



US 20040022970A1

(19) **United States**

(12) **Patent Application Publication**
Trompert

(10) **Pub. No.: US 2004/0022970 A1**

(43) **Pub. Date: Feb. 5, 2004**

(54) **WINDOW PANE, WINDOW PROVIDED
WITH A WINDOW PANE OF THIS TYPE,
METHOD FOR PRODUCING A WINDOW
PANE OF THIS TYPE, AND ITS USE**

(30) **Foreign Application Priority Data**

Jun. 12, 2002 (NL)..... 1020845

Publication Classification

(76) **Inventor: Michel Nicolas Trompert,**
Vx's-gravenhage (NL)

(51) **Int. Cl.⁷ E06B 3/24**

(52) **U.S. Cl. 428/34**

Correspondence Address:

WILLIAM COLLARD

COLLARD & ROE, P.C.

1077 NORTHERN BOULEVARD

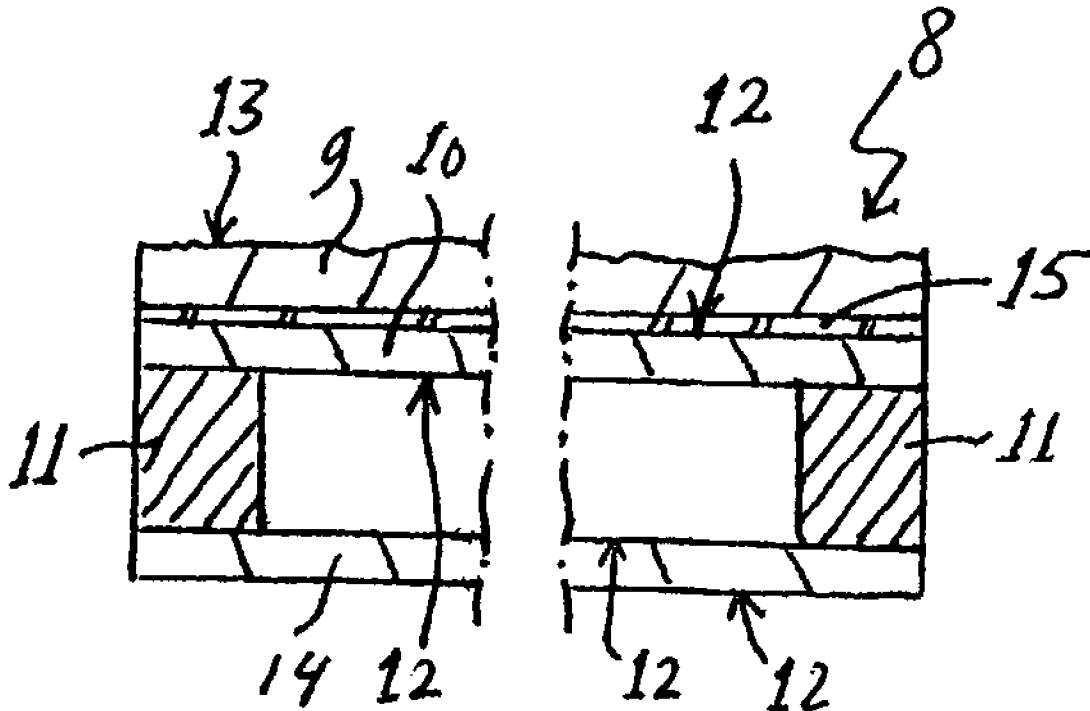
ROSLYN, NY 11576 (US)

ABSTRACT

A window pane comprises a laminated structure of at least two glass plates. At least one of the glass plates is made from traditional glass. The window pane can be made by stacking at least two glass plates with a layer of resin and/or a film between them. A heat-resistant covering layer may be arranged on one side of one of the glass plates. The window pane may form part of double glazing.

(21) **Appl. No.: 10/458,938**

(22) **Filed: Jun. 11, 2003**



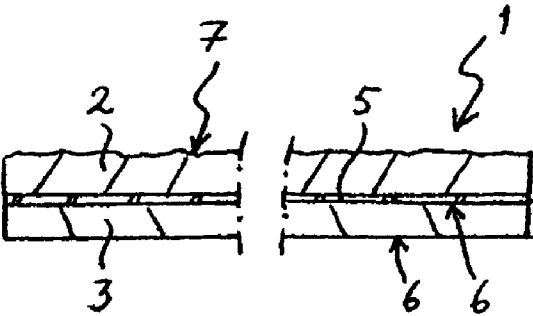


Fig. 1

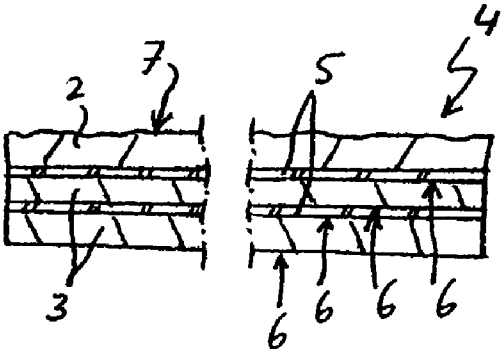


Fig. 1a

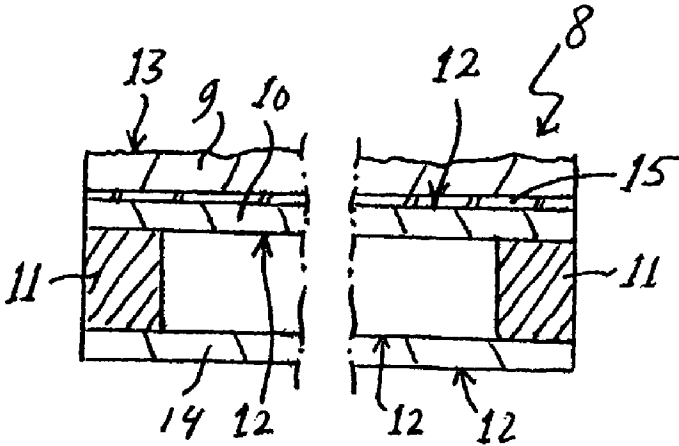


Fig. 2

WINDOW PANE, WINDOW PROVIDED WITH A WINDOW PANE OF THIS TYPE, METHOD FOR PRODUCING A WINDOW PANE OF THIS TYPE, AND ITS USE

FIELD OF THE INVENTION

[0001] The invention relates to a window pane comprising a laminated structure of at least two glass plates.

DISCUSSION OF THE PRIOR ART

[0002] Window panes which, in order to satisfy requirements relating to thermal insulation, sound insulation, heat-absorbing properties, bulletproofness, ability to withstand objects thrown at it, breaking resistance, protection against people falling through it and against people breaking in, comprise two or more glass plates instead of a single glass plate have long been in existence. Window panes of this type are normally referred to as "double glazing" or "laminated glass".

[0003] In the case of a double glazing window pane, there are usually two glass plates which are positioned parallel to and at a certain distance from one another, a metal spacer being arranged along the edges of the glass plates and the cavity which is enclosed by the glass plates and the spacer being filled with a gas, such as air.

[0004] The gas filling between the glass plates means that the glass plates tend to bend towards and away from one another slightly as a result of the fluctuating ambient air pressure. To prevent the glass plates from coming into contact with one another, it is necessary to maintain a certain distance between the glass plates, depending on the dimensions and rigidity of the glass plates, and consequently a double glazing window pane is relatively thick. For some applications, where the thickness of the window pane has to be limited, therefore, the use of double glazing presents difficulties. Furthermore, the metal spacer between the glass plates acts as a thermal bridge, with the result that annoying condensation can occur along the edges of the window pane in some applications.

[0005] In the case of a window pane made from laminated glass, there are usually two or more glass plates which are arranged parallel to and at a certain distance from one another, a relatively thin layer of resin and/or a film being arranged between the glass plates, connecting the glass plates to one another. As a result of the use of a thin layer of resin and/or a film, it is possible for laminated glass to be considerably thinner than double glazing for the same thickness of each of the glass plates from which it is formed.

[0006] In sash windows and other windows in historic buildings (including new buildings made to look historical), it is and has been traditional to use a single glass plate made from traditional glass, such as spun glass (i.e. disc or crown glass), cylinder glass, drawn glass, cast glass or glass which has a similar structure. A glass plate made from traditional glass has an irregular surface which is particularly suitable for the historic nature of the building in question.

[0007] In order to improve the thermal insulation, the sound insulation, the heat-absorbing properties, the bulletproofness, the ability to withstand objects thrown at them, the breaking resistance, the protection against people falling through them and breaking in through them for window

panes of historic buildings during restoration and maintenance work, consideration is given to using two or more glass plates instead of one glass plate in the windows.

[0008] However, the known double glazing window panes are not satisfactory, since the rebates and wood sizes of the windows are not able to accommodate the relatively thick double glazing. However, were the windows to be made suitable for receiving the double glazing, each window pane would acquire four reflection surfaces, which is considered to be at least disagreeable and in some cases even unacceptable. Moreover, the glass plates of the double glazing are usually made from what is known as float glass (i.e. glass which is (virtually) 100% flat and therefore gives scarcely any visual distortion), which on account of its flat surface would have an adverse effect on the historic character of the building in question when used in double glazing.

[0009] The known window panes made from laminated glass are also unsatisfactory. Although they are thinner than double glazing window panes, meaning that they require fewer or no modifications to the wood sizes of the windows, these window panes too are made from float glass and consequently are not in keeping with the historic nature of the building in question.

SUMMARY OF THE INVENTION

[0010] It is an object of the invention to provide a window pane having two or more glass plates which has the associated advantageous properties of thermal insulation, sound insulation, heat-absorbing properties, bulletproofness, ability to withstand objects thrown at it, breaking resistance, protection against people falling through it and against people breaking in, and can also enhance the historic nature of buildings.

[0011] To achieve this object, the window pane according to the invention comprises a laminated structure of at least two glass plates, wherein at least one of the glass plates is made from traditional glass, and at least another one of the glass plates is made from float glass. A layer of resin and/or a film is advantageously arranged between two successive glass plates. A window pane of this type is preferably arranged in a window, in particular a sash window, in such a manner that the glass plate which is made from traditional glass is on the outside of the building. Therefore, the outside of the historic building looks authentic, while a modern composite glazing with the associated technical advantages is still used. The view through the window from the inside of the historic building is also authentic. The window pane does not have a thermal bridge, preventing the formation of condensation. There are also no undesirable reflections.

[0012] Making just one of the glass plates from traditional glass limits the risk of breaking: the relatively fragile traditional glass is protected on one side by the less fragile resin and/or film and furthermore can be reinforced by the use of one or more glass plates made from float glass.

[0013] If a layer of resin and/or a film is located between the glass plates in the window pane according to the invention, a design of this type has a relatively low thickness, and can therefore generally be fitted without additional measures in conventional wood sizes of a window of a historic building.

[0014] In a further preferred embodiment, a heat-resistant covering layer is arranged on one side of a glass plate which is made from float glass and forms part of the window pane according to the invention.

[0015] In another preferred embodiment, the window pane forms part of double glazing. In this case, a space which is filled with a gas, such as air, may be located between the window pane according to the invention and a glass plate, but of course it is also possible to use a laminated structure comprising a plurality of glass plates instead of the glass plate, in which case at least one glass plate is made from traditional glass. This makes it possible to achieve an even higher level of insulation of the window, in particular where the window has a large surface area.

[0016] The window pane according to the invention can incidentally be produced in an essentially conventional way as laminated glass or double glazing.

[0017] Other claims, characteristic features and advantages of the invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description and considered in connection with the accompanying drawings, in which non-limiting exemplary embodiments are shown, and in which identical reference symbols relate to identical components or components with an identical function.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. 1 shows a cross section through a first embodiment of the window pane according to the invention designed as laminated glass.

[0019] FIG. 1a shows a cross section through a second embodiment of the window pane according to the invention designed as laminated glass.

[0020] FIG. 2 shows a cross section through a third embodiment of the window pane according to the invention designed as double glazing.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] FIG. 1 shows a laminated window pane 1 which comprises a glass plate 2 and a glass plate 3. Between the glass plates 2 and 3 there is a layer of resin and/or film 5, which is transparent. The glass plate 2 is made from traditional glass, and the glass plate 3 is usually made from float glass. On one of the sides denoted by 6, the glass plate 3 may be provided with a heat-resistant, substantially transparent coating. The side of the glass plate 2 which is denoted by 7 is intended to face towards the outside of a window.

[0022] The laminated window pane 1 may be produced by arranging an optionally curing resin and/or film 5 on one side of the glass plate 2, in order to form a layer of resin and/or film on the glass plate 2, and placing the glass plate 3 onto the layer of resin and/or film.

[0023] FIG. 1a shows a window pane 4 which is composed of more than two glass plates 2, 3.

[0024] FIG. 2 shows a window pane 8 of the "double glazing" type, which comprises glass plates 9, 10 and 14 as well as a spacer 11. The spacer 11 is usually made substantially from metal. The glass plates 9 and 10, on the one hand,

and the glass plate 14, on the other hand, are arranged at a distance from one another. A gas, such as air, is located in the space which is delimited by the glass plates 10 and 14 and the spacer 11. The glass plate 9 is made from traditional glass, and the glass plates 10 and 14 are made from float glass. There is a layer of resin and/or a film 15 between the glass plates 9 and 10. On one of the sides denoted by 12, the glass plate 10 and/or the glass plate 14 may be provided with a heat-resistant, substantially transparent coating. That side of the glass plate 9 which is denoted by 13 is intended to face towards the outside of the window.

[0025] The window pane 8 can be made by applying the layer of resin and/or the film 15 to the glass plate 9 and placing the glass plate 10 onto the layer of resin and/or the film 15. The spacer 11, in the form of a substantially continuous strip, is arranged along the periphery of that side of the glass plate 10 which is remote from the glass plate 9, and then the glass plate 14 is placed on the spacer 11, and the space enclosed by the glass plates 10, 14 and the spacer 11 is sealed off with a gas filling.

[0026] It should be noted that where the text refers to traditional glass, this term is to be understood to include also glass which has not been produced in a traditional way but which does have the appearance of having been produced in this way.

[0027] While the invention has been described and illustrated in its preferred embodiments, it should be understood that departures may be made therefrom within the scope of the invention, which is not limited to the details disclosed herein.

What is claimed is:

1. A window pane, comprising a laminated structure of at least two glass plates, wherein at least one of the glass plates is made from traditional glass, such as spun glass, cylinder glass, drawn glass, cast glass or glass with a similar structure, and at least another one of the glass plates is made from float glass.

2. The window pane according to claim 1, wherein there is a layer of resin between two successive glass plates.

3. The window pane according to claim 1, wherein there is a film between two successive glass plates.

4. The window pane according to claim 1, wherein a heat-resistant covering layer is arranged on one side of the glass plate made from float glass.

5. The window pane according to claim 1, wherein it forms part of double glazing.

6. A window provided with at least one window pane, said window pane comprising a laminated structure of at least two glass plates, wherein at least one of the glass plates is made from traditional glass, such as spun glass, cylinder glass, drawn glass, cast glass or glass with a similar structure, and at least another one of the glass plates is made from float glass.

7. A method for producing a window pane, comprising the stacking of at least two glass plates with a layer of resin and/or a film between them, wherein at least one of the glass plates is made from traditional glass, and at least another one of the glass plates is made from float glass.

8. The method for producing a window pane according to claim 7, further comprising a spacer in the form of a substantially continuous strip which is arranged along the

periphery of the window pane, and a subsequent glass plate or window pane is arranged on the spacer.

9. The method according to claim 8, wherein the space enclosed by the window pane, the glass plate and the spacer is filled with a gas.

10. The method according to claim 8, wherein the space enclosed by the two window panes and the spacer is filled with a gas.

11. A use of a window pane in a window of a historic building, the window pane comprising a laminated structure of at least two glass plates, wherein at least one of the glass

plates is made from traditional glass, such as spun glass, cylinder glass, drawn glass, cast glass or glass with a similar structure, and at least another one of the glass plates is made from float glass.

12. The use according to claim 11, wherein the window is a sash window.

13. The use according to claim 11, wherein the glass plate made of traditional glass is located on the outside of the building.

* * * * *