METHOD OF MAKING A BODY PANEL ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. application Ser. No. 10/065,361 filed Oct. 9, 2002, now U.S. Pat. No. 7,115,322, and hereby incorporated by reference in its entirety, which, in turn, claims the benefit of U.S. provisional application Ser. No. 60/328,456 filed Oct. 10, 2001.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a method for making a body panel assembly for a vehicle, such as a body panel assembly for a vehicle closure.

2. Background Art

Previously, vehicle body panels included a sealant that completely covered a hem area to prevent water from entering and collecting inside the hem, such as that disclosed in U.S. Pat. No. 4,719,689. In such body panels sealant was squeezed out during hemming and/or other manufacturing steps, resulting in waste and contamination of fixtures and other manufacturing equipment.

SUMMARY OF THE INVENTION

In at least one embodiment of the present invention, a method of manufacturing a body panel assembly for a vehicle is provided. The method includes the steps of providing first and second panels, applying an adhesive to a surface of the first panel, positioning the first and second panels, hemming the first and second panels together to form a subassembly, applying a coating to at least a portion of the subassembly, and heating the subassembly to at least partially melt the adhesive such that the adhesive bonds to the first and second panels.

In at least one other embodiment of the present invention, a method of manufacturing a closure panel assembly for a vehicle is provided. The method includes the steps of providing first and second panels having predetermined shapes, applying an adhesive to a surface of the first panel to define a footprint, positioning the first and second panels proximate each other such that the adhesive faces toward the second panel, hemming the first and second panels together to form a subassembly, applying a coating to at least a portion of the subassembly, and heating the subassembly to at least partially melt the adhesive such that adhesive bonds the first and second panels together and covers the footprint after the subassembly is heated.

In at least one other embodiment of the present invention, a method of manufacturing a closure panel assembly for a vehicle is provided. The method includes providing an inner panel having a plurality of dimples disposed near an end, providing an outer panel, applying an adhesive to an inner surface to the outer panel to define a footprint, positioning the inner panel near the outer panel such that the inner panel does not contact the adhesive, hemming the outer panel around the inner panel to form a subassembly, cleaning and electrocoating at least a portion of the subassembly, and heating the subassembly to at least partially melt the adhesive such that the adhesive flows into a gap separating the inner and outer panel to bond the first and second panels together. The adhesive may cover the footprint after the subassembly is heated to inhibit corrosion of the inner panel.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded perspective view of an exemplary vehicle body panel assembly.

FIG. **2** is a flowchart of a method for making the vehicle body panel assembly.

FIGS. **3-7** are section views of a portion of the vehicle body panel assembly made in accordance with the method of FIG. **2**.

FIG. **8** is a plan view of an exemplary embodiment of a manipulator having a dispensing system.

DETAILED DESCRIPTION

Detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various and alternative forms. The figures are not necessarily to scale, some features may be exaggerated or minimized to show details of particular components. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a representative basis for the claims and/or as a representative basis for teaching one skilled in the art to variously employ the present invention.

Referring to FIG. **1**, an exploded view of an exemplary embodiment of a body panel assembly **10** for a vehicle is shown. In an automotive application, the body panel assembly **10** may be a body closure panel such as a door, hood, liftgate, tailgate, or decklid. In at least one embodiment, the body panel assembly **10** may include an inner panel **12** and an outer panel **14**.

The inner and outer panels **12**,**14** may have any suitable configuration and may be made of any suitable material, such as a metallic material like aluminum, magnesium, titanium, or a steel like galvanized steel. Each panel **12**,**14** may be shaped or formed into a predetermined shape using any suitable fabrication process, such as stamping, drawing, hydroforming, or superplastic forming. In addition, each panel **12**,**14** may be a single piece or assembled from multiple pieces.

The inner and/or outer panels **12**,**14** may include a plurality of protrusions or dimples **16**. The dimples **16** may be provided when the inner and/or outer panels **12**,**14** are shaped or formed or may be provided as a separate manufacturing operation. The dimples **16** may be disposed proximate a hem area, described in more detail below, to help space at least a portion of the inner and outer panels **12**,**14** away from each other. Moreover, the dimples **16** may be disposed proximate to or spaced apart from an end of at least one panel **12**,**14**. In at least one embodiment, the dimples **16** are spaced apart from each other and provided on the inner panel **12** to provide a body panel assembly having an aesthetically pleasing appearance.

The inner panel **12** and the outer panel **14** may be at least partially joined together with an adhesive **18**. The adhesive **18** may separate the inner and outer panels **12**,**14** from each other to inhibit vibration, rattling, or other undesirable noises. In addition, the adhesive **18** may inhibit water ingression and/or corrosion. The adhesive **18** may be of any suitable type, such as a rubber-based or an epoxy-based material like Uniseal™ product number 2345. Moreover, the adhesive **18** may be a one-part or multi-part reactant mixture and may be expandable or non-expandable. The adhesive **18** may be adapted to withstand washing, cleaning, and/or coating operations that are associated with body panel fabrication or assembly operations. The adhesive **18** may be applied to the inner panel **12**