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(54) **ACCESS COVERS FOR MANHOLES**

DECKEL FÜR EINE SCHACHTABDECKUNG

COUVERCLE D'ACCES POUR TROUS D'HOMME

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Description

[0001] This invention relates to access covers, e.g. for manholes, of the kind in which a cover member is removably fitted within a generally rectangular outer frame, the cover member being fabricated as a generally rectangular inner frame fixed to a base plate to provide a space which is subsequently filled (normally on-site) with concrete or other appropriate filling material. An access cover of this kind is described and claimed in the specification of my UK Patent No. 2 145 138B.

[0002] In my UK Patent Specification, the filling for the inner frame is reinforced by bars (e.g. of steel), which are located and held in place within the outer frame by clips prior to introducing the filling material. It has been found that the reinforcement is best formed as a grid, or mesh, with the crossing points fixedly joined together. However, a disadvantage of such a reinforcement arrangement is that the mesh cannot be cut to size and trimmed automatically and without considerable waste and hence is time consuming and expensive to produce.

[0003] An object of this invention is to provide an access cover of the kind discussed above incorporating an alternative reinforcement arrangement which lends itself to automatic manufacture.

[0004] According to this invention an access cover of the kind referred to above is characterised by a reinforcement arrangement for the inner frame comprising a number of bars fixed to the base plate of said inner frame., each bar comprising sheet material formed into a channel shaped cross-section.

[0005] Conveniently, each bar comprises a bottom web incorporating spaced fixing means for attachment to said base plate and opposed walls which taper outwardly from said web.

[0006] Preferably, to strengthen the bars, the outer edges of said opposed walls are reinforced by being bent over. The opposed walls may be formed with rib-like indentations for stiffening the walls and to provide a mechanical bond for said filling material.

[0007] According to a feature of the invention, the bars extend parallel to each other and the base plate is provided with respective lines of spaced fixing means for co-operating with said fixing means of the bars and positioned to interlock with the bar fixing means. With such an interlocking construction, it will be appreciated that the base plate has a high degree of rigidity sufficient to support the weight of the filling material in its uncured state with a minimum amount of deformation. Furthermore, the reinforcement arrangement acts as a composite with the filling material in its cured state to provide an extremely strong and rigid cover member. The reinforcement arrangement thus has a significant advantage over the arrangement used hitherto, in that the clips used in the prior arrangement merely support and position the reinforcement mesh above the base plate and therefor do not provide any significant rigidity to the base plate itself.

[0008] In order that the invention may be readily understood, one embodiment thereof will now be described with reference to the accompanying drawings, in which :-

Figure 1 is a perspective view of a cut length of steel strip from which a bar is formed,

Figure 2 is a perspective view of a formed bar,

Figure 3 is an exploded, perspective view showing the fixing of a bar onto the base plate of the access cover, and

Figure 4 is an exploded, perspective view showing the strengthened base plate as to be fitted into the inner frame of the access cover.

[0009] Referring to Figure 1, the bars are cut from a strip of steel 1, which is preferably stainless steel so as to avoid corrosion problems in use. The cut length is formed with fixing means comprising, in this embodiment, cut-outs 2 spaced along a central longitudinal portion 3 and with two sets of rib-like indentations 4, 5 along longitudinal portions 6, 7 on either side of the central portion; the rib-like indentations are pressed out of the plane of the strip 1 as shown at 4a in Figure 1. The positioning and orientation of the indentations of each set are chosen to produce a required degree of rigidity in the bar and to provide a mechanical bond for the filling material; in this embodiment the indentations are diagonally opposed as shown at 4a.

[0010] Referring to Figure 2, each bar 8 is formed by bending whereby the longitudinal portion 3 provides a central web and the portions 6, 7 provide outwardly tapering, opposed walls. In addition, the longitudinal outer edges 9, 10 are reinforced by being bent over as shown. It will be appreciated from the foregoing that the bars can be readily formed automatically from strip material using a conventional forming machine and that the finished bars can be designed to provide a required level of strength and rigidity using a minimum amount of material, thereby significantly reducing manufacturing costs compared with the reinforcement mesh previously used.

[0011] Referring to Figure 3, the base plate 11 is preferably of the same material as the bars (i.e. stainless steel) also to avoid corrosion problems and comprises a rectangular sheet with co-operating fixing means for the fixing means provided in the bars 8. In this embodiment, the co-operating fixing means comprises parallel lines of tongues 12, which are spaced from each other and extend in a common direction to interlock with respective ones of the number of bars 8 required to provide an appropriate degree of rigidity for the particular size of inner frame 13 (see Figure 4) being constructed. It will be appreciated that the spacing of each line of tongues 12 corresponds to the spacing of the cut-outs 2 of a respective bar 8 and that said bar is interlocked onto the base plate 11 by aligning its cut-outs over said tongues and lateral sliding movement from one side of

said base plates, as shown by the arrows in Figure 3. To aid load transfer in shear from the bars 8 to the base plate 11, preferably the tongues 12 of adjacent lines of tongues extend in opposite directions, as shown, whereby the bars are interlocked alternately by sliding movement from opposite sides of the base plate 11. As mentioned above, this construction provides a high degree of rigidity over the complete area of the base plate 11, to the extent that transverse bars are not required as in the case of the reinforcement mesh used hitherto.

[0012] Referring to Figure 4, the base plate 11, complete with its reinforcement bars 8, is located on horizontal support faces 14 provided by the inner frame 13 for the access cover. As described in my said UK Patent No. 2 145 138B, the individual frame members 15 of the inner frame are of profiled section, preferably of aluminium, and are provided with mitred corners which are fixedly crimped together. After locating the base plate 11 within the inner frame 13 it is fixedly secured by welding, or other appropriate means. The bars 8 are then maintained in their interlocked positions by abutting against vertical faces of ribs (16) specifically provided on the profiled frame members 15.

[0013] As described in my UK Patent No. 2 145 138B, the complete access cover is designed to be supplied without the filling material, which is normally poured on-site and then finished off with a covering matching the surrounding surface, e.g. tiles, carpet or vinyl floor covering.

Claims

1. An access cover of the kind comprising a cover member removably fitted within a generally rectangular outer frame, the cover member being fabricated as a generally rectangular inner frame (13) fixed to a base plate (11), the space formed thereby being subsequently filled with an appropriate filling material, **characterised in that** a reinforcement arrangement is provided for the inner frame (13) comprising a number of bars (8) fixed to said base plate (11) of said inner frame, each bar comprising sheet material (1) formed into a channel shaped cross-section
2. An access cover according to claim 1, **characterised in that** each bar (8) comprises a bottom web (3) incorporating a line of spaced fixing means (2) for attachment to said base plate (11) and opposed walls (6, 7) which taper outwardly from said web.
3. An access cover according to claim 2, **characterised in that** the outer edges (9, 10) of said opposed walls (6, 7) are strengthened by being bent over.
4. An access cover according to Claim 2, or Claim 3, **characterised in that** the opposed walls (6, 7) are

formed with rib-like indentations (4, 5) for stiffening said walls and for providing a mechanical bond for said filling material.

5. An access cover according to any one of the preceding claims, **characterised in that** said bars extend parallel to each other, and said base plate (11) is provided with respective parallel lines of spaced fixing means (12) for co-operating with said fixing means (2) of said bars (8) and positioned to interlock with the bar fixing means, thereby to provide a degree of rigidity to said base plate sufficient to support the weight of the filling material.
6. An access cover according to claim 5, **characterised in that** said fixing means (2, 12) comprise a spaced line of co-operating tongues (12) and cut-outs (2) for each bar, the arrangement being such that each bar is interlocked onto the base plate (11) by aligning the co-operating cut-outs and tongues and thereafter providing a sliding movement from one side of said base plate.
7. An access cover according to claim 6, **characterised in that** alternate lines of tongues (12) extend in opposite directions, whereby said bars (8) are interlocked alternatively by sliding movement from opposite sides of said base plate (11).
8. An access cover according to any one of Claims 5 to 7, **characterised in that** said lines of cut-outs (2) are provided in said bars (8), and said lines of tongues (12) are provided in said base plate (11).

Patentansprüche

1. Schachtabdeckung der Art, die ein Deckelelement aufweist, das abnehmbar in einen allgemein rechtwinkligen Außenrahmen eingesetzt wird, wobei das Deckelelement als ein allgemein rechtwinkliger Innenrahmen (13) hergestellt wird, der an einer Grundplatte (11) befestigt ist, wobei der Raum, der dadurch gebildet wird, im wesentlichen mit einem geeigneten Füllmaterial gefüllt wird, **dadurch gekennzeichnet, daß** für den Innenrahmen (13) eine Verstärkungsanordnung bereitgestellt wird, die eine Reihe von Stäben (8) umfaßt, die an der Grundplatte (11) des Innenrahmens befestigt sind, wobei jeder Stab Plattenmaterial (1) umfaßt, das zu einem U-förmigen Querschnitt geformt worden ist.
2. Schachtabdeckung nach Anspruch 1, **dadurch gekennzeichnet, daß** jeder Stab (8) einen unteren Steg (3), in den eine Reihe von mit Zwischenraum angeordneten Befestigungsmitteln (2) für die Anbringung an der Grundplatte (11) einbezogen ist, und gegenüberliegende Wände (6, 7) aufweist, die

von dem Steg konisch nach außen verlaufen.

3. Schachtabdeckung nach Anspruch 2, **dadurch gekennzeichnet, daß** die Außenränder (9, 10) der gegenüberliegenden Wände (6, 7) dadurch verstärkt sind, daß sie umgebogen worden sind. 5
4. Schachtabdeckung nach Anspruch 2 oder Anspruch 3, **dadurch gekennzeichnet, daß** die gegenüberliegenden Wände (6, 7) mit rippenartigen Vertiefungen (4, 5) gebildet werden, um die Wände zu versteifen und um eine mechanische Bindung für das Füllmaterial bereitzustellen. 10
5. Schachtabdeckung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** die Stäbe parallel zueinander verlaufen und die Grundplatte (11) mit entsprechenden parallelen Reihen von mit Zwischenraum angeordneten Befestigungsmitteln (12) für das Zusammenwirken mit den Befestigungsmitteln (2) der Stäbe (8) versehen und für das Einrasten mit den Stab-Befestigungsmitteln angeordnet ist, um dadurch der Grundplatte einen Grad an Steifigkeit zu geben, der ausreicht, um das Gewicht des Füllmaterials zu tragen. 15 20 25
6. Schachtabdeckung nach Anspruch 5, **dadurch gekennzeichnet, daß** die Befestigungsmittel (2, 12) eine mit Zwischenraum angeordnete Reihe von zusammenwirkenden Zungen (12) und Ausschnitten (2) für jeden Stab umfassen, wobei die Anordnung so ist, daß jeder Stab dadurch auf der Grundplatte (11) eingerastet wird, daß die zusammenwirkenden Ausschnitte und Zungen ausgerichtet werden und anschließend eine Gleitbewegung von einer Seite der Grundplatte bereitgestellt wird. 30 35
7. Schachtabdeckung nach Anspruch 6, **dadurch gekennzeichnet, daß** abwechselnde Reihen von Zungen (12) in entgegengesetzten Richtungen verlaufen, wodurch die Stäbe (8) wechselweise durch eine Gleitbewegung von gegenüberliegenden Seiten der Grundplatte (11) eingerastet werden. 40
8. Schachtabdeckung nach einem der Ansprüche 5 bis 7, **dadurch gekennzeichnet, daß** die Reihen der Ausschnitte (2) in den Stäben (8) bereitgestellt werden und die Reihen der Zungen (12) in der Grundplatte (11) bereitgestellt werden. 45 50

Revendications

1. Couvercle d'accès du type comprenant un élément de couvercle agencé de manière amovible dans un cadre externe généralement rectangulaire, l'élément de couvercle étant fabriqué sous forme d'un cadre interne généralement rectangulaire (13) fixé 55

à une plaque de base (11), l'espace ainsi formé étant ensuite rempli d'un matériau de remplissage approprié, **caractérisé en ce qu'un** agencement de renforcement est prévu pour le cadre interne (13), comprenant un certain nombre de barres (8) fixées à ladite plaque de base (11) dudit cadre interne, chaque barre comprenant du matériau en feuille (1) formé en une section transversale en forme de canal.

2. Couvercle d'accès selon la revendication 1, **caractérisé en ce que** chaque barre (8) comprend une bande inférieure (3) comportant une ligne de moyens de fixation espacés (2) destinés à être fixés à ladite plaque de base (11), et des parois opposées (6, 7) effilées vers l'extérieur à partir de ladite bande. 2. 3. Couvercle d'accès selon la revendication 2, **caractérisé en ce que** les bords externes (9, 10) desdites parois opposées (6, 7) sont renforcées par courbure. 4. Couvercle d'accès selon la revendication 2 ou la revendication 3, **caractérisé en ce que** les parois opposées (6, 7) comportent des entailles en forme de nervures (4, 5) pour renforcer lesdites parois et pour établir une liaison mécanique pour ledit matériau de remplissage. 5. Couvercle d'accès selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdites barres s'étendent parallèlement les unes aux autres, ladite plaque de base (11) comportant des lignes parallèles respectives de moyens de fixation espacés (12) destinés à coopérer avec lesdits moyens de fixation (2) desdites barres (8) et agencés de sorte à être verrouillés sur les moyens de fixation des barres, pour établir ainsi un degré de rigidité suffisant de ladite plaque de base pour supporter le poids du matériau de remplissage. 6. Couvercle d'accès selon la revendication 5, **caractérisé en ce que** lesdits moyens de fixation (2, 12) comprennent une ligne espacée de languettes (12) et d'entailles (2) de coopération pour chaque barre, l'agencement étant tel que chaque barre est verrouillée sur la plaque de base (11) par alignement des entailles et des languettes de coopération avant un déplacement par glissement à partir d'un côté de ladite plaque de base. 7. Couvercle d'accès selon la revendication 6, **caractérisé en ce que** des lignes alternées de languettes (12) s'étendent dans des directions opposées, lesdites barres (8) étant ainsi alternativement verrouillées par le déplacement par glissement à partir des côtés opposés de ladite plaque de base (11).

8. Couverture d'accès selon l'une quelconque des revendications 5 à 7, **caractérisé en ce que** lesdites lignes d'entailles (2) sont agencées dans lesdites barres (8), lesdites lignes de languettes (12) étant agencées dans ladite plaque de base (11).

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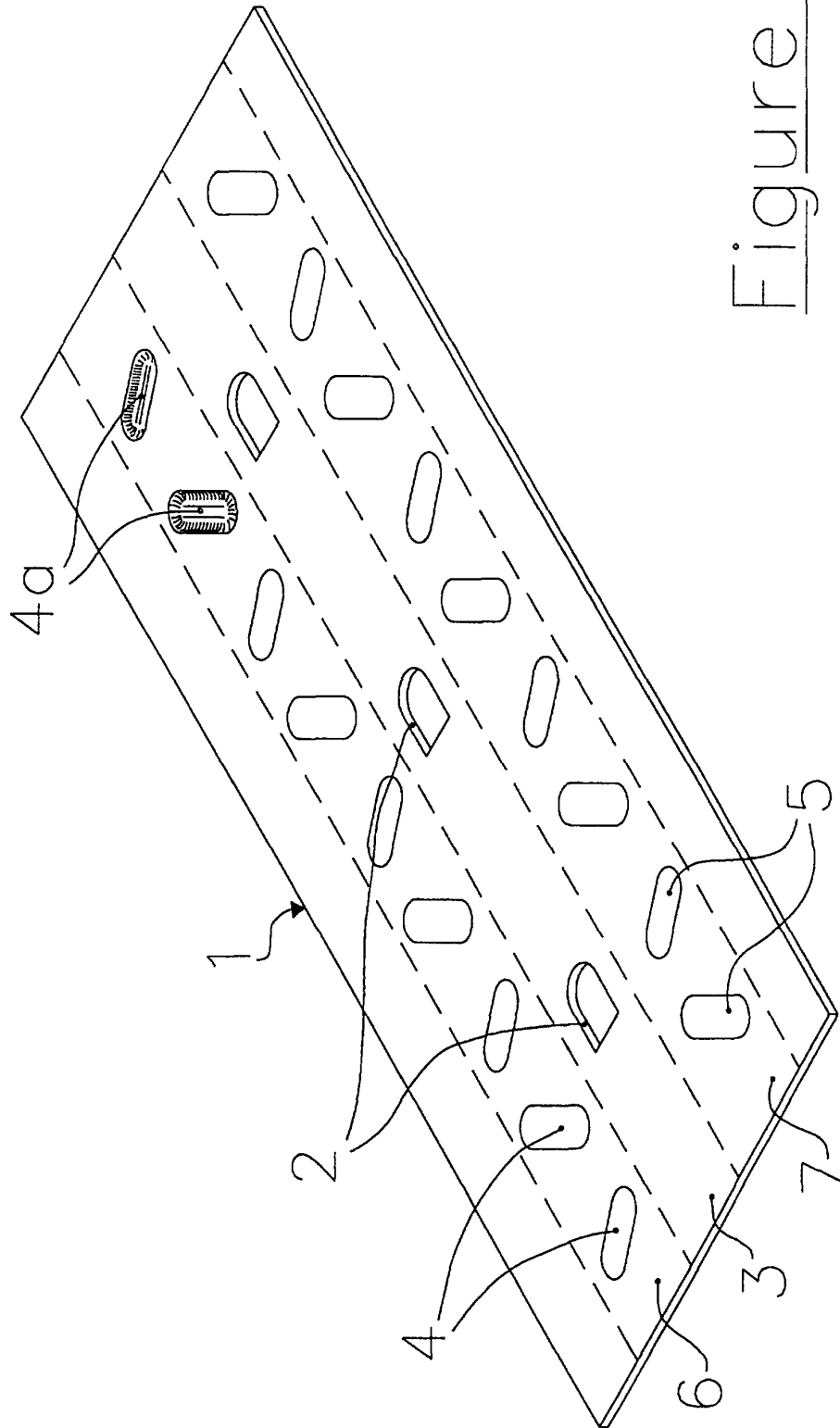


Figure 1

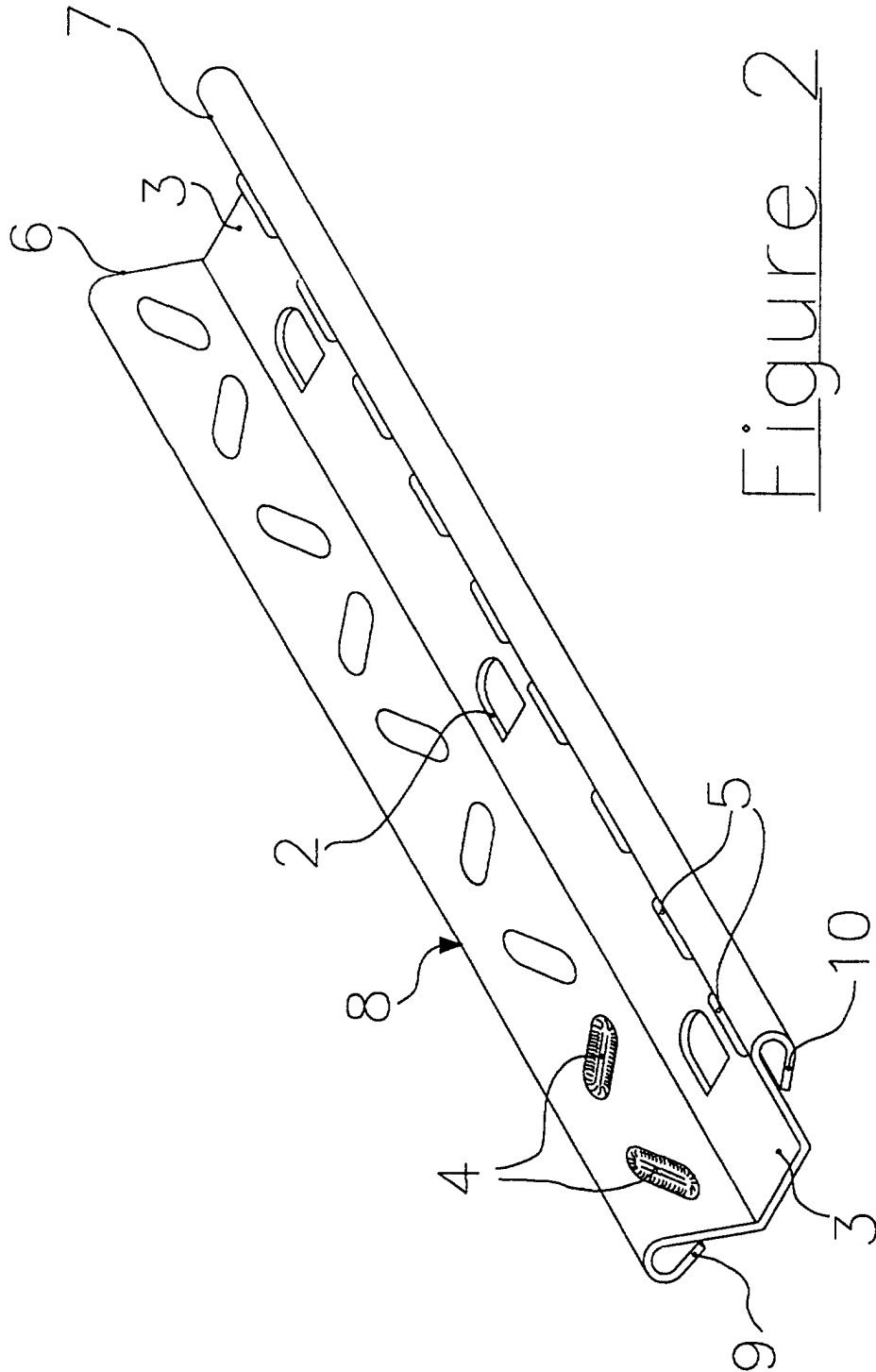


Figure 2

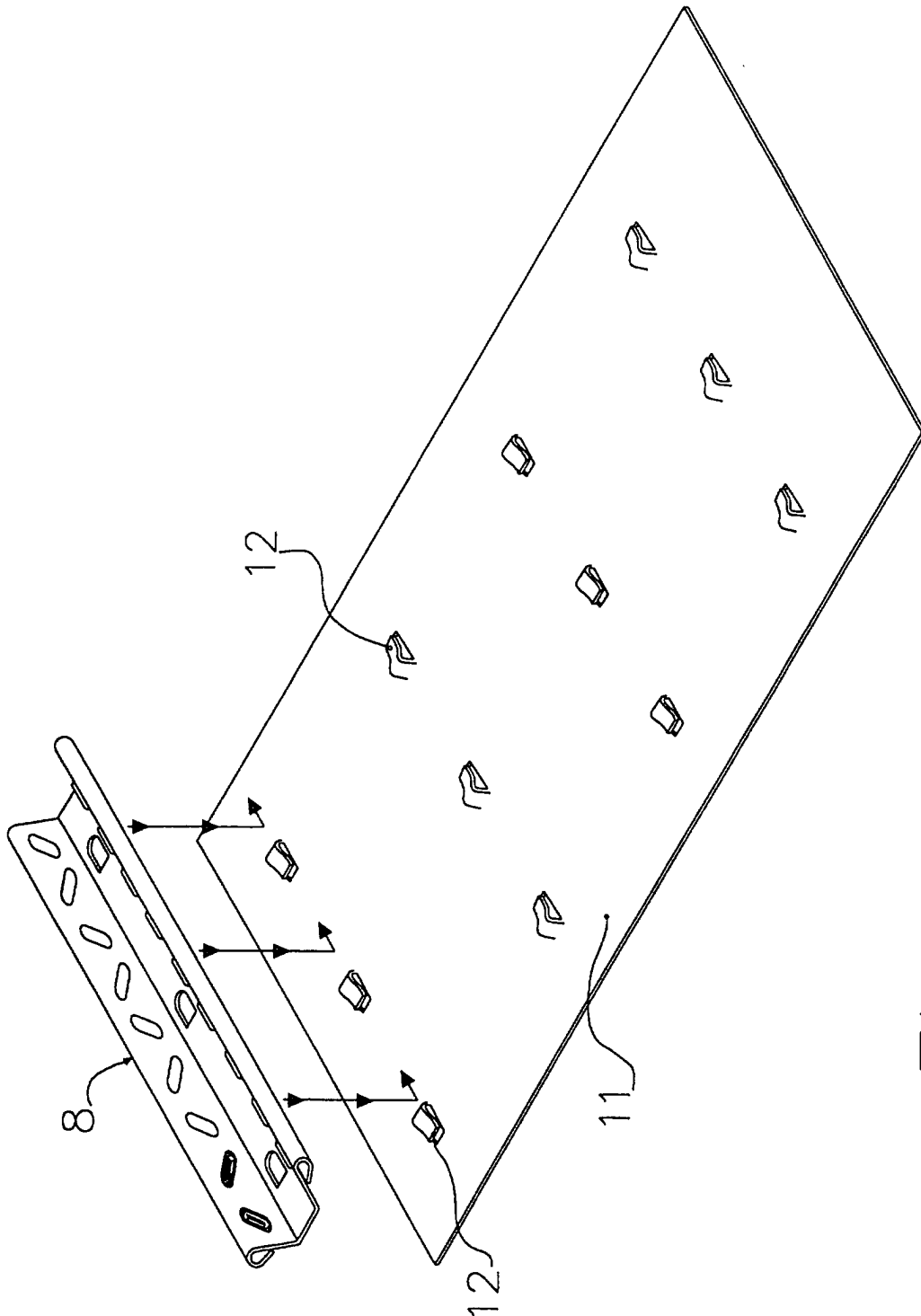


Figure 3

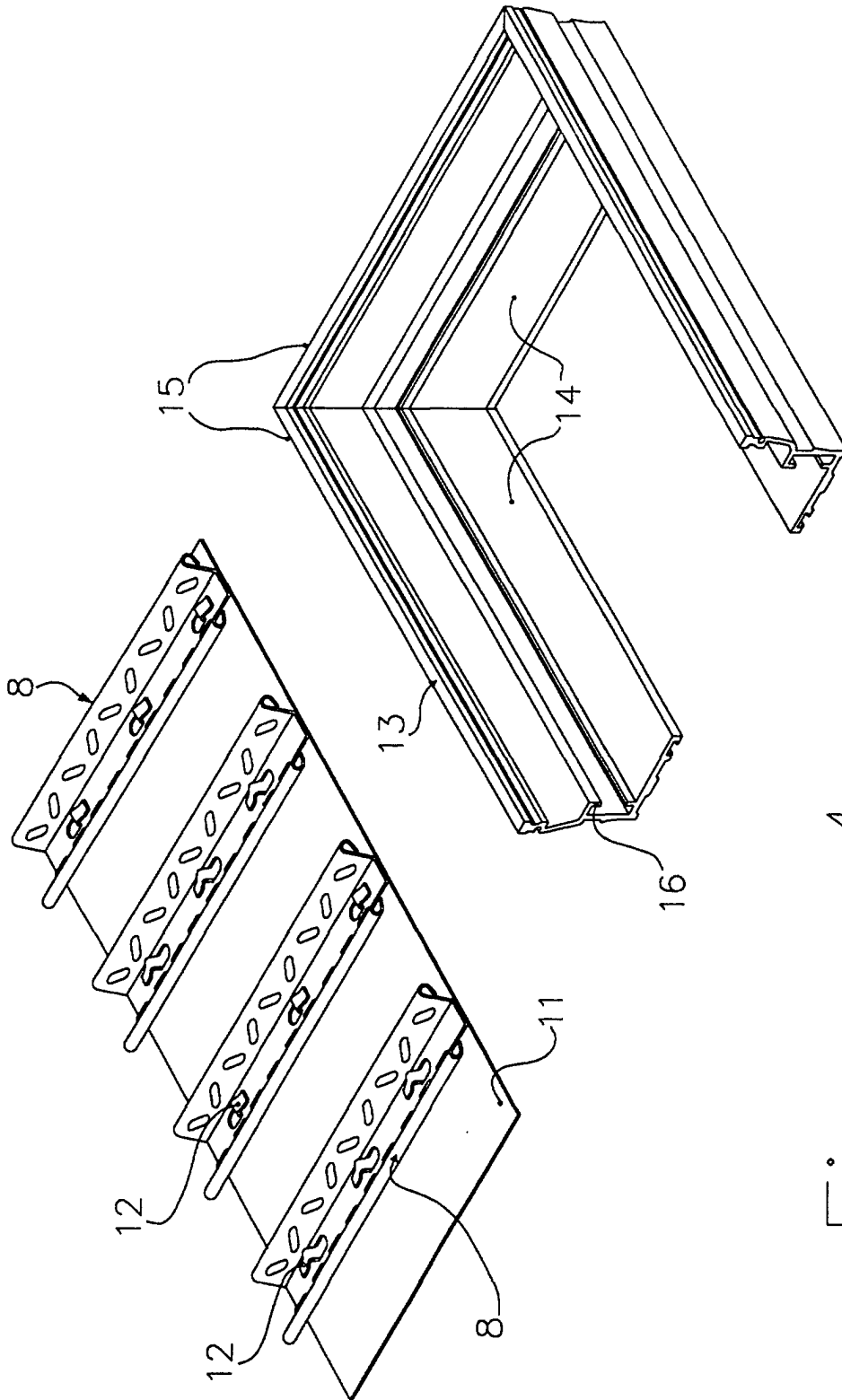


Figure 4