(12) UK Patent Application (19) GB (11) 2 250 530 (13) A

(43) Date of A publication 10.06.1992

(21) Application No 9022531.9

(22) Date of filing 17.10.1990

(51) INT CL[5]
E04B 1/76, E06B 1/56

(52) UK CL (Edition K)
E1J JA
E1D DDR

(56) Documents cited
GB 2228033 A GB 2147340 A GB 1397374 A
GB 1302696 A GB 1302695 A GB 1302694 A

(58) Field of search
UK CL (Edition K) E1D DDR, E1J JA JGA JGB JGD JGE JGF JGG JGK
INT CL[5] E04B, E06B

(71) Applicant
Kayplan Windows Ltd

(Incorporated in the United Kingdom)

289-293 High Holborn, London, WC1V 7HU, United Kingdom

(72) Inventors
Michael Charles Stather Bourne
John Beresford Tebbit

(74) Agent and/or Address for Service
R R Prentice & Co
The Hop Exchange, 24 Southwark Street, London, SE1 1TY, United Kingdom

(54) Fixing frames for windows, doors and the like

(57) A fixing frame for locating and mounting a window, door or like frame in a cavity wall comprises an upper section (1), a lower section (3) and two side sections (2) which are connected together to form a rectangular frame. Each of the lower and side sections comprises a first portion (4) which is adapted to be located in a cavity in a cavity wall and a second portion formed integrally with the first portion and extending to either side of the first portion so as to extend across the cavity and to butt against the outer and inner leaves of the cavity wall. Abutment means are also provided on the lower and side sections against which the window, door or like frame can be held by engagement means secured to the window, door or like frame and engageable with the abutment means. The fixing frame prevents cold bridging across a cavity wall and can readily be incorporated in a cavity wall without the need for assembly work on site.

FIG.1

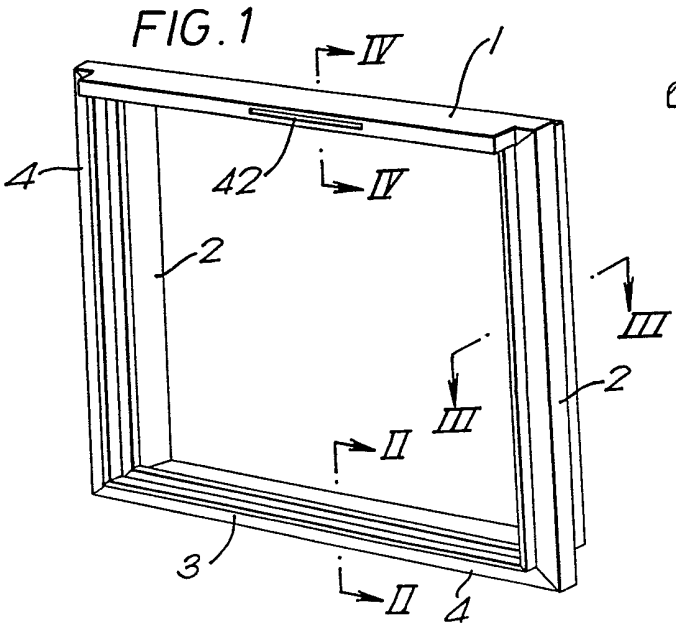
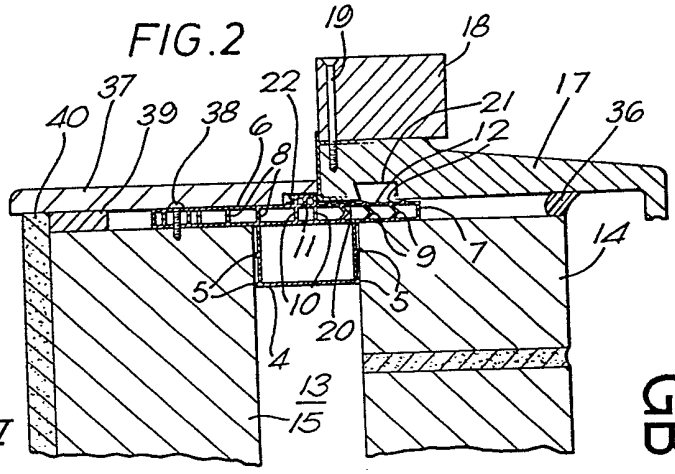


FIG.2



GB 2 250 530 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

FIG. 1

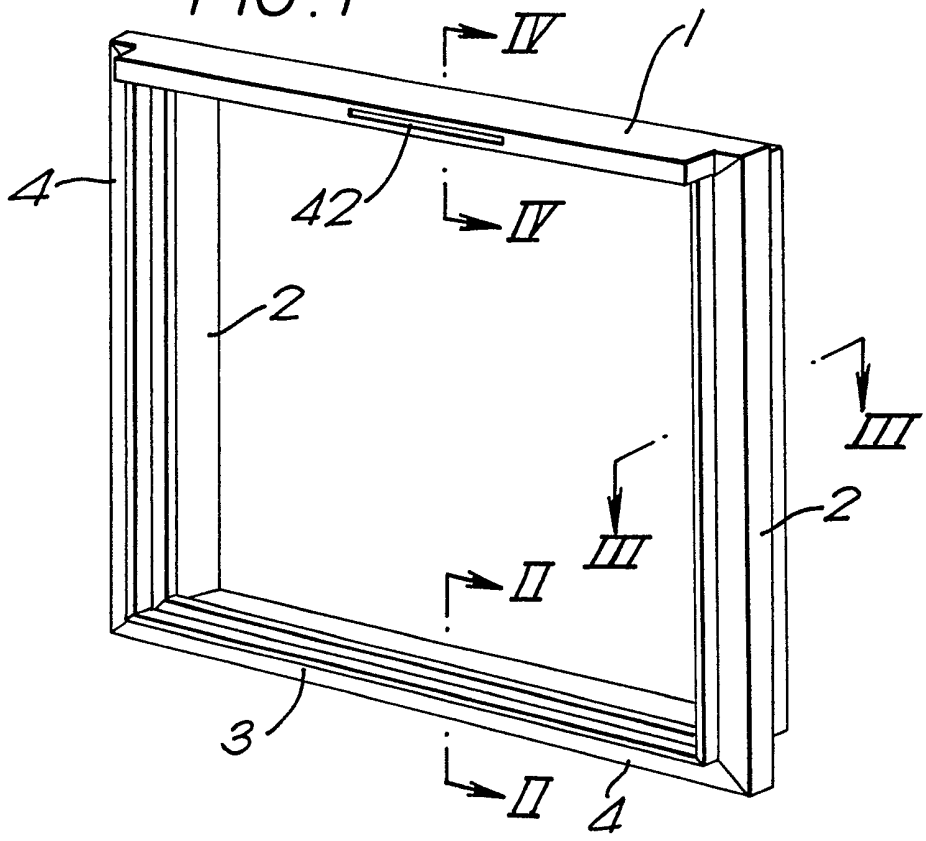

IV
1
4
42
IV
2
III
2
III
II
3
II
4

FIG. 2

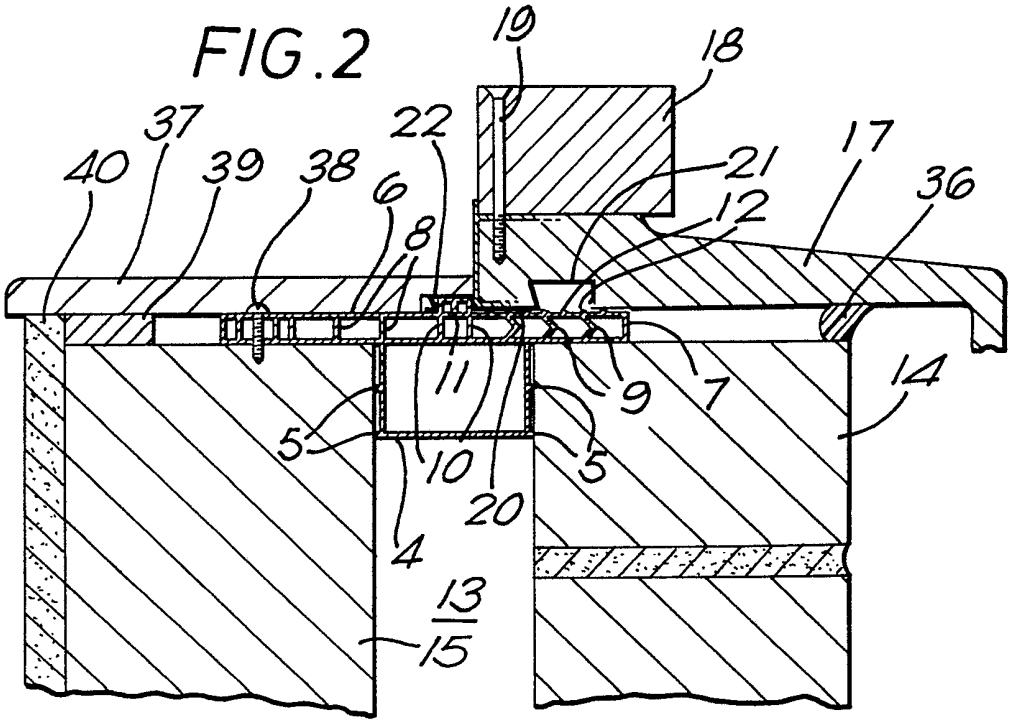

19
18
37
22
17
40
39
38
6
21
36
8
12
11
9
7
14
5
10
5
20
4
13
15

FIG. 3

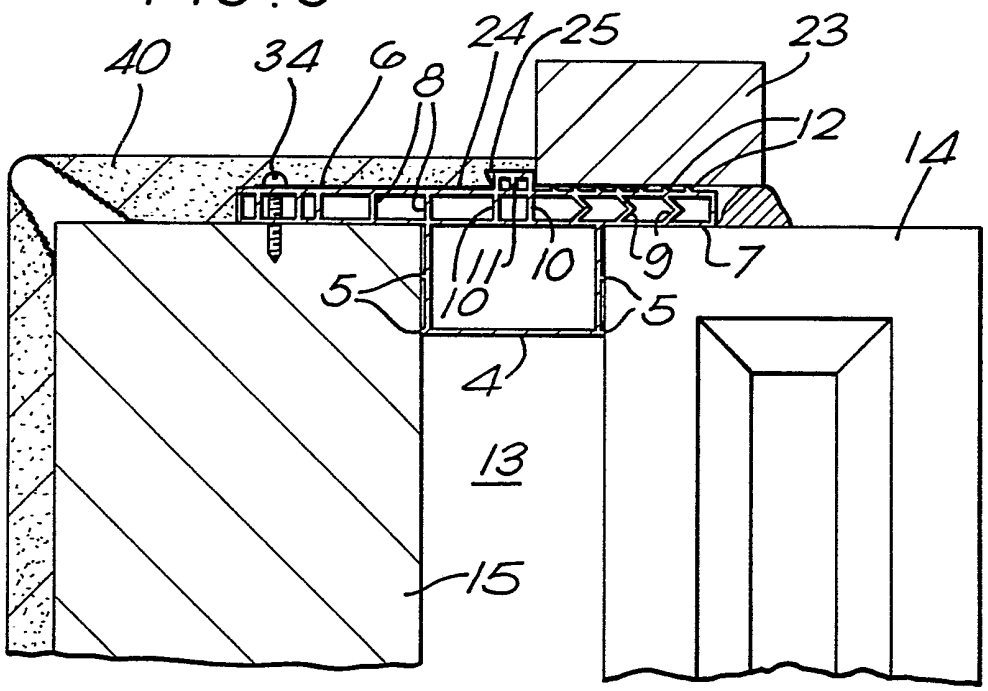
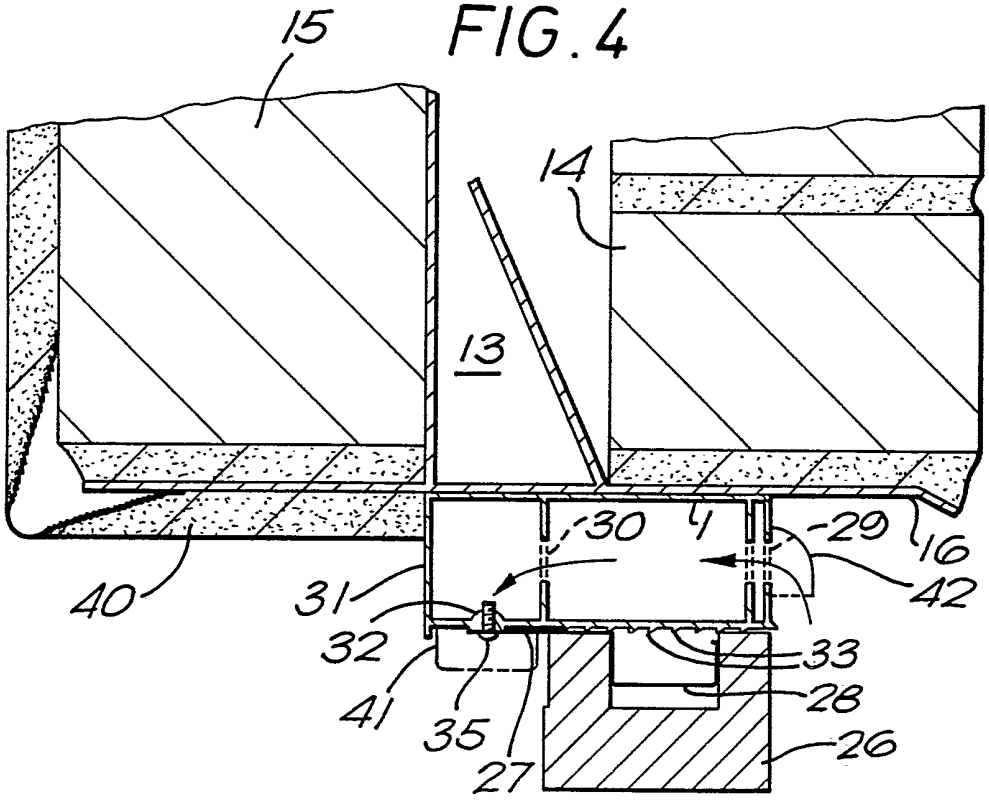

40
34
6
8
24
25
23
12
14
11
10
9
7
5
10
5
4
13
15

FIG. 4


15
14
13
30
4
29
16
40
31
42
32
33
28
41
35
27
26

Title: IMPROVEMENTS IN FIXING FRAMES FOR WINDOWS, DOORS AND THE LIKE

This invention relates to improvements in fixing frames for windows, doors and the like and is particularly concerned with cavity closures for cavity walls.

The use of cavity walls having outer and inner leaves in the construction of buildings is well-known. When a window or door is to be provided in a cavity wall, it is necessary to close or bridge the cavity and various prior attempts have been made to solve this problem. However, it is important to ensure that so-called "cold bridging" and damp penetration at these closures of the cavity does not take place since this can lead to condensation and mould growth.

The traditional method of solving this problem has been to close the cavity with reveal blocks and a vertical damp proof course (dpc). The blocks of the inner leaf were turned to close the cavity and the vertical dpc was put between the abutting blocks and the outer leaf which was usually constructed from brickwork. An opening for a window or door was formed by building the wall around a timber frame which was braced at the corners. The timber frame was subsequently removed before installation of a frame for the window or door. This method is inefficient and time-consuming and is susceptible to poor site working practices.

A prior attempt to solve the problem and to improve on the traditional method has involved the use of profiled sections which are cut to length on site and inserted into or fitted to an opening in a cavity wall at which a door or window is to be fitted. The profiled sections serve to close the cavity and to provide a vertical dpc.

It has also been proposed to provide a metallic sub-frame which is built into a wall opening and into which a door or window can be fitted directly. This obviates the need for removal of the timber frame prior to installation of the door or window.

The present invention aims to provide a still further improvement over the traditional method and prior attempts to provide a vertical damp proof course between the inner and outer leaves of a cavity wall, to close the cavity and to provide a sub-frame to define a window or door opening in the cavity wall.

A further aim of the present invention is to provide a fixing frame for a window, door or the like which overcomes the problem of cold bridging and damp penetration and which can readily be incorporated in a cavity wall without the need for assembly work on site.

According to the invention, there is provided a fixing frame for a window, door or the like, said frame comprising an upper section, a lower section and two interconnecting side sections wherein the frame is made of thermally insulating material and wherein the lower

and side sections each comprise a first portion which is adapted to be located in a cavity in a cavity wall, a second portion which is adapted to extend across said cavity and to butt against the outer and inner leaves of the cavity wall, and means for engaging the frame of a window, door or the like to hold the latter in position in the fixing frame.

Preferably, the fixing frame is substantially rectangular and is constructed from extruded lengths of a suitable synthetic plastics material. A suitable material for this purpose is UPVC.

According to a preferred embodiment of the invention, the said first portion takes the form of a hollow box section which may be provided on each side intended to face the leaves of a cavity wall with one or more ribs. The second portion is preferably formed integrally with the first portion and is also hollow. A series of compression members may be provided inside the second portion to allow for thermal expansion.

The invention will now be further described, by way of example, with reference to the drawings, in which:-

Fig. 1 is a perspective view of one embodiment of a fixing frame according to the invention;

Fig. 2 is a section taken on the line II-II in Fig. 1 but showing the frame installed in a cavity wall;

Fig. 3 is a section taken on the line III-III in Fig. 1 but again showing the frame installed in a cavity wall; and

Fig. 4 is a section taken on the line IV-IV in Fig. 1 and again showing the frame installed in a cavity wall.

In the drawings, like parts are denoted by like reference numerals.

Referring to the drawings, a fixing frame according to the invention comprises an upper section 1, a lower section 3 and two side sections 2 which are connected together to form a rectangular frame as shown in Fig. 1 of the drawings. The lower section and each side section are identical in cross-section and comprise a first portion 4 which is adapted to be inserted in a cavity in a cavity wall and a second portion formed integrally with the first portion and extending to either side of the first portion 4.

When the fixing frame shown in Fig. 1 is to be used for a window opening in a cavity wall, the wall consisting of an outer leaf 14 of brickwork and an inner leaf 15 of block work defining a cavity 13 therebetween is built up to the sill level of the opening. The lower section 3 is then placed on the wall with the first portion 4 of said lower section located in the cavity 13 as shown in Fig. 2 of the drawings. The frame is then stabilised in a conventional manner while building of the wall around the frame is continued.

As can be seen from Fig. 2, the sides of the first portion 4 of the fixing frame which face the leaves of the cavity wall are provided with ribs 5 which engage the inwardly facing surfaces of the leaves 14 and 15. The ribs allow for any variation in the width of the cavity 13. It is also clear from Fig. 2 that the second portion of the lower section 3 of the fixing frame extends beyond the width of the cavity in both directions and comprises a first inner part 6 which is designed to butt against the inner leaf 15 and a second outer part 7 which is designed to butt against the outer leaf 14 of the cavity wall when the first portion 4 is located in the cavity 13. Instead of butting directly on the inner and outer leaves of the cavity wall, the parts 6 and 7 may butt against a mortar bed on each of the respective leaves. The inner and outer parts 6, 7 of the second portion meet at a location which is substantially in the middle of the first portion 4 and an abutment member 11 projects from the surface of the second portion remote from the first portion 4 at this location. The second portion consists essentially of two sheets which are interconnected, in the region of the first part 6, by transverse cross members 8 and, in the region of the second part 7, by compression members 9. Further transverse cross members 10 are provided at the location of the abutment member 11 and a series of barbed projections 12 which slope towards the abutment member 11 are provided on the outer part 7 on the side remote from the first portion 4.

As mentioned above, once the fixing frame has been stabilised in position with the lower section 3 resting on the wall, building of the wall is continued up the sides 2 of the frame with the first portion 4 of each of

said sides being located in the cavity between the leaves of the wall as shown in Fig. 3 of the drawings. Once the leaves 14, 15 of the cavity wall have been built up the sides of the fixing frame a lintel 16 is fitted over the top of the frame, the lintel resting on the brickwork 14 and blockwork 15 with a slight gap between the lintel and the upper section 1 of the fixing frame. This gap is then filled with a suitable mastic sealant (not shown) and the building work is continued above the lintel as shown in Fig. 4 of the drawings.

Once the mortar for the brickwork and blockwork has set hard, a window can be fitted into the fixing frame. A sill 17 is secured to the bottom section 18 of the window frame by means of screws 19. A groove is provided in the underneath surface of the sill and a metal strip 20 is fitted to the sill. As can be seen from Fig. 2 of the drawings, the metal strip 20 has a first upstanding part 21 which is engaged in the groove in the sill and a second upstanding part 22 which is designed to fit over the abutment member 11 on the bottom section of the fixing frame.

A further metal strip 24 is secured by means of screws or clips (not shown) to each side member 23 of the window frame as shown in Fig. 3 of the drawings. Each metal strip 24 has an upstanding part 25 which is adapted to fit over the abutment member 11 at the corresponding side of the fixing frame and both of the strips 24 as well as the strip 20 are provided with a series of holes for the provision of fixing screws as will be hereinafter described.

The top member 26 of the window frame is provided with a groove which is adapted to receive an upstanding part 28 of a further metal strip 27 as shown in Fig. 4 of the drawings. Further, as shown in Fig. 4, the upper section 1 of the fixing frame is hollow and is provided with apertures 29 and 30 respectively in its front and rear faces to permit the flow of air, indicated by the arrows, through this part of the fixing frame. A rear portion 31 of the upper section is provided with a thickened bead 32 along its lower face in which screw holes are provided at spaced intervals. A series of barbed projections 33 are also provided on the lower surface of the main part of the upper section 1.

In order to fit the window frame into the fixing frame according to the invention, the sill 17 is first positioned so that the upstanding part 22 of the metal strip 20 is located over the abutment member 11 on the lower section 3 of the fixing frame. The metal strips 24 at the sides of the window frame are then flexed inwards and the window frame is pushed towards the fixing frame so that the strips 24 are engaged by the abutment members 11 at the respective sides of the fixing frame. The window frame is then pushed further towards the fixing frame and the metal strip 27 at the top of the frame is flexed downwards so that it bears against the lower surface of the upper section 1 of the fixing frame. Further inwards movement of the window frame results in inward flexing of the strips 24 until the upstanding parts 25 snap over the respective abutment members, as shown in Fig. 2, to hold the window

frame firmly in position in the fixing frame. The strip 27 at the top of the window frame slides over the barbed projections 33 which tend to deter outwards movement of the window frame with respect to the fixing frame.

While the window frame is firmly held in the fixing frame by the engagement of the abutment members 11 in the upstanding parts 22 and 25 of the strips 20 and 24, further security may be provided by means of screws 34 or other fixing devices which engage in the blockwork of the inner leaf 15 after passing through the inner parts 6 of the sides of the fixing frame and the holes in the strips 24. The metal strip 27 at the top of the window frame is also provided with a series of holes which are aligned with the screw holes in the bead 32 for the provision of fixing screws 35.

Once the window frame has been installed in the fixing frame, a mastic sealant 36 is applied at the gap between the sill 17 and the outer leaf 14 of the cavity wall and a sill board 37 can be fitted onto the inner leaf 15 on the inside of the window opening. The sill board is preferably secured to the wall by means of screws 38 which pass through the inner part 6 of the lower section 3 of the fixing frame and engage in the blockwork 15. Suitable spacers 39 corresponding in height to that of the inner part 6 are provided between the blockwork 15 and the lower surface of the sill board 37. The blockwork 15 can then be covered by plaster or other rendering 40 which has to be suitably thickened at the sides of the window opening to cover the inner parts 6 of the side members 2 of the fixing frame as well as the metal strips 24.

As shown in Fig. 4 of the drawings, a ventilator strip 41 is fitted to the rear part 31 of the upper section 1 of the fixing frame and this strip may include controls for regulating the flow of air through said upper section. The ventilator strip may be a simple snap-on fitting and it serves to cover the strip 27 and screws 35. The upper section 1 may further be provided on its front surface with a curved air deflector 42.

The sections of the fixing frame should preferably be made from a material having good properties of thermal insulation and are desirably made from a resilient plastics material. This enables variations in the width of the cavity 13 to be accommodated and also allows for expansion. Further, the compression members 9 in the outer parts 7 of the fixing frame allow for relative expansion between the window frame and the cavity wall to be compensated.

The metal strips 20, 24 and 27 are preferably made of galvanised steel or stainless steel although other metals or indeed other suitable materials may be used if desired. Moreover, instead of screws other fixing devices such as nails or rivets may be used to secure the strips 24 and sill board 37 to the blockwork 15.

The invention is not restricted to the above-described embodiment but variations and modifications may be made without departing from the scope of the invention. For example, instead of providing compression members inside the second part 7 of the second portion of the

fixing frame, this part could be provided with transverse cross-members 8 in which case compression members will be provided on one or both of the outer surfaces of the part 7.

Further, the sill 17 may be secured to the bottom section 18 of the window frame in a number of ways and a suitable alternative to the method above-described is to employ screws which come up through the sill and into the window frame from the groove in the underneath surface of the sill.

Moreover, instead of providing a groove in the top member 26 of the window frame to receive the upstanding part 28, the top member may simply be fixed in position by means of clips.

Furthermore, the invention is not restricted to windows but is equally applicable to door and other openings in cavity walls. The fixing frame according to the invention can also be installed in cavity walls in which both leaves are constructed from bricks or blocks or indeed any other suitable building materials.

The fixing frame will normally be manufactured in a factory and supplied in its erected form to a building site. However, as an alternative, it may be transported to a building site in sections which are slotted together on site.

It will be seen that the fixing frame according to the invention provides a convenient and simple way of closing a cavity in a cavity wall and of enabling a window, door or the like to be easily and rapidly fitted in a suitable opening in a cavity wall. A vertical damp proof course is automatically inserted and damage and/or incorrect installation are avoided which means that it is less susceptible to poor site working practices. The fixing frame according to the invention also removes the need for reveal blocks, which reduces the time and skill required in building a wall, and forms a precise opening into which windows can be inserted and installed quickly. The fixing frame itself forms the opening and acts as a template for the bricks, blocks or other materials used to construct the wall.

CLAIMS

1. A fixing frame for a window, door or the like, said fixing frame comprising an upper section, a lower section and two interconnecting side sections wherein the fixing frame is made of thermally insulating material and wherein the lower and side sections each comprise a first portion which is adapted to be located in a cavity in a cavity wall, a second portion which is adapted to extend across said cavity and to butt against the outer and inner leaves of the cavity wall, and means for engaging the frame of a window, door or the like to hold the latter in position in the fixing frame.

2. A fixing frame according to claim 1, wherein the fixing frame is substantially rectangular and is constructed from extruded lengths of a suitable synthetic plastics material.

3. A fixing frame according to claim 1 or claim 2, wherein the said first portion of each of said lower and side sections takes the form of a hollow box section.

4. A fixing frame according to claim 3, wherein each of said hollow box sections is provided on each side intended to face the leaves of a cavity wall with one or more ribs.

5. A fixing frame according to claim 3 or claim 4, wherein the second portion of each of said lower and side sections is formed integrally with the associated first portion and is also of hollow box section.

6. A fixing frame according to claim 5, wherein a series of compression members is provided inside each of said second portions.

7. A fixing frame according to any preceding claim, wherein the means for engaging a window, door or like frame comprise an abutment member projecting from the second portion of each of the lower and side sections in a direction away from the cavity and into the opening defined by the fixing frame.

8. A fixing frame according to claim 7, wherein each abutment member is located at a position substantially equi-spaced from the inner facing surfaces of the inner and outer leaves of the cavity wall when the fixing frame is installed in said wall.

9. A fixing frame according to claim 7 or claim 8, wherein the second portion of each of said lower and side sections is provided on a part intended to overlie the outer leaf of a cavity wall, and on a surface facing inwardly towards the opening defined by the fixing frame, with a series of barbed projections which slope in a direction towards the associated abutment member.

10. A fixing frame according to claim 9, which further comprises a metal strip adapted to be fitted to the lower edge of a window, door or like frame, or to a sill therefor, and having a bent portion which is engageable over the abutment member on the lower section of the fixing frame.

11. A fixing frame according to claim 10, wherein a first part of the metal strip to one side of the bent portion is engageable by the barbed projections and a second part of the metal strip to the other side of the bent portion is designed to extend along the second portion of the lower section of the fixing frame overlying the inner leaf of a cavity wall and is adapted to be secured thereto by screws or like fixing members.

12. A fixing frame according to claim 10 or claim 11, wherein the metal strip is provided with a further bent portion engageable in a slot or groove provided in the lower surface of the window, door or like frame or in the sill.

13. A fixing frame according to any one of claims 10 to 12, which further comprises a pair of further metal strips each of which is adapted to be fitted to a respective side of a window, door or like frame, each said further strip having a bent portion which is engageable over the abutment member on the respective side of the fixing frame.

14. A fixing frame according to claim 13, wherein a first part of each said further metal strip to one side of the bent portion is engageable by the barbed projections and a second part of each said further metal strip to the other side of the bent portion is designed to extend along the second portion of the respective side section of the fixing frame overlying the inner leaf of a cavity wall and is adapted to be secured thereto by screws or like fixing members.

15. A fixing frame according to claim 14, wherein the first part of each said further metal strip is adapted to be secured to a window, door or like frame by means of screws or like fastening members.

16. A fixing frame according to claim 15, wherein a window, door or like frame is fitted into the fixing frame by first securing the metal strips to the window, door or like frame and then offering up the latter to the fixing frame, the metal strips being flexed inwardly so that the second parts thereof are pushed over the respective abutment members until the bent portions of the metal strips snap over the respective abutment members, the window, door or like frame then being held in position in the fixing frame against said abutment members.

17. A fixing frame according to any preceding claim, wherein the upper section of the fixing frame is of hollow box section and is provided on its lower surface with a series of barbed projections which are adapted to engage with the upper edge of a window, door or like frame when the latter is fitted into the fixing frame.

18. A fixing frame according to claim 17, which further comprises a metal strip adapted to be secured to said upper edge of a window, door or like frame, adapted to slide over said barbed projections when the window, door or like frame is fitted into the fixing frame, and adapted to be secured to the upper section of the fixing frame, after the window, door or like frame has been fitted into the fixing frame, by screws or like fastening members.

19. A fixing frame according to claim 18, wherein the upper section is provided with a thickened bead in which screw holes are provided to enable the metal strip to be secured to said upper section.

20. A fixing frame according to any one of claims 17 to 19, wherein the upper section is provided with apertures to permit the flow of air through said section.

21. A fixing frame according to claim 20, wherein the apertures in one face of the upper section are closable by a ventilator strip having controls for regulating the flow of air through said upper section.

22. A fixing frame for a window, door or the like substantially as described herein with reference to the drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number

9022531.9

Relevant Technical fields

(i) UK Cl (Edition K) E1J:JA,JGA,JGB,JGD,JGE,JGF, JGG, JGK E1D:DDR

(ii) Int Cl (Edition 5) E06B E04B

Search Examiner

J ROWLATT

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

5 FEBRUARY 1992

Documents considered relevant following a search in respect of claims 1-22

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2228033 A (ESPE WINDOW SYSTEMS) whole document, especially page 3, lines 8-18	1-4,7
Y	GB 2147340 A (MOORLAIX ET CIE) whole document	1-4,7
Y	GB 1397374 A (INDUSTRIE SECCO) whole document	1-4,7
Y	GB 1302696 A (ECONA PLASTICS) whole document	1-4,7
Y	GB 1302695 A (ECONA PLASTICS) whole document	1-4,7
Y	GB 1302694 A (ECONA PLASTICS)	1-4,7

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

Published 1992 at The Patent Office, Concept House, Cardiff Road, Newport, Gwent NP9 1RH. Further copies may be obtained from Sales Branch, Unit 6, Nine Mile Point, Cwmfelinfach, Cross Keys, Newport, NP1 7HZ. Printed by Multiplex techniques ltd, St Mary Cray, Kent.