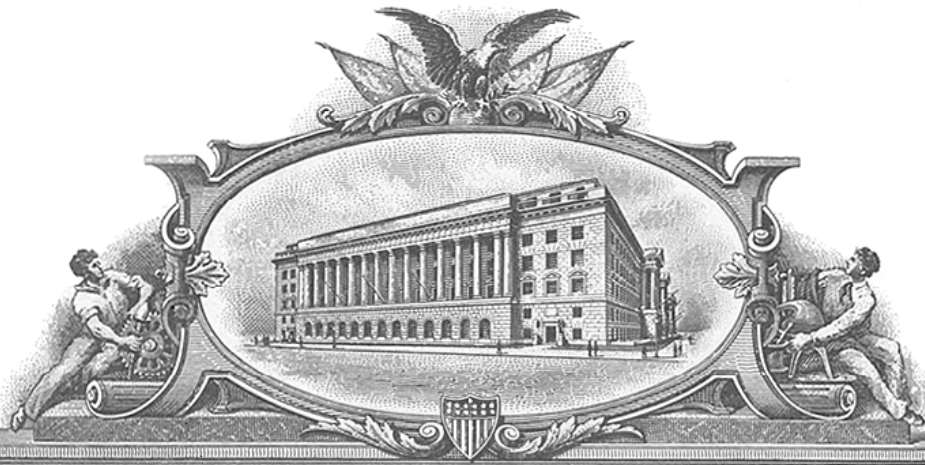


7665781



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

January 25, 2018

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 62/596,852
FILING DATE: *December 10, 2017*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US62/596,852



Certified by

Nichelle K. Lee

Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.24000
		Application Number	
Title of Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		
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.			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor	1				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Mario	Arturo	Mannheim Astete			
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service						
City	Lima		Country of Residence ⁱ	PE		
Mailing Address of Inventor:						
Address 1		Av. Guillermo Dansey 1996				
Address 2						
City	Cercado de Lima		State/Province			
Postal Code		Country ⁱ	PE			
Inventor	2				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Alfredo	Daniel	Koc Li			
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service						
City	Lima		Country of Residence ⁱ	PE		
Mailing Address of Inventor:						
Address 1		Av. Guillermo Dansey 1996				
Address 2						
City	Cercado de Lima		State/Province			
Postal Code		Country ⁱ	PE			
Inventor	3				Remove	
Legal Name						

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.24000
		Application Number	
Title of Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jean-Marie		Le Ny	
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service				
City	Lima	Country of Residence ⁱ	PE	

Mailing Address of Inventor:

Address 1	Av. Guillermo Dansey 1996			
Address 2				
City	Cercado de Lima	State/Province		
Postal Code		Country ⁱ	PE	
Inventor	4			Remove
Legal Name				

Prefix	Given Name	Middle Name	Family Name	Suffix
	Juan	Pablo	Suarez	
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service				
City	Lima	Country of Residence ⁱ	PE	

Mailing Address of Inventor:

Address 1	Av. Guillermo Dansey 1996			
Address 2				
City	Cercado de Lima	State/Province		
Postal Code		Country ⁱ	PE	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add				

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. 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 Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.24000
		Application Number	
Title of Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		

Application Information:

Title of the Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		
Attorney Docket Number	1511.24000	Small Entity Status Claimed	☐
Application Type	Provisional ▼		
Subject Matter	Utility ▼		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

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

Publication Information:

☐ 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.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.											
<table border="1"> <tr> <td>Please Select One:</td> <td>☒ Customer Number</td> <td>☐ US Patent Practitioner</td> <td>☐ Limited Recognition (37 CFR 11.9)</td> </tr> <tr> <td>Customer Number</td> <td colspan="3">130961</td> </tr> </table>				Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)	Customer Number	130961		
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)								
Customer Number	130961										

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.24000
		Application Number	
Title of Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)	Remove
Additional Foreign Priority Data may be generated within this form by selecting the Add button.				Add

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. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.24000
		Application Number	
Title of Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.24000
		Application Number	
Title of Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant	1	Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section. Clear		
☒ Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		
Name of the Deceased or Legally Incapacitated Inventor:		
If the Applicant is an Organization check here. ☒		
Organization Name	AGP America S.A.	
Mailing Address Information For Applicant:		
Address 1	Edificio Mossfon, Segundo Piso Calle 54 Este	
Address 2		
City	Panama City	State/Province
Country	PA	Postal Code
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. Add		

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.24000
		Application Number	
Title of Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		

Assignee 1				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
Remove				
If the Assignee or Non-Applicant Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add				

Signature:[Remove](#)

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Joseph L. Morales/		Date (YYYY-MM-DD)	2017-12-10
First Name	Joseph	Last Name	Morales	Registration Number
				58835
Additional Signature may be generated within this form by selecting the Add button. Add				

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1511.24000
		Application Number	
Title of Invention	GLAZING WITH IMPROVED ACOUSTING DAMPENING AT LOW TEMPERATURES		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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)

Inventor 1

Remove

Given Name

Middle Name

Family Name

City

State

Country ;

Mario

Arturo

Mannheim Astete

Lima

PE

Inventor 2

Remove

Given Name

Middle Name

Family Name

City

State

Country ;

Alfredo

Daniel

Koc Li

Lima

PE

Inventor 3

Remove

Given Name

Middle Name

Family Name

City

State

Country ;

Jean-Marie

Le Ny

Lima

PE

Inventor 4

Remove

Given Name

Middle Name

Family Name

City

State

Country ;

Juan

Pablo

Suarez

Lima

PE

All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

Add

Title of Invention

GLAZING WITH IMPROVED ACOUSTIC DAMPENING AT LOW TEMPERATURES

Attorney Docket Number (if applicable)

1511.24000

Correspondence Address

Direct all correspondence to (select one):

☒ The address corresponding to Customer Number

☐ 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.

☒ No.

Yes, the invention was made by an agency of the United States Government. The U.S. Government agency name is:

Yes, the invention was under a contract with an agency of the United States Government. The name of the U.S. Government agency and Government contract number are:

Doc Code: **TR.PROV**

Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (11-08)

Approved for use through 05/31/2015. OMB 0651-0032

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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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

- ☐ Applicant asserts small entity status under 37 CFR 1.27
- ☐ Applicant certifies micro entity status under 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
- ☒ No

Warning

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	Joseph L. Morales/			Date (YYYY-MM-DD)	2017-12-10
First Name	Joseph	Last Name	Morales	Registration Number (If appropriate)	58835

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that : (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

GLAZING WITH IMPROVED ACOUSTIC DAMPENING AT LOW TEMPERATURES

Cross-references to related applications

5 None

Abstract of the disclosure

In response to the government requirements for fuel economy, as well as the growing public awareness and demand for energy efficient environmentally friendly products,
10 vehicle manufacturers have been working to improve energy efficiency. This is especially important for electric vehicles where improvements directly translate into an increase in range, a key consumer concern.

One of the primary elements of this strategy is light weighting. A key area where weight
15 has been reduced is in the glazing. By reducing the thickness of the glazing substantial improvements in mass and efficiency can be made. At the same time, the glazed area has been increasing, displacing heavier materials.

The decrease in mass and increased area can result in higher noise levels. One of the
20 means used to offset this has been the use of sound dampening interlayers. However, the acoustic interlayers do not function any better than normal interlayer at lower temperatures. By adding a heating circuit the glazing is maintained at or above the temperature required for acceptable acoustic performance.

25 INVENTORS

Name	Nationality	Address
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Field of the invention

This invention relates to the field of laminated automotive glazing.

5 Background of the invention

In response to the government regulatory requirements for increased automotive fuel economy, as well as the growing public awareness and demand for energy efficient environmentally friendly products, automotive original equipment manufacturers, around the world, have been working to improve the energy efficiency of their vehicles.

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One of the key elements of this strategy to improve efficiency has been the concept of light weighting. Often times, more traditional, less expensive, conventional materials and processes are being replaced by innovative new materials and processes which while sometime being more expensive, still have higher utility than the materials and processes being replaced due to their lower weight and the corresponding increase in fuel efficiency. Sometimes, the new materials and processes bring with them added functionality as well in addition to their lighter weight. Vehicle glazing has been no exception.

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By reducing the weight of the vehicle substantial improvements can be made in energy consumption. This is especially important for electric vehicles where the improvement directly translates into an increase in the range of the vehicle which is a key consumer concern.

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For many years, the standard automotive windshield had a thickness of 5.4mm. In more recent years, we have seen the thickness decrease to 4.75 mm. While a reduction of 0.65 mm may not seem significant, at a density of 2600 kg per cubic meter for the typical standard soda-lime float glass, each millimeter that the thickness is reduced, decreases the weight by 2.6 kg per square meter. The weight of a typical 1.2 square meter windshield going from 5.4 mm to 4.75 mm is reduced by a little over 2 kg. On a vehicle

with a total of 6 square meters of glass, a 1 mm reduction on all of the windows translates into a savings of 15.6 kg.

5 In addition, the glazed area of vehicles has been steadily increasing and in the process displacing other heavier materials. The popular large glass panoramic roofs are just one example of this trend. A panoramic windshield is a windshield on which the top edge has been substantially extended such that it comprises a portion of the vehicle roof.

10 However, there are limits as to how thin the glazing can be using annealed soda-lime glass. Stress under wind load has always been a factor. With the trend towards increasing the size of windshields in particular, wind load is even more of a concern. Glass is also becoming a structural element in more and more vehicles. The glazing contributes to the stiffness and strength of the car. Fixed glass, once bonded with a relatively soft curing poly-urethane, is being mounted with higher modulus adhesives. As a result, the glass,
15 once isolated by rubber gaskets and soft butyl adhesives, is now much more subject to loading from the bumps in the road and vehicle torsion.

Today, windshields with a 2.1 mm outer ply, a 1.6 mm inner ply and a 0.76 mm plastic interlayer totaling just under 4.5 mm in total thickness are becoming common. This may
20 be close to the limit of what can be done with conventional annealed soda-lime glass.

The use of thinner glass and the use of chemically tempered glass has been among the key technologies used to reduce the thickness and weight of the glazing.

25 While a number of factors influence the transmission of sound, among the most important are density and mass. As density and mass are reduced, the level of sound transmitted increases. As an automotive glazing is made thinner and lighter, sound attenuation is degraded with the reduction in mass. Density also comes into play with some glass compositions commonly used for chemical tempering that have a lower density than soda-
30 lime glass.

Sound attenuation increases when the energy encounters a change in the density of the material that it is passing through. The change in density, going from glass to plastic to glass in a standard laminate, results in much better attenuation than in monolithic glazing of the same thickness.

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One approach used to offset the degradation in attenuation resulting from the use of thinner and lighter glass, as well as to improve the attenuation of ordinary laminates, has been the use of acoustic interlayers in laminated glazing. Interlayers that can dampen sound, above and beyond the level of attenuation of a normal laminate, are comprised in whole or in part of a layer of plastic that is softer and more flexible than that normally used. A reduction of as much as 6 db at certain frequencies is typical.

A non-acoustic automotive PVB interlayer will have a typical glass transition temperature of ~20 C whereas an acoustic PVB may have one as low as 0 C. At normal laminate assembly room temperatures (< 20 C), an acoustic PVB interlayer can be difficult to work with. They tend to be very soft, limp and sticky making them difficult to handle and to position on the glass as the laminate is assembled. Lower than normal assembly room ambient temperatures are needed to assemble laminates that comprise these types of monolithic acoustic PVBs. To address this disadvantage, a number of triple layer interlayer products have been introduced. In the triple layer product, the softer material is sandwiched between two thin layers of the normal PVB material. The overall thickness remains similar to that of an ordinary PVB interlayer. Handling is similar to ordinary PVB interlayer.

One of the drawbacks of an acoustic PVB interlayer is that the performance drops off with temperature. At lower temperatures and acoustic interlayer is no better than a standard interlayer.

It would be advantageous to be able to maintain acoustic attenuation at lower temperatures.

Brief summary of the invention

The attenuation of sound at lower temperatures is improved by adding a resistive heated circuit to the glazing. A variety of means can be used including but not limited to: printed silver frit, conductive coated glass, conductive coated film and embedded wire. The heated circuit does need to deice or defog and so can be designed to draw minimal power.

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Advantages:

- Extended lower temperature operation
- Fabricated using standard automotive glass processes and equipment.

Brief description of drawings

Figure 1A	Cross section of a typical automotive laminate.
Figure 1B	Cross section of a typical automotive laminate with coating and performance film.
Figure 2	Exploded view of windshield with an acoustic PVB interlayer and a screen print silver resistive heating circuit.
Figure 3	Exploded view of windshield with an acoustic PVB interlayer and a transparent conductive coated glass resistive heating circuit on the number two surface of glass.
Figure 4	Exploded view of windshield with an acoustic PVB interlayer and a transparent conductive coated film resistive heating circuit.
Figure 5	Exploded view of windshield with an acoustic PVB interlayer and an embedded wire resistive heating circuit.

Reference numerals

2	Glass
4	Plastic Interlayer
6	Obscuration
18	Coating
34	Bus bar
42	Coated Film
46	Silver
48	Wire
101	Surface one
102	Surface two
103	Surface three
104	Surface four
201	Outer glass layer
202	Inner glass layer

5 Detailed description of the invention

The following terminology is used to describe the laminated glazing of the invention.

A typical automotive laminate cross section is illustrated in Figures 1A and 1B. The laminate is comprised of two layers of glass, the exterior or outer, 201 and interior or inner, 202 that are permanently bonded together by a plastic layer 4 (interlayer). The glass surface that is on the exterior of the vehicle is referred to as surface one 101 or the number one surface. The opposite face of the exterior glass layer 201 is surface two 102 or the number two surface. The glass 2 surface that is on the interior of the vehicle is referred to as surface four 104 or the number four surface. The opposite face of the interior layer of glass 202 is surface three 103 or the number three surface. Surfaces two 102 and three 103 are bonded together by the plastic layer 4. An obscuration 6 may be also applied to the glass. Obscuration are commonly comprised of black enamel frit printed on either the number two 102 or number four surface 104 or on both. The laminate may also comprise a coating 18 on one or more of the surfaces. The laminate may also comprise a film 12 laminated between at least two plastic layers 4.

Most of the worlds' flat glass is produced by the float glass process, first commercialized in the 1950s. In the float glass process, the raw ingredients are melted in a large refractory vessel and then the molten glass is extruded from the vessel onto a bath of molten tin where the glass floats. The thickness of the glass is controlled by the speed at which the molten glass is drawn from the vessel. As the glass cools and hardens, the glass ribbon transfers to rollers.

We distinguish between the "air" side of the float glass and the "tin" side. A thin coating of tin remains on the glass which will fluoresce and thus can be detected with ultra-violet light.

The types of glass 2 that may be used include but are not limited to: the common soda-lime variety typical of automotive glazing as well as aluminosilicate, lithium aluminosilicate, borosilicate, glass ceramics, and the various other inorganic solid amorphous compositions which undergo a glass transition and are classified as glass included those that are not transparent. The glass layers may be comprised of heat absorbing glass compositions as well as infrared reflecting and other types of coatings.

The glass layers may be annealed or strengthened. There are two processes that can be used to increase the strength of glass. They are thermal strengthening, in which the hot glass is rapidly cooled (quenched) and chemical tempering which achieves the same effect through an ion exchange chemical treatment. In the chemical tempering process, ions in and near the outside surface of the glass are exchanged with ions that are larger. This places the outer layer of glass in compression. Compressive strengths of up to 1,000 Mpa are possible.

10 Laminated safety glass is made by bonding two sheets (201 & 202) of annealed glass 2 together using a plastic bonding layer comprised of a thin sheet of transparent thermo plastic 4 (interlayer) as shown in Figure 1. Annealed glass is glass that has been slowly cooled from the bending temperature down through the glass transition range. This process relieves any stress left in the glass from the bending process. Annealed glass
15 breaks into large shards with sharp edges. When laminated glass breaks, the shards of broken glass are held together, much like the pieces of a jigsaw puzzle, by the plastic layer helping to maintain the structural integrity of the glass. A vehicle with a broken windshield can still be operated. The plastic layer 4 also helps to prevent penetration by objects striking the laminate from the exterior and in the event of a crash occupant
20 retention is improved.

Black enamel frit is comprised of pigments, carriers, binders and finely ground glass. Other materials are also sometimes added to enhance certain properties: the firing temperate, anti-stick, chemical resistance, etc. The black frit is applied to the glass using
25 a silk screen or ink jet printing process prior to the heating and bending of the glass. As the flat glass is heated during the bending process, the powdered glass in the frit softens and melts, fusing to the surface of the glass. The black print becomes a permanent part of the glass. The frit is said to be “fired” when this takes place. This is a vitrification process which is very similar to the process used to apply enamel finishes on bathroom
30 fixtures, pottery, china and appliances.

This black frit print obscuration on many automotive glazings serves both a functional and an aesthetic role. The substantially opaque black print on the glass serves to protect the poly-urethane adhesive used to bond the glass to the vehicle from ultra-violet light and the degradation that it can cause. It also serves to hide the adhesive from view from the exterior of the vehicle. The black obscuration must be durable, lasting the life of the vehicle under all exposure and weather conditions. Part of the aesthetic requirement is that the black have a dark glossy appearance and a consistent appearance from part to part and over the time. A part produced today must match up with one that was produced and in service 20 years ago. The parts must also match up with the other parts in the vehicle which may not have been fabricated by the same manufacturer or with the same formulation of frit. Standard automotive black enamel inks (frits) have been developed that can meet these requirements.

The glass layers are formed using gravity bending, press bending, cold bending or any other conventional means known in the art. Gravity and press bending methods for forming glass are well known in the art and will not be discussed in the present disclosure.

Cold bending is a relatively new technology. As the name suggest, the glass is bent, while cold to its final shape, without the use of heat. On parts with minimal curvature a flat sheet of glass can be bent cold to the contour of the part. This is possible because as the thickness of glass decreases, the sheets becomes increasingly more flexible and can be bent without inducing stress levels high enough to significantly increase the long term probability of breakage. Thin sheets of annealed soda-lime glass, in thicknesses of about 1 mm, can be bent to large radii cylindrical shapes (greater than 6 m). When the glass is chemically or heat strengthened the glass is able to endure much higher levels of stress and can be bent along both major axis. The process is primarily used to bend chemically tempered thin glass sheets (≤ 1 mm) to shape.

Cylindrical shapes can be formed with a radius in one direction of less than 4 meters. Shapes with compound bend, that is curvature in the direction of both principle axis can be formed with a radius of curvature in each direction of as small as approximately 8

meters. Of course, much depends upon the surface area of the parts and the types and thicknesses of the substrates.

The cold bent glass will remain in tension and tend to distort the shape of the bent layer that it is bonded to. Therefore, the bent layer must be compensated to offset the tension. For more complex shapes with a high level of curvature, the flat glass may need to be partially thermally bent prior to cold bending.

The glass to be cold bent is placed with a bent to shape layer and with a bonding layer placed between the glass to be cold bent and the bent glass layer. The assembly is placed in what is known as a vacuum bag. The vacuum bag is an airtight set of plastic sheets, enclosing the assembly and bonded together at the edges, which allows for the air to be evacuated from the assembly and which also applies pressure on the assembly forcing the layers into contact. The assembly, in the evacuated vacuum bag, is then heated to seal the assembly. The assembly is next placed into an autoclave which heats the assembly and applies high pressure. This completes the cold bending process as the flat glass at this point has conformed to the shape of the bent layer and is permanently affixed. The cold bending process is very similar to a standard vacuum bag/autoclave process, well known in the art, with the exception of having an unbent glass layer added to the stack of glass.

Heat strengthened, full temper soda lime float glass, with a compressive strength in the range of at least 70 Mpa, can be used in all vehicle positions other than the windshield. Heat strengthened (tempered) glass has a layer of high compression on the outside surfaces of the glass, balanced by tension on the inside of the glass which is produced by the rapid cooling of the hot softened glass. When tempered glass breaks, the tension and compression are no longer in balance and the glass breaks into small beads with dull edges. Tempered glass is much stronger than annealed laminated glass. The thickness limits of the typical automotive heat strengthening process are in the 3.2mm to 3.6 mm range. This is due to the rapid heat transfer that is required. It is not possible to achieve the high surface compression needed with thinner glass using the typical blower type low pressure air quenching systems.

Automotive glazing often makes use of heat absorbing glass compositions to reduce the solar load on the vehicle. While a heat absorbing window can be very effective the glass will heat up and transfer energy to the passenger compartment through convective transfer and radiation. A more efficient method is to reflect the heat back to the atmosphere allowing the glass so stay cooler. This is done through the use of various infrared reflecting films and coatings. Infrared coatings and films are generally too soft to be mounted or applied to a glass surface exposed to the elements. Instead, they must be fabricated as one of the internal layers of a laminated product to prevent damage and degradation of the film or coating.

One of the big advantages of a laminated window over a tempered monolithic glazing is that a laminate can make use of infrared reflecting coatings and films in addition to heat absorbing compositions and interlayers.

Infrared reflecting coatings include but are not limited to the various metal/dielectric layered coatings applied through Magnetron Sputtered Vacuum Deposition (MSVD) as well as others known in the art that are applied via pyrolytic, spray, controlled vapor deposition (CVD), dip and other methods.

Infrared reflecting films include both metallic coated plastic substrates as well as organic based non-metallic optical films which reflect in the infrared. Most of the infrared reflecting films are comprised of a plastic film substrate having an infrared reflecting layered metallic coating applied.

The plastic bonding layer 4 (interlayer) has the primary function of bonding the major faces of adjacent layers to each other. The material selected is typically a clear plastic when bonding one glass layer 2 to another glass layer 2. For automotive use, the most commonly used bonding layer 4 (interlayer) is polyvinyl butyl (PVB). In addition to polyvinyl butyl, ionoplast polymers, ethylene vinyl acetate (EVA), cast in place (CIP) liquid resin and thermoplastic polyurethane (TPU) can also be used. Interlayers are available with enhanced capabilities beyond bonding the glass layers together.

The invention is comprised of at least one interlayer designed to dampen sound. Additional interlayers and performance films may also be used in conjunction with the acoustic sound dampening interlayer.

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Automotive interlayers are made by an extrusion process with has a thickness tolerance and process variation. As a smooth surface tends to stick to the glass, making it difficult to position on the glass and to trap air, to facilitate the handling of the plastic sheet and the removal or air (deairing) from the laminate, the surface of the plastic is normally embossed contributing additional variation to the sheet. Standard thicknesses for automotive PVB interlayer at 0.38 mm and 0.76 mm (15 and 30 mil).

Resistive heating circuits are commonly provided on automotive backlites in order to assist vision and enhance safety by melting snow and ice and clearing fog. Heated circuits are also provided on some windshields. On vehicles that have wipers that are hidden below the hood line when not in use, a heated wiper rest area is needed to keep the wipers clear of snow and ice when not in use and to prevent the buildup of snow in ice in the rest area when in use. Windshields that have safety cameras also require a heated circuit that can quickly clear the portion of the windshield in the camera field of view. Most vehicle are equipped with hot air windshield defrosting systems. Some are also provided with full windshield resistive heating as well. A number of technologies are in use in the production of the various types of heated circuits. In general, for most climates and typical glazing, a power density of at least 4 - 5 watts per square decimeter is required for good de-ice performance. For more demanding applications, such as the wiper rest area, power densities as high as 15 watts per square decimeter are known.

The optimum switching temperature is somewhere around 10 - 20 C although it will vary with the technology and the manufacturer. Likewise, the lower end of the range varies. A power density in the 2.5 – 3 watt range is sufficient to raise and maintain the temperature of the switchable material at a close to optimal temperature. The actual power density of the circuit will depend upon the technology, the position of the glazing and the manufacturer.

Several types of resistive heating circuits are used in automotive glazings. All can be used in embodiments of the invention.

- 5 Full surface windshield heating is commonly provided through the use of a conductive transparent coating. The coating is vacuum sputtered directly onto the glass and is comprised of multiple layers of metal and dielectrics. With resistances in the range of 2-6 ohms per square, a voltage converter is needed to reach the power density required. The lower power density required to maintain switching may allow for the use of a
10 standard 12 volt electrical supply.

Silver frit is the most common type of heated circuit used for backlights, heated wiper rests and camera defrosters. It is also the most cost effective. Finely silver powder is mixed with carriers, binders and finely ground glass. Other materials are also sometimes added
15 to enhance certain properties: the firing temperature, anti-stick, chemical resistance, etc. The silver frit is applied to the glass using a silk screen or ink jet printing process prior to the heating and bending of the glass. As the flat glass is heated during the bending process, the powdered glass in the frit softens and melts, fusing to the surface of the glass. The silver frit print becomes a permanent part of the glass. The frit is said to be “fired”
20 when this takes place. This is a vitrification process which is very similar to the process used to apply enamel finishes on bathroom fixtures, pottery, china and appliances. Resistances as low as 2 milliohms per square and line widths as narrow as 0.5 mm are possible. The primary drawback to silver print is the aesthetics of the fired silver which has a dark orange to mustard yellow color depending upon which side of the glass it is
25 printed on, the air side or the tin side.

A transparent conductive coated film can also be used to provide for a resistive heated circuit. This is very similar too and made in the same manner that transparent conductive coated glass is made. A voltage converter is needed to reach the power density required
30 for windshield full surface heating. The lower power density of the invention may allow for the use of a standard 12 volt electrical supply.

An embedded wire resistive heated circuit is formed by embedding fine wires into the plastic bonding layer of a laminate. The wires are embedded in the plastic through the use of heat or ultra-sound. Tungsten is a preferred material due to its tensile strength, which is 10x that of Copper and its flat black color. Heated windshields typically use tungsten wire that is in the 18 – 22 um range at which point the wires are virtually invisible. The wires are embedded using an oscillating sinusoidal like pattern to reduce glare that can occur under certain lighting conditions. For positions of the glazing other than the windshield, larger wire diameters can be used. Wire are typically embedded utilizing some sort of CNC machine.

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A micro-mesh resistive heating circuit is comprised of very fine conductive lines which are deposited onto a non-conductive substrate such as glass or plastic using a vacuum sputtering technique. Patterns are formed by masking of the substrate using a lithographic process similar to that used to produce integrated circuits. Line widths of 10 um are possible, at which point, the mesh is invisible for all practical purposes. The primary advantage of this method is that the pattern can be designed to provide for very precise control of the heating. As the conductors do not need to be transparent, the thickness can be much greater than that which is possible when coating the entire substrate. The process is also simpler as only a single metal layer is required.

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The heated circuit may be operated in a manual or automatic manner. Both methods have been used for deice and defog applications. The circuit may operate in response to the user. Generally, a timer is used to limit the power consumption and to prevent overheating. Temperature feedback may be provided for closed loop control. As most modern vehicles have interior and exterior temperature sensors, the vehicle climate control may operate the circuit based upon the temperature. For optimum efficiency, a sound sensor may be used to detect the level of sound attenuation so as to operate the heating circuit in response to the measured level and the temperature.

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It should be understood that while the exemplary embodiments are panoramic roofs, the same heated circuits may be incorporated into acoustic laminates design for use as a windshield, rear window, door window or in any other glazed position of the vehicle.

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DETAILED DESCRIPTION OF THE EMBODIMENTS

1. The laminated panoramic glass roof of Figures 2, illustrates the first embodiment. The laminate is comprised of a standard soda-lime 2.5 mm thick clear exterior glass layer **201** and a 2.1 mm soda-lime solar green interior glass layer **202**. Black frit **6** is screen printed on surface two **102** and surface four **104**. A silver frit heating circuit, with 0.6mm wide lines and a power density of 3 watts per decimeter squared is screen printed on the number four surface **104**. Screen printed silver frit busbars **37** are used to connect the printed heater lines. The glass **2** layers are thermally bent using a gravity bending process. The assembled laminated is processed, using standard automotive laminating equipment.
2. The laminated panoramic glass roof of Figures 3, illustrates the second embodiment. The laminate is comprised of a standard soda-lime 2.5 mm thick clear exterior glass layer **201** and a 2.1 mm soda-lime solar green interior glass layer **202**. Black frit **6** is screen printed on surface two **102** and surface four **104**. After printing, the outer glass layer 201 is heated to fire the black print. After firing, the outer layer is coated my means of a MSVD process to apply a transparent silver based coating having a sheet resistance of 2.5 ohms per square. At 12 volts, the heating circuit has a power density of 3 watts per decimeter square. Thin flat tinned copper busbars are used to power the coated heater circuits. The glass **2** layers are thermally bent using a gravity bending process. The assembled laminated is processed, using standard automotive laminating equipment.
3. The laminated panoramic glass roof of Figures 4, illustrates the third embodiment. The laminate is comprised of a standard soda-lime 2.5 mm thick clear exterior glass layer **201** and a 2.1 mm soda-lime solar green interior glass layer **202**. Black frit **6** is screen printed on surface two **102** and surface four **104**. The heated circuit is comprised of a plastic film coated by means of a MSVD process used to apply a transparent silver based coating having a sheet resistance of 2.5 ohms per square. At 12 volts, the heating circuit has a power density of 3 watts per decimeter square. Thin flat tinned copper busbars are used to power the coated heater circuit. The glass **2**

layers are thermally bent using a gravity bending process. The assembled laminated is processed, using standard automotive laminating equipment.

4. The laminated panoramic glass roof of Figures 5, illustrates the forth embodiment.
- 5 The laminate is comprised of a standard soda-lime 2.5 mm thick clear exterior glass layer **201** and a 0.7 mm chemically tempered interior glass layer **202**. Black frit **6** is screen printed on surface two **102**. An embedded tungsten wire heating circuit, with a power density of 3 watts per decimeter squared is embedded into the clear plastic bonding interlayer. Thin tinned copper busbars are used to provide 12 volt power to
- 10 the wire heating elements. The outer glass **201** layer is thermally bent using a gravity bending process. The interior glass layer 202, is cold bent. The assembled laminated is processed, using standard automotive laminating equipment.

It must be understood that this invention is not limited to the embodiments described and

15 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

What is claimed is:

1. A variable light transmittance laminated glazing comprising:
 - a. one exterior glass layer;
 - b. one interior glass layer; and
 - c. at least one acoustic plastic interlayer.
2. The laminate of claim 1, wherein the laminate comprises an infrared reflecting coating.
3. The laminate of claim 1, wherein the laminate comprises an infrared reflecting film.
4. The laminate of claim 1, wherein the heated circuit is comprised of an embedded wire heated circuit.
5. The laminate of claim 1, wherein the heated circuit is comprised of a silver frit heated circuit.
6. The laminate of claim 1, wherein the heated circuit is comprised of a transparent conductive coated film heated circuit.
7. The laminate of claim 1, wherein the heated circuit is comprised of a transparent conductive coated glass heated circuit.
8. The laminate of claim 1, wherein the laminate comprises a cold bent glass layer.
9. The laminate of claim 1, wherein the laminate comprises a chemically tempered glass layer.
10. A vehicle comprising the laminate of claim 1.

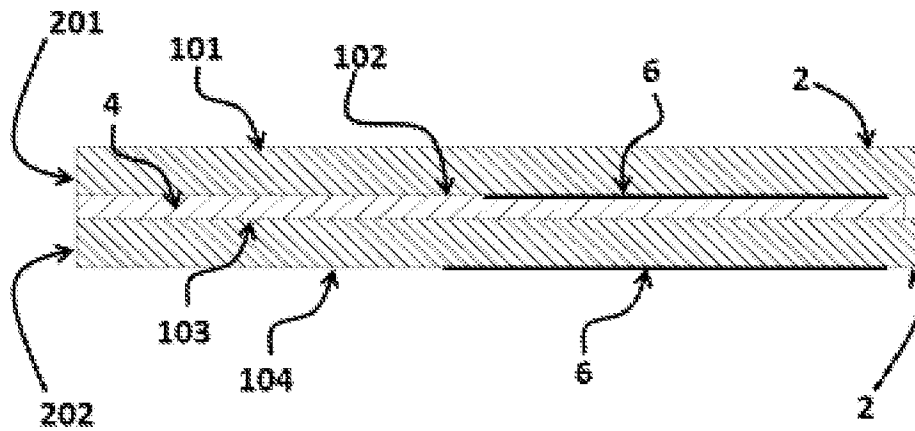


Fig. 1A

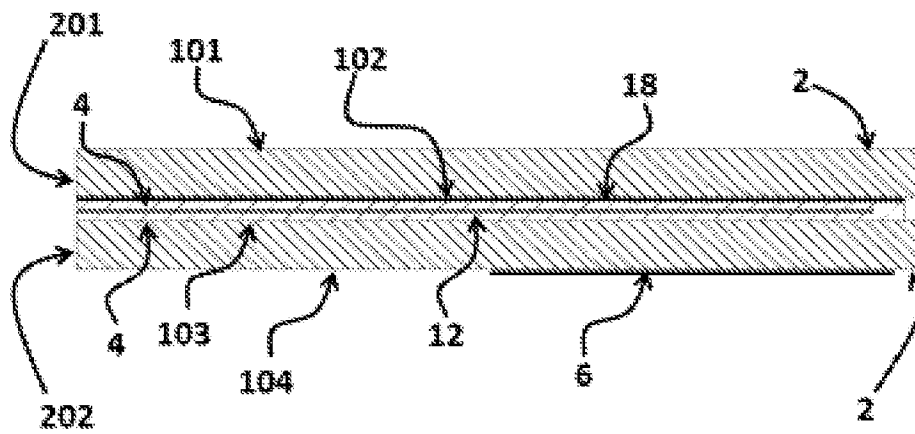


Fig. 1B

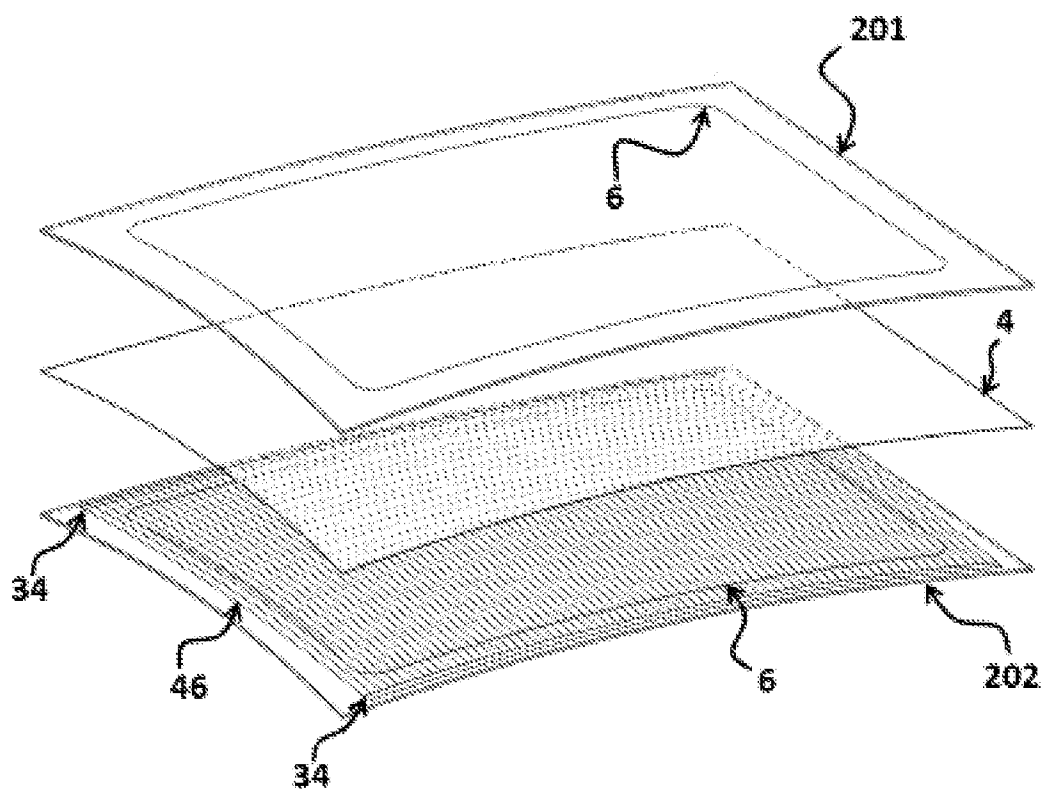


Fig. 2

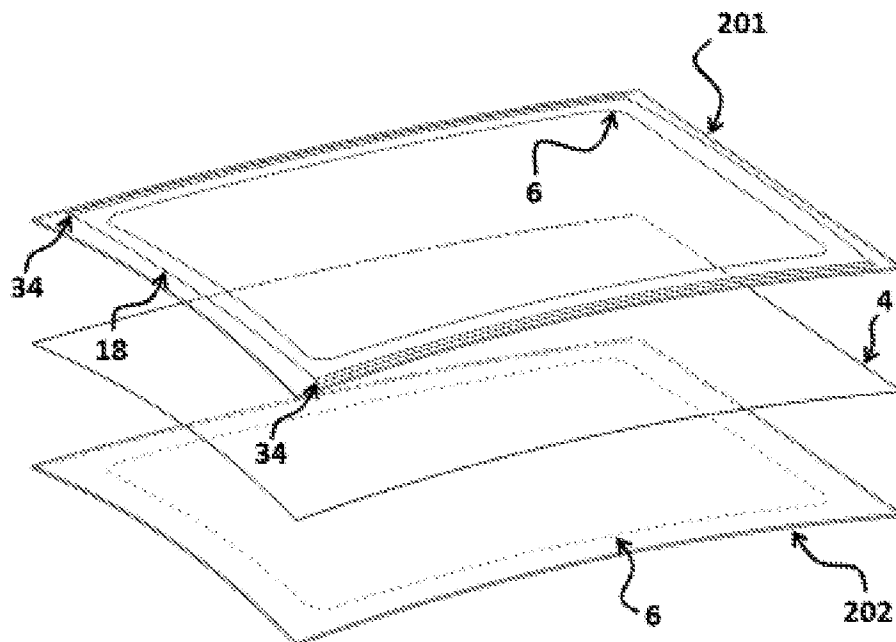


Fig. 3

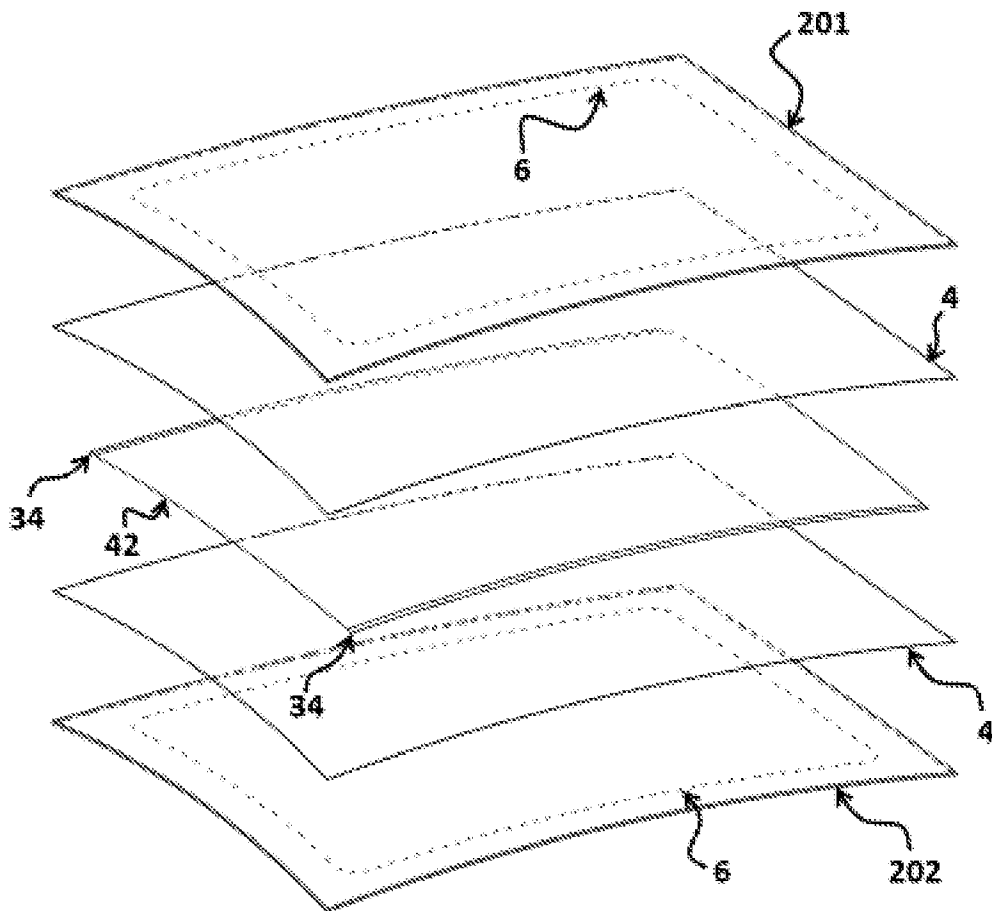


Fig. 4

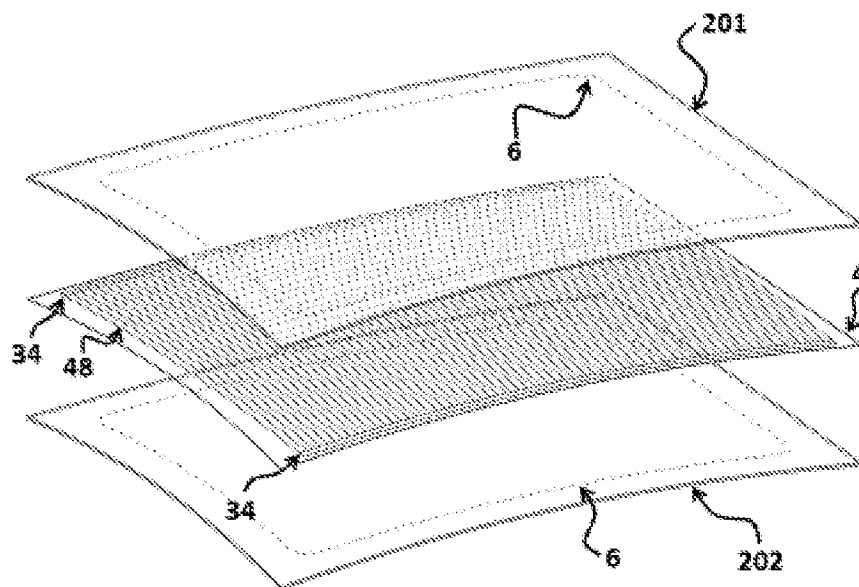


Fig. 5

Electronic Acknowledgement Receipt

EFS ID:	31179948
Application Number:	62596852
International Application Number:	
Confirmation Number:	5679
Title of Invention:	GLAZING WITH IMPROVED ACOUSTIC DAMPENING AT LOW TEMPERATURES
First Named Inventor/Applicant Name:	Mario Arturo Mannheim Astete
Customer Number:	130961
Filer:	Joseph L. Morales
Filer Authorized By:	
Attorney Docket Number:	1511.24000
Receipt Date:	10-DEC-2017
Filing Date:	
Time Stamp:	11:58:39
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$260
RAM confirmation Number	121117INTEFSW11592900
Deposit Account	
Authorized User	

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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	14048.PDF	1823085	no	9
			29e1b32ba4858bd86e35a44a99818ebfe75ebbdcc		
Warnings:					
Information:					
2	Provisional Cover Sheet (SB16)	14050.PDF	1477252	no	4
			8b318e0cdf93739fbc11e0c6eb49af362acc828e		
Warnings:					
Information:					
3	Specification	14051.PDF	249563	no	22
			4f66be8ef60d3336e005ef6da709926340fef83b		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	29821	no	2
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National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

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