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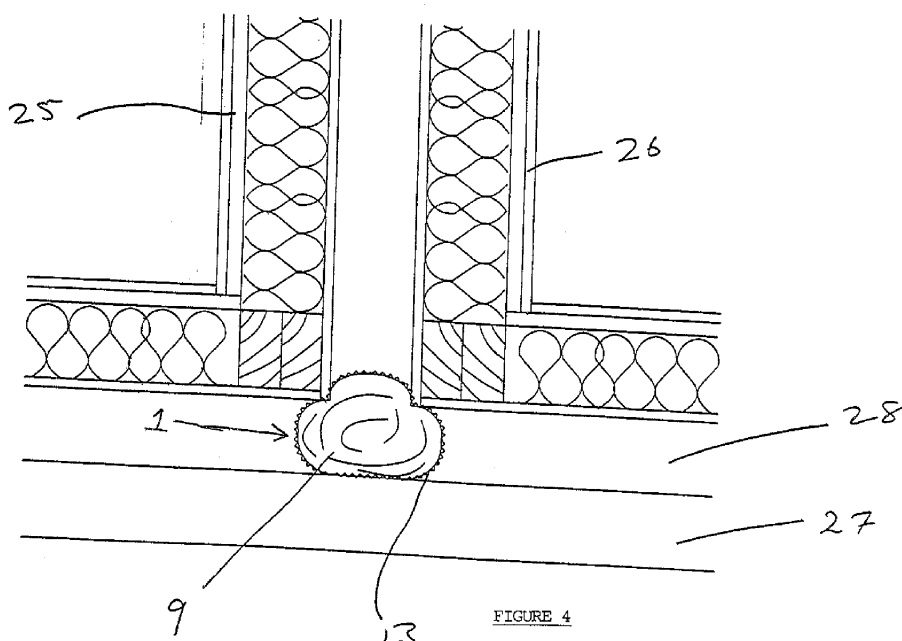
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(54) **A firebreak barrier and roof divide system**

(57) A barrier (1) for use in a gap (28) between structural members (25, 26, 27) to prevent the spread of fire is disclosed. The barrier comprises a barrier element (9) which moulds within a covering material (13) to take the form and shape of the underside of structural members, including any roofing material, to thereby form a seal between structural members. The invention has utility in a

firebreak roof divide system for use between a roof and the party wall of a building for preventing the spread of fires across the gap at a roof junction. The firebreak divide comprises a locating means mounted on top of the party wall dividing two areas of the building, the locating means receiving the barrier element which extends upwardly to abut the roof.



**FIGURE 4**

## Description

[0001] The present invention relates to a firebreak barrier and a firebreak roof divide system for preventing the spread of fire between adjacent structural members.

[0002] Gaps between adjacent structural members such as those between terraced and semi-detached buildings are often responsible for the spread of fires. As a result, adjacent properties to the source of the fire are often unnecessarily damaged by fire. The spread of fires across these gaps is particularly problematic at the roof junction. This is because, despite best endeavours, the provision of a fireproof joint in this area is not always possible and also because roofing felt is highly flammable. Imperfections in the construction at the roof junction also contribute to the spread of fires between such adjacent structural members.

[0003] A variety of solutions have been proposed to overcome these problems. GB Patent Application No. 2 082 647 shows a particularly effective barrier for sealing the gap between two structural members of a building. The barrier described is highly effective once fitted.

[0004] It is an object of the present invention to provide a barrier which is adapted to act as an effective firebreak barrier between at least two structural members to prevent the spread of fire. It is also an object of the present invention to improve upon the barrier disclosed GB Patent Application No. 2 082 647 by providing a firebreak barrier which takes the form of the underside of roofing material and maintains a good seal between the wall and the roof at the roofing junction.

[0005] It is acknowledged that the term 'comprise' may, under varying jurisdictions be provided with either an exclusive or inclusive meaning. For the purpose of this specification, and unless otherwise noted explicitly, the term comprise shall have an inclusive meaning - i.e. that it may be taken to mean an inclusion of not only the listed components it directly references, but also other non-specified components. Accordingly, the term 'comprise' is to be attributed with as broader interpretation as possible within any given jurisdiction and this rationale should also be used when the terms 'comprised' and/or 'comprising' are used.

[0006] Further aspects of the present invention will become apparent from the ensuing description which is given by way of example only.

[0007] Accordingly, there is provided a barrier for use in a gap between at least two structural members to prevent the spread of fire, **characterised in that** the barrier comprises a barrier element which is at least partially enclosed in a layer of a flexible covering material, the barrier element being adapted to mould within the covering material against surfaces of the structural members to seal the gap.

[0008] The shape of the barrier element is thus adapted to mould within the layer of the covering material to take the form and shape of the surfaces of the building structures to form a tight seal between the gaps and with-

in wall cavities. This will prevent the spread of fires through wall cavities between connected buildings and building structures.

[0009] Preferably, a first of said at least two structural members is an outer wall of a building, and the second of said at least two structural members is one or more cavity walls in the building.

[0010] In a further embodiment, the barrier extends horizontally and/or longitudinally between the structural members to seal the gap.

[0011] Preferably, the covering material is flexible wire mesh. Such a mesh will be able to flex to contain the barrier element as it moulds against facing wall surfaces in a gap or wall cavity.

[0012] In a further embodiment, the barrier is further covered by a damp proof course.

[0013] In a further embodiment, the barrier element is formed from a substantially non-expanding fire resistant material.

[0014] In a further aspect of the invention there is provided a barrier for use in a gap between a roof and a party wall of a building to prevent the spread of fire, the barrier comprising:

- a locating means mounted on top of the party wall dividing two areas of the building, and
- a barrier element positioned on the locating means which extends upwardly to abut the roof,

**characterised in that** the barrier element is at least partially enclosed in a layer of a flexible covering material, the barrier element being adapted to mould within the covering material against an inner facing surface of the roof to seal the gap between the party wall and the roof.

[0015] The shape of the barrier element is thus adapted to distort within the layer of the covering material to take the form and shape of the underside of any roofing material, thereby forming a tight seal between the roof and the wall. This will prevent the spread of fires across the gap at the roof junction. Forming the barrier element in this way will also eliminate the need to profile the barrier element to ensure it snugly fits under the roofing material to provide the required seal.

[0016] Preferably, the barrier element covering material is wire mesh.

[0017] Preferably, the barrier element is formed from a substantially non-expanding fire resistant material. It will be appreciated that the barrier element must be composed of a material which will maintain an abutment to the roof so that during a fire a good seal between the roof and party wall is maintained.

[0018] In a further embodiment, the locating means comprises a covering sheet on top of a gasket layer positioned on the party wall.

[0019] In a further embodiment, a depression is formed in the gasket layer and the barrier element is entrapped on the covering sheet in the depression.

[0020] Preferably, the depression is substantially "U"-

shaped.

**[0021]** In a further embodiment, the covering sheet comprises wings arranged to receive roofing felt from sides of the building.

**[0022]** In a further embodiment, the covering sheet is a fire resistant waterproof membrane. For example, the gasket layer covering sheet may be formed from aluminium foil, light gauge metal or similar like materials having the requisite fire resistance and water proofing characteristics. The gasket layer covering sheet will thus facilitate water proofing of the party wall components in the event of roofing failure.

**[0023]** In a further embodiment, the gasket layer is formed from the same material as the barrier element.

**[0024]** In a still further aspect of the invention there is provided a barrier for use in a gap between a roof and a party wall of a building to prevent the spread of fire, the barrier comprising:

a locating means mounted on top of the party wall dividing two areas of the building, and

a barrier element positioned on the locating means which extends upwardly to abut the roof,

**characterised in that** the barrier element is at least partially enclosed in a layer of a flexible covering material, the barrier element being adapted to mould within the covering material against an inner facing surface of the roof to seal the gap between the party wall and the roof, and wherein the locating means comprises a gasket layer at the top of the party wall and a channel section having a base and two side walls, the base of the channel section seated on the gasket layer.

**[0025]** Such an arrangement on the party wall will prevent smoke from spreading under the barrier into the adjoining building through small gaps between the top of the party wall and the base of the channel section.

**[0026]** In a further embodiment, the barrier element is provided by a block of material in the form of a cockscomb vertical brush, and the flexible covering material is wire mesh.

**[0027]** Preferably, the barrier element is formed from a substantially non-expanding fire resistant material.

**[0028]** In a further embodiment, an integrally formed wing extends from each side wall of the channel section, each wing being adapted to receive roofing felt from both sides of the building.

**[0029]** Preferably, the wings of the channel section are formed as "V"-shaped sections which extend from the side walls of channel section across the top of the party wall.

**[0030]** In a further embodiment the gasket layer is bonded to a fire resistant panel fixed to the top of the party wall.

**[0031]** Preferably, a link batten extends between a pair of roofing battens bridging the party wall.

**[0032]** Use of such a link batten provides a fulcrum

break point either side of the party wall, and allows the roof to collapse in a controlled manner as a result of fire without causing disruption to the configuration of the barrier at the critical abutment.

**[0033]** In a further embodiment, at least one of: the link batten and the gasket layer and the channel section include a barrier element fixing means for engaging with and holding the barrier element on the locating means. In such an embodiment, the barrier element fixing means may comprise spikes and/or blades which extend through the covering material into the barrier element.

**[0034]** The link batten may also include a barrier element fixing means adapted to engage with the barrier element to hold it in the depression. Such a barrier element fixing means extends from the gasket layer to engage the barrier element via the depression.

**[0035]** The invention will be more clearly understood from the following description of some embodiments thereof, given by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a sectional view of a barrier in position on a party wall of a building in accordance with the invention;

Fig. 2 is the sectional view of Fig. 1 in which the building is shown in further detail, and

Fig. 3 show the steps involved in fixing a roofing tile onto the barrier when in situ on the building;

Fig. 4 shows a cavity wall incorporating a barrier element in accordance with an alternative embodiment the invention;

Fig. 5 is a sectional view of a barrier in position on a party wall of a building in accordance with an alternative embodiment the invention;

Fig. 6 is the sectional view of Fig. 5 in which the building is shown in further detail; and

Fig. 7 illustrates the controlled collapse of the roof of a building which incorporates the barrier shown in Fig. 5.

**[0036]** Referring to the drawings, and initially to Fig. 4, shown is a barrier 1 for use in a gap 28 between at least two structural members 25, 26, 27 to prevent the spread of fire. The barrier 1 comprises a barrier element 9 which is at least partially enclosed in a layer of a flexible covering material 13. The barrier element 9 is adapted to deform within the covering material 13 and be contained within the covering material 13 so that it can mould against surfaces of the structural members 25, 26, 27 to seal the gap 28. In the embodiment shown, the barrier 1 is placed

in between stud cavity walls 25, 26 and an outer wall 27 of a building and extends horizontally and/or longitudinally throughout the wall cavity or gap 28. The barrier element 9 is formed from a substantially non-expanding fire resistant material, such as Rockfire®, and is enclosed in a flexible wire mesh 13. The barrier 1 may also be covered in a damp proof course (DPC), such as polythene, to aid waterproofing.

**[0037]** Referring now to Figs. 1 to 3, there is shown a barrier 1 for use in a gap 2 between a roof 3 and a party wall 4 of a building to prevent the spread of fire. The barrier 1 comprises a locating means, indicated generally by the reference numeral 5, mounted on top of the party wall 4 dividing two areas of the building. The locating means 5 receives a barrier element 9 which extends upwardly to abut a downward facing surface of the roof 3. The locating means 5 comprises a covering sheet 6 which rests on the top of a gasket layer 7 fixed to the top of the party wall 4. A depression 8 is formed in the gasket layer 7, whereby a base portion 10 of the barrier element 9 fits snugly on the gasket layer covering sheet 6 in the depression 8 and extends upwardly from the depression 8 to the roof 3. In the instance shown, the depression 8 is substantially u-shaped, although it will be appreciated that the depression 8 may also be substantially v-shaped, or it may have any suitable shape suitable for locating the base portion 10 of the barrier element 9.

**[0038]** The barrier element 9 is at least partially enclosed in a layer of a covering material 13, which in the instance shown is a wire mesh. The covering material 13 is provided to contain the barrier element 9 as it moulds against the roof surface. The barrier element 9 is provided by a block of material made from a substantially non-expanding fire resistant material such as that sold under the trade name RockFibre®. Such a material is suitable for maintaining an abutment to the roof 3 so that during a fire, the seal between the roof 3 and party wall 4 is maintained. The portion of the barrier element 9 which extends out of the depression 8 is substantially bulb shaped, and use of the wire mesh 13 will ensure that the compressive forces which will be exerted by the roof 3 will maintain the bulb shape of the barrier element 9. The barrier element 9 is thus adapted to mould within the covering material 13 against the inner facing surface of the roof to seal the gap between the party wall and the roof. The barrier element 9 will thus take the form and shape of the underside of any roofing material, and will thereby form a tight seal between the roof 3 and the wall 4. The barrier element 9 wrapped in the wire mesh 13 thus forms an effective fire and smoke barrier.

**[0039]** The ends of the covering sheet 6 terminate in wings 11, each wing 11 being adapted to receive roofing felt 12 from both sides of the building. In use, roofing felt 12 is rolled back onto the wings 11 thereby allowing any water which has leaked through the roofing tiles 3 to drain down the wings 11 and into the guttering (not shown). The covering sheet 6 is preferably formed from a waterproof membrane and it may also be foil backed and pre-

fixed to the gasket layer 7. The gasket layer 7 is also formed from a substantially non-expanding fire resistant material, such as that sold under the trade mark RockFibre®.

**[0040]** A link batten 15 extends between a pair of roof battens 16 bridging the gap 2. The link batten 15 includes a barrier element fixing means (not shown) adapted to engage with the barrier element 9 in the depression 8. Alternatively, the barrier element fixing means may extend from the gasket layer 7 to engage the barrier element 9 via the depression 8. Such a barrier element fixing means may comprise spikes and/or blades which extend into the barrier element 9.

**[0041]** The method by which roofing tiles are fitted over the barrier element 9 will now be described. Initially, the link batten 15 is fixed between each of the roof battens 16 bridging the party wall 4. In this way, the link batten 15 provides good structural connectivity between the battens 16, but also a further layer of protection against the spread of fire and smoke. The link batten 15 has two attachment plates 17 and a connecting arm 18 which extends across the gap 2. A vertical groove (not shown) is then cut in the barrier element 9 at the relevant position to receive the connecting arm 18 and the attachment plates 17 are nailed to the battens 16. The barrier element 9 is also cut across in line with the top edge of the battens 16 in order to allow installation of the roof tiles 3. As the roof tiles 3 are pushed onto the barrier element 9 and secured to the battens 16, as shown in Figs. 3(a) and (b), the bulb shaped cockscorn compresses as shown in Figs. 3(c) and (d) but still maintains a required critical bulb shape as it moulds to the shape of the underside of the roof coverings, including the roof tiles and any cladding.

**[0042]** Figs. 5 and 6 show a modification of the barrier shown in Figs. 1 to 3, with parts similar to those described already with respect to Figs. 1 to 3 being identified by the same reference numerals.

**[0043]** In the embodiment shown, the locating means 5 comprises a channel section, indicated generally by the reference numeral 20, mounted on top of the party wall 4 dividing two areas of the building. The channel section 20 is integrally formed and is adapted to entrap the base of the barrier element 9 which extends upwardly to abut the roofing tiles 7 to seal the gap 6 between the wall 4 and the roof 7. As in the previous embodiment of the invention, the barrier element is at least partially enclosed in a layer of a flexible covering material 13, and is adapted to mould within the covering material 13 against the inner facing surface of the roof tiles 3 to seal the gap between the party wall 4 and the roof 3. In the embodiment shown, the barrier element 9 is provided by a block of material in the form of a cockscorn vertical brush, and the flexible covering material is wire mesh.

**[0044]** Wings 21, which are integrally formed on each side of the channel section 20, are adapted to receive roofing felt 12 from both sides of the building. In the instance shown, the wings 21 of the channel section 20

are formed as "V"-shaped sections which extend from side walls 23 of the channel section 20. In use, the roofing felt 12 is rolled back into the wings 21 thereby allowing any water which has leaked through the roofing tiles 3 to drain down the wings 21 and into the guttering (not shown).

**[0045]** As shown, the channel section 20 comprises a base 24 and two side walls 23 and rests on its base 22 on the gasket layer 7 at the top of the party wall 4. In the instance shown, the gasket layer 7 is also bonded to a fire resistant panel 14 fixed to the top of the party wall 4. In this embodiment of the invention, the base of the barrier element 9 is entrapped within in the channel section 20, and the compressive forces which will be exerted by the roof 3 will not cause any change to the critical bulb shape of the barrier element 20 when the barrier is fitted in the gap 2.

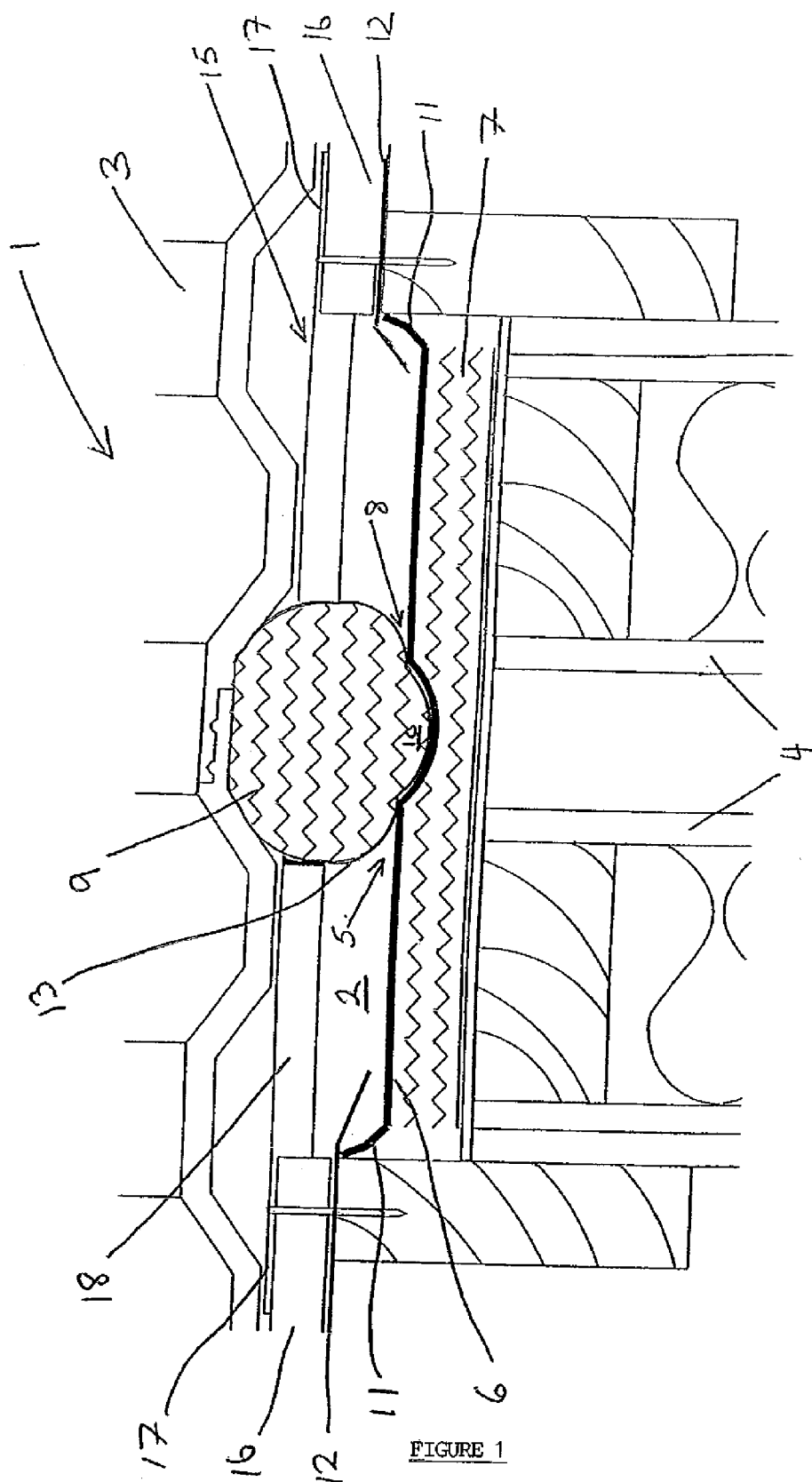
**[0046]** Fig. 7(a) and (b) show the controlled collapse of the roof on one side of the party wall. In the instance shown, the link batten 15 provides a fulcrum break point either side of the party wall 4, and allows the roof 3 to collapse in a controlled manner without causing disruption to the configuration of the barrier 1 at the critical abutment (i.e. within the gap 2).

**[0047]** Aspects of the present invention have been described by way of example only and it should be appreciated that additions and/or modifications may be made thereto without departing from the scope thereof as defined in the appended claims.

## Claims

1. A barrier for use in a gap between at least two structural members to prevent the spread of fire, **characterised in that** the barrier comprises a barrier element which is at least partially enclosed in a layer of a flexible covering material, the barrier element being adapted to mould within the covering material against surfaces of the structural members to seal the gap.
2. A barrier as claimed in Claim 1, wherein a first of said at least two structural members is an outer wall of a building, and the second of said at least two structural members is one or more cavity walls in the building.
3. A barrier as claimed in Claim 1 or Claim 2, which extends horizontally and/or longitudinally between the structural members to seal the gap.
4. A barrier as claimed in any preceding claim, wherein the covering material is flexible wire mesh.
5. A barrier as claimed in any preceding claim, which is further covered by a damp proof course.

6. A barrier as claimed in any preceding claim, wherein the barrier element is formed from a substantially non-expanding fire resistant material.



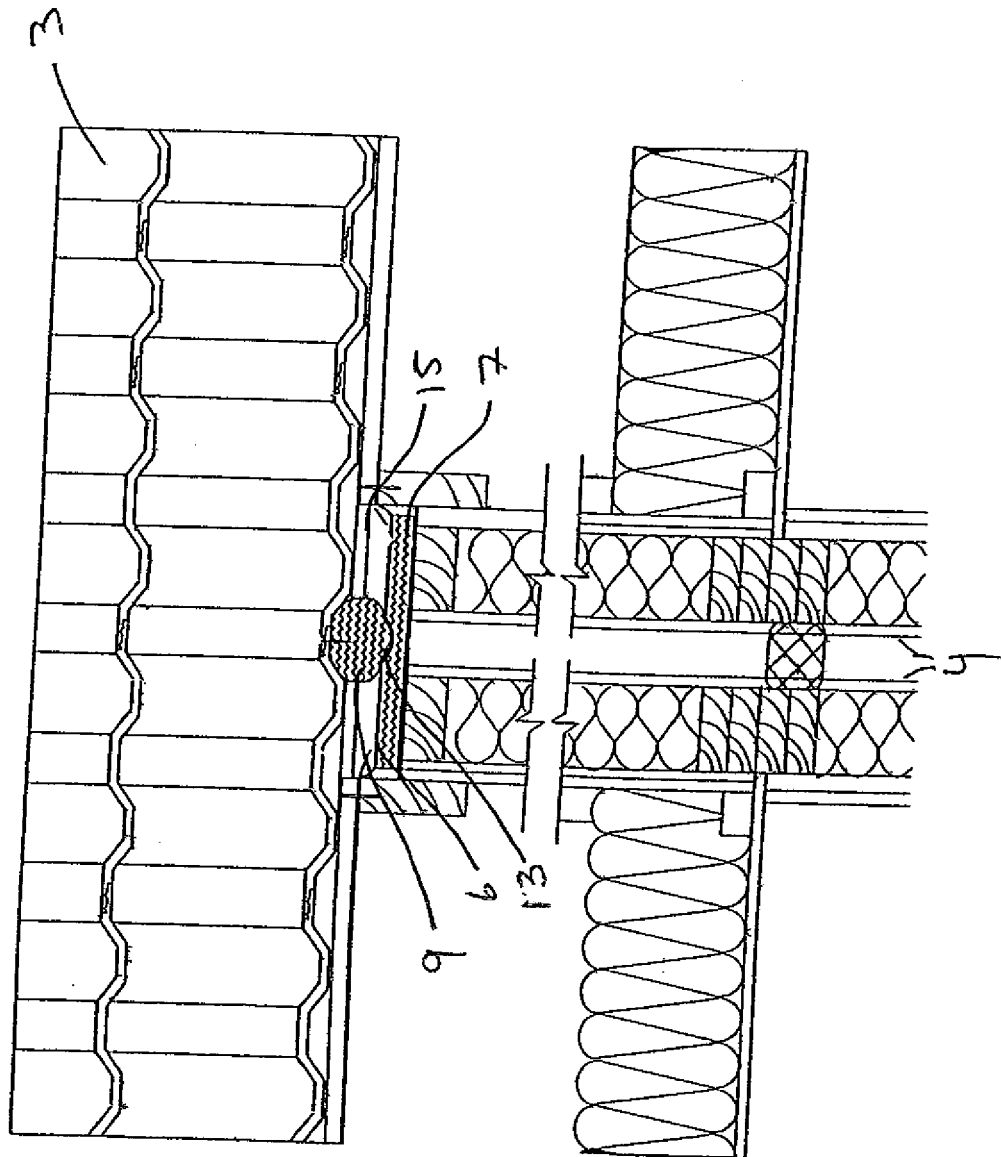


FIGURE 2

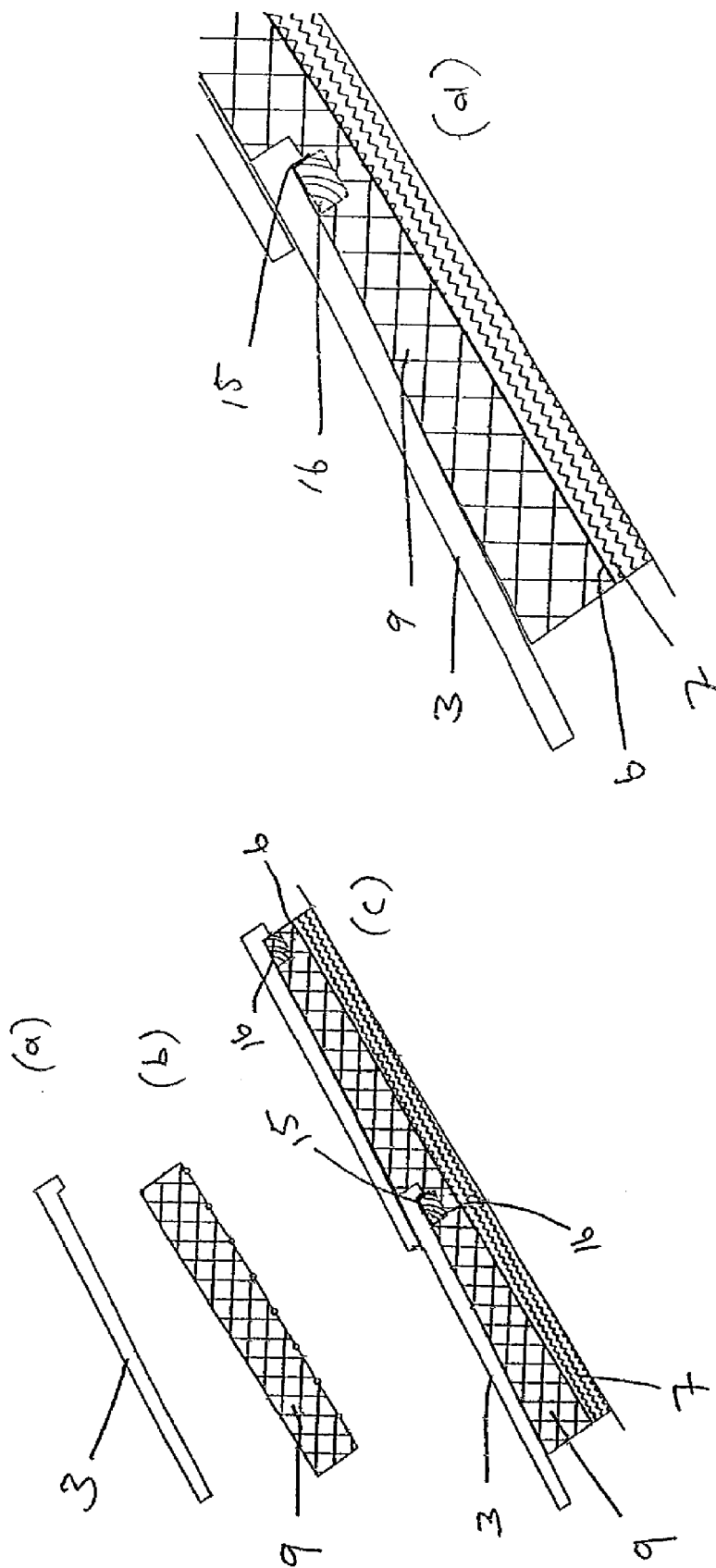


FIGURE 3



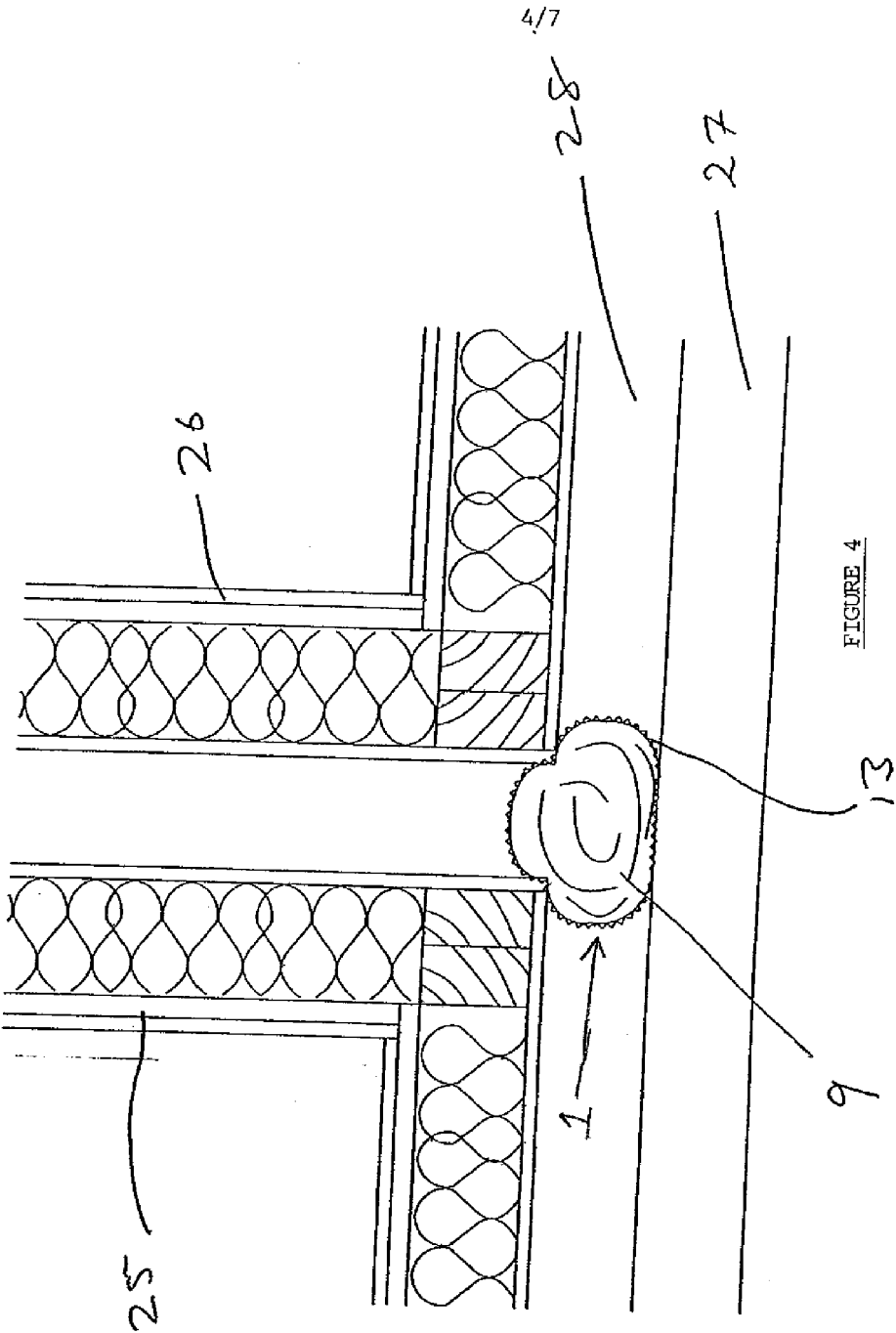


FIGURE 4

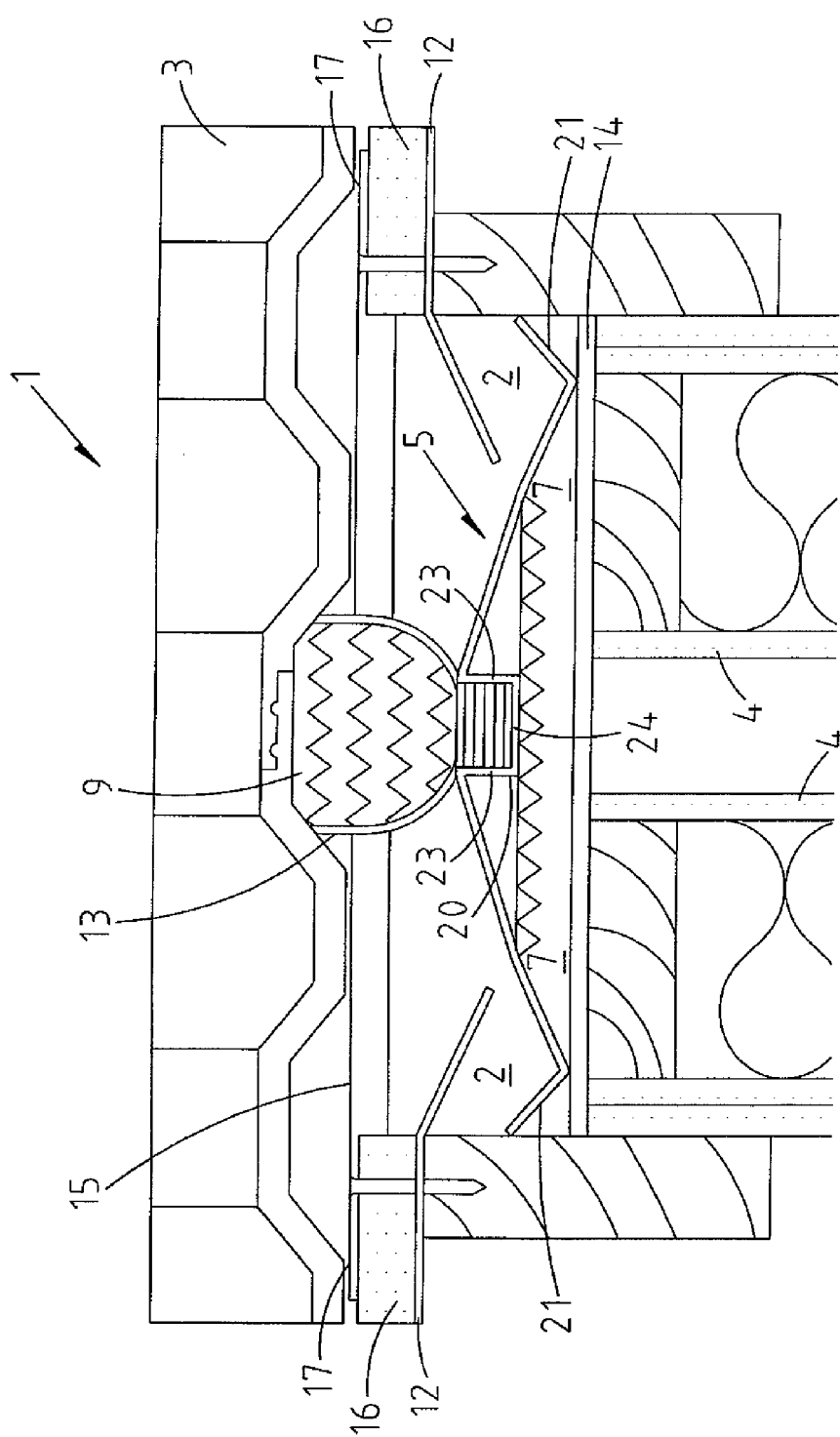


Fig. 5

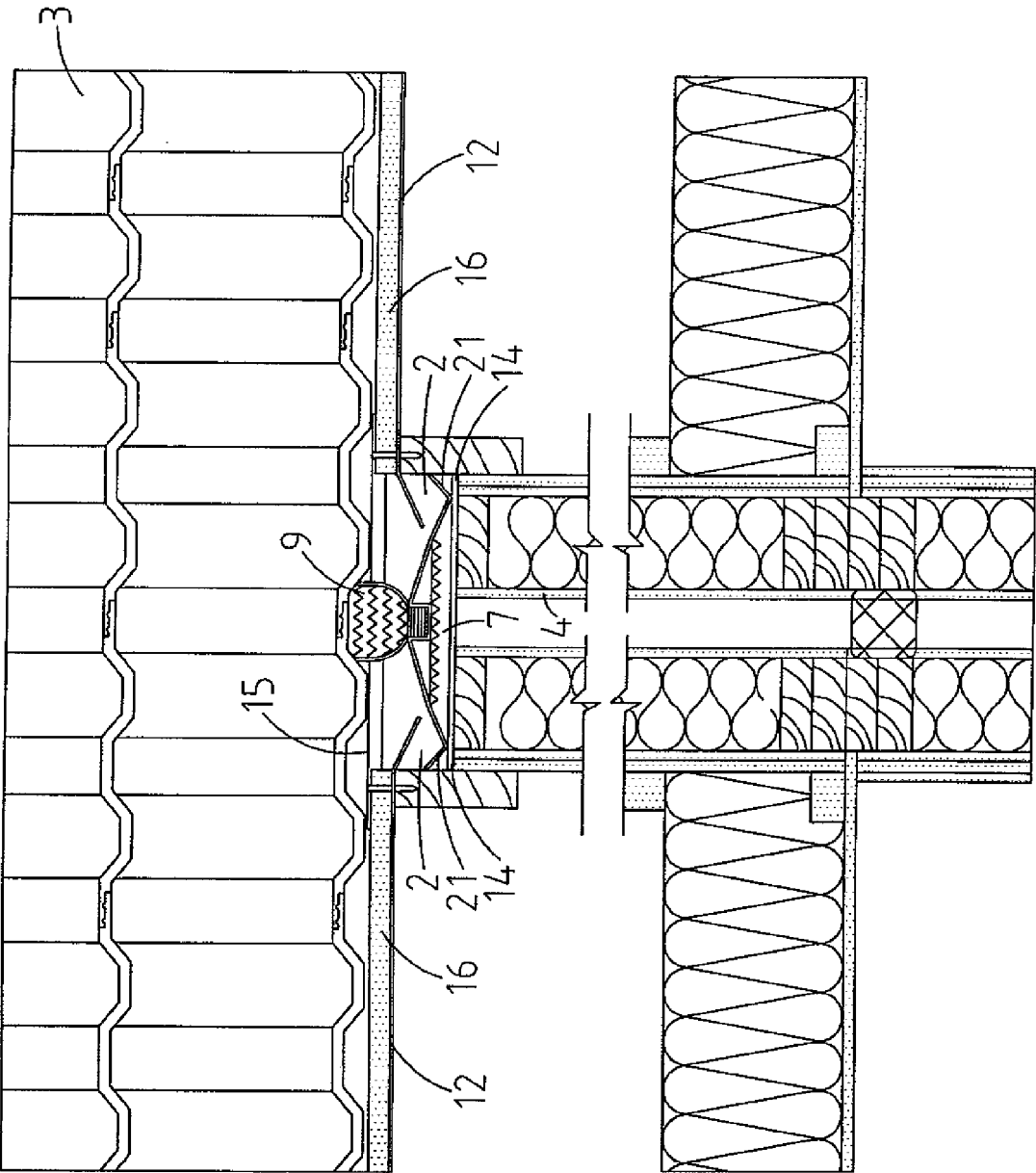


Fig. 6

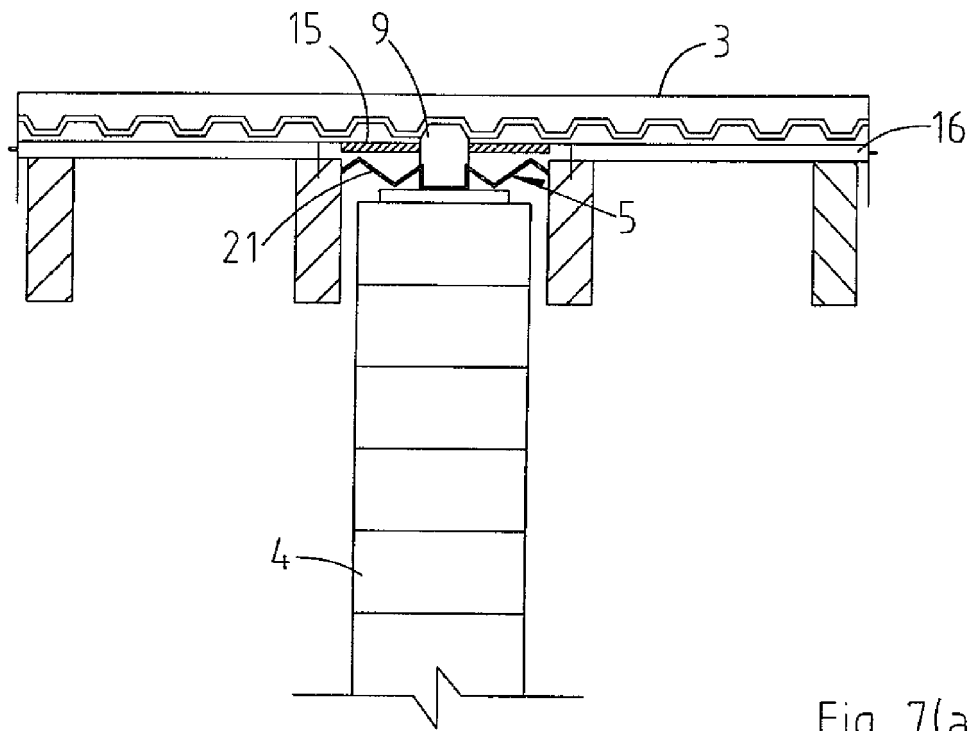


Fig. 7(a)

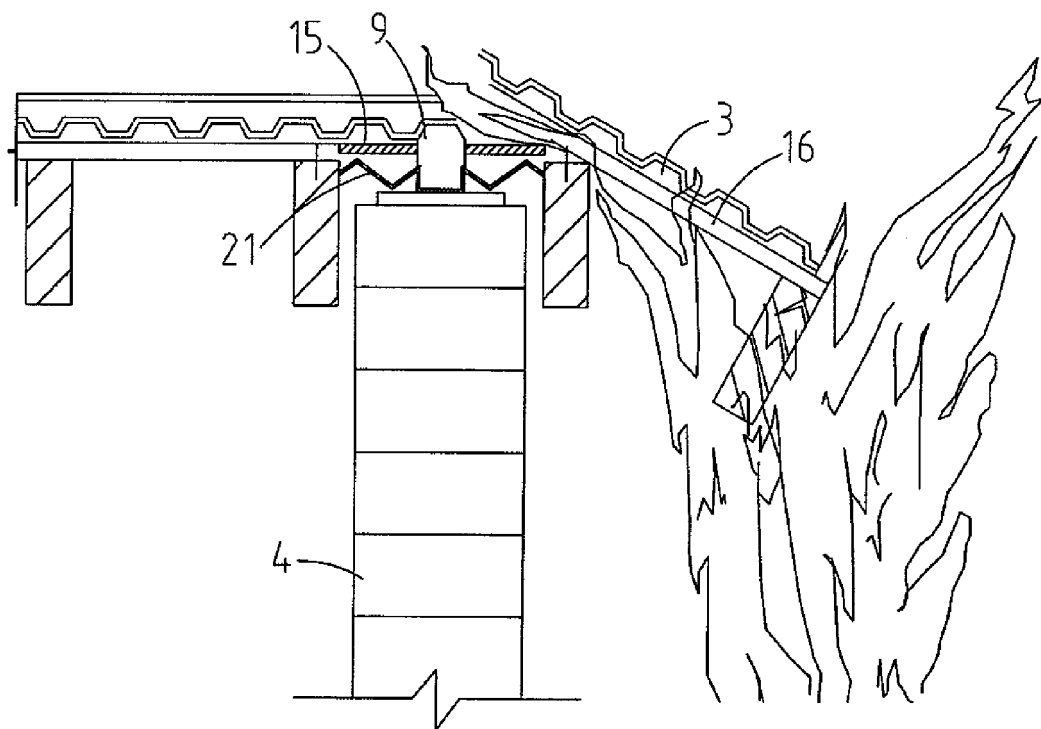


Fig. 7(b)

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- GB 2082647 A [0003] [0004]