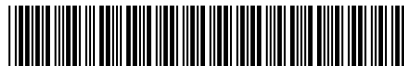


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(54) **Scaffold element**

Gerüstelement

Élément d'échafaudage

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Description

[0001] The present invention relates to a scaffold element for placing between a set of scaffold parts, intended and adapted to receive a further scaffold part thereon, comprising an intermediate bar with a support member on opposite outer ends for supporting therewith on either side on the set of scaffold parts.

[0002] Such a scaffold element is also referred to as transverse coupling bar and is used in a scaffolding construction to bridge an intermediate space within a set of scaffold parts so that support can be provided to the further scaffold part, such as a floor part in particular. A manhole for instance can thus be formed in relatively simple manner in a scaffold platform wholly or partially provided by the floor part.

[0003] Existing transverse coupling bars are formed by intermediate bars which support loosely on either side of the set of scaffold parts. Such a transverse coupling bar is known from the French patent document number FR 2063342. The herein described transverse coupling bar comprises an intermediate bar which is provided with support members on opposite outer ends to support loosely on either side on scaffold parts. Another such a transverse coupling bar is known from the British patent document number GB 1079875. The herein described transverse coupling bar likewise comprises an intermediate bar which is provided with support members on opposite outer ends for supporting loosely on either side of a set of scaffold parts. There is the danger here of the intermediate bar accidentally being lifted from one or both scaffold parts during work, resulting in a danger of collapse of the floor part. There are also transverse coupling bars which are provided with a locking. This locking is however found in practice not to be entirely secure. Firstly, the known locking requires attention during replacement of the transverse coupling bar, which may not be given, whereby the locking does not function. The known locking can also become stuck, thereby also creating a hazardous situation.

[0004] The present invention has for its object to provide a scaffold element where there is no or at least significantly less danger of this occurring.

[0005] In order to achieve the stated object a scaffold element of the type described in the preamble has the feature according to the invention that provided on the opposite outer ends of the intermediate bar are locking members which are movably connected thereto, that the locking members each comprise a locking part for locking co-action with a scaffold part of the set of scaffold parts and an operating part for actuating the locking part, wherein the operating part protrudes outside the intermediate bar in unloaded situation in order to receive the further scaffold part thereon, and the locking part displaces to a locking situation under the load of the further scaffold part. Under the influence of the load of the further scaffold part the intermediate bar will thus lock itself on either side in the set of scaffold parts and retain this

locked situation as long as the further scaffold part rests thereon, i.e. as long as necessary. Undesirable lifting of the intermediate bar from the set of scaffold parts is in this way prevented, thus avoiding the above described danger of collapse.

[0006] In a particular embodiment a scaffold element according to the invention is **characterized in that** the locking members comprise a set of locking pins which are axially movable in the intermediate bar, and a first outer end of which forms the operating member and protrudes outside the intermediate bar in unlocked situation, and the opposite outer end of which can be received in a locking cavity in the scaffold part. Under the influence of the load exerted thereon by the further scaffold part, the pin snaps into the locking cavity in the scaffold part in order to secure the intermediate bar therein. A preferred embodiment of the scaffold element has in this respect the feature according to the invention that the locking pin is axially movable counter to a spring tension. The locking pin will thus automatically snap back out of the locking cavity under the influence of the spring tension as soon as the further scaffold part is removed. This will significantly accelerate desired disassembly of a scaffold construction.

[0007] A further preferred embodiment of the scaffold element has the feature according to the invention that the locking members comprise a set of locking hooks connected pivotally to the intermediate bar and having on a first side of a pivot shaft an operating handle which protrudes outside the intermediate bar in unlocked situation, and on an opposite side of the pivot shaft a locking hook which engages round at least a part of the scaffold part in locking situation. Such a locking does not depend on the more or less accurate positioning of the intermediate bar relative to the set of scaffold parts, but can be realized at any more or less random position between the two. A further preferred embodiment of the scaffold part according to the invention has the feature here that in the locking situation the locking hook engages clampingly on the scaffold part. The locking hereby not only prevents separation of the two parts but also shifting of the two parts relative to each other, whereby a particularly stable, rigid whole is obtained.

[0008] A first particular embodiment of the scaffold element according to the invention has in this respect a relatively simple construction, which is **characterized in that** the operating handle pivots at least partially over the intermediate bar. The external locking hook can in this case be mounted afterward on the intermediate bar in relatively simple manner.

[0009] However, a further preferred embodiment of the scaffold element has the feature according to the invention that the operating handle pivots at least partially inside a cavity provided for this purpose in the intermediate bar. The thus internally pivoting operating handle in this case lies within the enclosing part of the intermediate bar and protected against mechanical influence from outside.

[0010] A scaffold construction is normally constructed from various types of more or less standard scaffold parts which may differ from each other in form and dimensioning. In order to be able to enter into a locking with different types of scaffold part, a further preferred embodiment of the scaffold element according to the invention has the feature that the locking hook comprises on a side directed toward the scaffold part a first profile intended and adapted to engage at least substantially fittingly therewith round a first type of scaffold part, and at least one further profile for engaging at least substantially fittingly therewith round a further type of scaffold part. The same intermediate bar can thus be applied in the case of different dimensioning and/or forms of the set of scaffold parts.

[0011] In a further particular embodiment the scaffold element according to the invention is **characterized in that** the intermediate bar comprises a tube part formed at least substantially from metal, in particular from an optionally preserved steel or aluminium.

[0012] The invention will now be further elucidated on the basis of a number of exemplary embodiments and a drawing. In the drawing:

- figure 1 shows a side view of a first exemplary embodiment of a scaffold element according to the invention;
- figure 2 shows a cross-section of the scaffold element of figure 1 in unloaded situation;
- figure 3 shows a cross-section of the scaffold element of figure 1 in a loaded, locking situation;
- figure 4 shows a top view of a second exemplary embodiment of a scaffold element according to the invention;
- figure 5 shows a perspective view of a locking member as applied in the scaffold element of figure 4;
- figure 6 shows a cross-section of the scaffold element of figure 4 in unloaded situation; and
- figure 7 shows a cross-section of the scaffold element of figure 4 in a loaded, locking situation.

[0013] The figures are otherwise purely schematic and not, or at least not always, drawn to scale. Some dimensions in particular may be exaggerated to greater or lesser extent. Corresponding parts are designated as far as possible in the figures with the same reference numeral.

[0014] Figures 1-3 show a first exemplary embodiment of a scaffold element according to the invention. The scaffold element comprises an intermediate bar 1, normally referred to as transverse coupling bar. Intermediate bar 1 comprises a tube body 3 having a support member in the form of claws 5 at each outer end thereof to enable support therewith on either side on a set of scaffold parts 17, see figures 2 and 3. The tube body is for instance formed from steel, with a diameter in the order of 50 millimetres and a wall thickness of 3-5 millimetres, while for claws 5 use is made in this embodiment of a steel, hot-rolled angle profile of roughly the same wall thickness.

The claws have here been released from an elongate angle profile by sawing or cutting, and connected firmly to the tube body by means of welding.

[0015] For the tube body use can be made of standard lengths of for instance 305, 610, 915, corresponding to standard recesses in a scaffolding construction, or it is possible to opt for an axially telescopic assembly, the length of which can be adjusted to a specific working dimension. The whole can optionally be preserved by means of galvanizing or powder coating in order to protect the intermediate bar from corrosion.

[0016] At opposite outer ends intermediate bar 1 comprises a locking member in the form of an angular locking hook 9, 11, which is mounted on tube body 3 for free rotation about a pivot shaft 13. The locking members here each comprise an operating part 9 on a first side of pivot shaft 13 and a locking hook 11 on an opposite side of pivot shaft 13.

[0017] Intermediate bar 1 is intended to receive a further scaffold part 15 thereon during operation, as shown by way of example in figure 3. The further scaffold part for instance comprises a floor part or other type of platform which must be arranged between the first set of scaffold parts 17 in an overall scaffolding construction. Under the influence of the load of further scaffold part 15 the operating parts 9 of the locking members displace downward to a locking position, and the freely pivotable locking members hereby pivot with locking hook 11 under and partially around scaffold parts 17 situated to the side. Intermediate bar 1 is now not connected to the scaffold parts in freely releasable manner. No further action is required for this locking of the intermediate bar to the set of scaffold parts 17, whereby the system is wholly reliable, or foolproof.

[0018] A second exemplary embodiment of the scaffold element according to the invention is shown in figures 4-7. This exemplary embodiment generally corresponds with the first exemplary embodiment, be it that in this case use is not made of a locking member which pivots over the tube body but of a locking member which is received for pivoting about a pivot shaft 13 inside a cavity 30 provided for this purpose in tube body 3. As in the first exemplary embodiment, the tube body is here formed from galvanized steel and comprises, welded fixedly thereon on either side, claws 5 from a hot-rolled angle profile. If desired, as in this embodiment, a friction layer 51 (anti-slip layer) can be provided on claws 5 which provides extra resistance to undesirable slipping or sliding thereon. For the locking members use is made in this embodiment of aluminium parts, as shown in further detail in figure 5. These relatively flat parts can be cast or milled although they are preferably, as in this embodiment, cut from an aluminium extrusion part.

[0019] The locking members each protrude into a cavity 30 and are freely pivotable therein by means of a pivot pin 31 with a centre of gravity on a side of pivot shaft 13 remote from operating handle 9, whereby the locking members pivot open automatically in an unloaded situ-

ation, see figure 6. If however a load 15 is placed on the intermediate bar during work, the operating handles displace downward to a locking position and thus arrange locking hooks 11 under and round scaffold parts 171, 172 situated on either side. In this embodiment locking hooks 11 herein comprise a first profile 111 intended and adapted for locking co-action with a first type of scaffold part 171, but also at least one further profile 112 which is adapted to a further type of scaffold part 172. The intermediate bar can thus be applied universally on different types of scaffold part.

[0020] Profiles 111, 112 can particularly be dimensioned in close-fitting manner relative to scaffold parts 171, 172 such that a mutual clamping results. This prevents mutual displacement of the two parts relative to each other and provides a particularly rigid and stable construction. A protruding lip 113 on the locking hook provides a stop with which the locking can be released, for instance for the purpose of displacing or removing the transverse coupling bar. For this purpose lip 113 can for instance be struck with a mallet in order to release the locking.

[0021] Although the invention has been further elucidated above with reference to only two exemplary embodiments, it will be apparent that the invention is by no means limited thereto. On the contrary, many other variations and embodiments are possible within the scope of the invention. If desired, other materials and/or dimensions can thus be applied instead of the stated materials and dimensions. Instead of a pivoting locking member, an axially movable locking member can also be applied with an operating part on a first outer end which in similar manner is pressed in under the influence of a load on the intermediate bar and forces a locking part at an opposite outer end into a locking cavity provided in the scaffold part for this purpose. What is important in all cases is that no further action is ever required for locking purposes, whereby not only is an operation saved but, more importantly, the locking can never be forgotten or overlooked. The system is thus foolproof or "idiot-proof".

Claims

1. Scaffold element (1) for placing between a set of scaffold parts, intended and adapted to receive a further scaffold part (15) thereon, comprising an intermediate bar (3) with a support member (5) on opposite outer ends for supporting therewith on either side on the set of scaffold parts (17), **characterized in that** on the opposite outer ends of the intermediate bar are provided locking members (9, 11) which are movably connected thereto, that the locking members each comprise a locking part (11) for locking co-action with a scaffold part (17) of the set of scaffold parts and an operating part (9) for actuating the locking part (11), wherein the operating part (9) protrudes outside the intermediate bar in unloaded situation

in order to receive the further scaffold part (15) thereon, and the locking part displaces to a locking situation under the load of the further scaffold part.

2. Scaffold element (1) as claimed in claim 1, **characterized in that** the locking members (9, 11) comprise a set of locking pins which are axially movable in the intermediate bar (3), and a first outer end of which forms the operating member and protrudes outside the intermediate bar in unlocked situation, and the opposite outer end of which can be received in a locking cavity in the scaffold part (17).
3. Scaffold element (1) as claimed in claim 2, **characterized in that** the locking pin is axially movable counter to a spring tension.
4. Scaffold element (1) as claimed in claim 1, **characterized in that** the locking members comprise (9, 11) a set of locking hooks (11) connected pivotally to the intermediate bar (3) and having on a first side of a pivot shaft an operating handle (9) which protrudes outside the intermediate bar in unlocked situation, and on an opposite side of the pivot shaft a locking hook (11) which engages round at least a part of the scaffold part (17) in locking situation.
5. Scaffold element (1) as claimed in claim 4, **characterized in that** in the locking situation the locking hook (11) engages clampingly on the scaffold part (17).
6. Scaffold element (1) as claimed in claim 4 or 5, **characterized in that** the operating handle (9) pivots at least partially over the intermediate bar (3).
7. Scaffold element (1) as claimed in claim 4 or 5, **characterized in that** the operating handle (9) pivots at least partially inside a cavity (30) provided for this purpose in the intermediate bar (3).
8. Scaffold element (1) as claimed in one or more of the claims 4-7, **characterized in that** the locking hook (11) comprises on a side directed toward the scaffold part (17) a first profile (111) intended and adapted to engage at least substantially fittingly therewith round a first type of scaffold part (171), and at least one further profile (112) for engaging at least substantially fittingly therewith round a further type of scaffold part (172).
9. Scaffold element (1) as claimed in one or more of the foregoing claims, **characterized in that** the intermediate bar (3) comprises a tube part formed at least substantially from metal, in particular from an optionally preserved steel or aluminium.

10. Scaffold element (1) as claimed in one or more of the foregoing claims, **characterized in that** the support member (5) comprises a friction layer on a free main surface.

Patentansprüche

1. Gerüstelement (1) zum Anordnen zwischen einem Satz von Gerüstteilen, vorgesehen und gestaltet zum Aufnehmen eines weiteren Gerüstteiles (15) hierauf, umfassend eine Zwischenstange (3) mit einem Tragelement (5) an einander gegenüberliegenden Außenenden, um hiermit auf beiden Seiten den Satz von Gerüstelementen (17) zu tragen, **dadurch gekennzeichnet, dass** an den gegenüberliegenden Außenenden der Zwischenstange Riegefelemente (9, 11) vorgesehen sind, die hieran beweglich angeschlossen sind, dass jedes Verriegelungselement einen Riegel (11) für ein zusammenwirkendes Verriegeln mit einem Gerüstteil (17) des Satzes von Gerüstteilen umfasst, wobei ein Bedienungshandgriff (9) in nicht belastetem Zustand über die Zwischenstange hinausragt, um ein weiteres Gerüstteil (15) aufzunehmen, und der Riegel unter Last des weiteren Gerüstteiles in eine Verriegelungsposition gelangt.
2. Gerüstelement (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Verriegelungselemente (9, 11) einen Satz von Verriegelungsstiften umfasst, die axial in der Zwischenstange (3) verschiebbar sind, und wovon ein erstes Außenende das Bedienungsteil bildet und in nicht verriegelter Position über die Zwischenstange hinausragt, und sein gegenüberliegendes Außenende in einer Verriegelungsaussparung im Gerüstteil (17) aufgenommen werden kann.
3. Gerüstelement (1) nach Anspruch 2, dadurch gekennzeichnet, dass der Verriegelungsstift entgegen der Kraft einer Feder axial verschiebbar ist
4. Gerüstelement (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Verriegelungselemente (9, 11) einen Satz von Verriegelungshaken (11) umfassen, gelenkig an die Zwischenstange (3) angeschlossen, und auf einer ersten Seite eines Gelenkzapfens einen Bedienungshandgriff (9) aufweisen, der in nicht verriegelter Position ist und dass sich auf der gegenüberliegenden Seite des Gelenkzapfens ein Verriegelungshaken (11) befindet, der in verriegelter Position wenigstens einen Teil des Gerüstteiles (17) erfasst.
5. Gerüstelement (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** der Verriegelungshaken (11) in verriegelter Position das Gerüstteil (17) klemmend umfasst.

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6. Gerüstelement (1) nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** der Bedienungshandgriff (9) wenigstens teilweise über die Zwischenstange (3) schwenkt.
7. Gerüstelement nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** der Bedienungshandgriff (9) wenigstens teilweise innerhalb der Aussparung (30) verschwenkt, die zu diesem Zwecke innerhalb der Zwischenstange (3) angeordnet ist.
8. Gerüstelement (1) nach einem oder mehreren der Ansprüche 4 bis 7, **dadurch gekennzeichnet, dass** der Verriegelungshaken (11) auf einer dem Gerüstteil (17) zugewandten Seite ein erstes Profil (111) umfasst, vorgesehen und gestaltet zum Erfassen und wenigstens teilweise passend zu einem ersten Teil von Gerüstteil (171), und wenigstens ein weiteres Profil (112) zum Erfassen und wenigstens im Wesentlichen passend zu einem weiteren Gerüstteil (172).
9. Gerüstelement (1) nach einem oder mehreren der vorausgegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Zwischenstange (3) eine Hülse umfasst, die wenigstens teilweise aus Metall besteht, insbesondere aus einem in geeigneter Weise behandelten Stahl oder Aluminium.
10. Gerüstelement (1) nach einem oder mehreren der vorausgegangenen Ansprüche, **dadurch gekennzeichnet, dass** das Tragelement (5) einen Reibbelag auf einer freien Hauptfläche aufweist.

Revendications

1. Élément d'échafaudage (1) destiné à être placé entre un ensemble de parties d'échafaudage, prévu et adapté pour recevoir une autre partie d'échafaudage (15) sur ce dernier, comprenant une barre intermédiaire (3) avec un élément de support (5) sur des extrémités externes opposées pour supporter avec ce dernier, de chaque côté de l'ensemble de parties d'échafaudage (17), **caractérisé en ce que** sur les extrémités externes opposées de la barre intermédiaire, sont disposés des éléments de blocage (9, 11) qui sont raccordés de manière mobile à ces dernières, de sorte que les éléments de blocage comprennent chacun une partie de blocage (11) pour se bloquer par coaction avec une partie d'échafaudage (17) de l'ensemble de parties d'échafaudage et une partie opérationnelle (9) pour actionner la partie de blocage (11), où la partie opérationnelle (9) fait saillie à l'extérieur de la barre intermédiaire dans une situation non chargée afin de recevoir la partie d'échafaudage (15) supplémentaire sur cette dernière, et la partie de blocage se déplace dans une situation

de blocage sous la charge de la partie d'échafaudage supplémentaire.

2. Elément d'échafaudage (1) selon la revendication 1, **caractérisé en ce que** les éléments de blocage (9, 11) comprennent un ensemble de broches de blocage qui sont axialement mobiles dans la barre intermédiaire (3), et dont une première extrémité externe forme l'élément opérationnel et fait saillie à l'extérieur de la barre intermédiaire dans la situation non bloquée, et dont l'extrémité externe opposée peut être reçue dans une cavité de blocage dans la partie d'échafaudage (17). 5
3. Elément d'échafaudage (1) selon la revendication 2, **caractérisé en ce que** la broche de blocage est axialement mobile à l'encontre d'une tension de ressort. 10
4. Ensemble d'échafaudage (1) selon la revendication 1, **caractérisé en ce que** les éléments de blocage (9, 11) comprennent un ensemble de crochets de blocage (11) raccordés de manière pivotante à la barre intermédiaire (3) et ayant sur un premier côté d'un arbre de pivot une poignée opérationnelle (9) qui fait saillie à l'extérieur de la barre intermédiaire dans la situation non bloquée, et sur un côté opposé de l'arbre de pivot un crochet de blocage (11) qui se met en prise autour d'au moins une partie de la partie d'échafaudage (17) dans la situation de blocage. 15
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5. Elément d'échafaudage (1) selon la revendication 4, **caractérisé en ce que** dans la situation de blocage, le crochet de blocage (11) s'enclenche de manière serrée sur la partie d'échafaudage (17). 35
6. Elément d'échafaudage (1) selon la revendication 4 ou 5, **caractérisé en ce que** la poignée opérationnelle (9) pivote au moins partiellement sur la barre intermédiaire (3). 40
7. Elément d'échafaudage (1) selon la revendication 4 ou 5, **caractérisé en ce que** la poignée opérationnelle (9) pivote au moins partiellement à l'intérieur d'une cavité (30) prévue pour ce but, dans la barre intermédiaire (3). 45
8. Elément d'échafaudage (1) selon une ou plusieurs des revendications 4 à 7, **caractérisé en ce que** le crochet de blocage (11) comprend sur un côté dirigé vers la partie d'échafaudage (17) un premier profil (111) prévu et adapté pour se mettre en prise de manière au moins substantiellement ajustée, autour d'un premier type de partie d'échafaudage (171), et au moins un profil supplémentaire (112) pour se mettre en prise de manière au moins substantiellement ajustée, autour d'un autre type de partie d'échafaudage (172). 50
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9. Elément d'échafaudage (1) selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** la barre intermédiaire (3) comprend une partie de tube formée au moins substantiellement à partir de métal, en particulier à partir d'un acier ou d'un aluminium facultativement préservé.
10. Elément d'échafaudage (1) selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** l'élément de support (5) comprend une couche de frottement sur une surface principale libre.

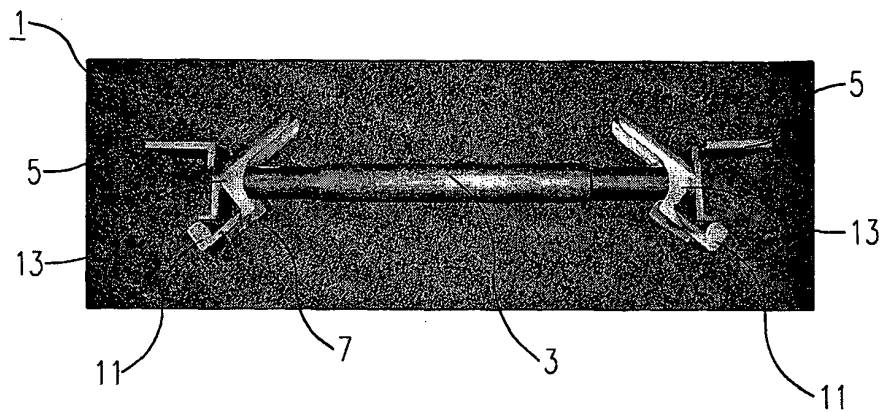


Fig.1

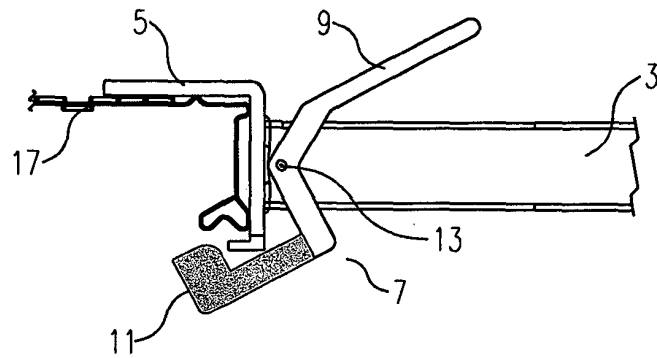


Fig.2

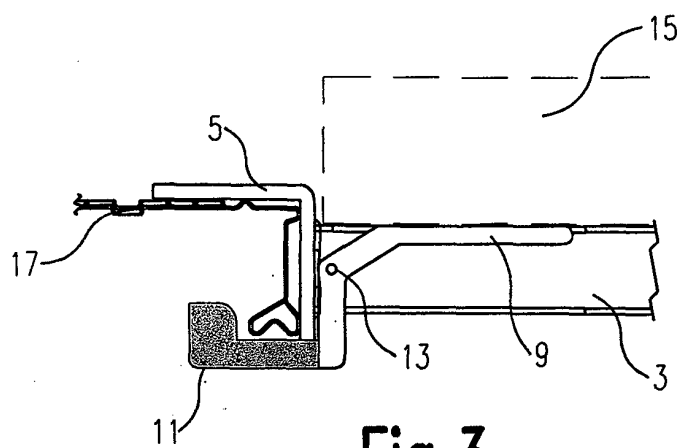


Fig.3

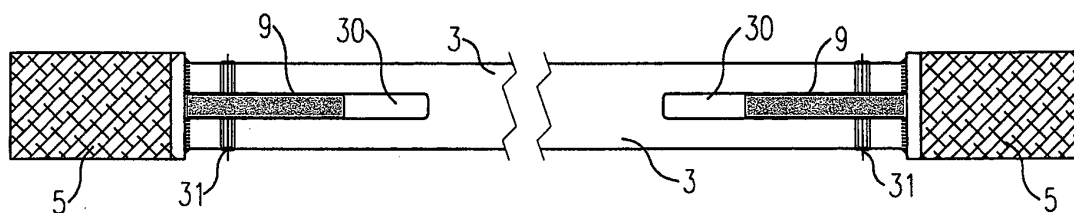


Fig. 4

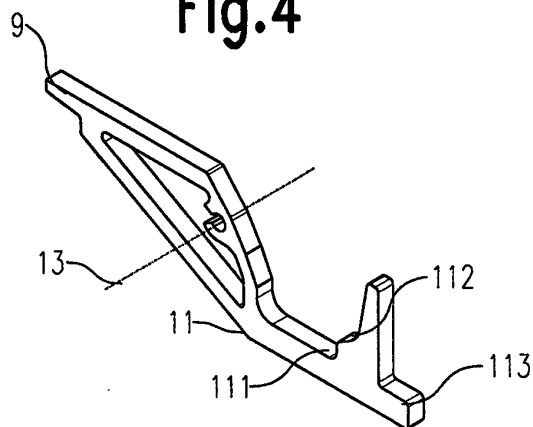


Fig. 5

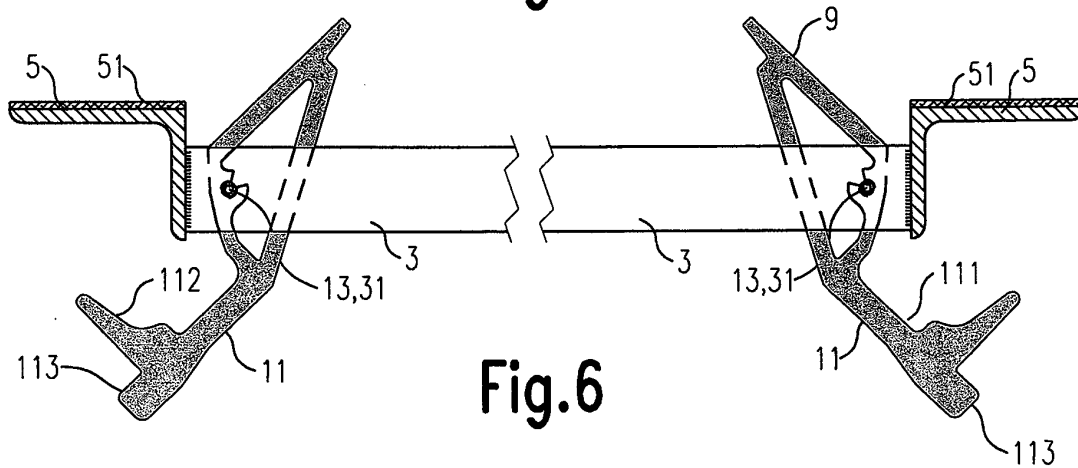


Fig. 6

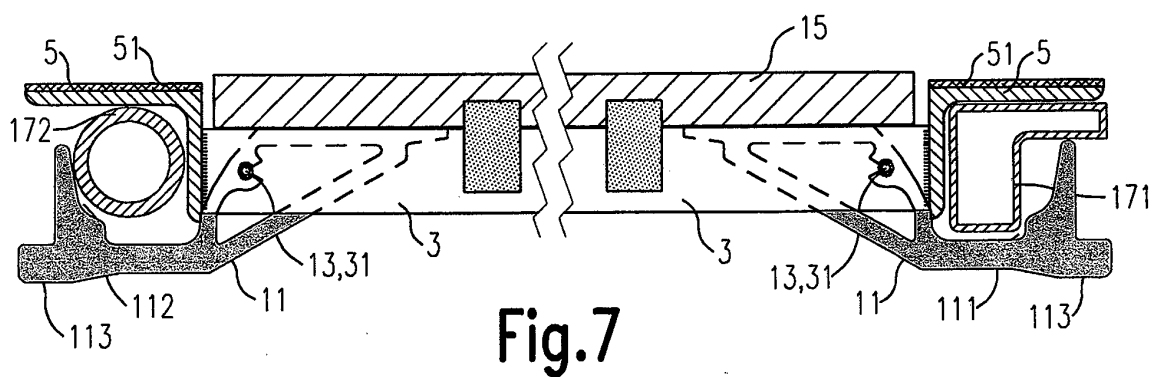


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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