

Description

[0001] The present invention relates to a scaffold for work on a sloping roof surface of a building, comprising a scaffold part and a ramp adapted to form a safe pathway for a worker over at least a part of the roof surface. The present invention also relates to a ramp as applied in such a scaffold.

[0002] Scaffolds are employed during work on or at a roof of a building, such as painting work, construction work or repair work. In order to carry out work on a sloping roof use is usually made of a ramp which protrudes from a scaffold part and extends over at least a part of a roof surface. The ramp forms a secure base providing some support to a worker on the roof. The worker can thus follow a pathway which is safeguarded to some extent and from which he can carry out work on the roof surface.

[0003] A scaffold of the type stated in the preamble is thus known from the British patent application GB 2204628, wherein a ladder protrudes from a scaffold part as ramp which extends over at least a part of the roof surface in order to form a safe pathway for a worker. The scaffold part is a ladder frame provided with a protruding holder which is provided with coupling pins for coupling of the ladder.

[0004] A drawback of this known scaffold is that the ladder is fixed non-displaceably to the protruding holder of the scaffold part. When work has to be carried out at locations on the roof surface which are not accessible to the worker from the ladder, either the scaffold part with the ladder must then be uncoupled from the scaffold, displaced and coupled again to the scaffold, or a plurality of scaffold parts with ladders have to be placed.

[0005] The present invention has for its object, among others, to provide a scaffold which obviates this drawback to at least significant extent.

[0006] In order to achieve the stated object a scaffold of the type stated in the preamble has the feature according to the invention that the ramp comprises at least close to an outer end coupling means with which the ramp, at least during use, can be coupled for substantially horizontal displacement to the scaffold part. In this way the ramp can for this purpose be displaced parallel to a roof edge over a length of the scaffold part without the ramp here having to be uncoupled. Another location on the roof surface can hereby be quickly accessed for work purposes and a larger area on the roof surface can be accessed using a single ramp without the scaffold itself having to be displaced.

[0007] In a first preferred embodiment the scaffold according to the invention has the feature that the scaffold part extends laterally over the roof edge from another part of the scaffold and comprises a closed bottom surface. A gap between the scaffold and the roof edge is thus spanned with a base which can be accessed by the worker directly from the scaffold, and falling hazard is drastically reduced.

[0008] In a further preferred embodiment the scaffold

according to the invention has the feature that the ramp can be coupled with the coupling means to a scaffold tube of the scaffold part which at least during use is horizontal. A scaffold and scaffold parts are largely constructed from scaffold tubes. These are highly suitable for reliable coupling of the ramp using coupling means adapted for this purpose. A horizontal scaffold tube at the position of the roof edge provides an excellent attachment point along which the ramp can be displaced at least substantially parallel to the roof edge.

[0009] In a further preferred embodiment the scaffold according to the invention has the feature that the coupling means comprise a coupling member which at least partially encloses the scaffold tube. It is possible here to envisage a hook, a partial ring or cylinder. A connection is for instance formed by hooking, snapping or folding the coupling member round the scaffold tube, optionally followed by a further fixation, for instance with a screw closure or a snap system. The coupling member is rotatable round the scaffold tube at least when the connection has not (yet) been arranged in tightly clamping manner, whereby an angle of the ramp relative to the scaffold part is adjustable. The scaffold is hereby suitable for use on a sloping roof, irrespective of a pitch of the sloping roof.

[0010] In a further preferred embodiment the coupling member comprises a fixing eye. A fixing eye can be pushed round the scaffold tube. An exceptionally firm coupling can hereby be realized which can moreover slide over a length of the scaffold tube and thus make the ramp displaceable along a length of the scaffold tube. The fixing eye is also rotatable round the scaffold tube in order to thus set an angle of the ramp relative to the scaffold part.

[0011] In a further preferred embodiment the scaffold according to the invention has the feature that the ramp comprises a ramp bottom for walking on, and that the ramp bottom is provided at least on at least one lengthwise side with a railing.

[0012] A railing provides multiple safety-improving properties. A railing provides grip for a user of the scaffold and moreover forms a fall barrier, whereby there is a more stable and safe situation when working or when walking up or down the ramp.

[0013] A user can moreover anchor himself to the railing, for instance by means of a cable or a rope provided with an anchoring element such as a hook, an eye or a loop.

[0014] It is also possible to attach objects to the railing, such as for instance tools or cans of paint, so that these need not be held by the user, who then has both hands available to carry out work. Attachment to the railing moreover avoids the objects falling from the roof.

[0015] In a particular preferred embodiment the scaffold according to the invention has the feature that the railing is arranged on the ramp bottom for pivoting about an axis and is adjustable between a folded-down position at least substantially parallel to the ramp bottom and a folded-out position at least substantially perpendicular to

the ramp bottom. A ramp with a folded-down railing is exceptionally compact, this providing great advantages during storage, transport, coupling of the ramp to the scaffold tube and placing of the ramp on the roof surface.

[0016] In a particular embodiment the ramp is provided over at least a length with a guide track along which a guide element of an anchor body is axially displaceable. This is understood to mean a guide track in which or around which an anchor body, for instance an eye-like anchor point for attachment of an anchor cable, is displaceable. The guide track is for instance a groove which at least partially encloses a guide element, for instance a nut, so that it is only displaceable in axial direction, and to which the anchor point is fixed, for instance with a bolt.

[0017] Using a displaceably fixed anchor body only a short connection is necessary between the worker and the anchor point, this reducing the risk of stumbling or falling from the ramp bottom. The ramp bottom can be provided with the guide track, although a railing that is present can alternatively also be provided with the guide track.

[0018] In a further preferred embodiment the ramp comprises at least on an outer end remote from the scaffold a support element for the purpose of supporting therewith on the roof surface. The support element at the outer end provides a more stable basis in the case of a roof surface which is not completely even. Furthermore, a contact surface between the ramp and the roof thus remains limited so that possible damage to the roof by the ramp remains limited.

[0019] In a further preferred embodiment the support element is height-adjustable. An angle of the ramp relative to the roof surface is hereby adjustable, whereby a somewhat less steep ramp, which is thereby easier to walk on and safer, can be obtained.

[0020] In a further preferred embodiment the scaffold according to the invention has the feature that the support element is rollable, preferably comprises a wheel and in particular a swivel wheel. Such a support element simplifies placing of the ramp on the roof. The ramp is rolled from the scaffold onto the roof. Using a wheel the ramp rolls smoothly over the roof and the chance of damaging the roof or the ramp is reduced because the latter does not slide over the roof or is not lowered thereon from a height.

[0021] Using a swivel wheel it is moreover possible to easily perform a horizontal, rolling lateral displacement of the ramp over the length of the scaffold part. The lateral displacement makes it possible to roll the ramp over the length of the scaffold part without the ramp needing to be lifted or dragged over the surface.

[0022] In a further preferred embodiment the scaffold according to the invention has the feature that the scaffold part is constructed from modular components. This has advantages in storage and transport, and it is only necessary to transport the required components to a roof. The modular components can comprise a primary component and at least one further component, wherein the

primary component comprises a ramp bottom part and the at least one further component is a component chosen from a group of a further ramp bottom part, a railing component, a support element, a guide element, a coupling means and other function-specific components. If a large component or component with protruding parts is constructed from multiple modular components, it can be more easily lifted as separate components onto the scaffold and there assembled. This moreover opens up possibilities for selecting or designing and applying useful or functional components specifically necessary for determined work operations.

[0023] In a further preferred embodiment the scaffold according to the invention has the feature that the ramp bottom part and a further ramp bottom part can be coupled in at least substantially continuous manner. Access of the ramp to the roof surface can hereby be adapted as required. The further ramp bottom part can be coupled here in a length direction or a width direction to the ramp bottom part so as to thus lengthen or widen the ramp. This makes it possible to access a part of the roof located higher or further away. The possibility of working with smaller ramp bottom parts provides advantages in transport and handling of the ramp or if it is not necessary to work on the roof very far from the scaffold.

[0024] A ramp as applied in a scaffold according to the invention can also be coupled to devices other than a scaffold so as to form a safe pathway at locations which are difficult to walk on. It is possible here to envisage a coupling to a ladder or an available railing.

[0025] In a preferred embodiment the ramp according to the invention is characterized in that the ramp bottom comprises a ladder. A ladder is a suitable ramp bottom since with the available rungs it comprises support elements and is moreover much used and available in this professional field. Components such as wheels and coupling means can optionally be mounted on an existing ladder in order to thus form a ramp according to the invention.

[0026] In a further embodiment the ramp bottom according to the invention has the feature that the ramp bottom comprises a closed walkway. It is hereby not necessary for the worker to support directly on the roof or to have to stand on rungs, which can be somewhat uncomfortable and unstable. Objects such as for instance cans of paint can also be set down on the closed walkway more easily and more stably compared to an open ramp bottom such as a ladder.

[0027] In a further preferred embodiment the ramp according to the invention has the feature that the ramp bottom comprises anti-slip means at least on a walking side. There is a present danger of slipping on a ladder, and particularly on a closed walkway of a ramp on a sloping roof surface. This is particularly undesirable, even if the user is anchored, because an unexpected fall due to slipping can possibly result in injury or worse to the user. Different anti-slip means are possible. Slightly protruding or structured parts can for instance thus be arranged on

the ramp bottom against which a person working on the roof can support with their feet so as to achieve more stability and safety. A ramp can also be covered for instance with an anti-slip material which provides more grip and thereby reduces the chance of slipping.

[0028] An underside of the ramp can also be provided with anti-slip means so as to thus prevent slipping or sliding of the ramp on the roof surface.

[0029] The invention will be further elucidated herein below on the basis of exemplary embodiments and accompanying drawing. In the drawing:

figure 1 is a side view of a scaffold according to the invention;

figure 2 is a side view of the ramp of the scaffold according to the invention;

figure 3 is a side view of a ramp of the scaffold according to the invention provided with a railing;

figure 4 is a top view of the ramp of the scaffold according to the invention;

figure 5 is a top view of two coupled ramps of the scaffold according to the invention;

figure 6 shows a particular embodiment of the scaffold according to the invention.

[0030] Figure 1 shows a side view of scaffold 1 next to a building. Ramp 11 is attached with two coupling members 13 to scaffold part 14 which forms the upper part of the scaffold.

[0031] Ramp 11 is provided with a railing 12. Railing 12 can serve as guide track for a displaceable anchor point to which a user can secure himself, for instance a hook, a ring or a loop of a securing cable. It is also possible for a bottom of the ramp to be provided along a length with a groove for receiving the movable anchor point.

[0032] The ramp rests on roof 2 with two swivel wheels 111. These wheels are height-adjustable in order to adjust an angle of ramp 11 relative to roof 2 in order to thus obtain a walkway which is for instance flatter and therefore easier to walk on. Ramp 11 couples to a scaffold tube 141 of scaffold part 14 located at roof height. A force directed away from the roof is created on the scaffold part when a person working on the roof stands on the ramp. This results in the danger of the scaffold tilting or even falling over. This is prevented by stabilizing the scaffold by means which prevent the tilting movement, for instance by using connecting means 142 to connect the scaffold to wall 21. The force directed away from the roof is hereby absorbed and an exceptionally stable situation is created.

[0033] It may be undesirable for the scaffold to be connected to wall 21, for instance because the integrity of

the wall may not be adversely affected. An alternative solution is to shore or support the scaffold at one or more positions on a side remote from the roof, for instance with transverse beans (not shown) extending from the scaffold to a ground surface.

[0034] When ramp 11 is displaced parallel to a roof edge along scaffold tube 141, the ramp slides easily over the tube, wherein swivel wheels 111 roll over the roof.

[0035] Figure 2 and figure 4 show respectively a side view and a top view of ramp 11 of the scaffold according to the invention. Ramp 11 with a closed walkway is provided with two types of anti-slip means 112 and 113. Foot support elements 112 are slight elevations situated at regular distances along the length of anti-slip mat 113 which is arranged on a whole surface of the closed walkway. Swivel wheels 111 are mounted rotatably in an outer end of ramp 11 remote from scaffold 14.

[0036] Railing attachment points 114 are situated on both longitudinal sides of ramp 11 in order to thus enable attachment of a railing 12 as shown in figure 3 on a chosen side or on both sides. In a particular embodiment the railing attachment points are pivotable (not shown) in order to tilt an attached railing 12 to the work surface so as to thus obtain a compact embodiment, which can be useful during transport or storage without the railing having to be removed.

[0037] Ramp 11 couples with coupling members 13 to scaffold tube 141. In the embodiment shown in figure 2 the coupling members 13 comprise a fixing eye which is slid round scaffold tube 141. Ramp 11 is thus coupled displaceably and rotatably round scaffold tube 141.

[0038] The embodiment shown in figure 4 shows coupling members 13 which do not take the form of a full ring and which partially enclose scaffold tube 141 and are then closed with a screw means. A firm coupling is thus effected. A strength of the coupling is determined by the degree of tightening of the screw means. If the tightening is not such that coupling members 13 are fixed clamping tightly round scaffold tube 141, they are rotatable round the scaffold tube and an angle between scaffold 14 and ramp 111 can be adjusted to an angle of roof 2. The ramp is in this case moreover displaceable along the length of scaffold tube 141 so that the ramp can be displaced over the roof without the coupling having to be released.

[0039] Figure 5 shows two identical, coupled ramps 11 and 11'. In this embodiment ramps 11 and 11' comprise coupling rods 115, 115' and coupling rod holders 116, 116'. Coupling rods 115, 115' have at least substantially the same diameter as scaffold tube 141. Ramp 11' couples to coupling rod 115 with coupling members 13' identical to coupling members 13 shown in figure 4 in the same way as ramp 11 couples to scaffold tube 141 with coupling members 13.

[0040] Figure 6 shows an embodiment of scaffold 1 for carrying out work on dormer window 23. In this embodiment scaffold 14 comprises a scaffold part 142 which extends laterally from another part of the scaffold over the roof edge and comprises a closed bottom surface.

Scaffold part 142 in this way bridges a gap between the other part of the scaffold and the roof edge, whereby the worker can work more safely. For greater safety scaffold part 142 is provided with railings. Ramp 11 can be coupled with coupling members 13 to a scaffold tube of scaffold part 142 in the same way as in any of the above described embodiments. Railing 112 is situated in this embodiment on a side of ramp 11 remote from the dormer window 23.

[0041] Although the invention has been further elucidated with reference to several 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 for the person with ordinary skill in the art.

Claims

1. Scaffold for work on a sloping roof surface (2) of a building, comprising:
 - a scaffold part (14);
 - a ramp (11) adapted to form a safe pathway for a worker over at least a part of the roof surface, **characterized in that** the ramp comprises at least close to an outer end coupling means (13) with which the ramp, at least during use, can be coupled for substantially horizontal displacement to the scaffold part (14).
 2. Scaffold as claimed in claim 1, **characterized in that** the scaffold part extends laterally over the roof edge from another part of the scaffold and comprises a closed bottom surface.
 3. Scaffold as claimed in one or more of the foregoing claims, **characterized in that** the ramp (11) can be coupled with the coupling means (13) to a scaffold tube of the scaffold part which at least during use is horizontal.
 4. Scaffold as claimed in claim 3, **characterized in that** the coupling means comprise a coupling member which at least partially encloses the scaffold tube.
 5. Scaffold as claimed in one or more of the foregoing claims, **characterized in that** the ramp bottom is provided at least on at least one lengthwise side with a railing which is arranged on the ramp bottom for pivoting about an axis and is adjustable between a folded-down position at least substantially parallel to the ramp bottom and a folded-out position at least substantially perpendicular to the ramp bottom.
 6. Scaffold as claimed in one or more of the foregoing claims, **characterized in that** the ramp is provided over at least a length with a guide track along which
- a guide element of an anchor body is axially displaceable.
 7. Scaffold as claimed in one or more of the foregoing claims, **characterized in that** the ramp comprises at least on an outer end remote from the scaffold a support element for the purpose of supporting therewith on the roof surface.
 8. Scaffold as claimed in claim 7, **characterized in that** the support element is rollable, preferably comprises a wheel and in particular a swivel wheel.
 9. Scaffold as claimed in one or more of the foregoing claims, **characterized in that** the ramp comprises a primary component and at least one further component, wherein the primary component comprises a ramp bottom part and the at least one further component is a component chosen from a group of a further ramp bottom part, a railing component, a support element, a guide element, a coupling means and other function-specific components.
 10. Scaffold as claimed in claim 9, **characterized in that** the ramp bottom part and a further ramp bottom part can be coupled in at least substantially continuous manner.
 11. Ramp as applied in a scaffold as claimed in one or more of the foregoing claims.
 12. Ramp as claimed in claim 11, **characterized in that** the ramp bottom comprises a ladder.
 13. Ramp as claimed in claim 11, **characterized in that** the ramp bottom comprises a closed walkway.
 14. Ramp as claimed in one or more of the claims 11-13, **characterized in that** the ramp bottom comprises anti-slip means at least on a walking side

Fig 1

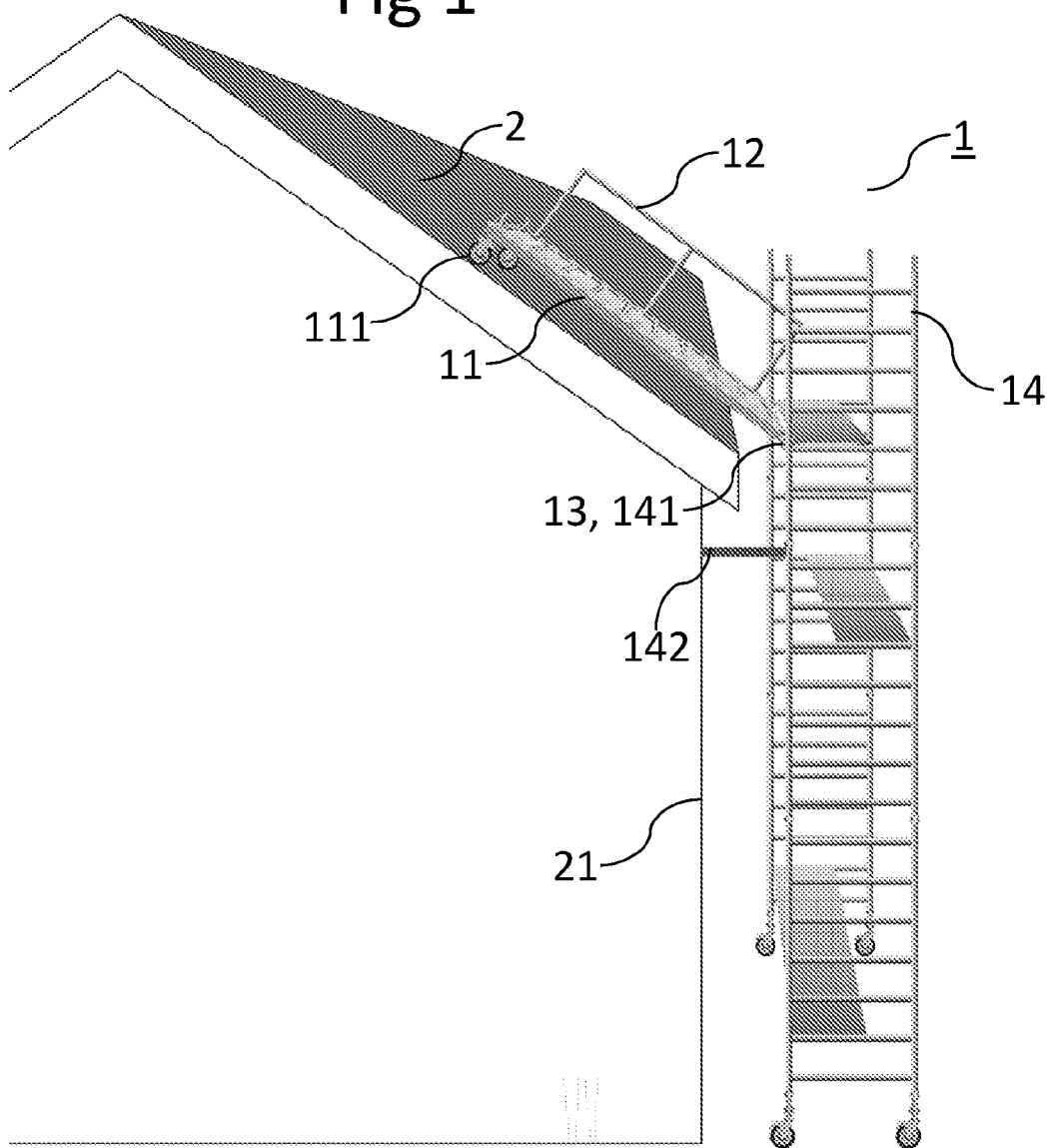


Fig 2

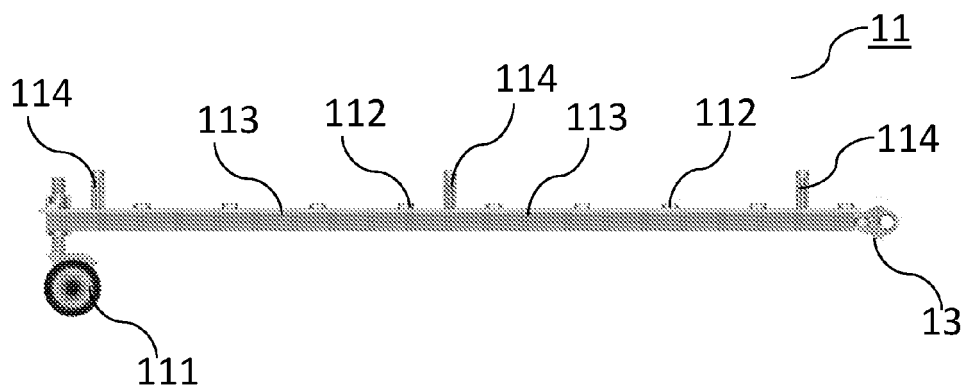
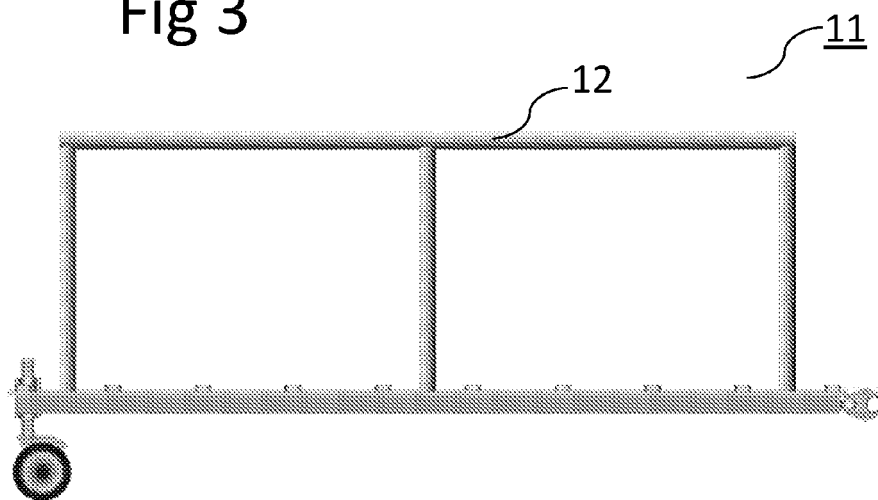


Fig 3



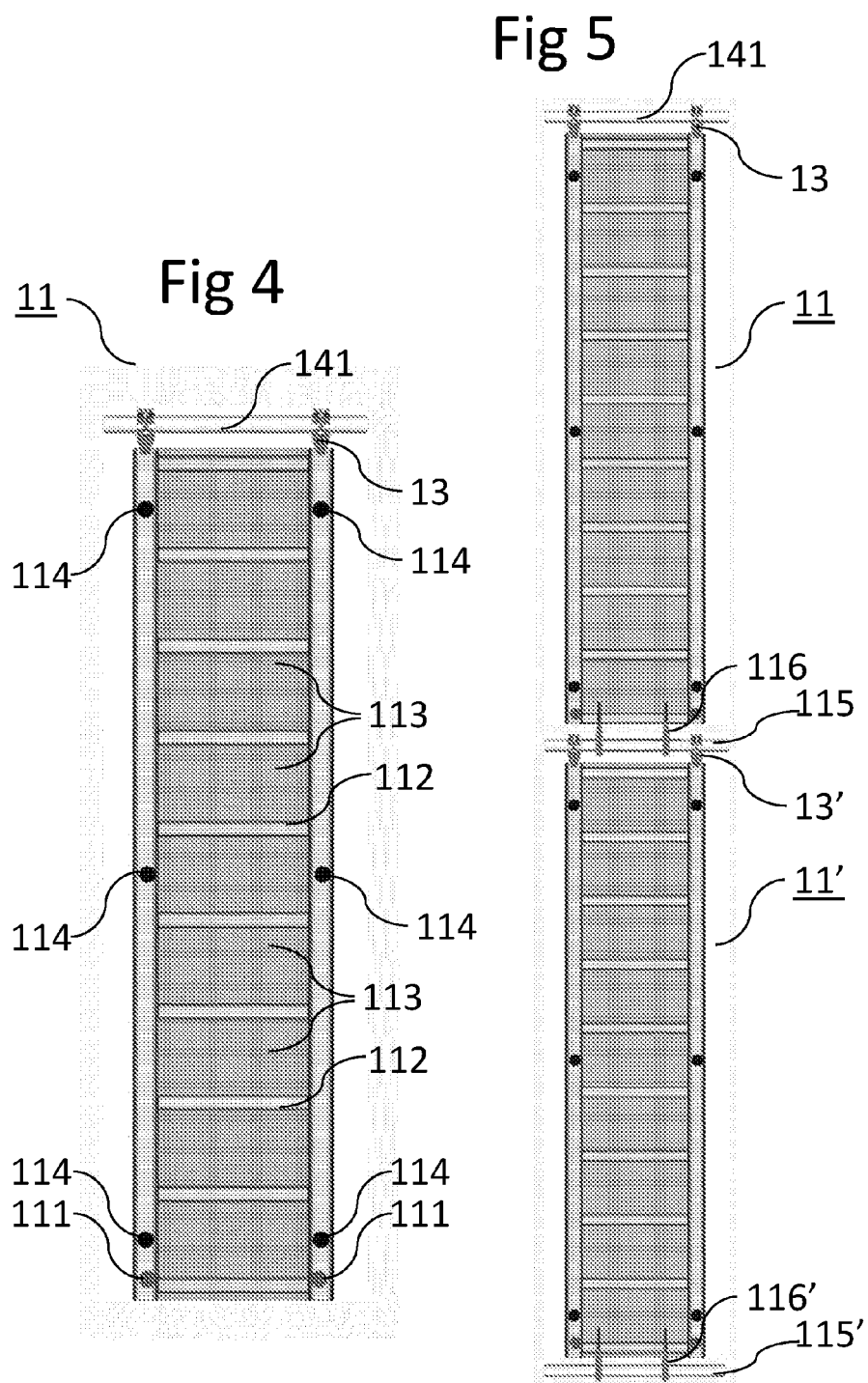
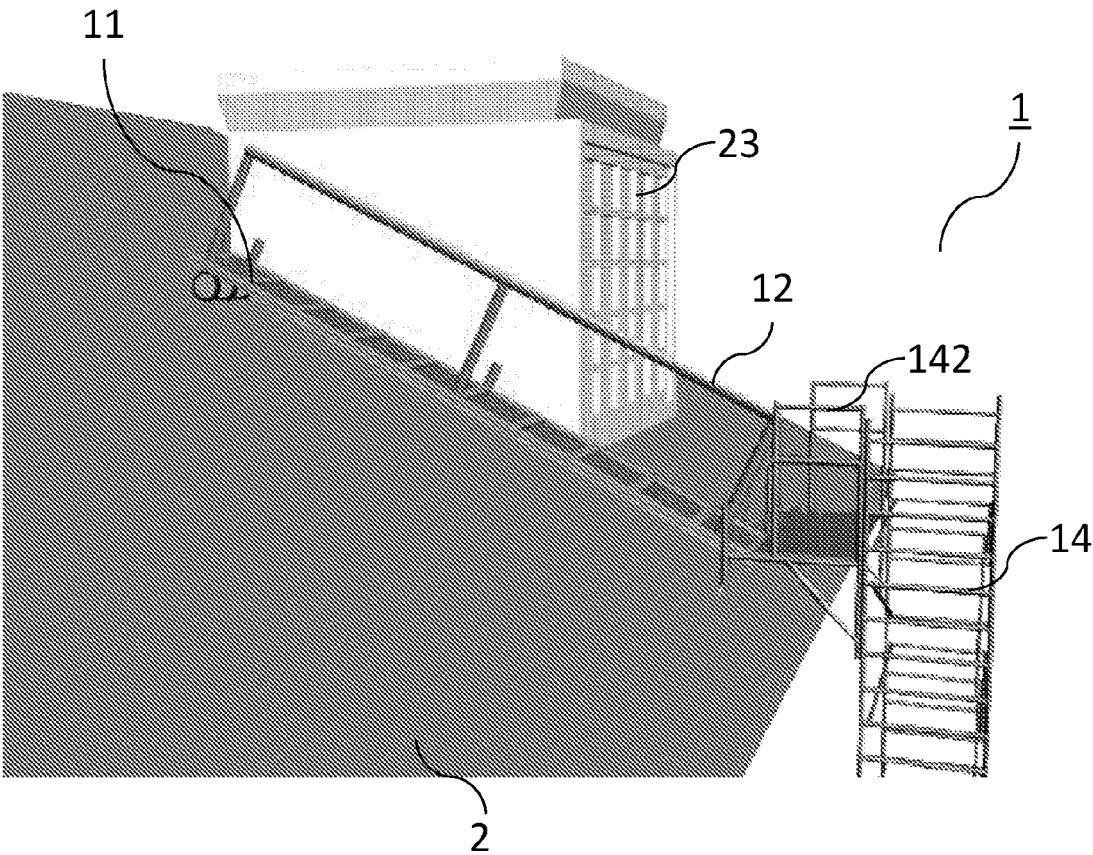


Fig 6



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2204628 A [0003]