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(54) Gutters

(57) An injection moulded gutter (1) has one end (4) of smaller cross section than the other, the external cross section (6) of said one end (4) substantially matching the internal cross (8) section of the other end and being adapted to cooperate with the other end of a like gutter to form a join. The gutter comprises a main section extending from said other end to adjacent said one end (4), where the cross section is reduced so as to form a spigot (4) to fit into the main section of a like gutter.

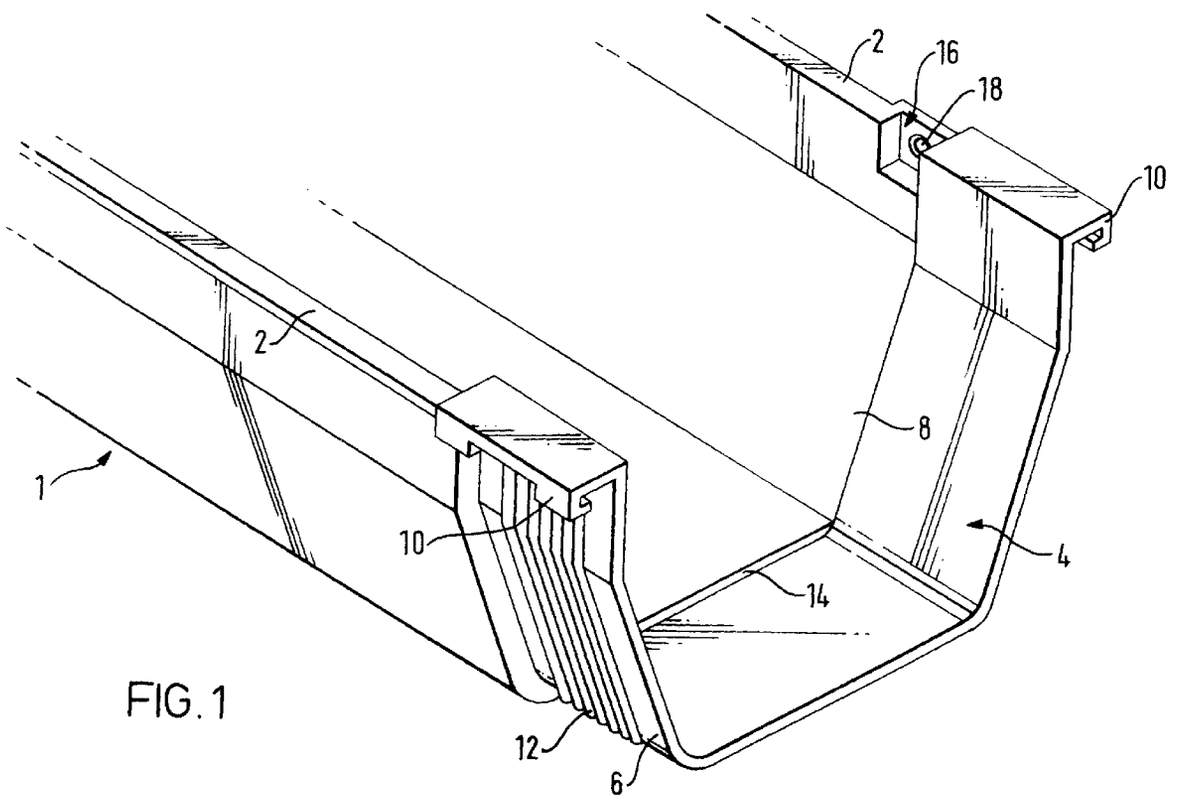

FIG. 1

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Description

This invention relates to gutters and more particularly, but not exclusively to injection moulded plastics gutters.

Plastics gutters have become extremely popular as an alternative to traditional cast iron gutters, the main advantage being that they are substantially cheaper to manufacture. Furthermore plastics gutters are much lighter than their cast iron counterparts and consequently easier to transport, handle and fix to buildings. The main disadvantage of plastics gutters is that they are not as attractive to look at as cast iron ones, which are often fancily decorated by forming suitable shapes on the inside of the casting mould. The latter are still therefore preferred by parts of the market, despite their cost.

Plastics gutters can be manufactured in a number of ways, e.g. by extrusion or by injection moulding. Extruding gutters is a particularly inexpensive way of making them, but has its disadvantages. For example the cross-sectional profile of the gutter has to be constant along its entire length since it is fixed by the shape of the extrusion nozzle. This means that separate unions, supporting brackets etc. must be made, by moulding them to fit around the outside of the gutter. Consequently separate tools are needed for each part, which is costly. Moreover, the appearance can be further adversely affected since the moulded and extruded articles will often not match each other in colour and texture.

An alternative method, which overcomes some of these problems is disclosed in GB-B-2245612. Here, the gutter is injection moulded rather than extruded. This offers the possibility of forming a union integrally on one end of the gutter to make a socket, thus avoiding the need for an extra mould tool. Similarly reinforcing braces may be formed at intermediate points along the gutter. The opposite end to that on which the socket is integrally formed constitutes a spigot which is inserted into the socket of an adjacent gutter. Accordingly, although moulding rather than extruding offers the possibility of adding decoration such as an embossed relief to the outside edge of the gutter, this is not done since the spigot end must be smooth to ensure a good seal with the corresponding socket. Although there could be partial decoration and a smooth portion could be formed at one end, this would preclude being able to cut the gutter to length if necessary since the smooth portion would then be lost.

From a first aspect the present invention provides a moulded gutter having one end of smaller cross section than the other, the external cross section of said one end substantially matching the internal cross section of the other end and being adapted to cooperate with the other end of a like gutter to form a join, characterised in that the gutter comprises a main section extending from said other end to adjacent said end portion, where the cross section is reduced so as to form a spigot to fit into the main section of a like gutter.

From a second aspect the invention provides a moulded gutter having a relatively short end portion of reduced cross-section at one end, adapted to cooperate with the main section of a like gutter to form a join, wherein the external cross-section of said end portion substantially matches the internal cross-section of the main section.

One advantage of the present invention is that rather than needing a separate union member, it is provided integrally with the gutter by the end portion. Effectively the end portion acts as a spigot and the rest of the gutter as a corresponding socket. In GB-B-02245012, by contrast, there is an end portion which acts as a socket. Thus in accordance with the present invention, adjacent pieces of gutter can be joined by inserting the end portion of one into the main section of the other. The union is internal and so cannot be seen from outside. This offers the possibility of moulding the gutter with decoration on the outside of the main section which may run continuously without being interrupted.

The gutter could be moulded from any suitable material e.g. aluminium, but preferably it is moulded from a plastics material. This has the advantage that the gutter is inexpensive to manufacture but be made to appear externally like a cast-iron gutter e.g. by using a suitable colour and texture. Furthermore since the whole length of the main section can act as a socket for such a spigot, the gutter may be cut anywhere along this length and still be able to be effectively joined to another piece of gutter by receiving its spigot.

The gutter may be of such a shape that adjacent gutter sections are self-retaining, requiring no clips or the like to retain the two sections together. Preferably however, the main gutter portion is provided with outwardly extending flanges along its upper edge, and the end portion is provided with corresponding sockets to receive the flanges on a like gutter. This maintains the ability to be able to shorten the gutter almost anywhere along the length of the main section without interfering with the means of fitting two adjacent gutters together.

In general, the sockets will be visible along the top edge of the outer surface of a length of gutter as a series of protrusions, partially detracting from its appearance. To overcome this, decorations such as castellations could be moulded along the top edge of the main gutter section which resemble the engaging means and provide a continuous pattern.

When two adjacent gutter pieces are fixed together, a seal is required between them to make the joint watertight. In the case of the present invention, the seal could be in the form of a seal, e.g. a rubber seal, partially retained in a cavity formed in a suitable position on the gutter. Alternatively, a liquid seal might be usable. Preferably however, a thin, ribbon type seal is used made of e.g. rubber, synthetic rubber, nitryl rubber or the like.

Where a solid seal is used, it may be attached to either portion of the gutter, but preferably it is attached to the outer surface of the spigot end portion of the gut-

ter. This is advantageous for the reasons of being able to shorten a piece of gutter as set out previously. The seal may be attached by any convenient method e.g. adhesive, but preferably the seal is attached by co-moulding or by ultrasonic welding.

The gutter may be fixed to the building or the like which it is intended to serve by any suitable means, e. g. a cradle type bracket which is affixed to the wall. Preferably however, a hole is defined near an upper edge of the gutter for receiving fixing means therethrough, e.g. a screw. In a preferred embodiment the hole is provided in the vicinity of the spigot end portion so that, as described above, a particular piece of gutter may be shortened whilst still retaining all its useful features.

The gutter may be produced in any convenient length. Preferably however the length is arranged to correspond to the maximum spacing between supports for the gutter for a given gutter strength. With such an arrangement, the spacing requirement is automatically fulfilled however the gutter is installed. More preferably the length of the gutter is between 0.5m and 1.5m and most preferably it is approximately 1 metre.

The spigot end portion is preferably provided with a support brace, most preferably an integral support brace, extending between opposite sides of the gutter. This will provide rigidity to the gutter and in many cases this may be all that is needed. In some cases however, a supporting brace may be provided to lend extra rigidity to the gutter. Such a brace would be most likely to be required where the gutter is to be used in regions of heavy snow-fall since here gutters are often subject to high loads when supporting the snow and subsequent water surges when it melts. Preferably, the additional brace is removably provided across the open top of the gutter so as not to interfere with the flow of water in the gutter. If no support brace is provided or any support brace that is provided is removable, the gutter pieces may be simply stacked inside each other. If an integral brace is provided at the spigot end portion then they may be stacked by reversing alternate pieces. By being removable, a strengthening brace may be fitted wherever required.

From a further aspect the invention provides a moulded gutter comprising a channel part and a supporting bracket which is vertically slidably receivable in said channel part.

This arrangement is advantageous in allowing a supporting bracket to be added to or removed from the bracket quickly and easily depending upon the operational requirements.

A gutter in accordance with the first or second aspects of the invention is advantageous in that only a single moulding tool is required to produce it. Practical gutter systems invariably comprise other elements in addition to straight gutter elements e.g. end stops, corners and downpipes. These elements may also be moulded with a portion to act either as a spigot or as a socket of the type formed at either end of the gutter described above. Such a system is novel and advantageous in itself and therefore from a second aspect the invention provides a gutter system comprising a gutter in accordance with the first aspect of the invention and a plurality of gutter elements each element having a mating portion either with an external cross-section which substantially matches the internal cross-section of the main portion of the gutter or an internal cross-section which substantially matches the external section of the end portion of the gutter.

A gutter system in accordance with the present invention may be assembled quickly and easily by virtue of being able to connect two pieces of gutter longitudinally by sliding the spigot formed on one end of a piece of gutter, into the opposite end of an adjacent gutter. Such a method is advantageous over known methods which require a straight line to be established along a wall or the like, along which brackets are affixed at regular intervals before fitting the pieces of gutter to them; since it is not necessary to affix any brackets prior to mounting the gutter pieces.

Certain preferred embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:-

Fig. 1 is a partial perspective view of a gutter in accordance with the present invention showing its spigot end;
Fig. 2 is a perspective view of a sliding support brace for use with the gutter of Fig. 1;
Fig. 3 is a partial perspective view of a gutter showing a fixed mid-way point for a support brace;
Fig. 4 is a perspective view of a support brace for use with the gutter of Fig. 3;
Fig. 5 is a partial perspective of a gutter showing its spigot joint, fixing hole and integral support brace;
Fig. 6 is a partial perspective view of a gutter having an integral support brace.

Turning first to Fig. 1, a piece of gutter made, e.g. by injection moulding, from plastics is denoted generally by the reference numeral 1. The gutter 1 is generally channel-shaped and at each upper edge has a horizontally extending lip or flange 2. At one end, a portion of the gutter 1 has the same cross-sectional shape as the rest of the gutter but is reduces in size. This end portion thus forms a spigot 4, since its external cross-section 6 substantially matches the internal cross-section 8 of the rest of the gutter. At either upper edge of the spigot 4 is a hook 10 which is shaped to slide over and laterally retain the lip 2 of another piece of gutter identical to the one shown.

A seal 12 is mounted to the outer surface 6 of the spigot 4. The seal 12 is a thin rubber or synthetic (e.g. nitryl rubber) seal which is attached to the surface 6, e. g. be adhesive, co-moulding or ultrasonic welding. The seal should be as thin as possible to minimise the size of the step 14 presented by the inner surface of the spig-

ot 4 when joined to another piece of gutter. An internal joint such as one of the sort set out here almost inevitably results in a step or the like. Whilst this usually has an insignificant effect on flow rate through the gutter, the gutter may be slightly enlarged as compared to an equivalent prior art gutter to ensure an equivalent flow capacity.

At one upper edge of the gutter 1 there is a recess 16 for accommodating a mounting screw (not shown) which extends through a hole 18 formed in the rear wall of the recess. The recess 16 and hole 18 are formed next to the joint spigot 4. This means that the gutter will maintain the means for mounting it to a wall or the like even if it is shortened. By moulding the gutter to be no longer than the maximum distance between brackets as set out in building regulations, this requirement need not be considered by the gutter installer, since it is `built-in'.

Referring now to Fig. 2, a sliding support brace 20 is shown, for providing extra strength to the gutter if necessary. At either end an integral hook 22 is formed which has the same form as the hooks 10 at the top of the spigot 4. Therefore, the brace 20 is able to slide along the lips 2 making it a simple matter to add as much extra support to the gutter as is required simply by sliding the required number of braces 20. Of course they must be slid onto the gutter from the opposite end to the one shown in Fig. 1. A mounting plate 24 is formed integrally with one of the hooks 22 and has a mounting hole 26 defined in it to enable the brace 20 to be mounted to the wall or the like. By making the brace removable, not only can it be used only where it is needed, but the gutters may be stacked prior to use.

Fig. 3 shows another embodiment of the gutter. In this embodiment another recess 16 is formed mid-way along the gutter and is partially closed by projections 28. Similar protrusions 30 are formed on the opposite upper edge of the gutter. The projections 28,30 are provided to accommodate mounting plates 34 which are integrally formed at each end of a support brace 32 (Fig. 4). The brace 32 is thus removable and therefore if required it may be inserted on site so as to allow the gutters to be stacked better during storage. If the centre mounting hole 18 is not required, then it may simply be left unused.

Fig. 5 shows another embodiment of the gutter which is very similar to that shown in Fig. 1. The difference is that an integral support bracket 36 is formed at the inner end of the spigot 4. Whilst this does have the disadvantage that it makes the gutters more difficult to stack, it is more advantageous for gutters that are to be used in heavy flow applications since it obviates the need to mould and fit a separate strengthening bracket.

Fig. 6 shows a further embodiment in which an integral support bracket 38 is formed near the socket end of the gutter. This may be provided in addition to or instead of a bracket 36 formed at the spigot end. Furthermore such brackets could be formed anywhere along the length of the gutter e.g. approximately centrally. A recess 40 is provided next to the bracket 38 to accommodate a suitable fixing means, e.g. a screw which could either be self-tapping or a hole could be drilled if and when required.

The method of assembling a gutter system using the gutter pieces described above will now be explained. Clearly, many different combinations of components are possible depending upon the exact gutter system required. Only the main steps for constructing a particular length of guttering will be described below. First, an end-piece e.g. in the form of a down-pipe, junction or an end stop is attached to a wall at one end of the desired length of gutter. This end-piece has an engaging portion in the form of a spigot 4 and hooks 10 identical to those shown in Fig. 1. A piece of gutter 1 is then brought longitudinally towards the end-piece with its socket end nearest to the end-piece. Once the gutter piece 1 is in place, it may be fixed at its other end through the mounting hole 18. If a sliding support brace 20 is to be used, it is slid onto the gutter piece 1 before doing this. If a support brace of the type shown in Fig. 4 is used, this is attached after the gutter has been fixed to the wall since the brace 20 will cover the fixing screw. Once in contact, the gutter piece 1 is manoeuvred so that the spigot 4 of the end piece enters the end of the gutter piece 1 and the hooks 10 slide over its lips 2. The hooks 10 and spigot 4 cooperate with the seal 12 to produce a watertight seal.

A second gutter piece 1 may then be pushed over the spigot 4 at the end of the first piece of gutter and fixed at its far end. This process is then repeated as many times as required until the guttering is the required length. If the required length is not an exact multiple of the length of a single gutter piece 1, the last piece may be cut to an appropriate length whilst still forming a suitable socket for the spigot of the previous piece. The length of guttering is then finished off by an end piece which has an engaging portion having the same cross section as the main portion of the gutter piece 1, i.e. it forms a suitable socket for the spigot 4.

It will be seen by those skilled in the art that various modifications may be made to the described embodiments without departing from the scope of the present invention. For example the outer edges of the gutter may be decorated with a three dimensional relief, which would not be interrupted by joining means since these are all accommodated internally. Also, whilst a particular cross-sectional gutter shape is shown, any suitable shape may be used e.g. a box gutter shape or half-round etc. Furthermore the gutter does not have to be made from a plastics material it could instead be made from e.g. aluminium.

Claims

1. A moulded gutter (1) having one end (4) of smaller cross section than the other, the external cross section (6) of said one end (4) substantially matching the internal cross (8) section of the other end

and being adapted to cooperate with the other end of a like gutter to form a join, characterised in that the gutter comprises a main section extending from said other end to adjacent said one end (4), where the cross section is reduced so as to form a spigot (4) to fit into the main section of a like gutter.

2. A moulded gutter (1) as claimed in claim 1, wherein the main section has a substantially constant cross section.

3. A moulded gutter (1) as claimed in claim 1 or 2, wherein said one end (4) has a support (20;32;36) extending between opposite sides of the gutter.

4. A moulded gutter (1) as claimed in claim 3, wherein said support (36) is integrally moulded with the end portion (4).

5. A moulded gutter (1) as claimed in any preceding claim, wherein the gutter is injection moulded from a plastics material.

6. A moulded gutter (1) as claimed in any preceding claim wherein the main section is provided with outwardly extending flanges (2) and the end portion is provided with corresponding sockets (10) for receiving the flanges on a like gutter.

7. A moulded gutter (1) as claimed in claim 6, wherein the upper edge of the gutter is provided with protrusions which are intended to resemble said sockets (10), thereby forming a continuous pattern along the top of the gutter.

8. A moulded gutter (1) as claimed in any preceding claim, wherein said one end (4) is provided with a seal (12).

9. A moulded gutter (1) as claimed in claim 8, wherein said seal (12) is bonded to said one end (4).

10. A moulded gutter (1) as claimed in any preceding claim, comprising a support brace (20;32) removably provided across the open top of the gutter.

11. A moulded gutter (1) as claimed in claim 10, wherein said support brace (32) is vertically, slidably receivable in the gutter.

12. A moulded gutter (1) as claimed in any preceding claim comprising a hole (18) defined near an upper edge of the gutter in the vicinity of said end (4) for receiving a fixing means therethrough.

14. A moulded gutter (1) as claimed in any preceding claim having a length of between 0.5m and 1.5m.

15. A gutter system comprising a moulded gutter (1) as claimed in any preceding claim and a plurality of gutter elements, each element having a mating portion either with an external cross-section which substantially matches the internal cross-section (8) of the main section of the gutter or an internal cross-section which substantially matches the external cross-section (6) of the one end of the gutter.

16. A gutter system as claimed in claim 16, wherein said gutter elements are selected from a group comprising downpipes junctions, right-angle bends and end stops.

17. A moulded gutter having a relatively short end portion of reduced cross-section at one end, adapted to cooperate with the main section of a like gutter to form a join, wherein the external cross-section of said end portion substantially matches the internal cross-section of the main section.

18. A moulded gutter comprising a channel part and a supporting bracket which is vertically slidably receivable in said channel part.

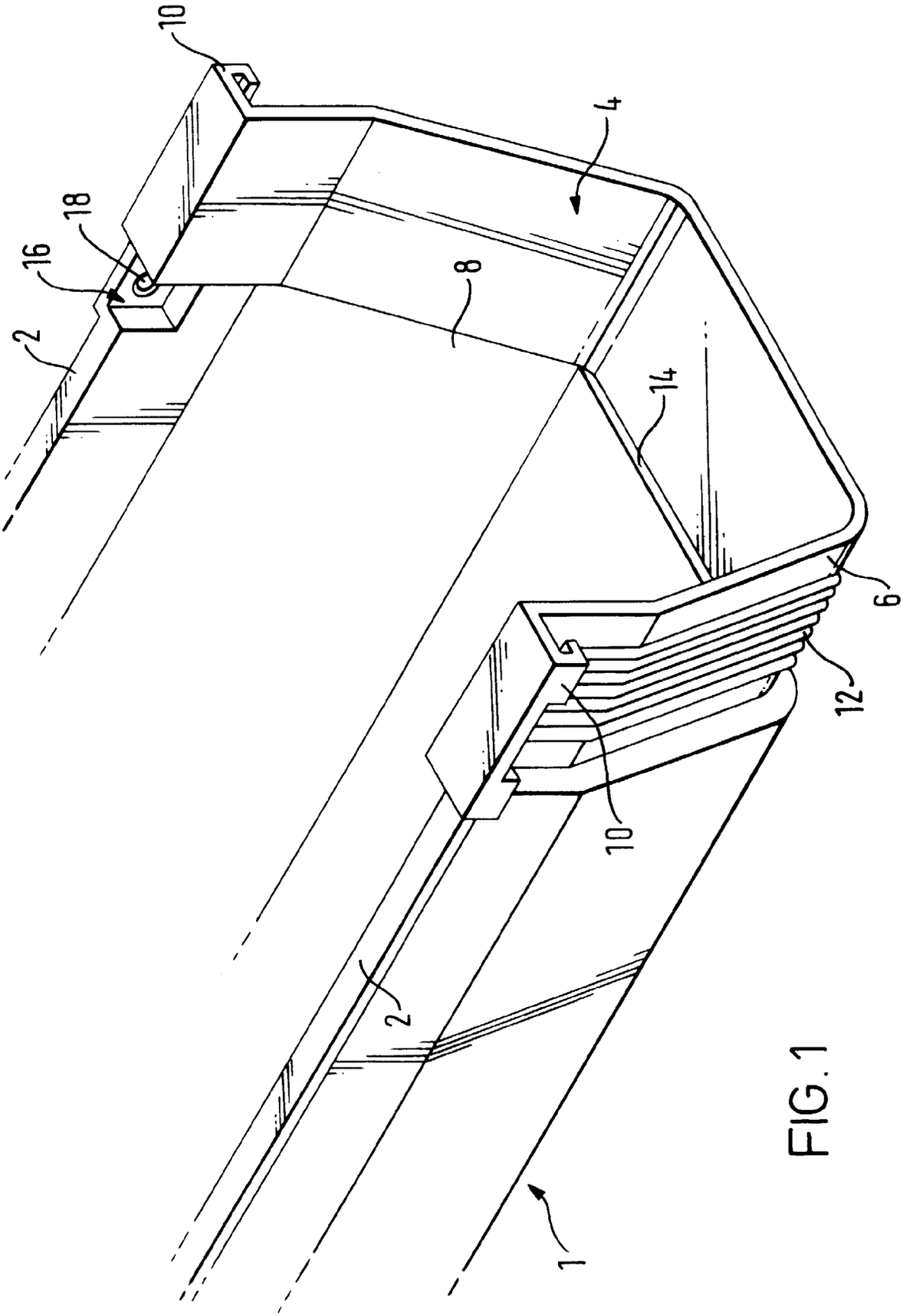

FIG. 1

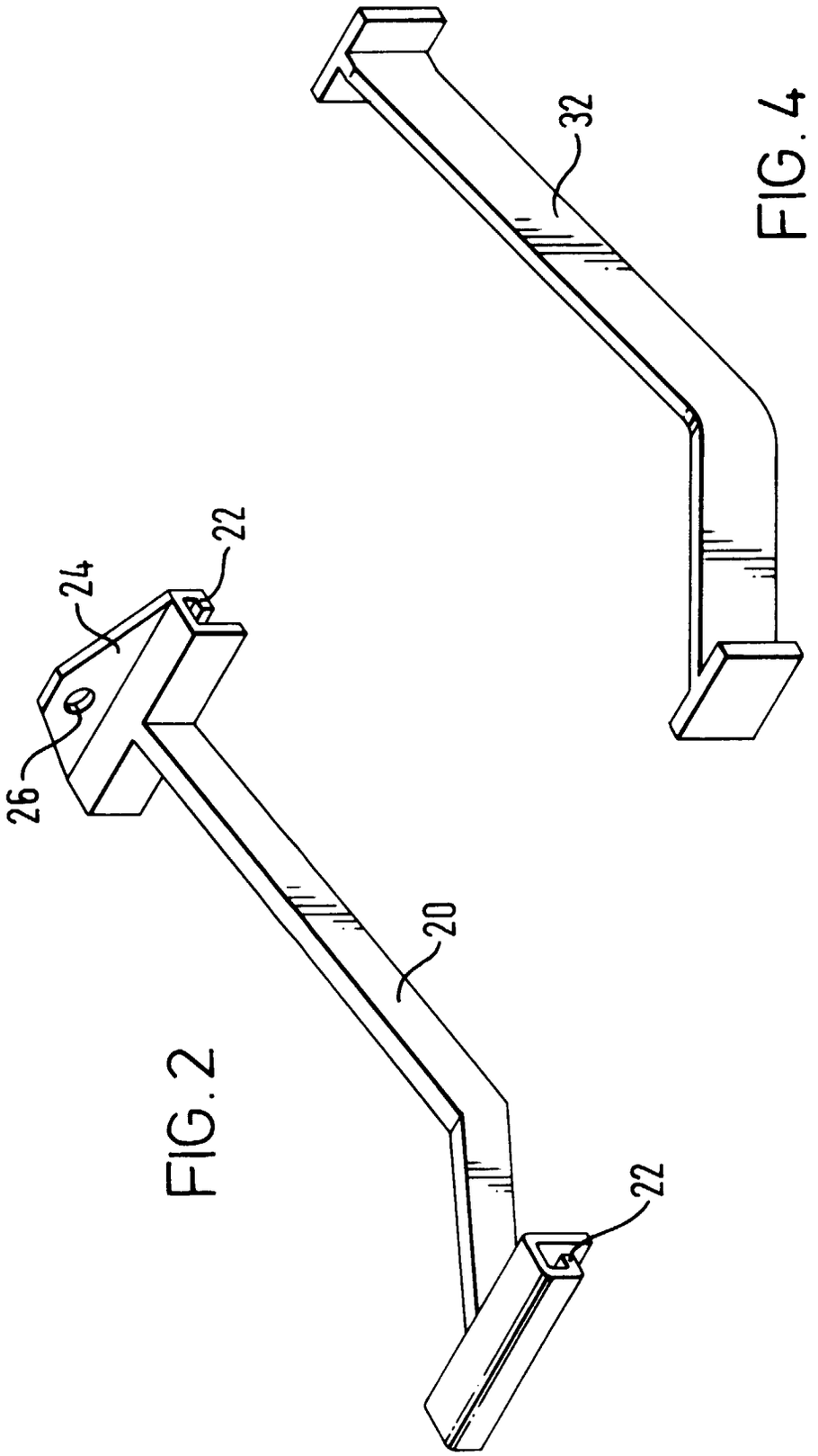

FIG. 4

FIG. 2

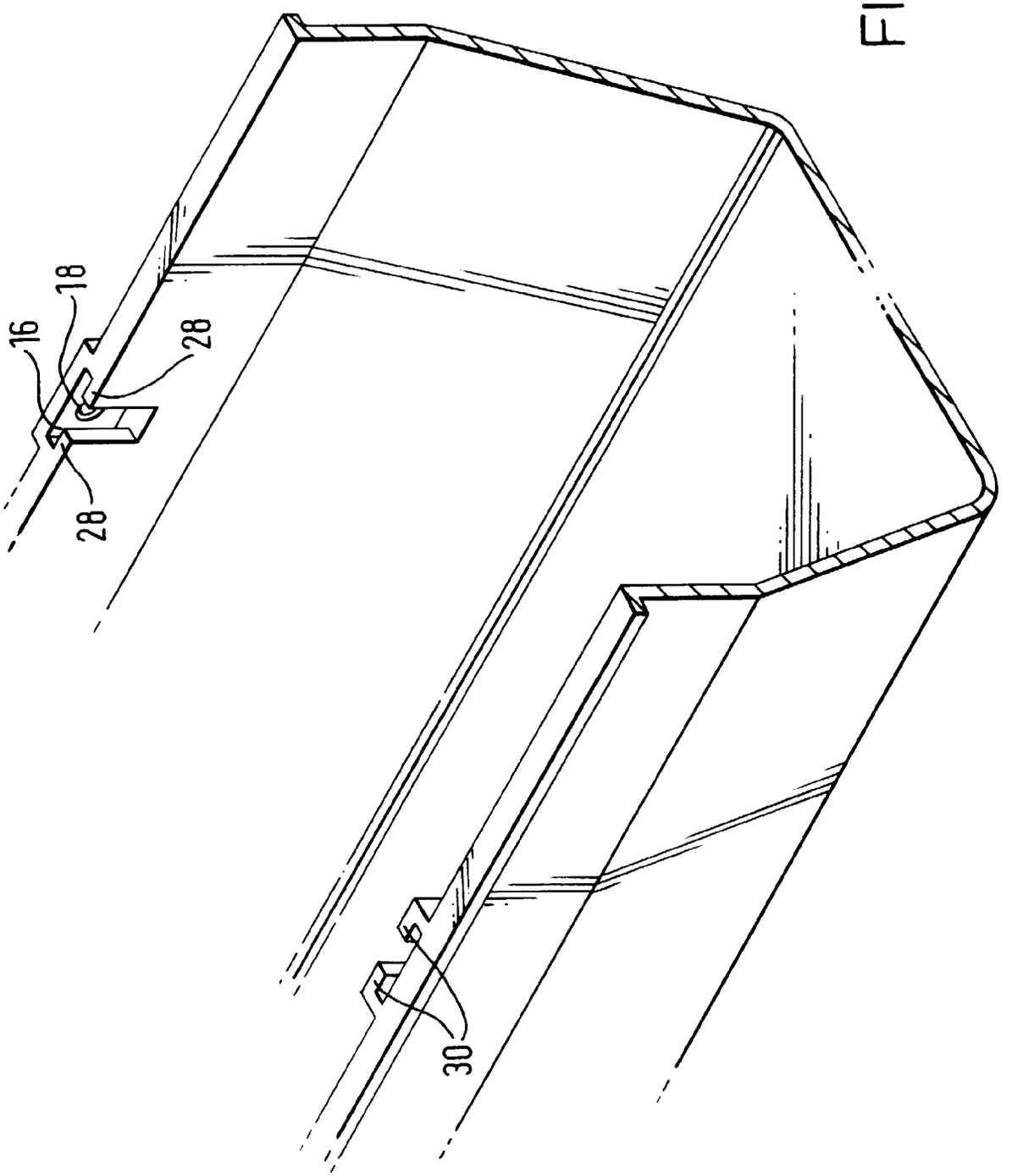

FIG. 3

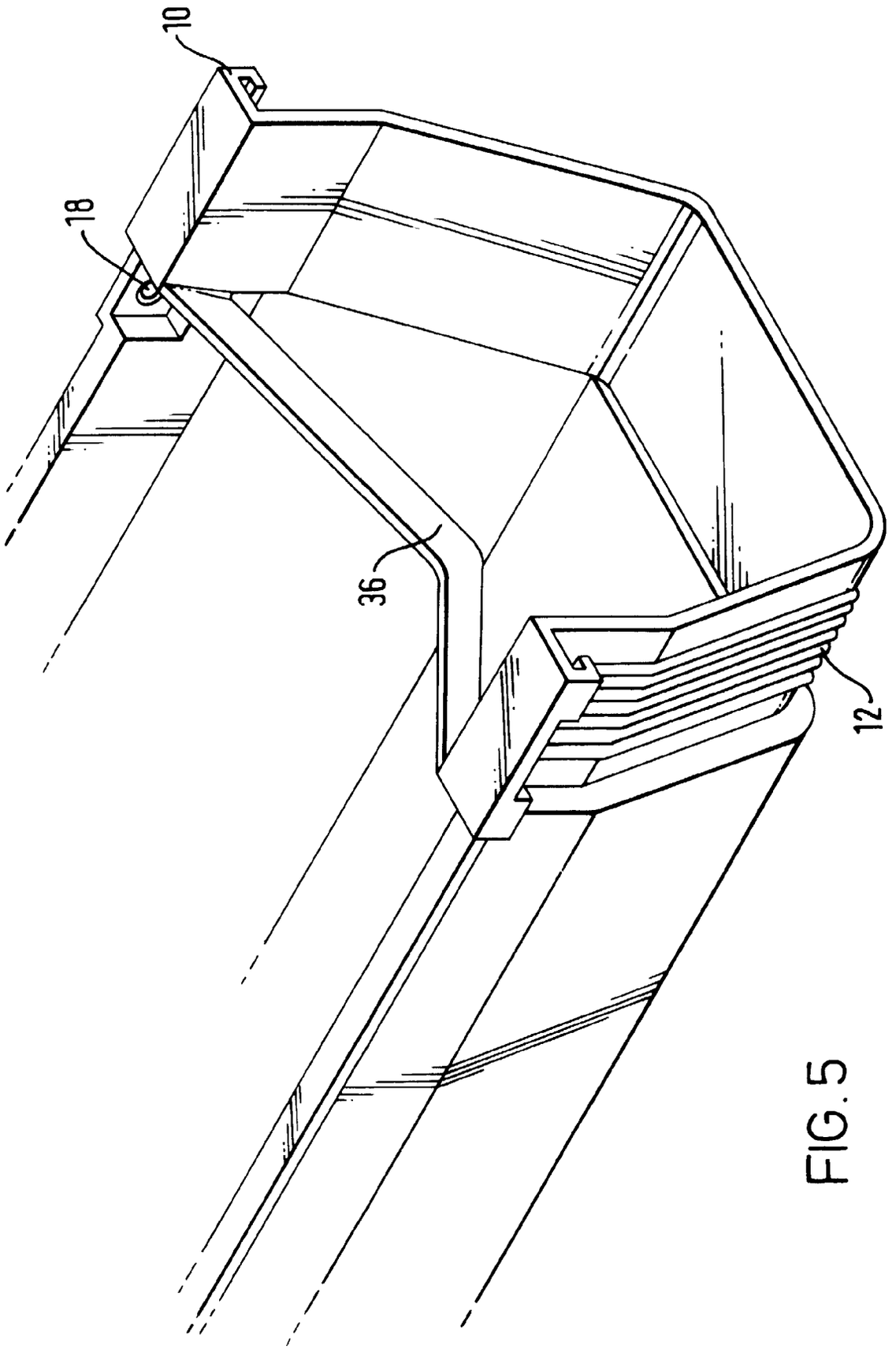

FIG. 5

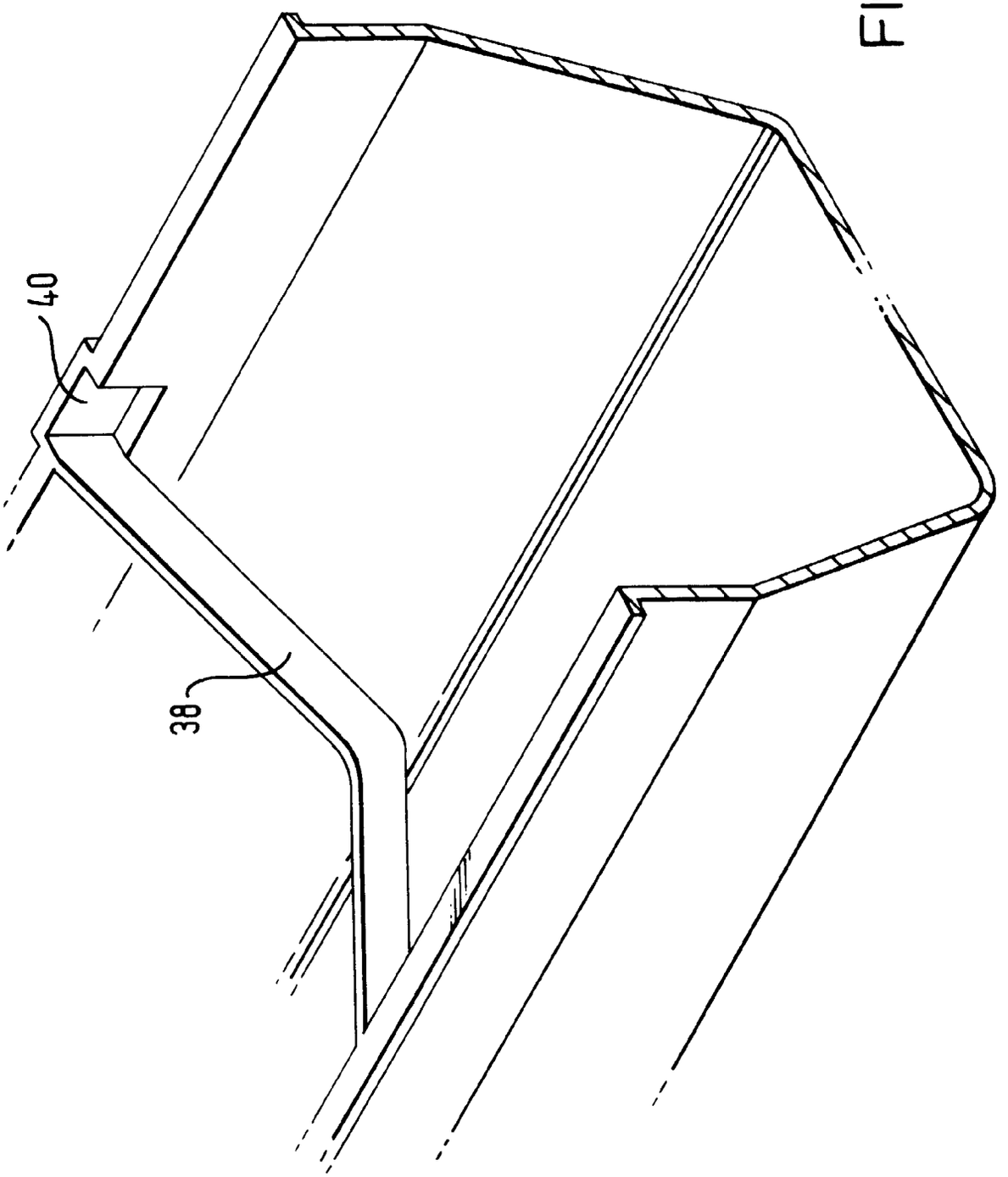

FIG.6