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(54) **Wall tie unit for a cavity wall.**

(57) A cavity wall insert comprising an inclined web 15, a front upper block 16 and a rear lower block 17. The upper block 16 is spaced from the web 15 and is connected to it by a series of ribs 18. The lower block 17 is also spaced from the web 15 and connected to it by a series of ribs 19. The web includes a ledge 21 extending from its lower edge. The upper and lower blocks 16 and 17 include channels 22, 23, and 24 in which anchors 25, 26 and 27 are slidably located. A front sheet 28 of damp proof course material is bonded to the top of the ledge 21 and a rear sheet 29 of damp proof course material is bonded to the web 15 at the top.

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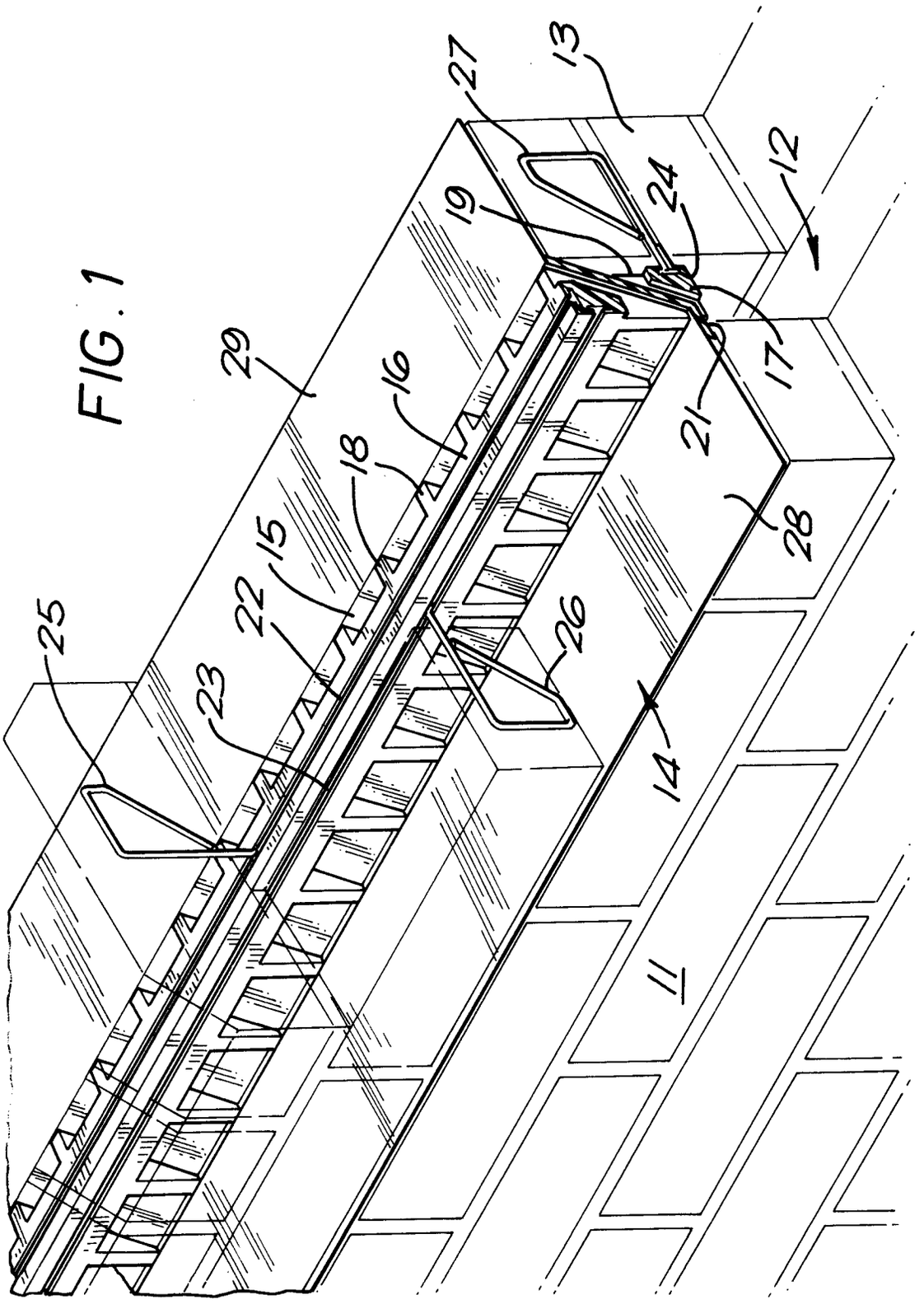
FIG. 1



The present invention relates to a damp proof course and structural restraint or wall tie unit for a cavity wall.

Conventionally, a damp proof course has comprised a sheet of damp proof course material or in some cases a cavity tray. In each case this has spanned the cavity in the wall and has provided a line or plane of weakness.

In some other arrangements, particularly at the top of parapet walls this disadvantage has been addressed by combining the damp proof course with a particular design of coping system in order to minimise the line of weakness at the damp proof course while at the same time effectively interlocking the two leaves of the wall. This type of system is effective but requires the use of specially shaped capping units and cannot, of course, be used at other features, such as beneath windows.

It is an object of the present invention to provide a system which acts as a damp proof course in a cavity wall and which also acts to tie together the two leaves.

It is a further object of the invention to provide such a system which can be used at a wall parapet and at other locations and features such as windows.

According to the present invention, there is provided a cavity wall insert comprising: a continuous elongate inclined web; an elongate front upper member spaced from and generally parallel to the web; a series of spaced supports connecting the upper member to the web; an elongate rear lower member generally parallel to and connected to the web; a front damp proof course material extending from the lower part of the web and a rear damp proof course material extending from the upper part of the web; an elongate channel in the upper member and an elongate channel in the lower member; and a series of anchors movably located in the channels.

The entire insert may be a moulded plastics construction with the exception of the anchors which may be of a corrosive resistant metal, e.g. stainless steel, though the anchors may also be of a plastics material. Alternatively, the entire insert may be of a corrosive resistant metal such as stainless steel.

Preferably, the supports connecting the upper member to the web take the form of vertical ribs, though they may take any other convenient form provided they maintain a spaced relationship between the web and the upper member. The lower member may be directly connected to the web or alternatively may be spaced from it. In the latter case, the lower member and the whole web may be connected by spaced supports such as ribs. The upper and lower members are preferably continuous, though they may be discontinuous. The upper and lower members may each include a generally vertical face, a generally horizontal face and an inclined face facing the web. However, these members may alternatively have any suitable cross-sectional shape and in particular may have rounded corners.

While the damp proof course material might constitute part of the overall moulded construction by simply extending outwards from the web, it more preferably comprises strips of conventional damp proof course material pre-bonded to the web. In this way, the material of the web and elongate members can be selected for its structural properties whereas the damp proof course can be selected for its compatibility with mortar.

The channel in the lower member preferably faces rearwards while the channel in the upper member preferably faces forwards. The upper member preferably also includes a second elongate channel facing upwards. The channels are preferably T-shaped in cross-section though any convenient profile may be adopted, such as an L-shape.

The anchors should have an end or a protrusion which is complementary in shape to the channels. Preferably, therefore, the anchors end in a T-bar, enabling them to be inserted into the T-shaped channels and rotated through 90° to prevent their removal. The anchors are preferably so shaped that after insertion and rotation, they occupy a plane which is perpendicular to the channel, ie a generally vertical plane in use.

Thus, the insert is conveniently employed in a cavity wall to serve both as a damp proof course and as a tie or structural restraint between the two leaves. Preferably, the front damp proof course material is located along a course of bricks in the outer leaf and the rear damp proof course material is located along a higher course of bricks in the inner leaf. This leaves a space for moisture along the front surface of the web behind the upper member and between the supports.

The anchors are inserted into the channels and moved to positions where they are adjacent the ends of bricks in the outer and inner leaves where they are mortared in. The upwardly extending anchors can either be located against coping stones or stretchers above in the case of a parapet wall or may extend into a joint between two bricks in the outer leaf when used in other locations such as beneath windows, etc.

The invention may be carried into practice in various ways and some embodiments will now be described by way of example with reference to the accompanying drawings, in which :-

Figure 1 is a perspective view of a partly completed cavity wall with an insert in accordance with the present invention located in position;

Figure 2 is a vertical section through a cavity wall including an insert in accordance with the invention;

Figure 3 is a view similar to Figure 2 but taken beneath a window; and

Figure 4 is a view similar to Figure 3 but with a different outer leaf arrangement.

Figures 1 and 2 show a cavity wall having an outer leaf 11, a cavity 12 and an inner leaf 13, and having an insert 14 in accordance with the present invention in position.

The insert 14 comprises a continuous inclined web 15, a continuous front upper block 16 and a continuous rear lower block 17. The upper block 16 is spaced from the web 15 and connected to it by a series of parallel vertical ribs 18. The lower block 17 is also spaced from the web 15 and connected to it by a series of parallel vertical ribs 19. The web 15 includes a ledge 21 extending from its lower front edge. The components 15 - 21 making up the insert as so far described comprise a single one-piece moulding from a corrosion resistant plastics material.

The upper block 16 includes a top channel 22 and a front channel 23. The lower block 17 includes a rear channel 24. The channels 22, 23, 24 each have a T-shaped cross-section. A series of generally P-shaped stainless steel anchors 25, 26, 27 are slidably located in the channels 22, 23, 24 respectively. Three anchors are shown though it is envisaged that there would be a number in each channel. The anchors 25, 26, 27 each have a T-shaped end which corresponds with the T-shaped channels 22, 23, 24.

A front sheet 28 of damp proof course material is bonded to the top of the ledge 21. A rear sheet 29 of damp proof course material is bonded to the web 15 at the top, accommodated by a slot 31 between the web 15 and the top of each rib 18.

To install the insert 14 at the top of a parapet wall, the outer and inner leaves 11, 12 are completed as far as the penultimate course of bricks prior to the coping units 32. Each anchor 25, 26, 27 is located in its channel 22, 23, 24 by placing its T-shaped end lengthways in the channel and turning it through 90°, so that the end is captive in the channel and the remainder of the P-shape occupies a plane perpendicular to the length of the channel. The insert 14 is then located in the cavity 13 with the ledge 21 on the front leaf penultimate course. The inner leaf final course is laid, during which the anchors 27 are moved to positions where they abut the ends of convenient bricks and are mortared in position. When this course is completed, the top rear of the web 15 is adjacent the top of the inner leaf final course. The two damp proof course sheets 28, 29 are then located on the respective brick courses and embedded in mortar joints.

The outer leaf final course is laid, during which the anchors 26 are moved to positions where they abut the ends of convenient bricks and are mortared in position. Finally, the coping units 32 are laid during which the anchors 25 are moved to positions where they abut faces of convenient bricks are are mortared in position. Naturally, the order of these operations can be varied somewhat.

Thus, the insert 14 serves as a damp proof course, through the web 15 and the two damp proof course sheets 28, 29, and also as a structural restraint, through the anchors 25, 26, 27 which hold together the inner and outer leaves and the capping course.

It will be appreciated that the anchors can be made to take up mirror image positions as shown in broken lines, though they are shaped to extend to one side only of the T-shaped base and are dimensioned to fit within the profile of a standard brick and Figure 3 illustrates the use of the insert 14 beneath a feature such as a window 33. The arrangement is generally similar to that in Figures 1 and 2 except that the upper damp proof course member is captured between the window frame 34 and the inner leaf 12, and in fact extends into the joint between the window frame 34 and the sill 35. Additionally, the absence of coping units renders the top anchors 25 largely unnecessary, however, they have been included to help to retain insulation sheets 36 in position.

Figure 4 also shows the insert 14 in use in conjunction with a window 33. However, in this case, the outer leaf course beneath the window 33 is a soldier course rather than a stretcher course. The arrangement is similar to that in Figure 3 though the insert 14 is positioned lower down and the rear damp proof course sheet may be extended somewhat in order to reach the sill 35. This embodiment also illustrates an alternative orientation for the top anchor 25 which, in addition to helping to locate the insulation, is embedded in the mortar joint between two soldier bricks in the outer leaf 11.

In all the embodiments shown (in Figures 2, 3 and 4), the anchors 25, 26, 27 are shown as being located in the same plane. However, it will be appreciated that this is for reasons of clarity of the drawings. In fact, the anchors would be staggered as shown in Figure 1.

Claims

1. A cavity wall insert (14) comprising: a continuous elongate inclined web (15); an elongate front upper member (16) spaced from and generally parallel to the web (15); a series of spaced supports (18) connecting the upper member (16) to the web (15); an elongate rear lower member (17) generally parallel to and connected to the web (15); a front damp proof course material (28) extending from the lower part of the web (15) and a rear damp proof course material (29) extending from the upper part of the web (15); an elongate channel (23) in the upper member (16) and an elongate channel (24) in the lower member (17); and a series of anchors (26, 27) movably located in the channels (23, 24).

2. An insert as claimed in Claim 1, characterised in that the supports (18) connecting the upper mem-

ber (16) to the web (15) take the form of vertical ribs which maintain a spaced relationship between the web (15) and the upper member (16).

3. An insert as claimed in any preceding Claim, characterised in that the lower member (17) is either directly connected to the web (15) or is spaced from the web (15) and is connected to it by spaced supports (19).

4. An insert as claimed in any preceding Claim, characterised in that the upper and lower members (16, 17) are continuous, and preferably include a generally vertical face, a generally horizontal face and an inclined face facing the web (15).

5. An insert as claimed in any preceding Claim, characterised in that it is of a moulded plastics construction with the exception of the anchors (26, 27) which are of a corrosive resistant metal.

6. An insert as claimed in any of Claims 1 to 6, characterised in that the damp proof course material (28, 29) comprises strips of conventional damp proof course material pre-bonded to the web (15).

7. An insert as claimed in any preceding Claim, characterised in that the channel (24) in the lower member (17) faces rearwards while the channel (23) in the upper member (16) faces forwards, and the upper member (16) includes a second elongate channel (22) facing upwards.

8. An insert as claimed in any preceding Claim, characterised in that the channels (22, 23, 24) are T-shaped in cross-section.

9. An insert as claimed in any preceding Claim, characterised in that the anchors (25, 26, 27) have an end or a protrusion which is complementary in shape to the channels (22, 23, 24).

10. An insert as claimed in any preceding Claim, characterised in that the anchors (25, 26, 27) are so shaped that after insertion and rotation through 90°C they occupy a plane which is perpendicular to their respective channel (22, 23, 24).

11. A method of constructing a cavity wall incorporating an insert (14) as claimed in any preceding Claim including the steps of locating the front damp proof course material (28) along a course of bricks in the outer leaf (11), locating the rear damp proof course material (29) along a higher course of bricks in the inner leaf (12), inserting the anchors (25, 26, 27) in to the channels (22, 23, 24), moving the anchors to positions where they are adjacent to the ends of the bricks in the outer and inner leaves (11, 12), and mortaring in the anchors.

FIG. 1

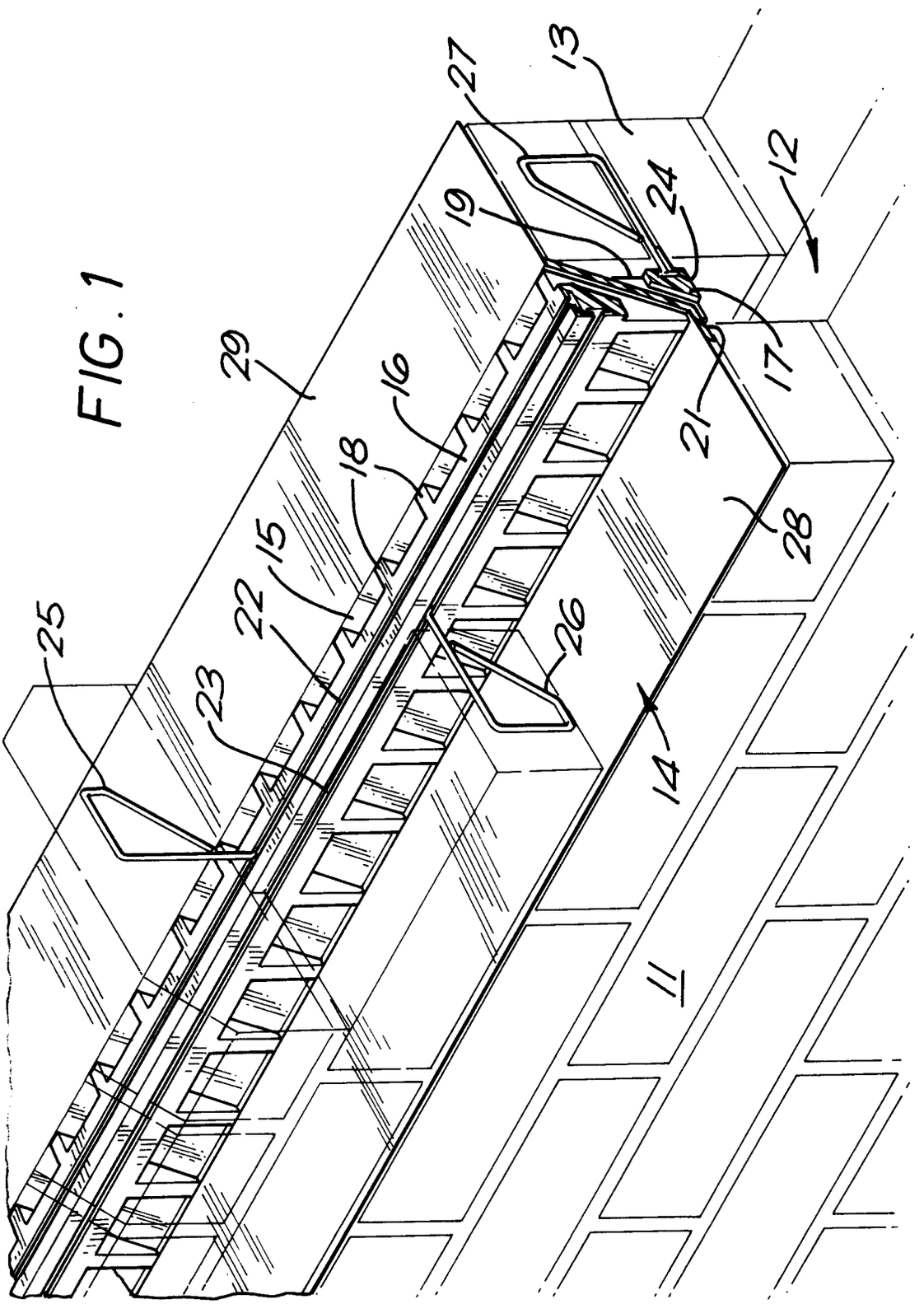


FIG. 2

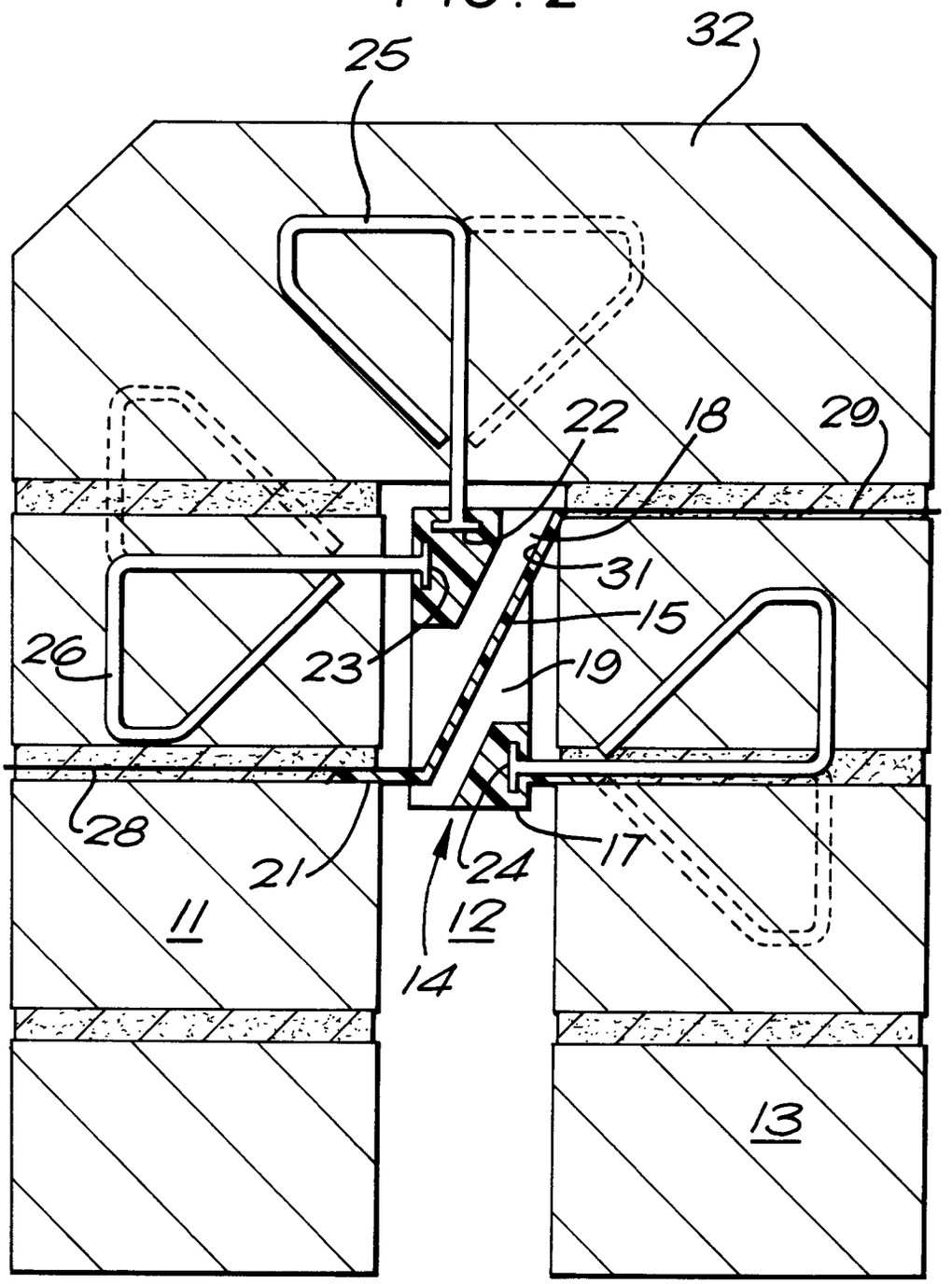


FIG. 3

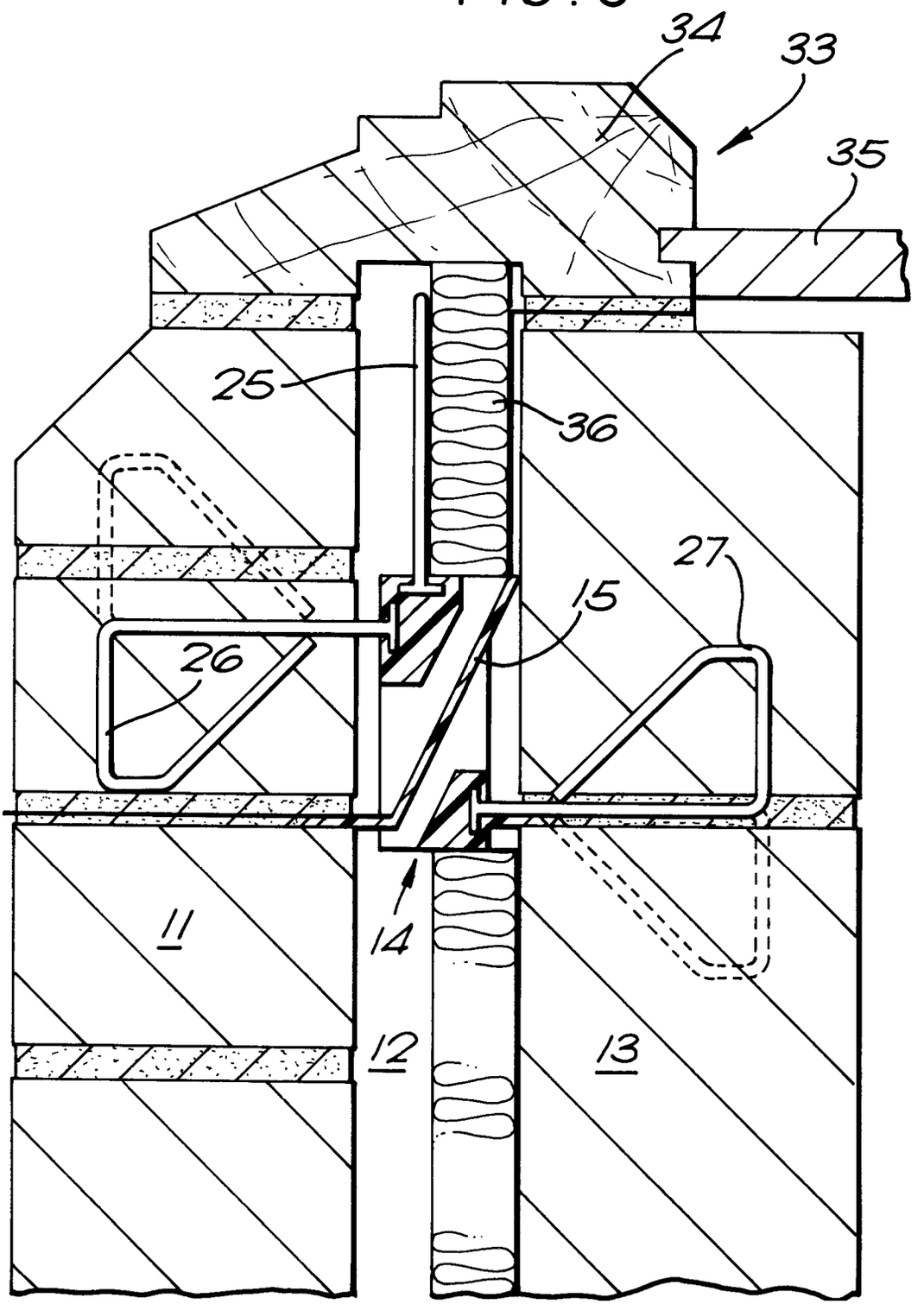


FIG.4