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(54) Title: DOUBLE GLAZING METHOD, CONTROL UNIT AND SPACER ASSEMBLY

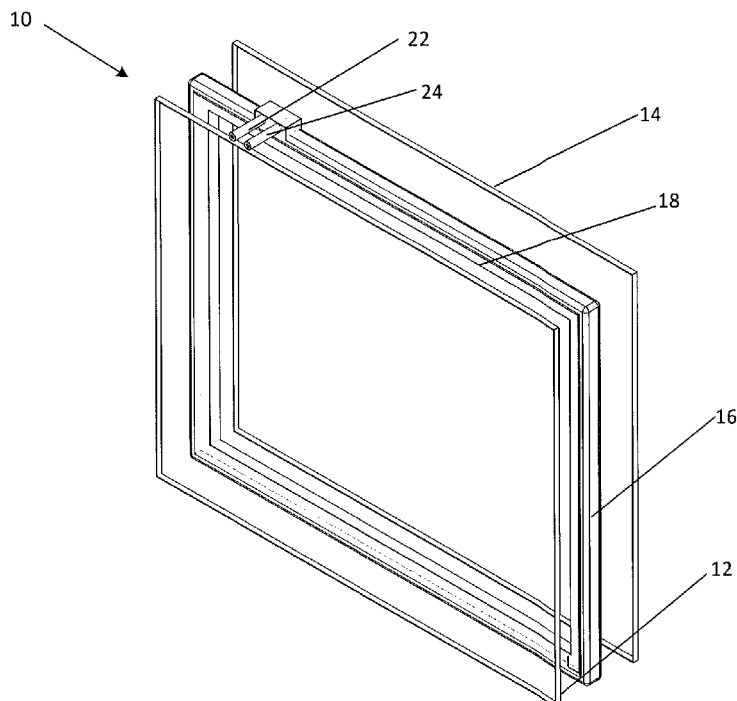


Figure 1

(57) Abstract: A method of fixing a double glazing sheet to a window pane, including the steps of: providing a heat activated adhesive seal for extending substantially adjacent a perimeter of the double glazing sheet; arranging the seal and the double glazing sheet so that the seal is brought into engagement with the window pane and the double glazing sheet; applying heat to the seal to activate said seal and to fix the double glazing sheet to the window pane, thereby at least partially defining an insulating space between the double glazing sheet and the window pane, the insulating space being accessible via a conduit; and drawing air from the insulating space through the conduit.

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TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, **Published:**
KM, ML, MR, NE, SN, TD, TG).

— *with international search report (Art. 21(3))*

- 1 -

DOUBLE GLAZING METHOD, CONTROL UNIT AND SPACER ASSEMBLY

FIELD OF THE INVENTION

- 5 The present invention relates to a method of fixing a double glazing sheet to a window pane, a control unit for use in the method and a spacer assembly.

BACKGROUND OF THE INVENTION

- 10 Double glazed windows can greatly improve the insulating properties of a building and it is desirable to improve the insulating properties of a building to reduce heating or cooling costs and/or to make a building more comfortable for occupants.

- Removal of existing windows for replacement with double glazed windows can be
15 expensive and wasteful if the existing windows cannot be recycled. Previous proposals to retrofit a double glazing sheet to an existing window pane can be expensive, complicated and generally inconvenient to install.

- Examples of the invention seek to solve, or at least ameliorate, one or more disadvantages
20 of previous systems for retrofitting a double glazing sheet to an existing window pane.

SUMMARY OF THE INVENTION

- According to one aspect of the present invention, there is provided a method of fixing a
25 double glazing sheet to a window pane, including the steps of: providing a heat activated adhesive seal for extending substantially adjacent a perimeter of the double glazing sheet; arranging the seal and the double glazing sheet so that the seal is brought into engagement with the window pane and the double glazing sheet; applying heat to the seal to activate said seal and to fix the double glazing sheet to the window pane, thereby at least partially
30 defining an insulating space between the double glazing sheet and the window pane, the

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insulating space being accessible via a conduit; and drawing air from the insulating space through the conduit.

According to preferred embodiments, the seal is arranged directly onto the double glazing
5 sheet then the double glazing is positioned so that the seal is brought into engagement with the window pane. Preferably, the step of positioning the double glazing sheet includes locating the double glazing sheet so as to be substantially parallel to the window pane.

The seal may be in the form of an elongate strip and the conduit may be disposed in a gap
10 defined between opposing ends of the seal.

According to preferred embodiments, the method further includes the step of applying a spacer to the double glazing sheet to maintain a predetermined gap between the double glazing sheet and the window pane. Preferably, the spacer is in the form of an elongate
15 member disposed generally adjacent the seal and the spacer is applied in the insulating space.

The conduit can be in the form of at least one duct fixed to the spacer and the method includes the step of installing the duct(s) in communication with the insulating space. In
20 preferred embodiments, an evacuation duct and a filling duct is provided.

Preferably, the method further includes the steps of removing a portion of the duct(s) after installation and plugging the remaining portion of the duct after removal.

25 Preferably, the method further includes the step of inserting an insulating gas into the insulating space. In preferred embodiments, the insulating gas is an Argon gas.

According to preferred embodiments, the seal is a hot-wire butyl seal which can be activated by applying an electrical current to the wire. Preferably, the steps of activating
30 the seal and evacuating the insulating space are performed simultaneously.

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The method can further include the step of arranging a desiccant bead around an outer perimeter of the insulating space. The method can also further include the step of fitting a cover over an outer edge of the double glazing sheet.

5 According to another aspect of the present invention, there is provided a method of fixing a double glazing sheet to a window pane, including the steps of: arranging a hot-wire butyl seal on the double glazing sheet substantially adjacent a perimeter of the double glazing sheet; installing an evacuation duct and a filling duct in cooperation with the seal; positioning the double glazing sheet so that the seal is brought into engagement with the
10 window pane; applying an electrical current to the wire of the seal to activate the seal and fix the double glazing sheet to the window pane, thereby at least partially defining an insulating space between the double glazing sheet and the window pane; drawing air from the insulating space through the evacuation duct; and inserting an insulating gas into the insulating space.

15

According to preferred embodiments, the method further includes the step of applying a spacer to the double glazing sheet to maintain a predetermined gap between the double glazing sheet and the window pane, wherein the steps of arranging the seal on the double glazing sheet, installing the ducts, and applying the spacer are performed independently of
20 the remaining steps.

According to another aspect of the present invention, there is provided a control unit for use in a method of the above described type the control unit comprising: a first connector configured for engagement with ends of the wire of the seal to apply electrical current to
25 the wire; an electrical current generator in communication with the first connector; a second connector configured for engagement with the ducts; a vacuum generator in communication with the second connector to draw air from the insulating space via the evacuation duct; and filling means in communication with the second connector for inserting the insulating gas via the filling duct.

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According to preferred embodiments, the control unit is configured to measure the electrical resistance of the wire to determine the electrical current required to activate the seal and wherein operation of the electrical current generator is variable in response to the measured resistance. Preferably, the control unit automatically varies the current generated
5 in response to the measured resistance.

Preferably, the control unit has a sensor for determining when the insulating space has been suitably evacuated and is configured to: maintain a vacuum for a predetermined amount of time once the seal has been activated; automatically insert the insulating gas
10 once the predetermined time has passed; and cease inserting the insulating gas once the insulating space has been filled.

According to another aspect of the present invention, there is provided a spacer assembly for use in fixing a double glazing sheet to a window pane, comprising: a frame member
15 configured to extend generally adjacent a perimeter of the double glazing sheet; a hot-wire butyl seal disposed around an outer perimeter of the frame member for sealing an insulating space between the double glazing sheet and the window pane; and an evacuation duct and a filling duct in communication with the insulating space.

20 The spacer can further comprise a desiccant bead arranged adjacent the frame member inside the insulating space. Preferably, the frame member, the evacuation duct and the filling duct are integrally formed.

BRIEF DESCRIPTION OF THE DRAWINGS

25

Preferred embodiments of the invention will be further described, by way of non-limiting example only, with reference to the accompanying drawings in which:

Figure 1 is a perspective exploded view of a retrofit double glazing system of one embodiment of the invention;

30 Figure 2 is a top view of the system;

Figure 3 is a front view of the system;

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Figure 4 is a perspective view of the system in an assembled state; and

Figure 5 is a side view of a control unit according to another embodiment of the invention.

5 DETAILED DESCRIPTION

A retrofit double glazing system 10 according to a preferred embodiment is shown in Figure 1. A method of using this system, in particular a method of fixing a double glazing sheet 12 to a window pane 14, according to a preferred embodiment of the invention is also described with reference to Figure 1. In a broad form, the method includes the step of providing a heat activated seal 16 for extending substantially adjacent a perimeter of the double glazing sheet 12 and arranging the seal 16 and the double glazing sheet 12 so that the seal 16 is brought into engagement with the window pane 14 and the double glazing sheet 12. In preferred embodiments, the method includes the step of arranging the heat activated adhesive seal 16 on the double glazing sheet 12 adjacent a perimeter of the double glazing sheet 12 and then positioning the double glazing sheet 12 adjacent the window pane 14 so that the seal 16 is brought into engagement with the window pane 14.

The seal 16 is disposed close to the outer edges of the double glazing sheet 12. In use, the seal 16 at least partially defines an insulating space 20 (refer Figure 3) between the double glazing sheet 12 and the window pane 14.

The insulating space 20 is accessible via a conduit, which in the described embodiment includes a pair of ducts 22, 24 that include an evacuation duct 22 and a filling duct 24, though it will be appreciated that arrangements having a single duct may similarly be provided. In other embodiments, the conduit may simply be a gap formed in the seal 16 and configured for accepting a nozzle. In one embodiment, the seal 16 is in the form of an elongate strip. In such an embodiment, the conduit may be disposed in a gap defined between opposing ends of the seal.

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Once the seal 16 is engagement with both the double glazing sheet 12 and the window

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pane 14, heat is applied to the seal 16 to activate it and fix the double glazing sheet 12 to the window pane, thereby at least partially defining an insulating space between the double glazing sheet and the window pane. In the described embodiment, the heat activated seal 16 is configured so that the adhesive properties of the seal are increased once heat is applied so that the seal may be initially positioned and then activated when required. In this regard, the seal becomes increasingly sticky as heated. The seal 16 is formed of butyl, though it is envisaged that other materials may similarly be used. Also, it is envisaged that heat could be applied to the seal by way of conduction, convection or radiation.

10 The method also includes the step of drawing air from the insulating space 20 through the conduit. Air may be drawn from the insulating space 20 while the seal 16 is being activated so as to create a vacuum which will act to urge the double glazing sheet 12 and the window pane 14 together while the seal 16 is activating, potentially increasing the adhesive force.

15

In the illustrated embodiment a spacer 18 is provided and the method further includes the step of applying the spacer 18 to the double glazing sheet 12 to maintain a predetermined gap between the double glazing sheet 12 and the window pane 14.

20 The illustrated spacer 18 is in the form of an elongate member disposed generally adjacent the seal 16. In this regard, the spacer 18 is generally rectangular and sized so as extend generally around a perimeter of the double glazing sheet 12. The spacer 18 is rigid and formed of a plastic material which is preferably light, formed using injection moulding techniques and may be UV stabilised. In other embodiments the spacer may be formed of a metallic material, such as steel or aluminium. The spacer may be formed from strip material or, in the case of aluminium, formed from extruded material. The function of the spacer is to maintain a predetermined gap between the double glazing sheet 12 and the window pane 14 and it will be appreciated that the spacer may take other forms and still provide this functionality. For example, the spacer may include a series of rigid elements which may or may not be linked together using rigid or flexible members.

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In the described method, the spacer 18 is disposed on an inner side of the seal 16 so as to be applied in the insulating space. It will be appreciated that the spacer 18 may be arranged on an outer side of the seal 16 and also that the spacer 18 may be applied directly to the window pane 14.

5

In some embodiments, the or each duct is fixed to the spacer and the step of arranging the seal on the double glazing sheet includes the step of installing the or each duct in communication with the insulating space. In this regard, the or each duct may be formed separately from the spacer and fixed to the spacer during installation. In the illustrated
10 embodiment, the evacuating duct 22 and the filling duct 24 are integrally formed with the spacer 18 so as to simplify installation.

As illustrated in Figures 1 and 2, the ducts 22, 24 each include a removable portion, which in the illustrated embodiment is in the form of extensions 23, 25 that protrudes from the
15 spacer 18. The described method further includes the steps of removing the extensions 23, 25 after installation and plugging the remaining portion of the duct after removal. The duct may be plugged using commercially available fillers such as silicone.

In the above described method, air is evacuated from the insulating space. Those skilled in
20 the art will appreciate that reference to evacuating the insulating space and/or creating a vacuum are intended to refer generally to the removal of air from the insulating space and not the absolute evacuation thereof. Although forming a vacuum in the insulating space will improve the insulating properties when compared to having air in the insulating space, it is preferred that the method further includes the step of inserting an insulating gas, which
25 in the described embodiment is an Argon gas, into the insulating space.

In a preferred embodiment, the heat activated seal 16 is a hot-wire butyl seal which can be activated by applying an electric current to the wire. Those skilled in the art will appreciate that the current required to activate the seal will depend on the length and
30 thickness of the wire and the thickness of the butyl seal material.

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A desiccant bead (not shown) is installed around an outer perimeter of the insulating space so as to absorb any moisture retained in the insulating space to prevent fogging of the double glazing sheet.

- 5 Once the insulating space is filled with an insulating gas, a cover (not shown) such as a trim cap may be fitted over an outer edge of the double glazing sheet so as to protect users from edges of the glass and improve aesthetics.

Figure 5 illustrates a control unit 50 for use in the above described method. The control
10 unit 50 comprises a first connector (not shown) configured for engagement with ends of the wire of the seal to apply electrical current to the wire and an electrical current generator 52 in communication with the first connector. The control unit 50 also comprises a second connector (not shown) which is configured for engagement with the ducts 22,24. A vacuum generator 54 is provided in communication with the second connector to draw air
15 from the insulating space via the evacuation duct 22 and a filling means is provided in communication with the second connector for inserting the insulating gas via the filling duct 24. In the illustrated control unit 50, the filling means includes a tank 56 of compressed Argon gas and a pressure regulator 58.

- 20 The control unit 50 is configured to measure the electrical resistance of the wire to determine the electrical current required to activate the seal. Operation of the electrical current generator 52 is variable in response to the measured resistance. In the described embodiment, the control unit 50 automatically varies the current generated in response to the measured resistance. In other embodiments, the control unit may display the measured
25 resistance and/or the calculated current required and allow a user to select a current level based on the measured resistance.

The control unit 50 has a sensor 60 for determining when the insulating space has been evacuated. A vacuum valve 62 is provided to control the level of vacuum created. The
30 control unit 50 is configured to maintain a vacuum for a predetermined amount of time once the seal has been activated, automatically insert the insulating gas once the

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predetermined time has passed; and cease inserting the insulating gas once the insulating space has been filled. A sensor 64 is provided to determine the filling level of Argon and a valve 66 is provided to control the flow of Argon.

- 5 In the illustrated embodiment, the control unit 50 is operated via a control screen 68, which is preferably a touch screen display to simplify operation. A control interface 70 is provided to control operation of the control unit 50.

- The embodiments have been described by way of example only and modifications are possible within the scope of the invention disclosed. For example, although the preferred
10 embodiments have been described with reference to a single seal 16, it will be appreciated that embodiments having multiple seals are possible and are intended to fall within the scope of the invention. For example, one seal may be provided for engagement with the double glazing sheet 12 and another for engagement with the window pane 14, more
15 particularly, one seal may be applied to a face of the frame member 18 which is brought into engagement with the double glazing sheet 12 and another seal may be applied to a face of the frame member 18 which is brought into engagement with the window pane 14.

CLAIMS

1. A method of fixing a double glazing sheet to a window pane, including the steps of:
providing a heat activated adhesive seal for extending substantially adjacent a
5 perimeter of the double glazing sheet;
arranging the seal and the double glazing sheet so that the seal is brought into
engagement with the window pane and the double glazing sheet;
applying heat to the seal to activate said seal and to fix the double glazing sheet to
the window pane, thereby at least partially defining an insulating space between the double
10 glazing sheet and the window pane, the insulating space being accessible via a conduit; and
drawing air from the insulating space through the conduit.
2. A method as claimed in claim 1, wherein the seal is arranged directly onto the
double glazing sheet then the double glazing is positioned so that the seal is brought into
engagement with the window pane.
- 15 3. A method as claimed in claim 2, wherein the step of positioning the double glazing
sheet includes locating the double glazing sheet so as to be substantially parallel to the
window pane.
4. A method as claimed in any one of claims 1 to 3, wherein the seal is in the form of
an elongate strip and the conduit is disposed in a gap defined between opposing ends of the
20 seal.
5. A method as claimed in claim in any one of the preceding claims, further including
the step of applying a spacer to the double glazing sheet to maintain a predetermined gap
between the double glazing sheet and the window pane.
6. A method as claimed in claim 5, wherein the spacer is in the form of an elongate
25 member disposed generally adjacent the seal and the spacer is applied in the insulating
space.
7. A method as claimed in claim 5 or claim 6, wherein the conduit is in the form of at
least one duct fixed to the spacer and the method includes the step of installing the duct(s)
in communication with the insulating space.

8. A method as claimed in claim 7, further including the steps of removing a portion of the duct(s) after installation and plugging the remaining portion of the duct after removal.
9. A method as claimed in any one of the preceding claims, further including the step
5 of inserting an insulating gas into the insulating space.
10. A method as claimed in claim 9, wherein the insulating gas is an Argon gas.
11. A method as claimed in any one of the preceding claims, wherein the seal is a hot-wire butyl seal which can be activated by applying an electrical current to the wire.
12. A method as claimed in any one of the preceding claims, wherein the steps of
10 activating the seal and evacuating the insulating space are performed simultaneously.
13. A method as claimed in any one of the preceding claims, further including the step of arranging a desiccant bead around an outer perimeter of the insulating space.
14. A method as claimed in any one of the preceding claims, further including the step of fitting a cover over an outer edge of the double glazing sheet.
- 15 15. A method of fixing a double glazing sheet to a window pane, including the steps of:
arranging a hot-wire butyl seal on the double glazing sheet substantially adjacent a
perimeter of the double glazing sheet;
installing an evacuation duct and a filling duct in cooperation with the seal;
positioning the double glazing sheet so that the seal is brought into engagement
20 with the window pane;
applying an electrical current to the wire of the seal to activate the seal and fix the
double glazing sheet to the window pane, thereby at least partially defining an insulating
space between the double glazing sheet and the window pane;
drawing air from the insulating space through the evacuation duct; and
25 inserting an insulating gas into the insulating space.
16. A method as claimed in claim 15, further including the step of applying a spacer to the double glazing sheet to maintain a predetermined gap between the double glazing sheet and the window pane, wherein the steps of arranging the seal on the double glazing sheet, installing the ducts, and applying the spacer are performed independently of the remaining
30 steps.

17. A control unit for use in a method according to claim 15 or claim 16, the control unit comprising:

a first connector configured for engagement with ends of the wire of the seal to apply electrical current to the wire;

5 an electrical current generator in communication with the first connector;

a second connector configured for engagement with the ducts;

a vacuum generator in communication with the second connector to draw air from the insulating space via the evacuation duct; and

10 filling means in communication with the second connector for inserting the insulating gas via the filling duct.

18. A control unit as claimed in claim 17, wherein the control unit is configured to measure the electrical resistance of the wire to determine the electrical current required to activate the seal and wherein operation of the electrical current generator is variable in response to the measured resistance.

15 19. A control unit as claimed in claim 18, wherein the control unit automatically varies the current generated in response to the measured resistance.

20. A control unit as claimed in any one of claims 17 to 19, wherein the control unit has a sensor for determining when the insulating space has been suitably evacuated and is configured to:

20 maintain a vacuum for a predetermined amount of time once the seal has been activated;

automatically insert the insulating gas once the predetermined time has passed; and
cease inserting the insulating gas once the insulating space has been filled.

25 21. A spacer assembly for use in fixing a double glazing sheet to a window pane, comprising:

a frame member configured to extend generally adjacent a perimeter of the double glazing sheet;

a hot-wire butyl seal disposed around an outer perimeter of the frame member for sealing an insulating space between the double glazing sheet and the window pane; and

30 an evacuation duct and a filling duct in communication with the insulating space.

22. A spacer assembly as claimed in claim 21, further comprising a desiccant bead arranged adjacent the frame member inside the insulating space.
23. A spacer assembly as claimed in claim 21, wherein the frame member, the evacuation duct and the filling duct are integrally formed.

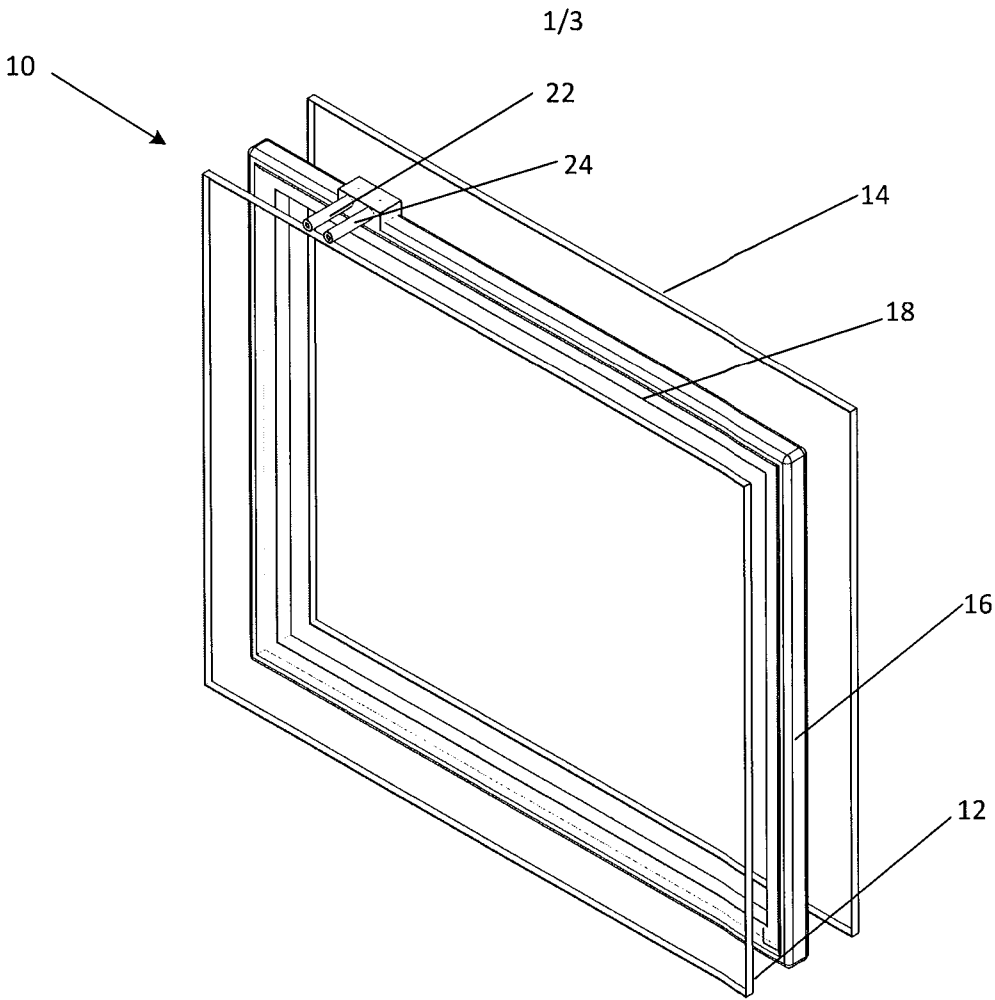


Figure 1

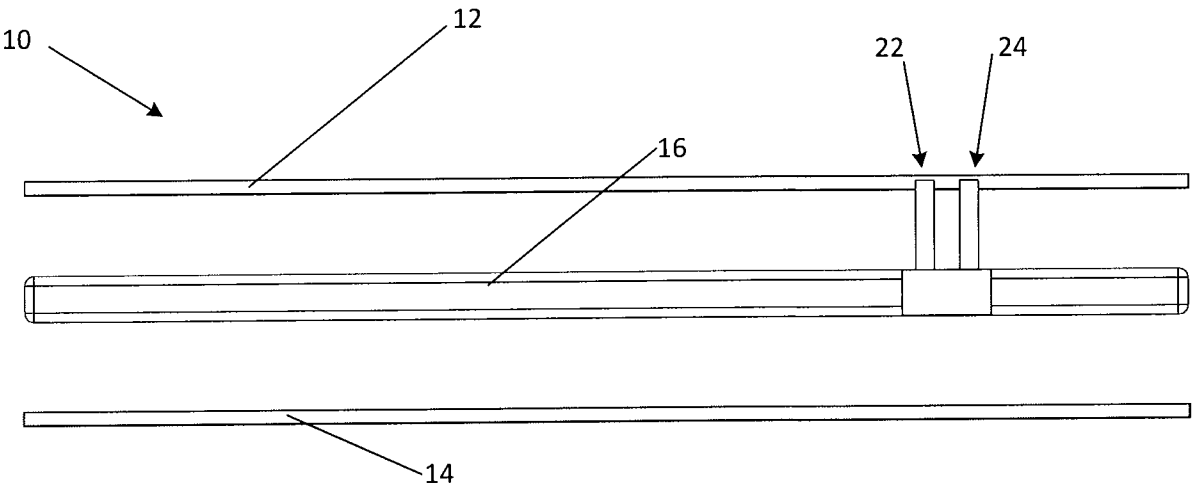


Figure 2

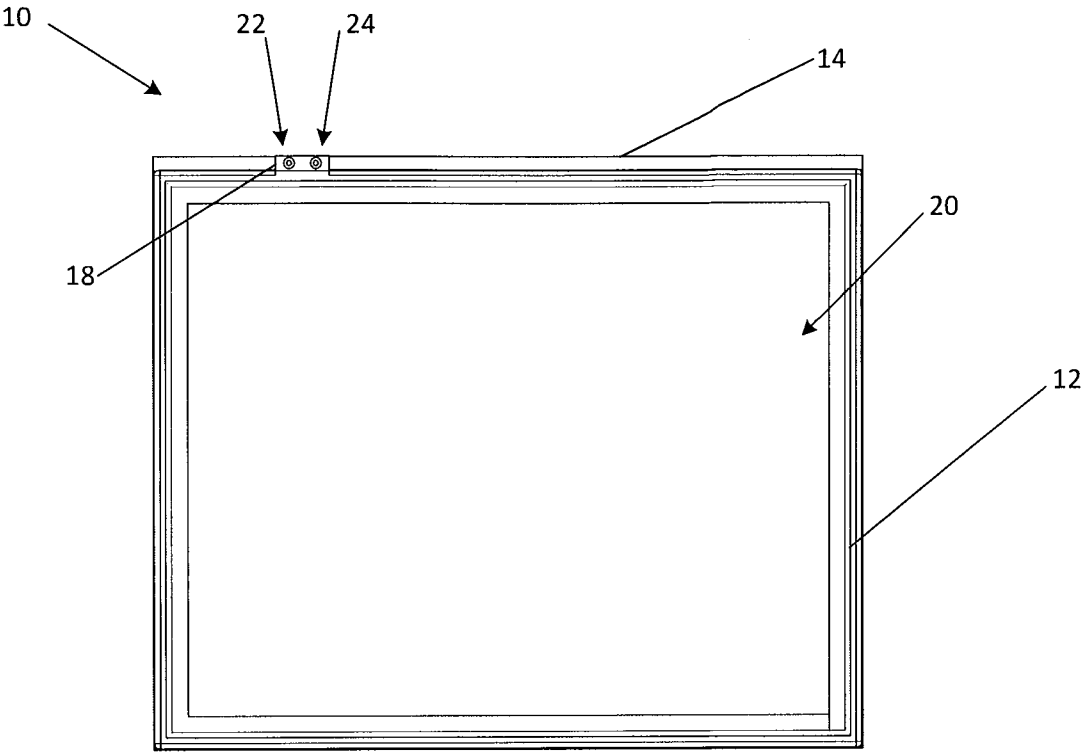


Figure 3

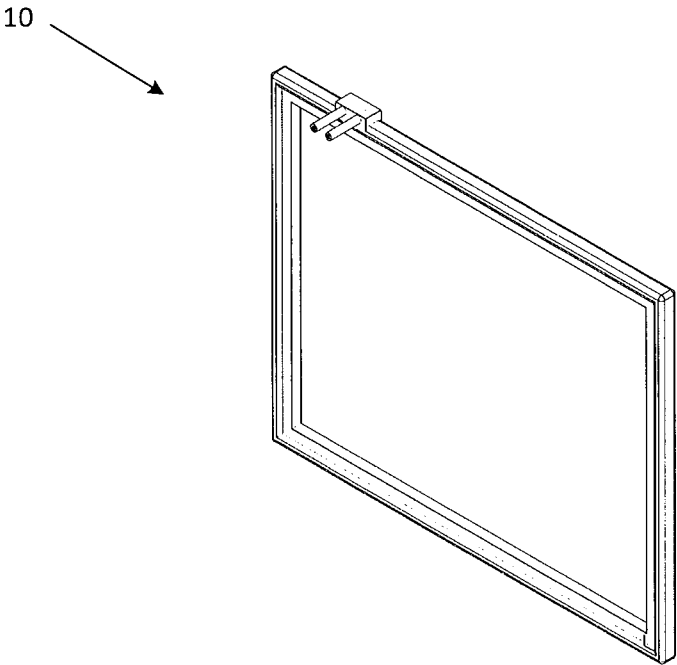


Figure 4

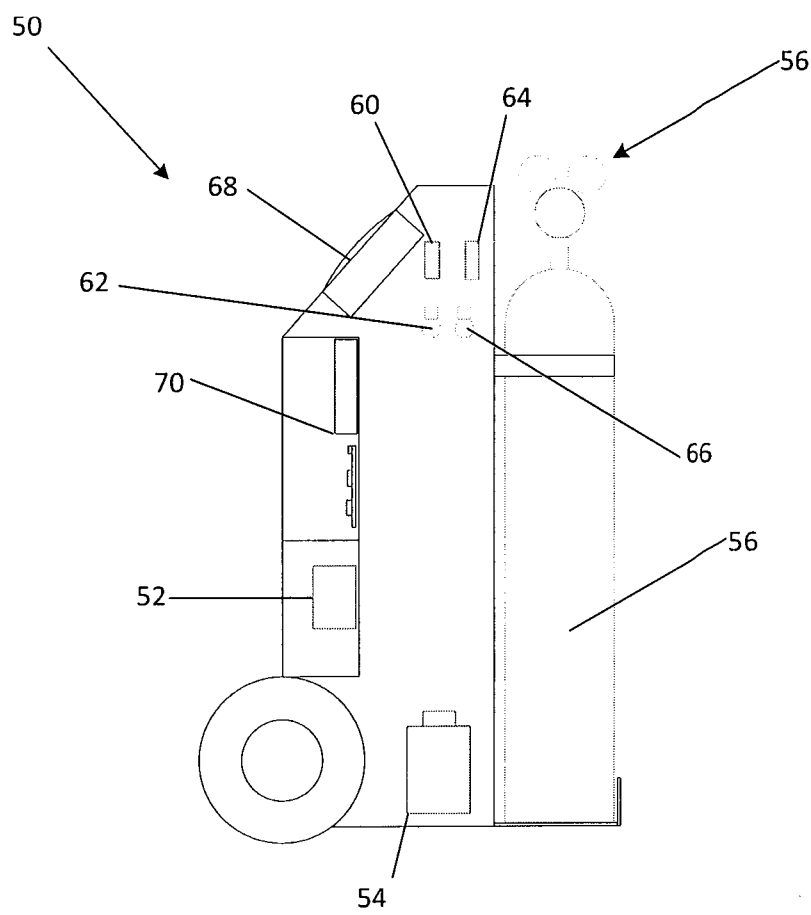


Figure 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2014/050065

A. CLASSIFICATION OF SUBJECT MATTER

E06B 3/66 (2006.01) E06B 3/64 (2006.01) B32B 17/00 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, TXTE databases: using classification marks (IC/EC/CN): **E06B** 3/24, 3/263, 3/267, 3/54, 3/56, 3/64, 3/66, 3/663, 3/67, 3/673, 3/677, 5/20; **B32B** 17/-; **B64C** 1/14, 1/40; **B60J** 1/-; with keywords (double glazing, multi-paned, VIG, DGU, thermopane, evacuate, suck, vacuum, gas, argon, monatomic, noble, inert, adhesive, seal, butyl, hot wire, element, electric, resistor, ohm, retrofit, conversion, conduit, tube, breather, ducts, and similar terms); and, inventor (Mastroiannis, P.) and applicant (Innovations Development).

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	



Further documents are listed in the continuation of Box C



See patent family annex

* "A"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 21 July 2014		Date of mailing of the international search report 21 July 2014	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustalia.gov.au		Authorised officer Stuart Ash AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. 0399359633	

INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. PCT/AU2014/050065
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4520602 A (MILLER) 04 June 1985 Abstract; figures 1-10; column 7, lines 50 to 59; column 9, lines 39 to 50; column 10, lines 29 to 32; claim 1	1-16, 21-23
Y	US 4632853 A (DE VRIJ) 30 December 1986 Abstract, figures 1 to 5, column 2, lines 11 to 44, and column 3, lines 19 to 21	1-16, 21-23
Y	US 3971178 A (MAZZONI et al.) 27 July 1976 Figures 4, 10 and 11; column 7, line 48 to column 8, line 8; claim 28	1-8, 11-14
Y	US 6055783 A (GUHL et al.) 02 May 2000 Figure 4; column 6, line 63 to column 7, line 11	1, 5-6, 9-11, 15-16, 21-23
A	US 3573149 A (TIBBLE, W. et al.) 30 March 1971 Figure 8	17-20

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Box for Details

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

Supplemental Box**Continuation of: Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1-16, and 21 to 23 are directed to fixing a second glazing pane to a window pane. The feature of a heat-activated seal for sealing an evacuated insulation space between spaced apart panes is specific to this group of claims.
- Claims 17-20 are directed to a control unit suitable for use in assembling a double glazed window. The feature of the means to providing electrical power, vacuum pressure, and filling means is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. Therefore there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a priori*.

INTERNATIONAL SEARCH REPORT		International application No.	
Information on patent family members		PCT/AU2014/050065	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
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INTERNATIONAL SEARCH REPORT Information on patent family members		International application No. PCT/AU2014/050065	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
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