tailing surface **120** allowing the top fairing **168** to adapt to top surfaces having no rain gutter and rain gutters **118** of different dimensions, whereby mounting the brackets **178**, thus the top fairing **168**, farther (for a top surface

136 featuring no rain gutter) or closer (for a top surface **136** featuring a rain gutter **118** of up to e.g., 1⅜ inches to have the tailing edge **121** above the rain gutter **118** and reaching the terminal end **174**.
[0132] According to an embodiment, the rear edge **138** features an upward-rearward slop followed in the direction of the tailing edge **121** by a rearward portion. This shape is adapted to improve clearance while limiting the cantilevered portion of the tailing airflow surface **120** to an acceptable value.
[0133] According to a preferred realization, the tailing airflow surface **120** may be marked with indications (not depicted) where to cut the tailing airflow surface **120** based on the dimension of the rain gutter **118** to adapt to.
[0134] According to a preferred realization, the meeting location **122**, where uplift forces are at their maximum, is within 10% of the total chord **145** from the leading edge **160** to the tailing edge **121** relative to the position in the longitudinal direction of the center of the bar **126**. More preferably, it is within 5% relative to the position in the longitudinal direction of the center of the bar **126**.
[0135] The profile of the top fairing **168** may be defined by the parameters of the leading airflow surface **114** and the tailing airflow surface **120**, including the root angle, characteristics of their meeting, etc. According to a preferred realization, the root angle **116** is between 8 and 16 degrees, and more preferably between 12 and 16 degrees, and preferably about 14.4 degrees. The leading radius **127** is in the range from 500 millimeters to 1800 millimeters. In more preferred embodiments, the leading radius **127** is from 500 to 900 millimeters, and preferably from 700 millimeters to 800 millimeters, and preferably about 760 millimeters. The tailing radius **128** is in the same ranges than the leading radius, and preferably about 900 millimeters. The center of curvature of the leading radius **127** is located under the surfaces **114**, **120** and its longitudinal coordinate is within 20% of the chord **145** relative to the meeting location **122**, and preferably within 10% of the chord **145** relative to the longitudinal coordinate of the meeting location **122**. The center of curvature of the tailing radius **128** is located under the surfaces **114**, **120** and its longitudinal coordinate is within 20% of the chord **145** relative to the meeting location **122**, and preferably within 10% of the chord **145** relative to the longitudinal coordinate of the meeting location **122**. The tailing angle **129** (see FIG. **12** for depiction on the side fairing **170**) is between 10 and 30 degrees, and preferably more than 10 degrees, and more preferably more than 12 degrees.
[0136] According to another perspective, the ratio of the leading radius **127** over the tailing radius **128** is between 2 over 1 and 1 over 2, preferably between 3 over 2 and 2 over 3, preferably between 4 over 5 and 5 over 4, and preferably about 5 over 6.
[0137] Referring now to FIGS. **15** to **21**, according to embodiments, top fairings **168** feature an improved water management feature comprising a series of water inlets **194** having a generally funnel-shaped aperture on the anchoring flange **142** extending over the whole depth of the anchoring flange **142** and ending with a e.g., curved opening **198** at the root of the leading airflow surface **114**, wherein the opening **198** has small height **200** and an inlet width **204** providing passage for big water drops to travel from in front of the anchoring flange **142** to under the top fairing **168** and finally reaching e.g., a rain gutter. Accordingly, water falling over the top surface **136**, instead of accumulating in front of the anchoring flange **142**, and travelling over the top fairing **168** and risking falling from the tailing edge **121** at the rear of the trailer **112** on following vehicles, are drained through the rain gutter **118** (see for example FIG. **7**).
[0138] Embodiments includes top fairings **168** featuring from **3** water inlets **194** (FIG. **21**) including two partial water inlets on the sides and a central one, and to more than **30** water inlets **194**. According to embodiments, the height **200** of the aperture may vary from about the thickness of the anchoring flange **142** to up to three times the thickness of the anchoring flange **142** with low influence on drag reduction resulting from the use of the top fairing **168**. The present disclosure contemplates different shapes (e.g., straight, curved) and width **202** of side walls **194** for the funnel-shaped apertures and spacing between the side walls **194** of neighbor water inlets **194** being

null to a ratio of e.g., four time the width **202**. The present disclosure further contemplates general shapes of the opening **198** from being either straight or having a curved shape, or another shape appropriate in relation with the material in which the top fairing **168** is made of.

Side Fairing

[0139] Referring now to FIGS. **1** to **3** and **11** to **14**, the side fairing **170** extends in a vertical direction **148** of the trailer **112** along some, but typically not all, of the vertical height of the trailer **112**. The side fairing **170** is typically located closer to the top surface **136** of the trailer **112** than a bottom surface of the trailer **112**. The side fairing **170** may be located at the top surface **136**, or it may be spaced some distance from the top surface **136** in the vertical direction **148**. The side fairing **170** is mounted to the side surface **134** of the trailer **112**.

[0140] According to an embodiment, the side fairing **170**, which function is to direct the flow of air around the side of the trailer **112** and to an area behind the trailer **112** to result in less drag on the trailer **112** when the trailer **112** is hauled by a truck, has an anchoring flange **142** attached to the side surface **134**, and a leading airflow surface **114** that joins the anchoring flange **142** farther in the longitudinal direction **144**, and a tailing airflow surface **120** that follows the leading airflow surface **114** in the longitudinal direction **144**.

[0141] In some instances, the side surface **134** of the trailer **112** can include corrugations **156** that extend in horizontally in the longitudinal direction **144**. The side fairing **170** may be provided with notches **154** having an ogive-like shape having a pair of parallel edges **157** at the anchoring flange **142** leading to a curved apex **158** distant to the anchoring flange **142**. The notches **154** are adapted for the corrugations **156** to be disposed therein in order to allow the anchoring flange **142** of the side fairing **170** to marry the flat portion of the side surface **134** between the corrugations **156**.

[0142] The side fairing **170** has a leading airflow surface **114** and a tailing airflow surface **120** that have similar characteristics than the ones of the top fairing **168**.

[0143] According to an embodiment, the radii **127**, **128** of the side fairing **170** are respectively of about 1450 millimeters and of about 900 millimeters.

[0144] According to an embodiment, the side fairing **170** is secured to the side surface **134** using a series of mounting brackets **188** having surface-contacting portions **190** and fairing-mounting portions **192** spaced from the side surface **134** such as adapted to provide clearance for corrugations **156** and mounting screw tips. The mounting brackets **188** are adapted for the surface-contacting portions **190** to be secured to the side surface **134** with tape and/or rivets. The side fairing **170** is secured to the fairing-mounting portions **192** with screws.

[0145] According to a preferred embodiment, the side fairing **170** features recesses **164** for the head of the screw to not extend, or extend only slightly, over its outer surface **114** or **120**.

[0146] According to embodiment, the side fairings **170** may be mounted to extend beyond the terminal end **174** of the trailer **112**. In some embodiments, hinge notches **184** (of similar shape to the corrugation notches **154**) are present to provide clearance for hinges when opening the doors of the trailer **112** without the hinges flexing the side fairings **170**.

[0147] In is to be noted that the design of the top fairing **168** and the side fairing **170** may differ in that their root angle and their radii. However, it is preferred that profiles for the top fairing **168** and the side fairing **170** remain with the ranges listed herein.

[0148] Referring now to FIG. **22** and FIG. **23**, the top fairing **168** of an embodiment features a leading airflow surface **114** that has a leading radius **127**. The leading airflow surface **114** meets a tailing airflow surface **120** at a meeting location **122**, and a common tangent line **124** that extends through the meeting location **122** that is tangent to both the leading airflow surface **114** and the tailing airflow surface **120**. The top fairings **168** are designed for the air to be deflected thereby, the air travelling over the leading airflow surface **114** and following the tailing airflow surface **120** to result in a reduction of drag on the rear of the trailer **112**, or more generally a cargo body or body of a cargo container, during transport.

[0149] Referring additionally to FIGS. **1** to **3** where is illustrated a trailer **112** adapted to be hauled

by a truck that features aerodynamic fairings **110** close to the terminal end **174** of the trailer **112** in accordance with an exemplary embodiment. The combination of the truck and trailer **112** extends in a longitudinal direction **144** which is the general direction of travel as the truck hauls the trailer **112** forward. The aerodynamic fairings **110** are designed to deflect airflow in an optimal manner for a reference speed, the airflow being deflected about the back of the trailer **112** so that drag on the trailer **112** during travel is optimally reduced at the reference speed while providing substantial reduction of drag when traveling at neighbor speeds. The geometric design of the fairing **168** includes features that result in this optimal reduction of drag. Although three aerodynamic fairings **110**, namely top fairing **168** and side fairings **170**, are shown at the back end of the trailer **112**, it is to be understood that the trailer **112** may be outfitted with only the top fairing **110** or the side fairings **170** in other exemplary embodiments. The aerodynamic fairings **110** are preferably located proximate to the terminal end **174** of the trailer **112**, secured to the trailer **112**, and mounted either forward to the terminal end **174** in the longitudinal direction **144** or slightly extending rearward to the terminal end **174** of the trailer **112**. Additional fairings (not shown), of the same nature or of a different nature, not specifically discussed herein, can be combined thereto, mounted e.g., at the bottom of the trailer **112** or in upstream locations on the trailer **112** for combined effect of reduction of drag of the trailer **112**.

[0150] Referring back to FIG. **22**, FIG. **23**, and referring further to FIG. **24**, FIG. **25**, FIG. **26**, FIG. **27** and FIG. **28**, top fairing **168** comprises a top wall **131** providing an airflow surface **212** along which the air flows, the airflow surface **212** comprising a leading airflow surface **114** that is forward of a tailing airflow surface **120** in the transversal direction **165** of the top fairing **168**. According to an embodiment, the top fairing **168** is made of extruded material providing a regular, preferably invariant, profile in its longitudinal direction comprising in an embodiment a series of closed cells **141** adapted to provide structure and to mount the top fairing **168** to a mounting surface **136** of the trailer **112**.

[0151] It is worth noting that the top fairing **168**, once manufactured, may be cut for installation, e.g., cut to the appropriate length, and be customized for a particular use, e.g., notches may be cut in the tailing portion of the top wall **131** for providing clearance for e.g., rails and door locking mechanisms.

[0152] According to a preferred embodiment, the top fairing **168** is preferably sized to cover the whole width of the trailer **112** when installed on the top of the trailer **112**. When compared to existing fairings, the present top fairing **168** spread over a wider proportion of the trailer **112**, improving the drag reduction effect thereof.

[0153] In a typical embodiment, the leading airflow surface **114** of the top fairing **168** has a leading edge **160** that is the frontmost portion of the leading airflow surface **114** in the transversal direction **165** of the top fairing **168**, and thus the longitudinal direction **144** of the trailer, once mounted thereto. Forward of the leading edge **160** is a front flange **142** adapted to marry the surface of the trailer **112** to which it is mounted. The leading airflow surface **114** is oriented, from the front flange **142** parallel to the top surface **136**, with a root angle **116** that is typically from 8 to 16 degrees, and more preferably from 12 to 16 degrees, and preferably about 14.4 degrees. The root angle **116** is oriented rearward in the longitudinal direction **144**. The root angle **116** is measured relative to the top surface of the front flange **142**, itself parallel to the mounting surface **136**. In this regard, an angle of zero (0) degree refer to a surface parallel to the mounting surface **136** to which is mounted the top fairing **168**. The leading airflow surface **114** is curved at a set degree so that the entire leading airflow surface **114** has a single leading radius **127**. The leading radius **127** is in the range from 500 millimeters to 900 millimeters. In more preferred embodiments, the leading radius **127** is from 700 millimeters to 800 millimeters, and preferably about 760 millimeters.

[0154] The leading airflow surface **114** ends at a meeting location **122** where it meets the tailing airflow surface **120**. The tailing airflow surface **120** is a curved surface that extends from the meeting location **122** to a tailing edge **121**, in other words aft edge, or at the aft end of the top

fairing **168**. In an embodiment, the tailing edge **121** is designed to be mounted about or rearward to the terminal end **174** of the trailer **112**. In the embodiment shown, the tailing airflow surface **120** is curved at a set amount so that the entire tailing airflow surface **120** has a single tailing radius **128**. The tailing radius **128** is in a range between 500 millimeters and 1800 millimeters. In more preferred embodiments, the tailing radius **128** is in a range between 800 millimeters and 1600 millimeters, and preferably about 900 millimeters.

[0155] The leading airflow surface **114** and the tailing airflow surface **120** are oriented with respect to one another so that they share a common tangent line **124** that is about the apex, e.g., within the top 5% of the height of the top fairing **168** when mounted to a mounting surface **136**, and preferably within the top 2.5% of the height of the top fairing **168**, and about the center, e.g., in a range between 30% to 70% of a reference chord **208** measured following the airflow surface **212** from the leading edge **160** to the tailing edge **121** according to a point of the leading edge **160** and the tailing edge **121** intersected by the straight line **137** corresponding to the mounting surface **136** when mounted thereto, and preferably in a range of between 40% to 60% of the reference chord **208**. The meeting location **122** is the point of engagement between the leading airflow surface **114** and the tailing airflow surface **120**. This arrangement affords airflow off from the leading airflow surface **114** to channel against the tailing airflow surface **120** with no disruption. The orientation and leading radius **127** of the leading airflow surface **114** and of the tailing airflow surface **120** results in a geometry of the airflow surface of the top fairing **168** that causes an airflow to travel toward the space rearward to the terminal end **174** over the top fairing **168** and thereby reduce dragging force while the truck is hauling the trailer **112**, and in consequence improving its fuel efficiency.

[0156] In a realization, the front flange **142** extends a little lower than the straight line **137** before installation (see relaxed front flange in e.g., FIG. **44**), thereby for the installation on the top surface **136** applying a downward force preloading the leading edge **142** to minimize the ingress of air and vibration over the mounting surface **136**.

[0157] According to an embodiment, the top fairing **168** comprises at least one closed cell **141** opposed to the airflow surface **212** (e.g., FIG. **41**). According to an embodiment, the top fairing **168** comprises at least one member, e.g., a plurality of members, extending from the top wall **131** (e.g., FIG. **42**).

[0158] The leading edge **160** is distant from the frontmost member such that the top wall **131**, frontwards to the junction of frontmost member to the top wall **131**, is a cantilever portion, e.g., a front portion, or in other words a front flange **142** that is not supported as the frontmost position. According to an embodiment, the leading edge **160**, when the top fairing **168** is mounted to the cargo, is designed to abut against the surface of the cargo with a load generated in the top portion biasing the leading edge **160** to remain in contact with the cargo.

[0159] Similarly, the tailing edge **121** is distant from the rearmost member with the top wall **131**, rearwards to the junction of rearmost member to the top wall **131**, is a cantilever portion.

[0160] According to an embodiment, the tailing edge **121** is designed to remain above the cargo, not in contact with the cargo.

[0161] According to an embodiment, at least some of the closed cells **141** are made of a section of the top wall **131**, a frontmost side member **210**, a rearmost side member **147**, and a bottom wall **216** (e.g., FIG. **23**). In a preferred embodiment, the side members **210**, **147** of at least one of the cells **141** are sloped in opposed direction, one sloped frontward and the other sloped rearward, with the geometry providing resistance against shear load therefore limiting deformation of the top fairing **168**.

[0162] According to an embodiment, the top fairing **168** features a symmetric mounting cell, aka having the same geometry from a front perspective and a rear perspective, having symmetric abutting surface faces provided by the side members **210**, **147**, allowing to mount the top fairing **168** with identical brackets **180** (see e.g., FIG. **30**).

[0163] According to an embodiment, the top fairing **168** features a cantilever closed cell **143** not in contact with the mounting surface **136** when the top fairing **168** is mounted thereto, providing extra structure to the top wall before the tailing cantilever portion of the top wall **131**.
[0164] According to an embodiment depicted through FIG. **25**, the mounting wall **216** comprises at least one of a front anti-peeling lip **155** and a rear anti-peeling lip **155** extending beyond the intersection of the mounting wall **216** to a frontmost or rearmost intersecting side member **210**, **147** either frontward or rearward. The anti-peeling lip **155** is designed to be glued to the cargo.
[0165] According to an embodiment, the top wall **131** features in its tailing cantilever portion opposed to the tailing airflow surface **120** at least one longitudinal ridge **220** usable as a guide to slide a blade at its root to perform a longitudinal cut. Based on the location of the cut, it may adapt to different heights of trailer rear headers.
[0166] According to an embodiment, the front flange **142** is attached, typically glued with automotive double-face tape **162**, to the mounting surface **136**. According to an embodiment, the front flange **142** is glued with a continuous length of double-sided tape **162**. According to an embodiment, segmented sections of double-sided tape **162** spaced apart with longitudinal sections free of tape are used.
[0167] Referring additionally to FIG. **29**, according to an embodiment, the mounting wall **216** (bottommost part of the bottommost extending cells) is applied glue, e.g., automotive double-sided tape **162**, thereto to mount the top fairing **168** to the mounting surface **136**.
[0168] According to an embodiment, the top fairing **168** may be mounted using a combination of double-sided tape and liquid glue. Referring to FIG. **29**, holes may be drilled in the mounting wall **216** for excess of glue to exit the space between the mounting wall **216** and the mounting surface **136**. A tape limiting longitudinal distribution of glue may be mounted to the top fairing **168** before the application of glue.
[0169] Referring additionally to FIG. **24**, FIG. **30**, FIG. **31**, FIG. **32**, FIG. **33**, and FIG. **34**, according to an embodiment, the top fairing **168** may be mounted using brackets **180** designed to be mounted to the mounting surface **136**. The brackets **180**, when mounted, are bordering the port and starboard extremities of the mounting wall **216** between the mounting surface **136** and the brackets **180**. According to an embodiment, the brackets **180** have a continuous wall defining a bordering wall **181** and folded beyond into abutting walls **182** designed to abut against the members **210**, **147**, designed to limit displacement of the top fairing **168** in its transversal direction **165**. According to an embodiment wherein brackets **180** feature a single abutting wall **182**, combination of brackets **180** used to mount one extremity of the top fairing **168**, port end or starboard end, provide a frontward abutting wall and a rearward abutting wall limiting together frontward and rearward displacement of the top fairing **168** in its transversal direction **165**, and thus in the longitudinal direction **144** of the trailer **112**.
[0170] According to a preferred embodiment, at least one, and preferably both of the top fairing **168** (cut before the installation) and the brackets **180** features oblong mounting holes **224** designed for the top fairing **168** being able to thermally expand and contract in its longitudinal direction along a longitudinal axis **228**.
[0171] Use of brackets **180** allows to screw or bolt the brackets **180** to the mounting surface **136** with the head of the screws **186** located under the airflow surface **212**, limiting undesired distortion of the airflow.
[0172] According to an embodiment, the brackets **180** feature a side wall **185** joining segments of the bordering wall **181**.
[0173] Referring to FIG. **35**, according to an embodiment, porous material **149**, such a foam, e.g., expanded polystyrene, is injected in at least one of the at least one closed cell **141**.
[0174] According to an embodiment, the thickness of the top wall **131**, the side members **210**, **147** and the mounting wall **216** are at most 3 mm, and preferably less than 2 mm, and more preferably about than 1.27 mm.

[0175] According to an embodiment, the cross-section area delimited between a) the frontmost face of the frontmost cell, b) the rearmost face of the rearmost cell, c) the leading airflow **114** surface between the faces defined by these cells, and d) the mounting surface between these faces defined by these cells is preferably about 4,000 square millimeters, and most preferably about or less 3,300 square millimeters.
[0176] Referring to FIG. **36**, FIG. **39**, and FIG. **37**, a top fairing **168** in accordance with another embodiment comprises a series of parallel central members **230**, and an oblique member **232** joining the rearmost one of the members **230** to the cantilever portion of the top wall **131**. The top fairing **168** comprises a generally flat bottom wall **216** joining the members **230** and the top wall **131** frontwards to the frontmost one of the members **230**.
[0177] The front flange **142** of the top wall **131** frontward to the junction of the bottom wall **216** normally extends below the plane formed by the bottom wall **216**, is flexible so as deforming when mounted to the top surface **136** to provide a flexed front flange **142** adapted to guide airflow over the fairing. Furthermore, mounting of the top fairing **168** with forces flexion of front flange **142** generates a pre-constraints on the front flange **142** that prevents the front flange **142** to rattle over the mounting surface **136**.
[0178] According to an embodiment, the frontmost member **230** extends from the top wall **131** oblique to the plane of the bottom wall **216** before curving to form the front of the bottom wall **216**. This configuration provides some flexibility to the front of the top fairing so that the front flange **142** may flex upwards when abutting against the cargo without breaking or without forcing the front of the bottom wall **216** to raise above the mounting surface.
[0179] According to an embodiment, a top fairing **168** features a bottom wall **216** that is substantially flat, increasing slightly the amount of material at the junctions between the bottom wall **216** and the members **230**.
[0180] Referring to FIG. **38**, according to an embodiment, the bottom wall **216** of the top fairing **168** may be segmented in two of more portions, e.g., a front bottom wall portion **216-1** joining the top wall **131** frontwards to the frontmost one of the members **230** and at least one other member **230**, and a rear bottom wall portion **216-2** joining at least two members **230** rearwards to the front bottom wall portion **216-1**.
[0181] Referring to FIG. **40**, according to an embodiment, a top fairing **168** comprises less members **230**, in this case two members **230**, with a bottom wall **216** joining the members **230** and the top wall **131** up front. The top wall **131**, up front to the junction to bottom wall **216**, has flat a flat bottom surface **226** extending in the same plane as the bottom wall **216**. According to this embodiment, the top wall **131** is not exerted upward, not stress loaded, by the installation of the top fairing **168** over the mounting surface **136**. Accordingly, this top fairing **168** present less cells **141**, with the cells being closed cells **141**.
[0182] Referring to FIG. **41**, according to an embodiment, the top fairing **168** comprises a single compound member **236** forming a single cell **141** under the top wall **131**. The compound member **236** comprises a bottom wall portion **242** joining the top wall **131** up front about the leading edge **160**, and a rear portion **244** extending upward from the bottom wall portion **242** and joining the top wall **131** upfront to a cantilever portion. According to an embodiment, the cell **141** is at least partially filled with filling material (see e.g. FIG. **35**), such as polystyrene or alternative polymer, at the manufacturing step or at the installation step.
[0183] Referring to FIG. **42**, according to an embodiment, the top fairing **168** comprises no closed cell. The top fairing **168** comprises a series of vertical members **230** each comprising one or more notch or lip **252** providing increased stability and surfaces usable to mount the top fairing **168** to the mounting surface **136**.
[0184] Referring to FIG. **43**, according to an embodiment, the top fairing **168** is made of more than one extruded parts, combined after extrusion. According to an embodiment, the top part **262** and the bottom part **264** are combined e.g., fused, with glue, and/or physically interlocked at the

manufacture, before being sent for installation. According to another embodiment, the top part **262** and the bottom part **264** are glued, interlocked and/or secured to each other or to the mounting surface **136** when mounting the top fairing **168** to the mounting surface **136**.
[0185] According to an embodiment, the top part **262** comprises members **230** having lips **252** at the bottom, the bottom part **264** comprises upward and sideward compound protrusions **266** defining channels in which the lips **252** are sled to mechanically secure to the parts **262**, **264** together.
[0186] According to an embodiment, the bottom part **264** comprises a plurality of shorter bottom parts **264** scattered over the length of the top fairing **168**, wherein the shorted bottom parts **264** may be substantially shorted than the top fairing **168**, and distributed spaced from one another. The bottom parts **264** are designed to engage with the sections of the top fairing and with the top surface of the trailer. The non-engaged sections of the top faring therebetween are thereby hovering above the top surface of the trailer.
[0187] Referring to FIG. **44**, according to an embodiment, the top fairing **168** is made of two parts extruded separately and secured to each other afterwards. The parts are divided into a front part **272** comprising closed cells **141** and a bottom wall **216-1**, and the rear party **274** comprises closed cells **141** and a bottom wall **216-2**, that are extending after assembly into a substantially flat bottom surface **216**. The parts **272**, **274** are secured to each other using lips inserted into channels of at least partially corresponding shape designed to retain the lip therein once inserted.
[0188] Referring to FIG. **45**, according to an embodiment, the top fairing **168** comprises three (3) parts: a front part, **272**, a central part **276**, and a rear part **274**, designed to be assembled into the operational top fairing **168**.
[0189] Through the previous embodiments, the present document contemplated designs of a top fairing **168** made of one or more parts, secured to each other, wherein the parts may be divided front/rear, top/bottom, and a combination thereof.
[0190] Referring now to FIG. **46**, according to an embodiment, the top fairing **168** may have a one or more sections of the top wall **131** being made of closed cells **282** increasing general thickness of this specific section of the top wall **131**. Accordingly, the closed cells **282** of the top wall **131** increased the rigidity of this part of the top wall **131** with less weight increase and with less section of thicker material than with thicker wall portions of uniform density.
[0191] Referring to FIG. **47**, FIG. **48** and FIG. **49**, according to an embodiment, a mode of installation comprises a longitudinal bracket **292** inserted in a cell **141**, e.g., a closed cell **141**, for retaining the top fairing **168** against uplift forces resulting from air flowing over the top wall **131**. An end bracket **294** is mounted at each end to the mounting surface **136** through, e.g., screws, bolts, or rivets inserted in oblong holes **296** parallel to the longitudinal direction of the top fairing **168**. The oblong holes **296** allows displacement of the end bracket **294** longitudinal to the top fairing **168** to respond to thermal expansion/contraction of the material of top fairing **168**. The longitudinal bracket **292** is further secured to the end bracket **294**, using e.g., rivets or screws, preventing it to lift away from the mounting surface **136**.
[0192] According to an embodiment, the end bracket **294** comprises a raised portion **302** around each of the securing portion **304** featuring the oblong holes **296**. The top fairing **168** comprises clearances **312** corresponding to at least the securing portions **304** thereby having the top fairing **168** complementarily bordered between mounting surface **136** and the raised portion **302**. The end bracket **294** further comprises longitudinal raised surfaces **298** designed to abut members, e.g. members **230** of the top fairing **168**. Particularly, the end brackets **294** comprises two longitudinal raised surfaces **298** joined by a side wall **300**, one longitudinal raised surface **298-1** designed to take place upfront to a member **230**, and another longitudinal raised surface **298-2** designed to take place rearwards to a member **230**, thereby bordering transversally the top fairing **168**.
[0193] According to an embodiment, the longitudinal bracket **292** extends on a portion of the length of the top fairing **168**. The longitudinal brackets **292** may connect to each other or be

disconnected from each other.
[0194] According to an embodiment (not depicted), the longitudinal bracket **292** features a non-flat cross-section, such as upwards lips or a V shape increasing resistance of the longitudinal bracket **292** against flexion, and thereby against the top fairing **168** lifting about its center.
[0195] It is to be noted that the end brackets **294** may be secured about or at the edge of the top surface **136** of the trailer **112**. The top fairing **168**, with the leading airflow surface **114** extending below the bottom wall **216** and the longitudinal bracket **292** rigidifying the top fairing **168**, is mounted with the leading edge **160** forced to contact the mounting surface **136**, thereby maintaining the operative conditions for the top fairing **168**.
[0196] It is further to be noted that the top fairing **168** may have openings **316** cut off the top wall **131** to secure the end brackets **294** to the mounting surface **136**. According to an embodiments, a single end cap **320** (FIG. **54**) or caps **318** (FIG. **55**) are mounted to the openings **316** once the top fairing **168** secured to the mounting surface **136**.
[0197] FIG. **49** and close-up FIG. **49**A show portions of the bottom wall **216** of the top fairing **168** bordered and thereby hindered between the mounting surface **136** and the end bracket **294**. It further shows the raised surfaces **298** enclosing frontwards and rearwards the central one of the cells **141**. The end brackets **294** are in consequence limiting frontwards/rearwards movement of the top fairing **168** while allowing longitudinal contraction/expansion thereof.
[0198] Referring to FIG. **50**, according to an embodiment, a top fairing **168** installed without necessary use of a bracket. The top fairing **168** is taped and/or glued and/or secured to the mounting surface **136** of the trailer **112**. The top fairing **168** comprises a notch **322** extending frontwards to the bottom wall **216**, frontwards to the frontmost one of the cell **141**. The top fairing **168** further comprises rearwards to the rearmost one of the cells **141** a rear anti-peel lip **155**. According to embodiment, the bottom wall **216** may feature holes **326**. The bottom wall **216** features a dam **328** (lengthy protrusion crossing transversally the bottom wall **216**). Both holes **326** and dam **328** are features for controlling spreading of the glue over the bottom wall **216**.
[0199] Referring to FIG. **51**, according to an embodiment, a top fairing **168** is mounted to a mounting surface **136** using end brackets **332** of another embodiment. The end brackets **332** comprises cling studs **334** to secure the top fairing **168** to the end bracket **332**, e.g., nuts are used to hold the top fairing **168**. The nuts are used or comprise compression-limiting features. According to an embodiment, no longitudinal bracket is coupled thereto.
[0200] Referring to FIG. **52** and FIG. **53**, these figures depict the end bracket **294** mounted to the corner rail **340** of the trailer **112**. The top fairing **168** extends longitudinally to substantially cover the end bracket **294**. The top fairing **168** according to an embodiment, extends transversally to extend over at least a portion of the rain gutter of the trailer **112**, longitudinally relative to the trailer **112** beyond the rear doors of the trailer **112**.
[0201] Exemplary installation of the top fairing **168** involves placing the top fairing **168** to extend sideways slightly less than the width of the trailer **112**. Afterwards, longitudinal brackets **292** may be inserted. The end brackets **294** are inserted. The longitudinal brackets are secured to the end brackets **294**. The end brackets **294** are secured to the trailer **112**, generating a load in the front flange **142** of the top wall **131** that maintains contact between the leading edge **130** and the roof of the cargo body. Longitudinal raised surfaces **298** abutting against walls of cell(s) **141** of the top fairing **168** prevent the top fairing **168** to move frontwards/rearwards. The end brackets **294** further border and overlap the top fairing **168** on top of the corner rails **340**, allowing longitudinal expansion/contraction of the top fairing **168** with no risk of the top fairing **168** breaking or dislodging from the brackets **294**.
[0202] It is worth noting that even thus the present description presents a top fairing **168** to be installed on the roof, it is herein contemplated that in alternative embodiments a similar aerodynamic fairing assembly may be mounted to side walls of the cargo body, in a similar fashion, with no modification or small modifications of the fairing relative to the top fairing **168** that one

person skilled in the art would consider without extra teaching necessary, using e.g., the described brackets **294** featuring no modification of small modifications one person skilled in the art would consider without extra teaching necessary.
[0203] Referring to FIG. **54**, according to an embodiment, end caps **320** may be mounted to the ends of the top fairing **168**, closing the end openings and the top openings **316** used to access the components used to secure the end brackets **294** to the trailer **112**.
[0204] Referring to FIG. **55**, according to an embodiment, the side openings remain unobstructed, while the top openings **316** are closed with, e.g., individual caps **318**, e.g., clinging to the edge of the top openings **316**.
[0205] Referring to FIG. **56**, the side view depicts the top fairing **168** mounted through the end brackets **294** to the corner rails **340**, with the top fairing **168** comprising a rear flange **139** of the top wall **131** extending beyond the rear doors (with the exterior face of the doors being hidden by side cushions) over the rain gutter **118**.
[0206] It is to be noted that, according to an embodiment, the extruded nature of the material, with a flexible front flange **142** normally extending below the bottom wall **216** provides a front leading airflow surface abutting against the mounting surface **136** of the trailer **112**, thereby defining a seal against airflow. The preload resulting from the deformation of the front flange **142** of the top wall **131** further improves the response of the top fairing **168** to vibrations that result from road irregularities and airflow.
[0207] Furthermore, by changing the shape of the longitudinal bracket **292**, or by adding filling with one or more of the cells **141** with expending material, or adhering material to the top wall **131** wherein facing the roof, natural frequency of the top fairing **168** may be modified to avoid the natural frequency of the trailer **112** and of the top fairing **168** to be too close to one another.
[0208] Referring to FIGS. **58**-**61**, examples of top fairing **168** are provided wherein the fairing is manufactured and installed without filling (FIG. **58** and FIG. **60**) and with filling, e.g., porous material **149** (FIG. **59** and FIG. **61**).
[0209] Referring to FIG. **56**, according to an embodiment, the front flange **142** of the top wall **131** has a first thickness, and the rear flange **139** of the top wall **131** has a second thickness greater than the first thickness. Therefore, the rear flange **139** is more rigid than the front flange **142**.
[0210] It is to be noted that the present fairing allows to spread over almost or the whole width of the trailer **112**. Such optimize spread of the top fairing allows to improve of about 15% the drag reduction efficiency due to the top fairing **168**. Practically, the present top fairing **168** has a length of one hundred and two (102) inches, increasing by six (6) inches the covering provided compared to top fairings used nowadays, with no increase of the associated weight, and no additional challenges in its installation on the trailer **112**.
[0211] Referring to FIG. **57**, a cross-section view of an embodiment of the top fairing **168** shows that the bottom wall portion **216** has a first thickness **255** of about 0.11 inches, and that the top wall **131** has a relatively constant thickness **256** between leading edge **160** and the tailing edge **121** of about 0.15 inches. According to an embodiment, the members **230** have a thickness **257** that is about the same as the bottom wall portion **216**.
[0212] According to an embodiment, the area or material of the top fairing is at most 4000 mm.sup.2, or in other words the material used to manufacture the top fairing **168** is at most 4000000 mm.sup.3 per longitudinal meter of top fairing **168** (4 cm.sup.3 per longitudinal meter of top fairing). According to an embodiment, material is less than 3.75 cm.sup.3 per longitudinal meter, and preferably less than 3.50 cm.sup.3 per longitudinal meter.
[0213] According to an embodiment, the leading edge **160** extends below the bottom wall portion **216** at least 0.10 inches perpendicular to the bottom wall portion **216**, and preferably at least 0.30 inches, and more preferably about 0.50 inches.
[0214] According to embodiments, the area enclosed by the top fairing between the top wall **131** and the mounting surface of the cargo along a plane transversal to the top fairing **168** is at most

30000 mm.sup.2, and preferably at most 25000 mm.sup.2, and most preferably about 20300 mm.sup.2.
[0215] In a preferred embodiment, the method of manufacture of the top fairing **168** comprises having a mold defining a space for a top wall **131** providing an airflow surface, and spaces for at least one cell **141** comprising a portion of the top wall **131** and members, and extruding material through the mold to obtain a top fairing **168**. Afterwards, the method involves cutting the top fairing to the width of the trailer to be mounted to. It may include to cut/generate openings for passing tools for mounting the top fairing **168** to the trailer **112**, or for interface with e.g. end brackets **294**.
[0216] A method of used of the top fairing **168** comprising to mount the top fairing **168** to a mounting surface **136** of a trailer **112** through glue, brackets **180**, or a combination thereof.
[0217] While preferred embodiments have been described above and illustrated in the accompanying drawings, it will be evident to those skilled in the art that modifications may be made without departing from this disclosure. Such modifications are considered as possible variants comprised in the scope of the disclosure.

Claims

1. An aerodynamic fairing for a body of a cargo container, comprising: a top wall providing an airflow leading surface, extending from a leading edge to a tailing edge thereof, in a transversal direction of the aerodynamic fairing, and from a first extremity to a second extremity thereof in a longitudinal direction along a longitudinal axis; a first member extending from the top wall away from the leading airflow surface, the first member providing a bottom wall extending distant to the top wall that provides a mounting surface to abut directly or indirectly against the cargo body, wherein, from where the top wall is joining the first member to the leading edge, the top wall comprises a front portion that is cantilevered, and wherein the aerodynamic fairing features a profile according to a plane perpendicular to the longitudinal axis, the profile being substantially constant over most of its length spanning between the first extremity and the second extremity.
2. The aerodynamic fairing of claim 1, wherein, from where the top wall is joining the first member to the tailing edge, the top wall comprises a rear portion that is a cantilevered.
3. The aerodynamic fairing of claim 1, wherein the first member is a compound member.
4. The aerodynamic fairing of claim 1, further comprising a second member that couples the top wall to the first member.
5. The aerodynamic fairing of claim 1, wherein the first member extends perpendicular to the top wall where the first member joins the top wall.
6. The aerodynamic fairing of claim 1, wherein the first member extends oblique to the top wall where the first member joins the top wall.
7. The aerodynamic fairing of claim 1, wherein the first member extends oblique to the mounting surface with at least a portion of the first member that is sloped frontwards, and further comprising a second member that extends oblique to the mounting surface with at least a section of the second member that is being sloped rearwards.
8. The aerodynamic fairing of claim 1, wherein the mounting surface defines a mounting plane, and wherein the top wall crosses the mounting plane frontwards to the first member.
9. The aerodynamic fairing of claim 1, wherein the top wall has a first average thickness frontwards to the first member, and a second average thickness rearwards to the first member, wherein the first average thickness is smaller than the second average thickness.
10. The aerodynamic fairing of claim 2, wherein the front portion of the top wall is shorter than the rear portion of the top wall.
11. The aerodynamic fairing of claim 1, further comprising a second member, wherein the bottom wall joins the first member to the second member, thereby defining a closed cell.

12. The aerodynamic fairing of claim 11, wherein the first member and the second member are extending along parallel planes.
13. The aerodynamic fairing of claim 1, further comprising a second member extending from the top wall, wherein the mounting surface defines a mounting plane, and wherein the leading airflow surface has an apex relative to the mounting surface located between wherein the first member and the second member are joining the top wall.
14. The aerodynamic fairing of claim 1, comprising a front edge and a rear edge, and wherein the top wall is a unitary body spanning between the front edge, the rear edge, the first extremity and the second extremity.
15. The aerodynamic fairing of claim 1, comprising a first component and a second component that when secured together form the aerodynamic fairing.
16. The aerodynamic fairing of claim 15, wherein the first component comprises at least one channel and the second component comprises at least one prong for inserting into the at least one channel to secure the first component to the second component.
17. The aerodynamic fairing of claim 11, further comprising a filling material adhered to the top wall about the first member.
18. The aerodynamic fairing of claim 1, wherein the aerodynamic fairing is made predominantly of at least one of polymer and of a composite material.
19. The aerodynamic fairing of claim 1, wherein at least one of the top wall and the first member has a thickness of at most 10 mm.
20. The aerodynamic fairing of claim 1, wherein an area of the profile of the aerodynamic fairing delimited within the leading airflow surface, a mounting plane in which extends the mounting surface, and lines perpendicular to the mounting plane joining the mounting plane to the leading airflow surface has a dimension of between about 3000 mm2 and 5000 mm2.
21. The aerodynamic fairing of claim 1, wherein the bottom wall of the aerodynamic fairing is glued to the cargo container.
22. An aerodynamic fairing assembly to be mounted to a body of a cargo container, comprising: a) an aerodynamic fairing comprising: i) a top wall providing an airflow leading surface extending from a leading edge to a tailing edge in a transversal direction, and from a first extremity to a second extremity in a longitudinal direction along a longitudinal axis; and ii) a first member extending from the top wall away from the leading airflow surface, the first member providing a bottom wall extending distant to the top wall that provides a mounting surface to abut directly or indirectly against the cargo body; b) an end bracket for mounting the aerodynamic fairing to the body of the cargo container, the end bracket comprising: i) a mounting portion for securing to the body of the cargo container; and ii) a bordering portion for bordering at least part of the bottom wall of the aerodynamic fairing therebetween and the body of the cargo container.
23. The aerodynamic fairing assembly of claim 22, further comprising at least one raised portion abutting the aerodynamic fairing distant to the first member between the leading edge and the tailing edge.
23. The aerodynamic fairing assembly of claim 22, further comprising a longitudinal bracket secured to the end bracket.
24. The aerodynamic fairing assembly of claim 22, further comprising an end cap at least partially closing an opening between the top wall and the bottom wall.
25. The aerodynamic fairing assembly of claim 22, wherein the aerodynamic fairing consists of a multi-piece extrusion.
26. A vehicle comprising an aerodynamic fairing mounted to a body of a cargo container of the vehicle, the aerodynamic fairing comprising: a top wall providing an airflow leading surface extending from a leading edge to a tailing edge in a transversal direction of the aerodynamic fairing, and from a first extremity to a second extremity in a longitudinal direction of the aerodynamic fairing along a longitudinal axis; a first member extending from the top wall away

from the leading airflow surface, the first member providing a bottom wall extending distant to the top wall that provides a mounting surface to abut directly or indirectly against the body of the cargo container, wherein, from where the top wall is joining the first member to the leading edge, the top wall comprises a front portion that is a cantilevered and biased to abut against the cargo container, wherein the aerodynamic fairing when mounted to the body of the cargo container, has the bottom wall and the leading edge abutting against the cargo container.