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European Patent Office
Office européen des brevets



(11) Publication number:

0 481 819 B1

(12)

EUROPEAN PATENT SPECIFICATION

(49) Date of publication of patent specification: **29.11.95** (51) Int. Cl.⁶: **E04D 13/064**

(21) Application number: **91309661.6**

(22) Date of filing: **17.10.91**

(54) **Guttering.**

(30) Priority: **17.10.90 GB 9022516**

(43) Date of publication of application:
22.04.92 Bulletin 92/17

(45) Publication of the grant of the patent:
29.11.95 Bulletin 95/48

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB IT LI LU NL SE

(56) References cited:

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Description

This invention relates to guttering for the roofs of buildings.

There have been many proposals to provide guttering in which a series of spaced apart brackets is secured to a building adjacent its roof and a gutter body is engaged with the brackets by a clipping action sometimes with the addition of a positive fastening device.

In AU-B-6841273 an arrangement is shown for rolled sheet gutters. This includes fairly complex shapes for the brackets and necessitates re-entrant or other gutter formations which prevent the gutter having a smooth, unrelieved, interior of simple cross sectional shape. Furthermore although the arrangement provides for clipping the gutter body to the brackets the eventual engagement of the gutter with its brackets does not hold them tightly together and would permit limited movement between them. Furthermore it is made clear that the gutter may be unclipped from its brackets by a reversal of the assembly movement. Also it is unclear how adjacent lengths of guttering are joined so as to provide a watertight joint and so as to obtain a clean "sweep".

WO 84/02552 and GB 2145754A both show clipped arrangements involving both side walls of the gutter and requiring part of each bracket to extend across the upper, open, part of the gutter. Again, in both cases it is clearly intended that the gutter may be unclipped by reversing the assembly movement. FR-A-2526836 shows an arrangement which has internal profiles making sweeping difficult, is easy to unclip and has joints between lengths of guttering which are unclear and appear to require welding or heat sealing. Other arrangements are shown in US-A-3150853 and US-A-3864882.

According to one aspect of the present invention there is provided roof guttering comprising in combination a gutter body and a plurality of spaced connectors to be secured to a building adjacent its roof in which each connector has upper and lower spaced apart arms extending from a base to project outwardly of the building wherein the body is formed at one side thereof with spaced apart, first and second formations accessible externally of the body to cooperate with the respective upper and lower arms so that after the connector is secured to the building the first and upper formation may be engaged with the upper arm and the body rotated to engage the second and lower formation with the lower arm as a snap fit to lock the body and the connector together characterised in that the second formation forms a solid arm extending outwardly of the gutter body so as to present a smooth unbroken non-reentrant profile for the inner surface of

the body between its inner and outer edges, wherein the engagement of each lower arm and the second formation for locking the body to the connector is achieved by means of a nib formed on either the second formation or the lower arm which engages with a recess formed on the other of the second formation and the lower arm.

One embodiment of the invention will now be described by way of example with reference to the single figure of the accompanying drawing which shows, partly in transverse section a gutter secured to a building. Referring to the drawing a gutter body 1 is carried by a series of connectors 2 secured to a building fascia 3 below its roof 4.

The body 1 is extruded from an aluminium alloy to be slightly more than semi-circular in section. Its inner end 5 is formed with a cap 6 having an inwardly hooked part 7 and an outwardly hooked part 8. The outer end 9 of the body is formed with a cap 10 having an inwardly hooked part 11 corresponding to the part 7. Spaced below the inner end 5, and on the inner side of the body an arm 12 extends outwardly of the body 1.

This arm has an inner part 13 connected with a flat base 14 by an inclined part 15. The outer end 16 of the base is connected to a tongue 17 inclined oppositely to the part 14. The tongue terminates in a nib 18 having an inclined face 18a. Thus a recess is formed above the base 14 between the part 15 and the tongue 17.

The connector 2 is also extruded from an aluminium alloy which is then cut into short lengths so that a plurality of such connectors can be secured at intervals along the fascia 3. The connector has a base 19 formed with at least one slot to be secured against the fascia by a fastener 20. At its upper end the connector is formed with a first arm 21 terminating in an upward extension 22. The connector has a second arm 23 spaced from its lower end 24. This second arm has an inner zig-zag portion 25 providing a recess 26 and an outer flat portion 27 having a chamfered end 28.

The fascia 3 and roof 4 are indicated diagrammatically and when the gutter body 1 is mounted as described the outer end 29 of the roof extends partially across its open end 30.

In practice a series of connectors 2 is secured to the fascia 3 at intervals of say, 1m and a length of gutter body (which may be 5m) has its hooked part 8 engaged over the extensions 22 of the connectors. The body is then pivoted about the extensions 22 until the nib 18 passes the flat portions 27 with a small clearance and engages shoulders 31 of the zig-zag portions 25. Further pivoting under increased pressure causes the nib 18 to ride up these shoulders and snap into the recesses 26. This arrangement provides a very firm fixing and it will be noted that, when assembled the flat portion

27 closely engages within the recess above the base 14.

When the gutter assembly is in place screws (not shown) could extend on the line 37 to secure the arm 12 to some or all of the connectors 2.

With the arrangement described and shown in the drawing it has been found that the force required to unclip the body by reversal of the assembly movement is much greater than the assembly force. Thus the body 1 can, in practice, be removed from the connectors 2 only by longitudinal sliding. This subordinate feature of the invention can be important when the guttering is of expensive alloy and is used at a location where it might be stolen.

This particularly firm fixing is achieved by virtue of the close engagement of the inclined face 18a within the recess 26. It will be understood that the corresponding surface of the recess 26 closely engages the face 18a and is disposed at such an angle to the base 19 that unclipping the body 1, by rotating it about the upper part of the upward extension 22, requires much greater force than the original assembly movement. While such unclipping is not impossible it means that, for practical purposes, the body 1 can be removed from the connections only by sliding.

In a modification, not shown in the drawing, the zig-zag portion 25 is omitted and the arm 12 lies closely along the tongue 17.

At a juncture of two bodies 2 a bridge 32 is provided. This bridge is also extruded from an aluminium alloy to the same shape as the body 1 but of sufficiently smaller size both to fit within the body and also so that in a relaxed position (not shown) its ends 33 and 34 are curved slightly towards one another. This arrangement enables one end, say 33, to be engaged under the hooked part 7 with the other end 34 outside the hooked part 11. The bridge 32 may then be flexed until its end 34 snaps beneath the hooked part 11 to hold the bridge firmly in place. The bridge has three longitudinal ribs 35 on its outer surface to engage the inner surfaces of adjoining bodies 1 and it is expected that a sealant mastic (not shown) will fill the space 36 between the bodies and the bridge 32. The ribs 35 ensure that the thickness of the body of mastic will be substantially even.

Although as described the body 1 is substantially semi-circular, other shapes could be provided. Also other metals or plastics could be used for the various parts of the gutter assembly.

In the arrangement described above the arm 12 provides substantially all the flexing required to achieve a snap-fit between the body 1 and the connector 2. Other constructions (not shown) are envisaged in which, for example, a locking formation is provided on the body 1 and the arm 23 is

appropriately shaped and flexes to engage it.

With some snap-fit arrangements it would be possible to roll form the gutter body 1.

With the described arrangement the continuous arm 12 provides a pleasing appearance from below and also prevents access to the fastening 20 for the connectors 2.

It will be understood that the slot formed in the base 19 of the connector 2 for the fastener 20 enables some adjustment to be made so that a number of connectors can be accurately aligned on the fascia 3. Packing pieces may be used beneath selected connectors to allow for irregularities in the fascia surface. Alternatively the base 19 could be in two parts (not shown) in a manner well known, for example, for other mounting brackets to provide adjustment both in the plane of the fascia and normal thereto.

In addition the snap-fit arrangement could include various positions of engagement. In the described construction this could be achieved by providing a plurality of recesses 26 along the second arm 23 so that the nib 18 can engage any one of them. Such an arrangement would provide additional flexibility in fixing the gutter 1 in circumstances in which it is difficult accurately to align the connectors.

Thus the present invention provides guttering that can include some or all of the following features.

1. All parts of the guttering can be extruded from light metal alloy.
2. The appearance of the guttering from below is aesthetically pleasing.
3. The interior of the gutter body is unencumbered by fixing devices and presents a smooth profile so that clogging by leaves or other debris is minimised.
4. There is freedom to have the gutter body of different cross sectional shapes.
5. The snap-fit between the body and connectors is particularly firm and can be designed so that unclipping by reverse movement is difficult and, in practice, the body needs to be removed from the connectors by sliding action.

Claims

1. Roof guttering comprising in combination a gutter body (1) and a plurality of spaced connectors (2) to be secured to a building (3) adjacent its roof (4) in which each connector has upper (21) and lower (23) spaced apart arms extending from a base (19) to project outwardly of the building wherein the body is formed at one side thereof with spaced apart, first (8) and second (12) formations accessible externally of the body to cooperate with the

respective upper and lower arms so that after the connector is secured to the building the first and upper formation may be engaged with the upper arm and the body rotated to engage the second and lower formation with the lower arm as a snap fit to lock the body and the connector together characterised in that the second formation (12) forms a solid arm extending outwardly of the gutter body so as to present a smooth unbroken non-reentrant profile for the inner surface of the body between its inner (5) and outer (9) edges, wherein the engagement of each lower arm (23) and the second formation (12) for locking the body to the connector is achieved by means of a nib (18) formed on either the second formation (12) or the lower arm (23) which engages with a recess (26) formed on the other of the second formation (12) and the lower arm (23).

2. Guttering according to claim 1 in which the inner edge (5) of the gutter body is formed with an outwardly hooked part (8) constituting the first formation and the second formation (12) extends outwardly of the gutter body at a position spaced from the first formation to each connector base (19) so as to enclose each lower arm (23).
3. Guttering according to claim 1 or claim 2 in which each lower arm (23) has a part to engage a cooperating part (18a) on the second formation in such a manner that the force required to engage the parts as a snap fit is significantly less than that required to release the parts on reversal of the engagement motion.
4. Guttering as claimed in any one of the preceding claims further comprising a bridge (32) to join together two adjacent gutter bodies (1) by engagement with inwardly hooked parts (7,11) of both bodies, the hooked parts being provided at the inner (5) and outer (9) edges.
5. Guttering according to claim 4 in which the bridge has the same cross-sectional shape as the bodies but is of sufficiently smaller size to fit within the bodies.
6. Guttering as claimed in claims 4 or 5 wherein said bridge (32) is provided with longitudinal downwardly facing ribs (35).
7. Guttering according to any one of the preceding claims in which the gutter body and the connectors are extruded from an aluminium alloy, the connector extrusions being cut to

form individual connectors.

8. Guttering according to any one of the preceding claims wherein more than one said recess (26) is provided so that the nib can engage any one of the said recesses so as to provide various positions of engagement between said lower arm (23) and the second formation (12).

Patentansprüche

1. Dachrinne, enthaltend eine Kombination eines Dachrinnenkörpers (1) mit einer Vielzahl von beabstandeten Verbindern (2) zur Befestigung an einem Gebäude (3) angrenzend zu dessen Dach (4), wobei jeder Verbinder obere (21) und untere (23) beabstandete getrennte Arme enthält, die sich von einer Grundplatte (19) zum äußeren des Gebäudes erstrecken, und wobei der Körper an einer Seite mit beabstandeten getrennten ersten (8) und zweiten (12) Ausformungen versehen ist, die vom äußeren des Körpers zugänglich sind und mit den oberen bzw. unteren Armen so zusammenwirken, daß nach der Befestigung des Verbinders an dem Gebäude die erste und obere Ausformung in Eingriff mit dem oberen Arm gebracht und der Körper so gedreht werden kann, daß die zweite und untere Ausformung als Schnappverbindung mit dem unteren Arm in Eingriff gebracht werden kann, um den Körper und den Verbinder miteinander zu verriegeln, **dadurch gekennzeichnet**, daß die zweite Ausformung (12) einen festen Arm bildet, der sich zum äußeren des Dachrinnenkörpers erstreckt und ein glattes, nicht unterbrochenes, nicht abgesetztes Profil für die innere Oberfläche des Körpers zwischen seiner inneren (5) und äußeren (9) Kante bildet, wobei der Eingriff jedes unteren Armes (23) mit der zweiten Ausformung (12) zur Verriegelung des Körpers mit dem Verbinder durch eine Lippe (18) erreicht ist, die entweder auf der zweiten Ausformung (12) oder dem unteren Arm (23) ausgebildet ist und mit einer Vertiefung (26) in Eingriff gelangt, die auf der anderen zweiten Ausformung (12) und dem unteren Arm (23) ausgebildet ist.
2. Dachrinne nach Anspruch 1, bei der die innere Kante (5) des Dachrinnenkörpers mit einem nach außen gerichteten hakenförmigen Teil (8) ausgebildet ist, das die erste Ausformung bildet, und die zweite Ausformung (12) sich an einer Stelle zum äußeren des Dachrinnenkörpers erstreckt, die von der ersten Ausformung zu jeder Verbinder-Grundplatte (19) beabstandet ist und so jeden unteren Arm (23) einschließt.

3. Dachrinne nach Anspruch 1 oder 2, bei der jeder untere Arm (23) ein Teil zum Eingriff mit einem zusammenwirkenden Teil (18a) auf der zweiten Ausformung aufweist, derart, daß die für den Eingriff der Teile als Schnappverbindung erforderliche Kraft wesentlich kleiner ist als die zum Lösen der Teile bei der zur Eingriffsbewegung entgegengesetzten Bewegung benötigte Kraft. 5
4. Dachrinne nach einem der vorhergehenden Ansprüche, ferner enthaltend eine Brücke (32) zur Verbindung von zwei aneinanderliegenden Dachrinnenkörpern (1) durch Eingriff mit nach innen gerichteten hakenförmigen Teilen (7, 11) an beiden Körpern, wobei die hakenförmigen Teile an der inneren (5) und äußeren (9) Kante vorgesehen sind. 10 15
5. Dachrinne nach Anspruch 4, bei der die Brücke dieselbe Querschnittsform wie die Körper, jedoch derart ausreichend geringere Abmessungen aufweist, daß sie innerhalb der Körper eingepaßt werden kann. 20
6. Dachrinne nach Anspruch 4 oder 5, bei der die Brücke (32) mit in Längsrichtung verlaufenden, nach unten gerichteten Rippen (35) versehen ist. 25 30
7. Dachrinne nach einem der vorhergehenden Ansprüche, bei der der Dachrinnenkörper und die Verbinder aus einer Aluminium-Legierung stranggepreßt sind und die Verbinder-Preßprofile so abgeschnitten sind, daß sie einzelne Verbinder bilden. 35
8. Dachrinne nach einem der vorhergehenden Ansprüche, bei der mehr als eine Vertiefung (26) vorgesehen ist, derart, daß die Lippe mit jeder der Vertiefungen in Eingriff gelangen kann, um so verschiedene Positionen für den Eingriff zwischen dem unteren Arm (23) und der zweiten Ausformung (12) vorzusehen. 40

Revendications

1. Gouttière de toiture comprenant en combinaison un corps de gouttière (1) et une pluralité de connecteurs espacés (2) devant être fixés à un bâtiment (3) près de son toit (4), dans laquelle chaque connecteur comporte des bras supérieur (21) et inférieur (23) espacés l'un de l'autre, s'étendant à partir d'une base (19) pour faire saillie vers l'extérieur du bâtiment, dans laquelle le corps est constitué sur un de ses côtés avec des première (8) et seconde (12) conformations, accessibles depuis l'extérieur 50 55

du corps pour coopérer avec les bras supérieur et inférieur respectifs de manière qu'après la fixation du connecteur au bâtiment, la première et supérieure conformation puisse venir en prise avec le bras supérieur et que le corps tourne pour faire venir en prise la seconde et inférieure conformation avec le bras inférieur, par fixation instantanée afin de verrouiller le corps sur le connecteur, caractérisée en ce que la seconde conformation (12) constitue un bras rigide s'étendant vers l'extérieur du corps de gouttière de manière à présenter un profil lisse, non-rentrant et non-interrompu pour la surface interne du corps entre ses bords interne (5) et externe (9), dans laquelle l'engagement de chaque bras inférieur (23) et de la seconde conformation (12) pour verrouiller le corps sur le connecteur est obtenu à l'aide d'un talon (18) formé soit sur la seconde conformation (12) soit sur le bras inférieur (23), qui vient en prise avec un évidement (26) formé sur l'autre de la seconde conformation (12) et du bras inférieur (23).

2. Gouttière selon la revendication 1 dans laquelle le bord interne (5) du corps de gouttière est formé avec une partie externe en crochet (8) constituant la première conformation et la seconde conformation (12) s'étend vers l'extérieur du corps de gouttière en un emplacement espacé de la première conformation vers chaque base de connecteur (19) de manière à enfermer chaque bras inférieur (23). 25 30
3. Gouttière selon la revendication 1 ou 2 dans laquelle chaque bras inférieur (23) comporte une partie venant en prise avec une partie coopérante (18a) sur la seconde conformation de manière que la force nécessaire pour faire venir en prise les parties, par fixation instantanée est significativement plus faible que celle nécessaire à la libération des pièces lors de l'inversion du mouvement d'engagement. 35
4. Gouttière selon l'une quelconque des revendications précédentes comprenant en outre un pont (32) pour raccorder deux corps de gouttière adjacents (1), par engagement sur des parties en crochet internes (7,11) des deux corps, les parties en crochet étant prévues sur les bords interne (5) et externe (9). 40 45
5. Gouttière selon la revendication 4 dans laquelle le pont présente la même forme de section droite que les corps, mais il est de dimension suffisamment plus petite pour s'ajuster dans le corps. 50 55

6. Gouttière selon les revendications 4 ou 5, dans laquelle ledit pont (32) est muni de nervures longitudinales orientées vers le bas (35).
7. Gouttière selon l'une quelconque des revendications précédentes dans laquelle le corps de gouttière et les connecteurs sont extrudés à partir d'un alliage d'aluminium, les extrusions de connecteurs étant découpées de façon à former des connecteurs individuels. 5
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8. Gouttière selon l'une quelconque des revendications précédentes dans laquelle on prévoit plus d'un évidement (26) afin que le talon puisse venir en prise sur n'importe lequel desdits évidements en vue de fournir diverses positions d'engagement entre ledit bras inférieur (23) et la seconde conformation (12). 15
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