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APPLICATION NUMBER: 62/692,764
FILING DATE: *June 30, 2018*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US62/692,764



Certified by

Andres Ibarra

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.27300
		Application Number	
Title of Invention	Method for Manufacturing Flush Vehicle Glazing		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

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Inventor Information:

Inventor	1				Remove
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Residence Information (Select One) US Residency ● Non US Residency Active US Military Service					
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All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.27300
		Application Number	
Title of Invention	Method for Manufacturing Flush Vehicle Glazing		

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For further information see 37 CFR 1.33(a).

☐ An Address is being provided for the correspondence information of this application.

Customer Number	130961		
Email Address	morales@moralesq.com	Add Email	Remove Email

Application Information:

Title of the Invention	Method for Manufacturing Flush Vehicle Glazing		
Attorney Docket Number	1511.27300	Small Entity Status Claimed	☐
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

Filing By Reference :

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For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

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☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.27300
		Application Number	
Title of Invention	Method for Manufacturing Flush Vehicle Glazing		

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Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.27300
		Application Number	
Title of Invention	Method for Manufacturing Flush Vehicle Glazing		

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Clear		
☒ Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
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Name of the Deceased or Legally Incapacitated Inventor :		
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Organization Name	AGP AMERICA S.A.	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.27300
		Application Number	
Title of Invention	Method for Manufacturing Flush Vehicle Glazing		

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Additional Applicant Data may be generated within this form by selecting the Add button. Add			

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.27300
		Application Number	
Title of Invention	Method for Manufacturing Flush Vehicle Glazing		

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Signature	/Joseph L. Morales/			Date (YYYY-MM-DD)	2018-06-30
First Name	Joseph	Last Name	Morales	Registration Number	58835

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Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

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Title of Invention

Method for Manufacturing Flush Vehicle Glazing

Attorney Docket Number (if applicable)

1511.27300

Correspondence Address

Direct all correspondence to (select one):

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☐ Firm or Individual Name

Customer Number

130961

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

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Entity Status

Applicant asserts small entity status under 37 CFR 1.27 or applicant certifies micro entity status under 37 CFR 1.29

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Signature	Joseph L. Morales/			Date (YYYY-MM-DD)	2018-06-30
First Name	Joseph	Last Name	Morales	Registration Number (If appropriate)	58835

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METHOD FOR MANUFACTURING A FLUSH VEHICLE GLAZING

Field of the invention

The present disclosed invention relates to a method for manufacturing a flush vehicle glazing, and more particularly to a method for manufacturing a flush vehicle glazing by using a LASER for cutting a curved glazing.

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Jean-Marie Le Ny	French	Av. Guillermo Dansey 1846, Cercado de Lima, Perú

Background of the invention

In assembled products, the original form has been divided for different reasons, such as manufacturability, safety issues, replacement parts, etc. In the case of automobiles, part of the assembly corresponds to the vehicle glazing area. The vehicle glazing area needs to be divided into windshield, roof, backlite among others for satisfying functional reasons.

The traditional manufacturing process comprises the cutting and bending of each of these pieces separately. As shown in Figure 1A in first instance, the pieces are cut in flat glass **1** separately and most of the times by mechanical cutting means. After this, they are bent individually. In the bending process, a glass sheet is bent in order to adopt a specific permanent shape by using a bending technique such as gravity bending, press bending, hot bending or any other well-known in the art.

Regarding the mechanical cutting of the individual pieces, it reduces the strength of the glass

by 60% on average. The edges are the weakest zone, the strength of the individual pieces could be increased by treating the edges. The most common method is grinding followed by polishing. However, the strength of the glass increases only by approximately 30%.

Once the vehicle glazings are assembled as shown in figure 1B, the fit-up of the individual pieces is inspected by measuring the width of the gap **3** between two adjacent panels and the alignment of the two surfaces, also called flushness.

Considering the traditional manufacturing process, it is difficult to achieve a good alignment in the final assembled product due to geometry deviation during the manufacturing process. Since the cutting and bending is carried out in each piece separately, when assembling, both the contours and the surfaces can create a significant gap.

The gaps between the individual pieces in an assembled product can be critical for the aerodynamics, acoustic and the aesthetic quality of a product. The aerodynamic drag coefficient is a measure of the effectiveness of a streamline aerodynamic body shape in reducing the air resistance to the forward motion of a vehicle. These gaps increase the drag coefficient causing a high air resistance when the vehicle is in motion, thereby, increasing the fuel consumption of the vehicle. Likewise, due to the gaps, the airflow in the vehicle glazing area is substantially more turbulent increasing the wind noise inside the vehicle. In the other hand, the appearance of vehicles having a series of glass pieces adjacent to one another with gaps in the middle thereof is not particularly aesthetically attractive.

In this sense, it would be desirable to provide a method that allows the manufacturing of a vehicle glazing area without gaps between the adjacent surfaces in a way that reduces or eliminates the problems described above.

Summary of the invention

It is an object of the present invention to provide a method for manufacturing a flush vehicle glazing that allows to achieve a perfect alignment between the adjacent sections of the glazing vehicle area in the final assembled product.

This object can be attained by a method of manufacturing a flush vehicle glazing comprising a vehicle glass panel that has at least two adjacent sections of the vehicle glazing area. The vehicle glass panel is heated at a predetermined temperature T1 for a predetermined period of time t3 for bending it by a bending process, wherein the temperature T1 ranges from about a temperature at which the viscosity of the vehicle glass panel is $10^{13.6}$ Pa.s to a temperature at which the viscosity of the vehicle glass panel is 10^3 Pa.s and the time t3 is enough to impart a selected permanent curvature to the vehicle glass panel. Then, the bent vehicle glass panel is cut by a high-power LASER in the adjacent sections at a predetermined local temperature T2, wherein the temperature T2 ranges from about a temperature at which the viscosity of the cut line of the bent vehicle glass panel is 10^3 Pa.s to a temperature at which the viscosity of the cut line of the bent vehicle glass panel is $10^{12.4}$ Pa.s; and finally the cut vehicle glass panel is cooled.

As can be noted, by bending a single panel that contains all the desired adjacent sections of the vehicle glazing area and cutting it before cooling, the method of the present invention allows to overcome the difficulties in the assembly of the vehicle glazing manufactured by a traditional process.

Also, by improving the spatial relation between the adjacent sections, the aesthetic quality of the vehicle is improved as well as the aerodynamics and acoustics, which means, the reduction of fuel consumption and noise due to turbulence. Furthermore, by cutting the vehicle glass panel with a high-power LASER, low roughness and smooth surfaces are generated, improving the edge quality and the glass hardness.

Numeral references

1	Flat glass
2	Vehicle glazing area
3	Gap
10	Vehicle glass panel
11	Adjacent sections
12	Windshield
14	Roof
16	Backlite
20	Bent vehicle glazing
22	LASER
30	Flush vehicle glazing
32	Split-line

Brief description of the drawings

These features and advantages of the present invention will become apparent from the detailed description of the following embodiments in conjunction with the accompanying drawings, wherein:

FIG. 1A shows the pieces of the vehicle glazing area cut in flat separately

FIG. 1B shows the pieces of the vehicle glazing area assembled with gaps.

FIG. 2 shows the first embodiment of the invention.

FIG. 3 shows the bent vehicle glass panel being divided in three sections, windshield, roof and backlite by LASER cutting.

FIG. 4 shows a flush vehicle glazing with no gap between adjacent sections.

FIG. 5 shows the second embodiment of the invention.

FIG. 6 shows the third embodiment of the invention.

FIG. 7 shows the steps of the method with the three stages: bending, cutting and cooling being T1 and T2 ranges of temperature.

Detailed description of the invention

Referring now to the drawings, there are shown preferred embodiments of the method for manufacturing a flush vehicle glazing.

For invention disclosure purposes, the vehicle glazing area **2** would be comprise by windshield **12**, roof **14** and backlite **16** as shown in Figure 1B.

In a first embodiment, the vehicle glass panel **10** comprises three adjacent sections **11** of the glazing vehicle area, windshield-roof-backlite in one single part as shown in Figure 2. The vehicle glass panel **10** is heated at a predetermined temperature T1 for a predetermined period of time t3 for bending it by a bending process. The temperature T1 ranges from about a temperature at which the viscosity of a vehicle glass panel **10** is $10^{13.6}$ Pa.s to a temperature at which the viscosity of the vehicle glass panel **10** is 10^3 Pa.s and the time t3 is enough to impart a selected permanent curvature to the vehicle glass panel **10**. Then, the bent vehicle glass panel **20** is divided in the three aforementioned sections **11**, windshield **12**, roof **14** and backlite **16** by a high-power LASER **22** cutting as shown in Figure 3. The bent vehicle glass panel **20** is cut while hot, i.e, at a predetermined local temperature T2, wherein the temperature T2 ranges from about a temperature at which the viscosity of the cut line of the bent vehicle glass panel is 10^3 Pa.s to a temperature at which the viscosity of the cut line of the bent vehicle glass panel is $10^{12.4}$ Pa.s, being temperature T2 greater than temperature T1. After that, the cut vehicle glass panel is cooled. The result is an excellent degree of flushness

between the adjacent sections **11** of the glazing vehicle area in the final assembled product, i.e, a flush vehicle glazing **30** with no gap between adjacent surfaces as shown in Figure 4.

The contours of the individual geometries create a spatial relation defined as a split-line **32**. In the case of the final product, said split-line it is not a gap that stands out at the sight but a line that is hardly noticed.

In a second embodiment, the vehicle glass panel **10** comprises two adjacent sections **11** of the glazing vehicle area, windshield-roof in one single part, as shown in Figure 5. The subsequent steps are the same as the previous embodiment, and consequently an excellent degree of flushness between said two adjacent sections **11** is obtained.

Likewise, in a third embodiment, the vehicle glass panel comprises **10** two adjacent sections **11** of the glazing vehicle area, roof-backlite in one single part as shown in Figure 6. The subsequent steps are the same as the previous embodiment, and consequently an excellent degree of flushness between said two adjacent sections **11** is obtained.

In order to maintain its mechanical properties, the bent vehicle glass panel needs the step of cutting before cooling. After bending, the glass panel has zones in different states. Some zones are in glass transition state, as the bottom of the final bent glass panel, while others are in solid state, as the edges. The edges are cooled quickly because they are in contact with breezes and vapors, causing compression in their internal structure. Edge compression is favorable for the glass mechanical behavior. When cutting the edges before cooling completely, ensures the permanence of this property, which would not be possible when cutting after cooling, since cutting an edge which is already in compression, would weakens the glass and increase the probability of breakage.

Figure 7 shows a graph viscosity (Pa.s) against Temperature (°C) for a better appreciation of the steps of the method. Temperatures T1 and T2 represent ranges wherein is possible to reach different viscosities that allows to carry out the steps of bending and cutting. As is

shown, after bending the vehicle glass panel at a range of temperature T1, the local temperature of the cut line needs to drops to a range of temperature T2 so as to cut the bent vehicle glass panel. Then, the temperature of the cut vehicle glass panel continues dropping in the cooling step (not shown).

In all the embodiments, the bending process is carried out by a technique selected from the group consisting of gravity bending, press bending and combinations thereof.

In preferred embodiment, the step of cutting the bent vehicle glass panel is carried out by a high-power LASER. In several embodiments, the high-power LASER is a diffusion-cooled gas LASER.

It must be understood that this invention is not limited to the embodiments described and illustrated above. A person skilled in the art will understand that numerous variations and/or modifications can be carried out that do not depart from the spirit of the invention, which is only defined by the following claims.

CLAIMS

1. A method of manufacturing a flush vehicle glazing, comprising the steps of:

providing a vehicle glass panel which comprise at least two adjacent sections of the vehicle glazing area;

heating the vehicle glass panel at a predetermined temperature T1 for a predetermined period of time t3 for bending it by a bending process, wherein the temperature T1 ranges from about a temperature at which the viscosity of the vehicle glass panel is $10^{13.6}$ Pa.s to a temperature at which the viscosity of the vehicle glass panel is 10^3 Pa.s and the time t3 is enough to impart a selected permanent curvature to the vehicle glass panel;

cutting the bent vehicle glass panel in said at least two adjacent sections, wherein the cutting step is carried out at a predetermined local temperature T2, wherein the temperature T2 ranges from about a temperature at which the viscosity of the cut line of the bent vehicle glass panel is 10^3 Pa.s to a temperature at which the viscosity of the cut line of the bent vehicle glass panel is $10^{12.4}$ Pa.s;

cooling the cut vehicle glass panel.

2. The method of claim 1, wherein in the step of providing a vehicle glass panel said at least two adjacent sections are selected from the group consisting of windshield-roof-backlite, windshield-roof and roof-backlite.

3. The method of claim 1, wherein the step of providing a vehicle glass panel said vehicle glass panel is a monolithic glass panel.

4. The method of claim 1, wherein in the step of heating the vehicle glass panel, the bending process is carried out by a technique selected from the group consisting of gravity bending, press bending and combinations thereof.
5. The method of claim 1, wherein the step of cutting the bent vehicle glass panel is carried out by a high-power LASER.
6. The method of claim 1, wherein the step of cooling the cut vehicle glass panel is carried out in a mold.
7. The method of claim 5, where in the high-power LASER is a diffusion-cooled gas LASER.

Abstract

Method for manufacturing a flush vehicle glazing that allows to achieve a perfect alignment between the adjacent sections of the glazing vehicle area in the final assembled product by providing a vehicle glass panel which comprise at least two adjacent sections of the vehicle glazing area in one single panel, followed by bending the vehicle glass panel and LASER cutting before cooling thereof.

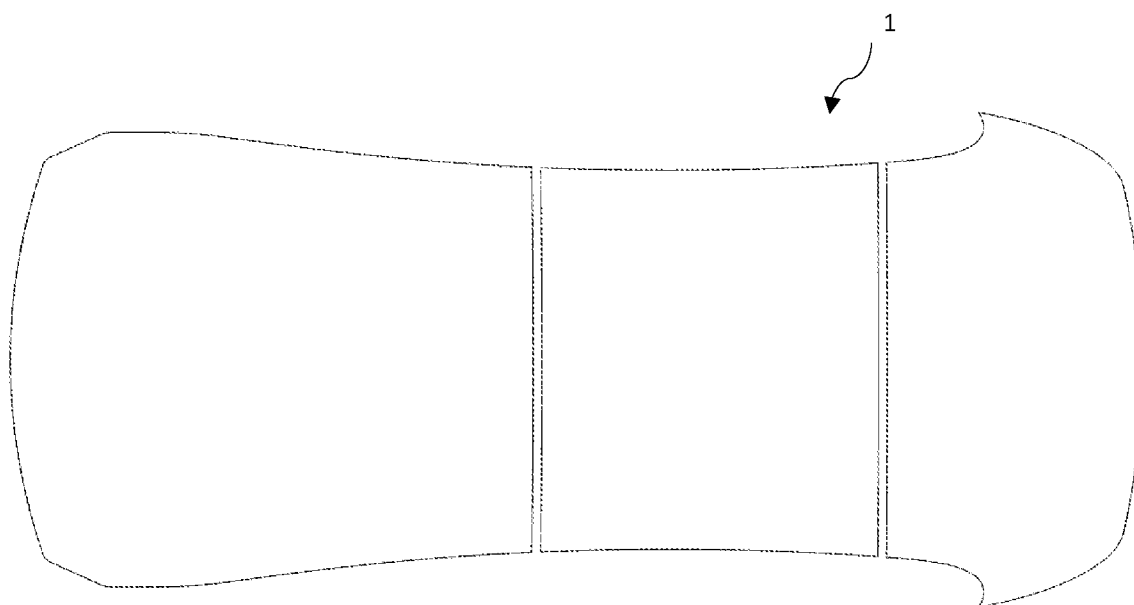


Fig. 1A

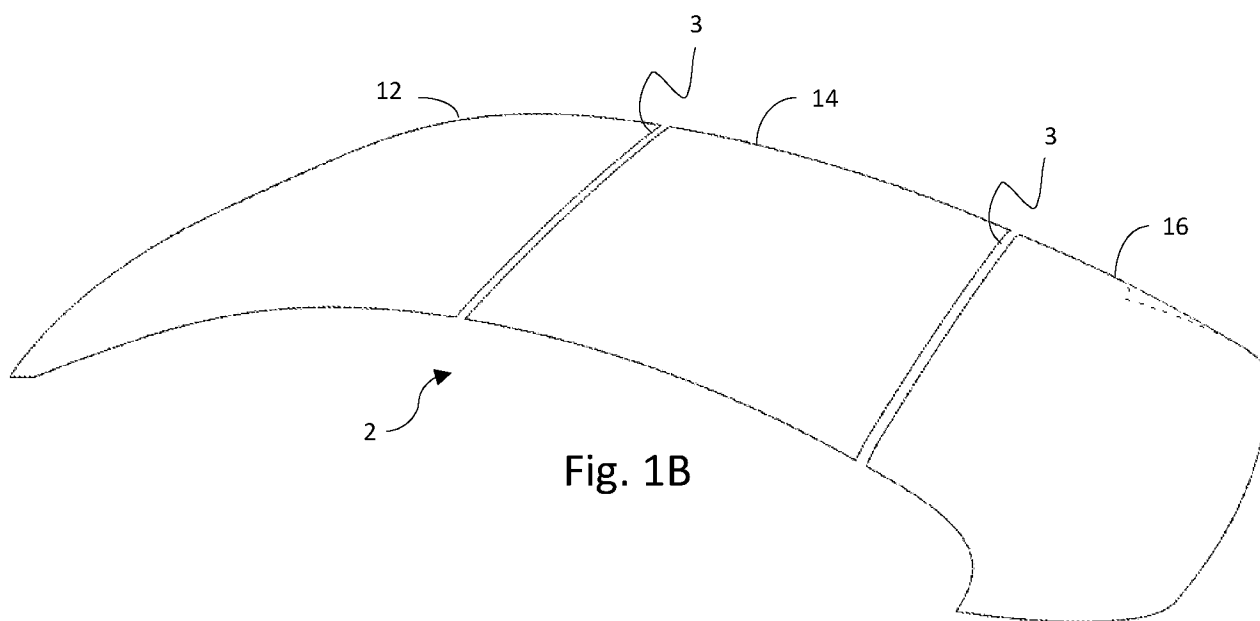


Fig. 1B

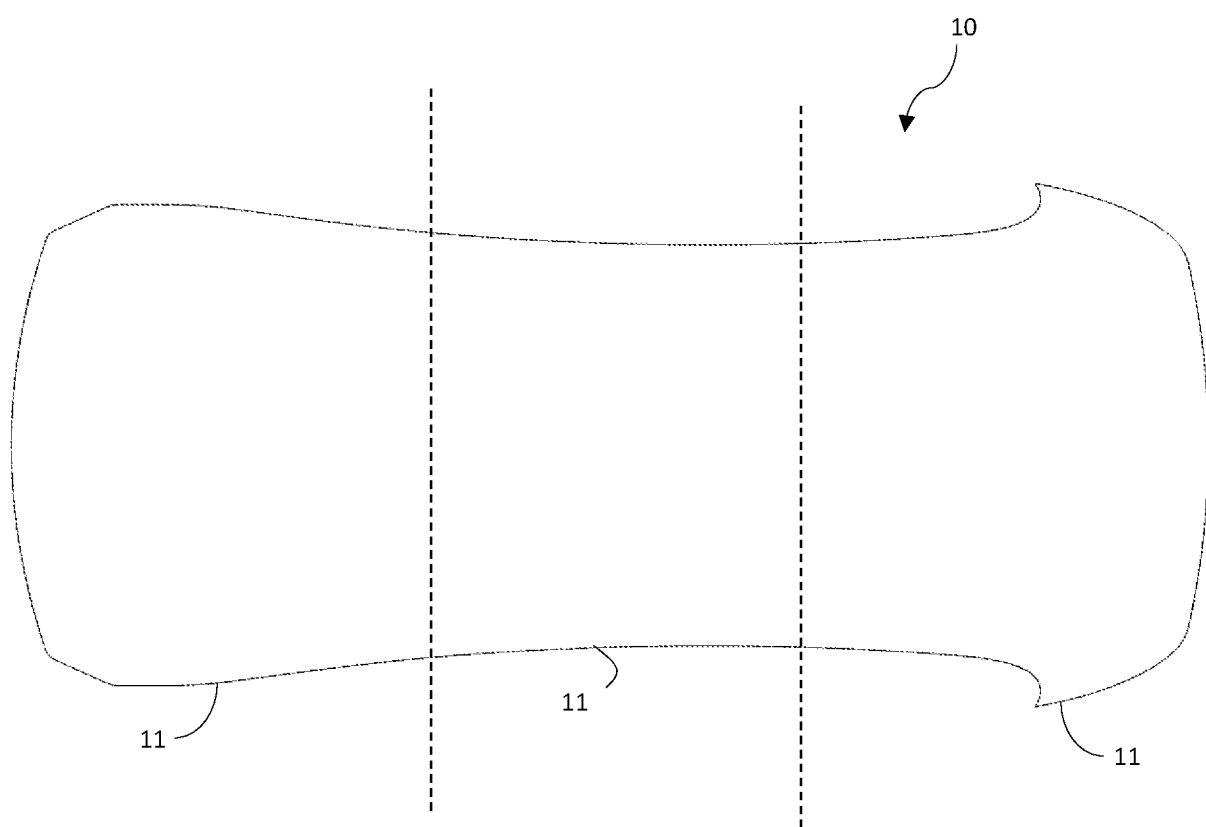


Fig. 2

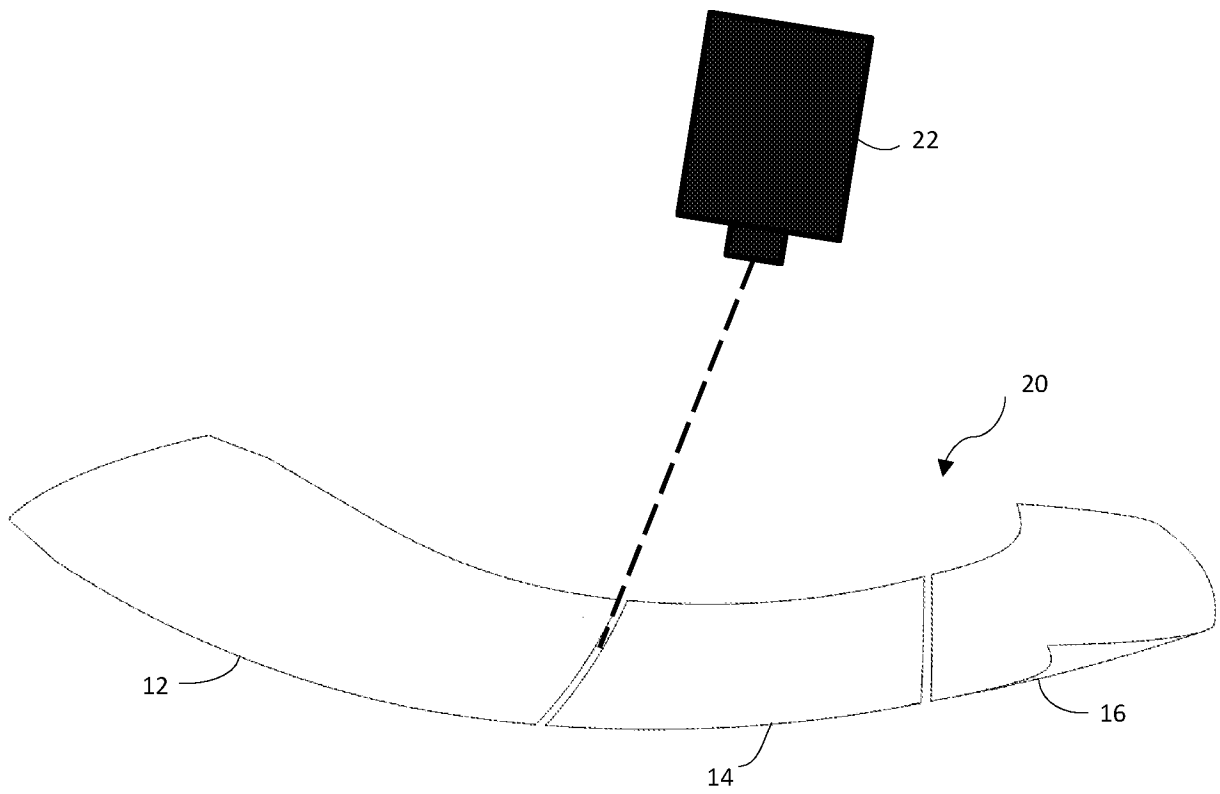


Fig. 3

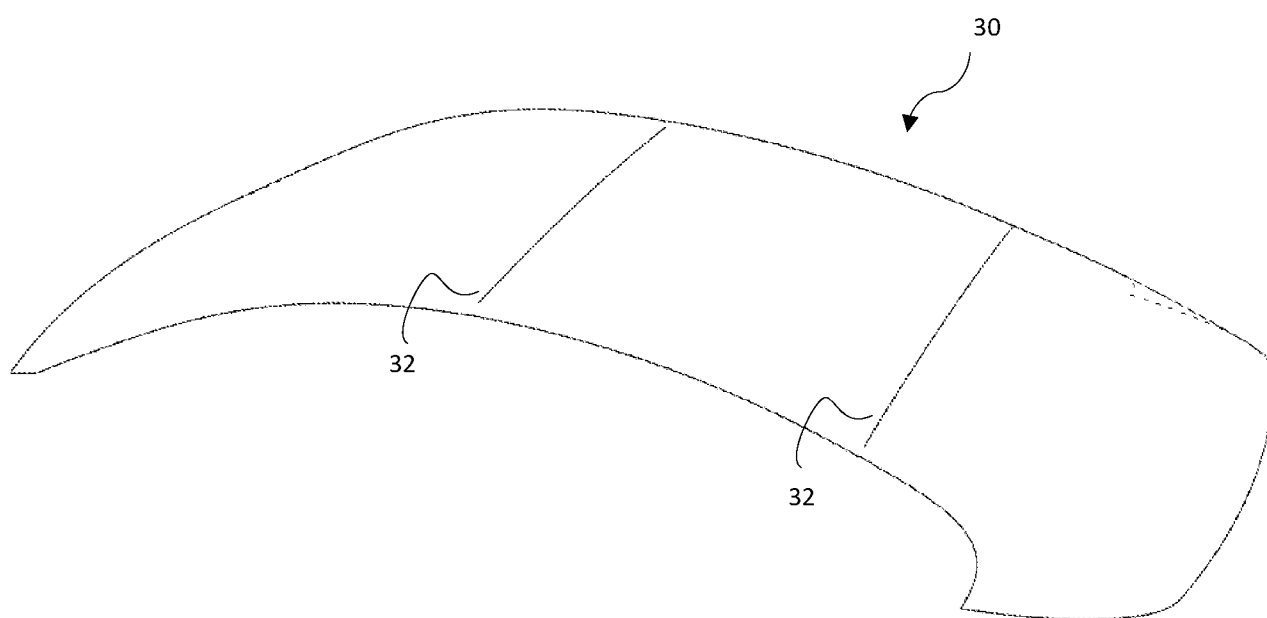


Fig. 4

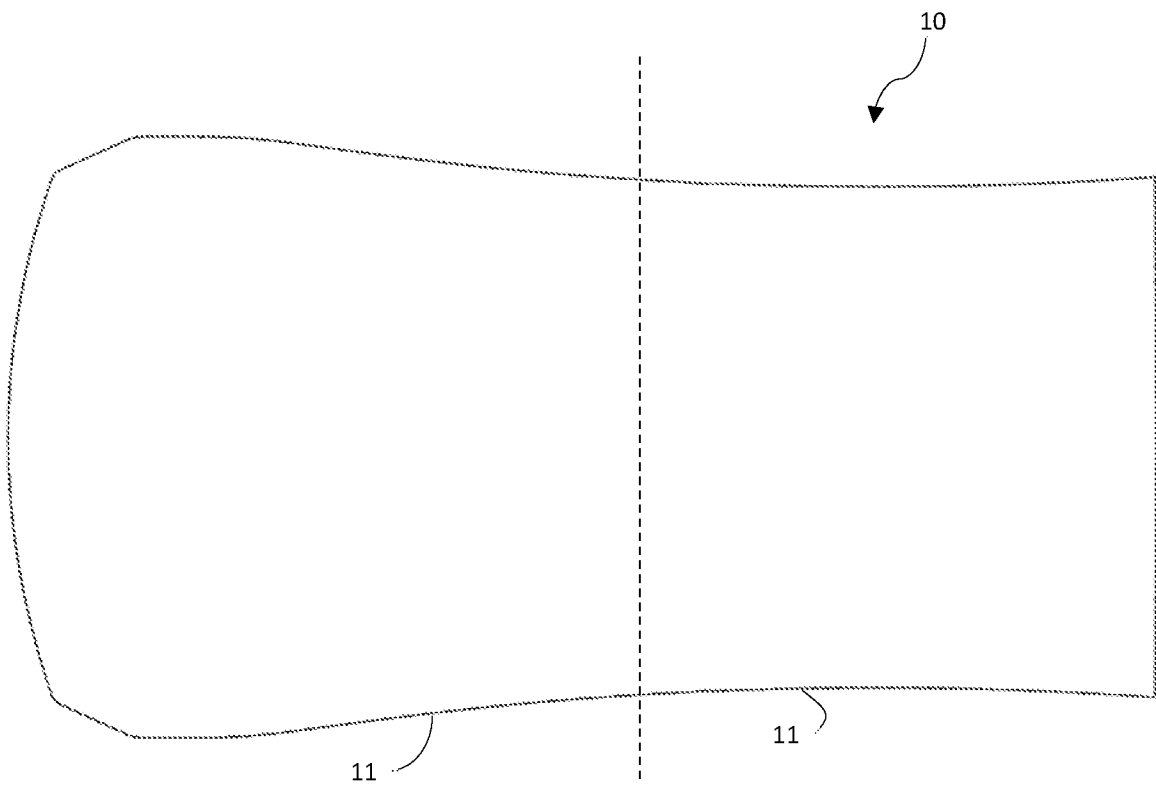


Fig. 5

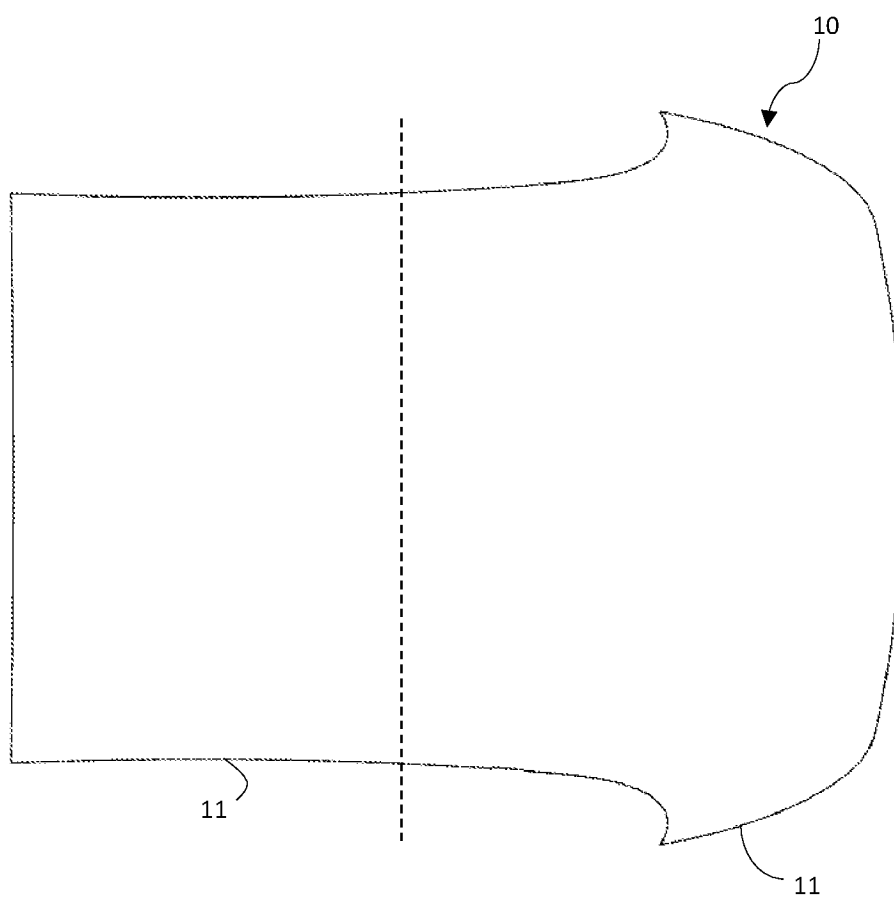


Fig. 6

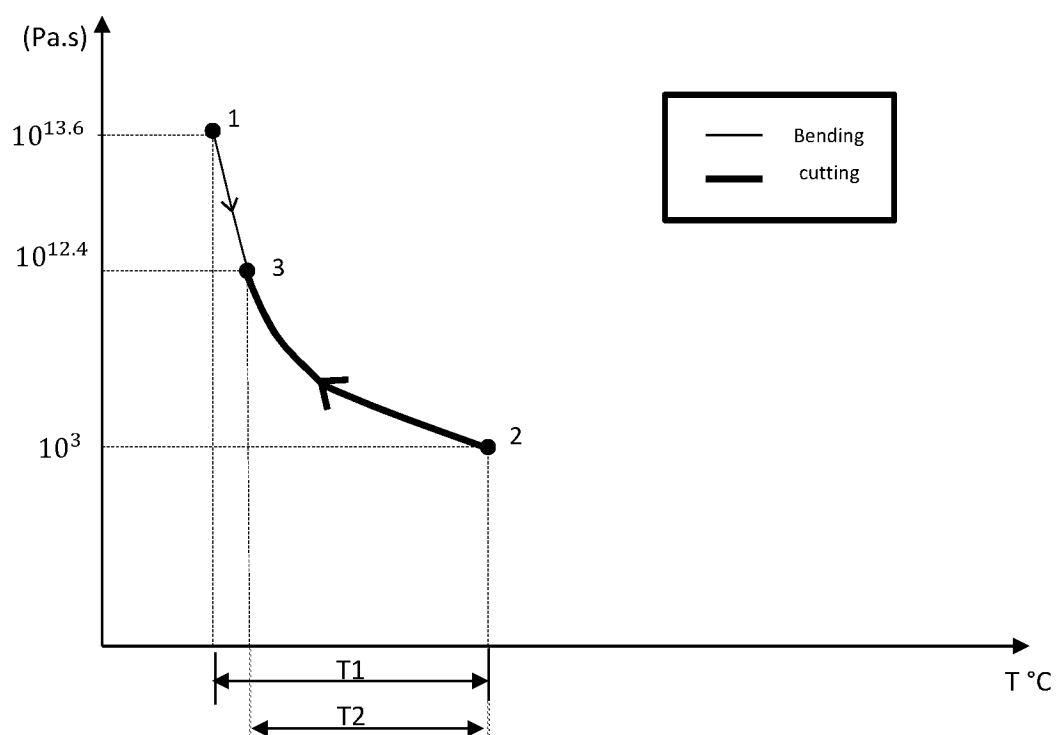


Fig. 7
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Electronic Acknowledgement Receipt

EFS ID:	33059311
Application Number:	62692764
International Application Number:	
Confirmation Number:	9802
Title of Invention:	Method for Manufacturing Flush Vehicle Glazing
First Named Inventor/Applicant Name:	Mario Arturo Mannheim Astete
Customer Number:	130961
Filer:	Joseph L. Morales
Filer Authorized By:	
Attorney Docket Number:	1511.27300
Receipt Date:	30-JUN-2018
Filing Date:	
Time Stamp:	22:09:45
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 280
RAM confirmation Number	070218INTEFSW22102800
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	15909.PDF	1819177	no	7
			60d9781474484818f5b21704e3e1b9a7b1c6955f		
Warnings:					
Information:					
2	Provisional Cover Sheet (SB16)	15910.PDF	1477198	no	3
			a72750d8e0a6528e81608c0efc10fd190d9d5b58		
Warnings:					
Information:					
3		15908.PDF	248687	yes	17
			29f92aea54dd8eeafff48e0f513dc780ee0f5273		
	Multipart Description/PDF files in .zip description				
	Document Description	Start	End		
	Specification	1	10		
	Drawings-only black and white line drawings	11	17		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	29786	no	2
			16b32a6427b758b5e98c33350a88cfe79f498c50		
Warnings:					
Information:					
Total Files Size (in bytes):			3574848		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

OLARTE MOURE

OLARTE MOURE & ASOCIADOS

Abogados - Attorneys



ASSIGNMENT

CESION

**MARIO ARTURO MANNHEIM ASTETE
JEAN MARIE LE NY**

by means of this document assign(s) worldwide,
to

por medio de la presente cedo(cedemos) a
nivel mundial, a

AGP AMERICA S.A.

A company
organized under the laws of

una compañía
organizada bajo las leyes de

República de Panamá

Domiciled in

domiciliada en

MMG Tower, piso 23, Avenida paseo del Mar, Ciudad de Panamá

(hereinafter referred to as the "ASSIGNEE"),

(de ahora en adelante el
"CESIONARIO"),

all my (our) rights, including those of priority,
title and interest in and to my (our) invention for
a new and useful improvement entitled and as
fully set forth and described in:

todos mis (nuestros) derechos, incluyendo
los de prioridad, título e interés sobre mi
(nuestra) invención tal como describe en:

METHOD FOR MANUFACTURING A FLUSH VEHICLE GLAZING

**MÉTODO PARA LA FABRICACIÓN DE ACRISTALAMIENTO ENRASADO PARA
VEHÍCULOS**

Place, date and signature

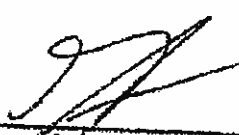
Mario Arturo MANNHEIM ASTETE

Lugar, fecha y firma

OLARTE MOURE

OLARTE MOURE & ASOCIADOS

Abogados - Attorneys


Place, date and signature
Jean-Marie LE NY

Lugar, fecha y firma

Señores

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

DIRECCIÓN DE NUEVAS CREACIONES

E. _____ S. _____ D. _____

Re: Expediente No. NC2018/0008278

Solicitud de Patente de Invención Titulada: “MÉTODO PARA LA FABRICACIÓN DE ACRISTALAMIENTO ENRASADO PARA VEHÍCULOS”

Solicitante: AGP AMERICA S.A.

Nuestra Ref.: P2018/000125

RESPUESTA AL OFICIO No. 9921, NOTIFICADO EL DÍA 15 DE AGOSTO DE
2018
(EXAMEN DE FORMA)

CARLOS R. OLARTE, mayor de edad y vecino de Bogotá, identificado tal como aparece al pie de mi firma, en mi carácter de apoderado de la sociedad solicitante, me permito manifestar lo siguiente ante el auto emanado por ese Despacho, dentro del plazo legal previsto en el artículo 39 de la Decisión 486 en los siguientes términos:

1. a- El Examinador solicita allegar el documento de cesión de derechos de los inventores al solicitante.

b- Me permito adjuntar al presente memorial la respectiva copia del documento de cesión.

2. a- El Examinador señala que se debe presentar dentro de los nueve meses siguientes contados a partir de la fecha de presentación de la solicitud, la copia certificada de la prioridad.

b- Considero superada la anterior objeción en tanto que se adjunta al presente escrito la copia de prioridad.

3. Por lo anterior, considero que la objeción presentada por la Examinadora en su examen de forma ha sido resuelta y por consiguiente solicito respetuosamente que el Despacho tenga por cumplidos los requisitos de forma y proceda con la publicación de la solicitud de acuerdo con el artículo 40 de la Decisión 486.

Atentamente,



CARLOS R. OLARTE

C.C. No. 79.782.747 de Bogotá

T.P. 74.295

Anexos:

- Copia documento de cesión;
- Copia del documento de prioridad.