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ONLINE: WPI, EPODOC, JAPIO.

(54) Abstract Title
A gas flue system with laterally spaced supports and retaining guides

(57) A gas flue system 10 comprises a a flue stack 37, a pair of laterally spaced supports 46 with each support having a retaining member 48 and a cover plate 50 which provide lateral support to a rear and a front surface, respectively of the flue stack. Preferably the flue stack consists of a plurality of precast concrete flue blocks 44, stacked on top of a cover block 42 which is disposed on top of a stack of three starter blocks 38. Each block may have a rebate and a correspondingly shaped lip disposed on its upper and lower surfaces, respectively. The supports are preferably in the form of timber studs and the retaining member attached thereto may consist of a right-angled section. The cover plate usually extends over a portion of the front surface of the stack. Both the cover plate and retaining member are preferably manufactured from galvanized steel. A bead of fireproof compound may be used between each course of blocks.

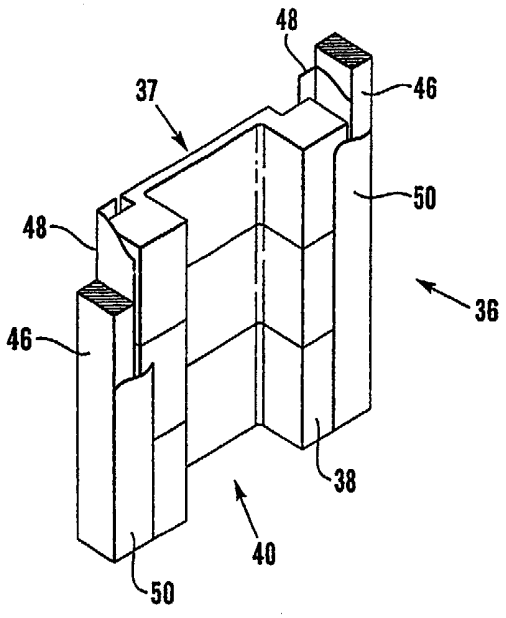

Fig.2

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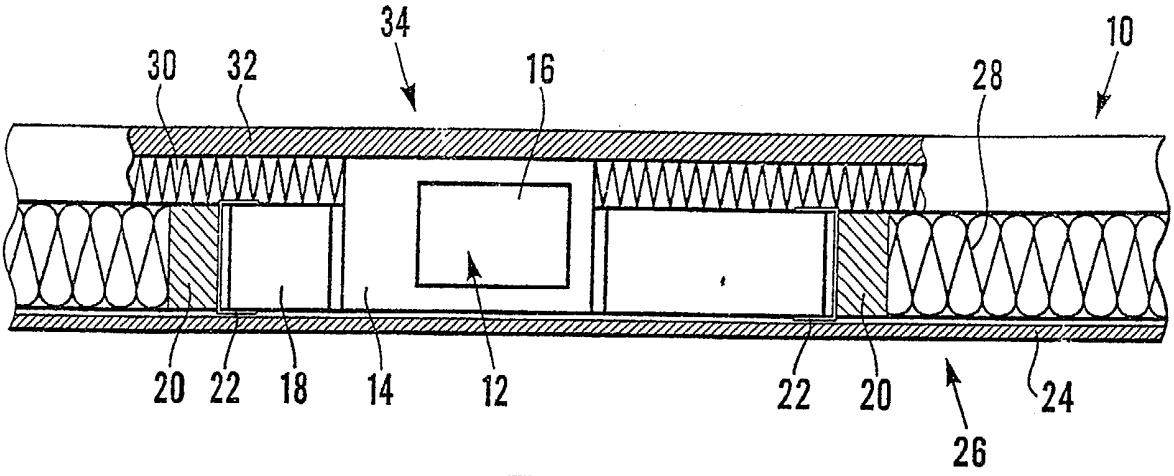
34
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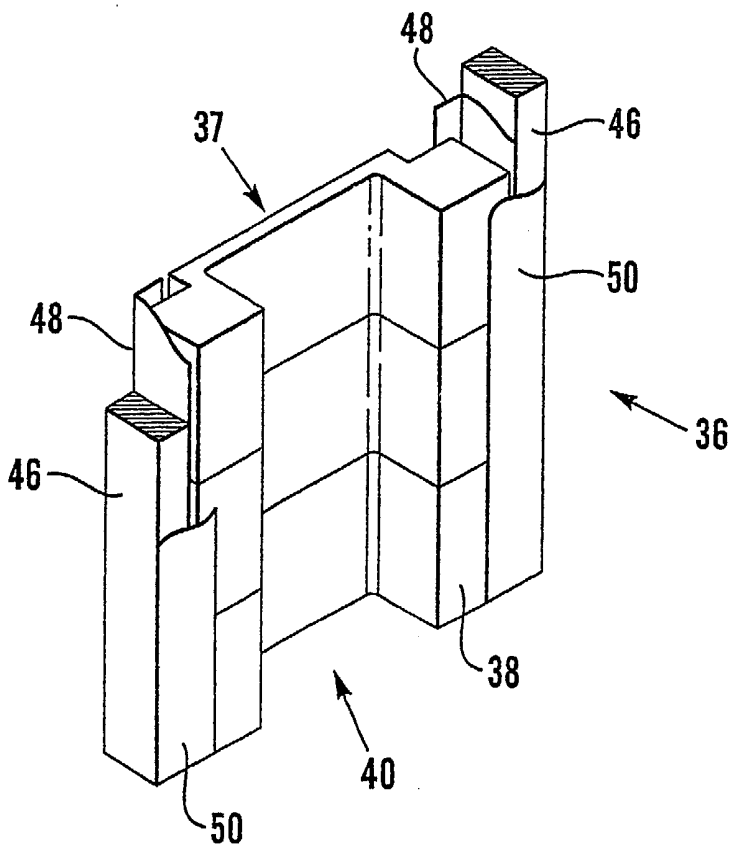
Fig. 1


48
37
46
50
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36
46
38
40
50

Fig. 2

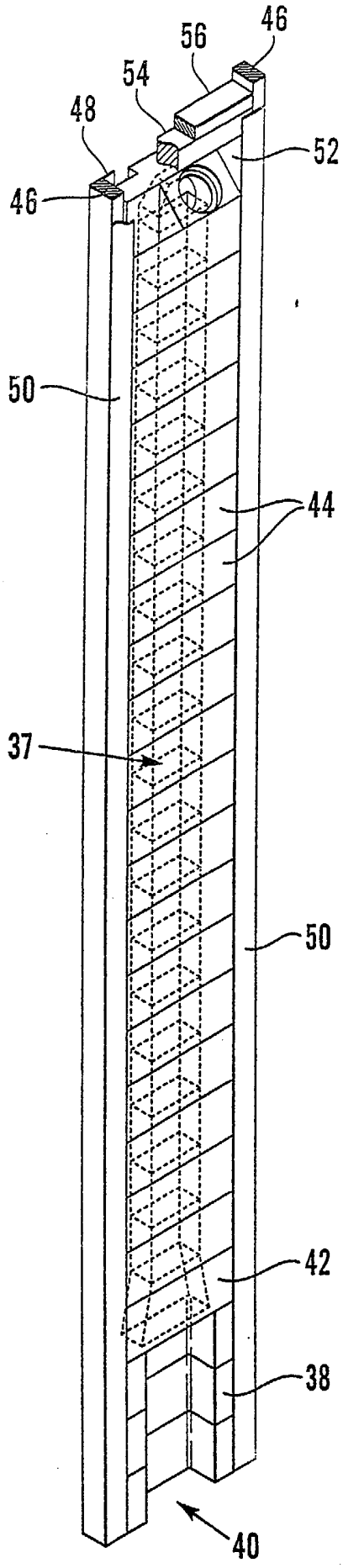

Fig.3

TITLE: Gas flue system

The present invention relates to a gas flue system, more particularly, but not exclusively, to a gas flue system for domestic, timber frame buildings.

It is known to install a gas flue system in a house or other building, to provide a flue passage through which the products of combustion from a gas appliance can be expelled.

One known gas flue system consists of a stack of pre-cast concrete flue blocks, each having an internal passage extending vertically through the block. The internal passages are aligned to create a flue passage. The flue blocks are constructed on a stack of pre-cast concrete starter blocks. The starter blocks are each of U-shaped channel cross-section, to create a suitable recess for receiving a typical gas appliance. A concrete cover block, also known as a lintel block, is provided on top of the assembled starter blocks, before the flue blocks. The cover block has a tapered internal passage, to provide a lead passage for the combustion gases from an appliance installed in the recess into the flue passage. A specially designed exit block is provided on the uppermost flue block, as a terminal for connection to a metal exit flue pipe. A bonding compound, commonly a fireproof mortar, is provided between each course of blockwork, to ensure an airtight seal within the flue passage.

In a timber frame building, the flue blockwork is provided between two laterally spaced vertical timber studs, for example as part of an external or internal wall. The flue system further consists of a vertical galvanised steel U channel affixed to each stud with the open region of each channel facing one another. Each U channel consists of two parallel arms spaced at a distance corresponding substantially to the width of the flue blockwork. The blockwork, substantially as described above, is assembled between the arms of the channel sections, so as to be in abutment therewith, to provide lateral support for the flue blockwork. The U channels are provided in 1.2m lengths and are fixed in place as the work progresses, starting from the base system.

During assembly of the above timber frame gas flue system, it will be appreciated that each course of blockwork has to be lowered into position through the open part of the U channel sections. This arrangement suffers from poor structural integrity, since satisfactory positioning and bonding of, the blocks within the confined area of the U channels is problematic. This disadvantage can be exacerbated at the top of a building, for example, where there may not be sufficient space to gain access through the top of the U channels, in which case the upper most blocks tend not be securely positioned or supported.

It is an object of the invention to reduce, or substantially obviate, the disadvantages of conventional gas flue systems for use in timber framed buildings referred to above.

According to a first aspect of the invention, there is provided a gas flue system comprising a pair of laterally spaced supports and a flue stack, each support having a retaining member which provides lateral support to a rear surface of the flue stack, and a separate cover member which provides lateral support to a front surface of the flue stack.

Preferably, each retaining member is in the form of a vertically extending right angle section having two limbs, one limb being secured to an opposing surface of a respective support, the other limb extending over a portion of the rear surface of the flue stack.

According to a second aspect of the invention, there is provided a method of assembly for a gas flue system, the method involving the steps of providing a pair of laterally spaced supports at a predetermined spacing from one another, providing a retaining member on each support, providing a flue stack between the supports, each retaining member providing lateral support to a rear surface of the flue stack, and providing each support with a cover member which provides lateral support to a front surface of the flue stack.

Other preferred features of the invention can be found in the dependent claims.

The system and method of assembly according to the invention overcomes the disadvantages of

known flue systems for timber frame buildings, since the flue blockwork can be easily assembled between the vertical supports, without the need to lower each course of blockwork into position. The assembly of the system according to the invention is therefore more expedient than known systems for timber frame buildings.

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

Figure 1 is a plan view of a known gas flue system in use in a domestic, timber frame building;

Figure 2 is a detailed diagrammatic perspective view of a starting section of an embodiment of a gas flue system according to the invention; and

Figure 3 is a diagrammatic perspective view showing the embodiment of the invention shown in Figure 2 in its assembled condition.

Referring to Figure 1, a known gas flue system installed in an exterior wall of a domestic, timber frame building is designated 10. The flue blockwork (only one course of which is visible) is in the form of a "bonded system". In a bonded system, each course of blockwork consists of a flue block inter-leaved with at least one flanking block, as will be described in more detail below.

The gas flue system 10 consists of a plurality of pre-cast concrete flue blocks 12 stacked within a recess created by two vertical studs 20. Each flue block 12 has a bonding extension 14 provided on one side of an internal passage 16.

In use, the flue blocks 12 are stacked with the bonding extension 14 arranged on alternate sides of the internal passage 16 at each course. The successive bonding extensions 14 are inter-leaved with pre-cast concrete flanking blocks 18, to provide additional stability to the system 10. Furthermore, it is standard practice to provide a minimum clearance of 50mm between an inner

surface of a flue passage and any adjacent structural timbers. In this respect, the flanking blocks 18 provide a satisfactory clearance (and therefore a temperature drop) between the inner surfaces of the internal passage 16 and the adjacent vertical timber studs 20.

A bonding compound (not shown), commonly a fireproof mortar, is provided between each course of blockwork, to ensure an airtight seal within the flue passage.

The vertical timber studs 20 are positioned at a pre-determined spacing prior to installation of the pre-cast concrete blockwork. A longitudinally extending galvanised steel U channel 22 is secured to an opposing faces of each stud 20, respectively, to provide lateral support for the flue blockwork. The U channels are provided in 1.2m lengths and are fixed in place as the work progresses, starting from the base system prior to the positioning of the first course of blockwork.

The exterior wall also consists of a layer of plasterboard 24 provided on the inner leaf 26. An insulation quilt 28 is provided in alignment with the studs 20, as viewed, and a layer of insulating quilt 30 and a damp proof mat 32 is provided in the cavity between the inner leaf 26 and outer leaf, part of which is shown at 34.

During assembly of the gas flue system, it will be appreciated that at least one component of each course of blockwork has to be lowered into position through the top of a U channel section. This can be problematic for several reasons. Firstly, a component of the first course installed at each new section of U-channel has to be lowered carefully into position along the full height of the channel, which is time-consuming. Furthermore, access within the channel sections is restricted, which can lead to problems when applying the bonding compound between each course, resulting in poor structural integrity. This disadvantage can be exacerbated at the top of a building, for example, where there may not be sufficient space to gain access through the top of the U channels, in which case the uppermost blocks tend not be securely positioned or supported.

Referring to Figures 2 and 3, an embodiment of a gas flue system according to the invention is designated 36. The illustrated system 36 includes a plurality of gas flue blocks (visible in Figure

3 only) which form part of our co-filed application, ref: red1610.uk, incorporated here by reference.

The flue system 36 includes a pair of laterally spaced supports in the form of a pair of vertical timber studs 46.

A flue stack, indicated generally at 37, is provided between the studs 46. In this embodiment, the flue stack 37 includes three pre-cast concrete starter blocks 38 of U-shaped internal cross-section, which create a suitable recess 40 for receiving a typical gas appliance.

A concrete cover block 42 is positioned on top of the assembled starter blocks 38. The cover block 42 has a tapered internal passage to provide a lead passage for the combustion gases from an appliance installed in the recess 40 into the flue passage.

A plurality of gas flue blocks, only two of which labelled 44 by way of indication, are stacked on top of the cover block 42. The flue blocks 44 are each provided with an internal passage, the internal passages being aligned to create a flue passage.

Although not visible in Figures 2 and 3, typically the upper surface of each block 44 is provided with a rebate around the periphery of the internal passage and a correspondingly shaped lip around the periphery of the internal passage on the lower surface, as described in our co-filed application, ref. 1609.uk. During construction, a successive block can be easily aligned by positioning the lip into the rebate of a previously laid block. A bead of bonding compound, commonly a fireproof mortar, is provided within each rebate and/or upon each lip, to ensure an airtight seal between the flue blocks.

The flue stack is in the form of a "plain" system. In a plain system, as opposed to a bonded system, the flue stack is free standing, i.e. without inter-leaved flanking blocks. Each of the starter, cover and flue blocks 38, 42, 44, are provided with side extensions on opposite sides of the internal passage. The side extensions provide insulation (referred to as a temperature drop, in use)

between the internal face of the flue passage and the adjacent structural timber studs 46.

As is best illustrated in Figure 2, the gas flue system 36 also includes a rear retaining member provided on each stud 46. In this embodiment, each retaining member is in the form of vertically extending galvanized steel right angle section 48. Each angle section 48 has two limbs, one limb being secured to an opposing surface of a respective stud 46. The other limb extends over a portion of a rear surface of the flue stack 37, to provide lateral support to the flue stack 37.

A front cover member in the form of a galvanised steel cover plate 50 is also provided on each stud 46. Each cover plate 50 extends over a portion of a front surface of the flue stack 37, to provide lateral support thereto.

As can be seen in Figure 3, an exit block 52 is provided on the uppermost gas flue block 44, as a terminal for connection to a metal exit flue pipe, for example.

To assemble the gas flue system 36, the studs 46 are positioned at a predetermined lateral spacing, typically 600mm apart, to create an opening for the starter blocks 38. An angle section 48 is positioned against a respective stud 46, the front edge of a respective limb of each steel angle section 48 positioned flush with the front edge of the respective stud 46, as viewed in Figure 2. The angle sections 48 are secured in place with nails or screws, for example. The angle sections 48 are supplied in 1m lengths and must be fitted to the studs successively, as the flue stack blockwork progresses. The angle sections 48 provide simple means for aligning and positioning of each course of the flue stack 37.

It is usual for the first starter block 38 to be laid directly onto a floor slab of a building, in which case a bead of bonding compound is extruded directly onto the floor slab to receive the first starter block 38. The first starter block 38 is positioned centrally within the opening and the second and third starter blocks 38 are positioned thereon, each laid starter block 38 being provided with a bead of bonding compound to its upper surface.

The cover block 42 is positioned onto the assembled starter blocks 38 and a bead of bonding compound extruded onto a grooved rebate (not shown) on its upper surface.

A bead of bonding compound is then extruded onto the lip on the lower surface of a gas flue block 44, which is then located into the groove of the cover block 42. Any surplus bonding compound which is forced out into the flue passage must be removed. Beading compound is then applied to the upper grooved rebate. Successive gas flue blocks 44 are stacked on top of one another to the desired height, ensuring that the flue passage remains devoid of bonding compound. The steel cover plates 50 are supplied in 1m lengths and are secured to the studs 46 successively, as the work progresses, to secure the assembled sections of flue stack 37 in place.

The exit block 52 is then positioned on the uppermost gas flue block 44, at the top of the flue system 36, substantially in the same manner as the successive gas flue blocks 44. To complete the stack of gas flue components, a lintel 54 and covering timber support 56 are provided on top of the exit block 52. The final sections of steel cover plate 50 are secured in place, and the system 36 may then be connected to a terminal, such as a metal flue pipe or chimney pot, for example.

Although the invention has been described with particular reference to timber frame buildings, the gas flue system and method according to the invention is also suitable for use in steel frame buildings. In this case, the vertical supports will be steel sections, and the steel angle sections and cover plates will be secured to the supports by suitable means, e.g. bolts or rivets.

The steel angle sections and cover plates may be supplied as preformed continuous lengths, to the required height, as opposed to 1m sections, as described.

It will be appreciated that the system and method of assembly according to the invention overcomes the disadvantages of known flue systems for timber framed buildings. The rear retaining members provide a simple means for aligning and positioning of each course of the flue stack, without the need to lower each course of blockwork into position. Assembly of a system according to the invention thereby simpler and more expedient than known systems for timber frame buildings.

Claims

1. A gas flue system comprising a pair of laterally spaced supports and a flue stack, each support having a retaining member which provides lateral support to a rear surface of the flue stack, and a separate cover member which provides lateral support to a portion of the front surface of the flue stack.

2. A gas flue system as claimed in claim 1, in which each retaining member is in the form of a vertically extending right angle section having two limbs, one limb being secured to an opposing surface of a respective support, the other limb extending over a portion of the rear surface of the flue stack.

3. A gas flue system as claimed in claim 1 or claim 2, in which the pair of laterally spaced supports comprise a pair of timber studs.

4. A gas flue system as claimed in any one of claims 1 to 3, in which the flue stack includes a plurality of superposed flue blocks, each having an internal passage extending through the flue block, the internal passages being in alignment with one another to provide a flue passage.

5. A gas flue system as claimed in claim 4, in which each flue block has a rebate around the internal passage on the upper surface and a correspondingly shaped lip around the internal passage on the lower surface.

6. A gas flue system as claimed in claim 4 or claim 5, in which each flue block is provided with a side extension on either side of the internal passage to provide insulation between the flue passage and the laterally spaced supports.

7. A method of assembly for a gas flue system, the method involving the steps of providing a pair of laterally spaced supports at a predetermined spacing from one another, providing

a retaining member on each support, providing a flue stack between the supports, each retaining member providing lateral support to a rear surface of the flue stack, and then providing each support with a cover member which provides lateral support to a front surface of the flue stack.

8. A method of assembly of a gas flue system as claimed in claim 7, in which each retaining member is in the form of a vertically extending right angle section having two limbs, one limb being secured to an opposing surface of a respective support, the other limb extending over a portion of the rear surface of the flue stack.

Application No: GB 0207809.5 10 **Examiner:** Tyrone Moore
Claims searched: 1-8 **Date of search:** 27 August 2002

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): F4J

Int Cl (Ed.7): E04F (17/02, 21/00); F23J (13/00).

Other: ONLINE: WPI, EPODOC, JAPIO.

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	GB 2361524 A	(DUNBRIK LTD) See figures 1-5, items 52, 54 and the description on page 4 in paragraph 1, 2, 4. An example of a 'U' shaped retaining member attached to a timber stud.	
A	GB 2358457 A	(DUNBRIK LTD) See figures 1-7, items 4, 28, 38, and the description on page 2 in paragraph 3 and page 7, paragraph 3. An example of a 'U' shaped retaining member attached to a timber stud.	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.