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(54) Scaffolding attachment

(57) The invention relates to a scaffolding attachment (54) for scaffolding (34) and to scaffolding (34) including a scaffolding attachment (54). In a preferred embodiment of the invention, the scaffolding attachment (54) forms a ladder with the scaffolding (34). The attachment (54) comprises a ladder portion (56) and left and right locking arms (58, 60). Left and right stiles (62, 64) of the ladder portion (56) have recesses (72), for engaging bracing tubes (50, 52) of a frame section (36) of the scaffolding (34). The locking arms (58, 60) include similar recesses (76), also for engaging the bracing tubes (50, 52). The ladder portion (56) and the locking arms (58, 60) co-operate to engage and surround the bracing tubes (50, 52), and the locking arms (58, 60) are coupled to the stiles (62, 64) by nut and bolt assemblies (70), to lock the scaffolding attachment (54) to the frame section (36) in a releasably tight-fit. Rungs (66, 68) of the ladder portion (56), together with the bracing tubes (50, 52) provide rungs of the ladder.

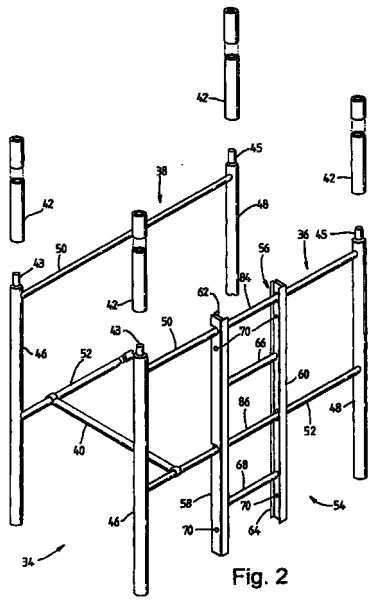

Fig. 2

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Description

[0001] The present invention relates to a scaffolding attachment. In particular, but not exclusively, the present invention relates to a scaffolding attachment for providing an access ladder for scaffolding.

[0002] Modern scaffolding frequently comprises a number of frame sections which are inter-connected using tubular cross or diagonal bracing members. The frame sections each have tube members which are disposed vertically when the scaffolding is assembled, and bracing tube members, which are disposed horizontally when the scaffolding is assembled. Each frame section is of a defined overall height and width, and successive frame sections of the same or different height may be located on lower frame sections via male/female connectors.

[0003] Under European and UK Health and Safety regulations, the horizontal bracing tube members are not permitted to be used as a makeshift ladder to access the scaffolding, because, in the relatively wide frame sections, there is a danger that a user may slip and fall. This is due mainly to the fact that there are no vertical stiles such as those which a typical ladder includes, which stop the users' feet from sliding laterally along the horizontal bracing tube members.

[0004] Instead, the regulations require that a ladder having rungs of predetermined regulated spacings be provided.

[0005] One such ladder is a simple lean-to ladder provided with curved hooks by which the ladder may engage the horizontal tube members of the frame sections. However, such ladders suffer from the disadvantage that the ladder rung spacing often differs from that of the horizontal tube members of the frame sections, which can be dangerous where these are relatively closely spaced. Furthermore, this results in added weight, cost, and waste of materials.

[0006] Alternatively, ladders are provided integrally with scaffolding frame sections, by welding a ladder to the frame sections. This is typically done by providing a gap in the length of the bracing tube members and welding the ladder into the gap to complete the frame section. However, such frame sections are relatively costly and time consuming to manufacture, and can be expensive to repair in the event of damage to the ladder, as this may necessitate removing the ladder from the frame by breaking the welds between the ladder and the frame section to effect repair. Furthermore, such ladders cannot readily be used with alternative scaffolding. Also, in many cases, the rung spacing of the ladder is different from the spacing of the horizontal bracing members of the frame sections. This can cause difficulty in standardisation of components, and is practically and aesthetically undesirable.

[0007] It is an object of one or more embodiments of the present invention to obviate or mitigate at least one of the foregoing disadvantages.

[0008] According to a first aspect of the present invention there is provided a scaffolding attachment comprising at least one stile member and means for releasably securing at least one stile member to at least one scaffolding member.

[0009] Advantageously there are provided first and second stile members having at least one rung (tread) provided therebetween.

[0010] Preferably the securing means comprises at least one locking arm releasably fixable to one of the stile members.

[0011] Advantageously the securing means comprises first and second locking arms releasably fixable to the first and second stile members.

[0012] Advantageously the locking arm(s) is/are fixed to the /the respective stile member by locking means.

[0013] According to a second aspect of the present invention there is provided a scaffolding attachment comprising:

at least one stile member adapted to engage at least
a portion of scaffolding; and
means for releasably fixing the at least one stile member to a member of the scaffolding so as to provide an access ladder for the scaffolding, wherein the member of the scaffolding acts as a rung of the ladder.

[0014] This enables an access ladder to be formed by attaching the scaffolding attachment to the scaffolding, where one or more of the ladder rungs are formed by a member of the scaffolding. As will be appreciated by persons skilled in the art, a stile is an upright member, such as upright members which form the sides of a ladder, and a rung is a support member disposed substantially horizontally in use, extending between two such stiles, and providing support for a user to climb the ladder.

[0015] Preferably, the member of the scaffolding is disposed substantially horizontally in use. Conveniently, the member of the scaffolding is a tubular bracing member which forms part of the scaffolding.

[0016] Preferably, there are at least two such members which are, in use, spaced vertically along the scaffolding.

[0017] Preferably also, the stile member includes one or more rungs forming rungs of the ladder. Conveniently, the members of the scaffolding and the rungs of the stile member form alternate rungs of the ladder.

[0018] In this way, the rungs of the access ladder may alternately comprise members of the scaffolding and rungs of the stile member respectively.

[0019] Alternatively, the members of the scaffolding may form all of the rungs of the ladder.

[0020] In a further alternative, the means for fixing the stile member to a member of the scaffolding

includes one or more rungs.

[0021] Preferably, the scaffolding attachment comprises two stile members, each of which may include a recess for engaging a member of the scaffolding. Conveniently, the recess is U-shaped in cross-section.

[0022] Conveniently, the stile member includes at least two engaging recesses such that the stile member may engage two of the members of the scaffolding. Preferably, the rungs of the stile member are connected at one end to one stile member, and at the other end to the other stile member.

[0023] Alternatively, where the scaffolding attachment comprises only one stile member, the rungs of the stile member may be connected at one end to the stile member, and at the other end to a member of the scaffolding which, in use, is disposed substantially vertically.

[0024] Preferably, the means for fixing the stile member to a member of the scaffolding comprises left and right locking arms, each advantageously having a recess for engaging the member of the scaffolding, and means for engaging the stile member. Conveniently, the recess is U-shaped in cross-section, and engages the member which is engaged by the stile member such that, together with the stile member, the scaffolding attachment engages and at least substantially surrounds the member of the scaffolding to form the access ladder. The engaging means may be a nut and bolt arrangement. Alternatively, the engaging means may be a screw, retaining pin or the like. This enables the scaffolding attachment to be removed for maintenance, or to be located in an alternative position upon the scaffolding, or to be used with an alternative scaffolding.

[0025] Alternatively, the means for fixing the stile member may be provided integrally with the stile member. The means for fixing the stile member may comprise a latching means. Conveniently, the latching means may be a spring-loaded latch, adapted to engage the member of the scaffolding to lock the scaffolding attachment to the scaffolding. The latch may be formed in the engaging recess of the stile member. The latching means may be disengaged by a user disengaging the latch. A switch, button, lever or handle may be provided for the user to disengage the latching means. Alternatively, the latching means may comprise a retractable bolt.

[0026] In a further alternative, the latching means may comprise a spring-loaded retaining arm formed at the entrance to the U-shaped recess.

[0027] According to a third aspect of the present invention, there is provided a scaffolding including at least one scaffolding attachment in accordance with the first aspect of the present invention.

[0028] According to a fourth aspect of the present invention, there is provided a scaffolding including at least one scaffolding attachment in accordance with the second aspect of the present invention.

[0029] According to a fifth aspect of the present invention, there is provided a method of providing a scaffolding including an access ladder, the method comprising:

providing a scaffolding, which includes at least one member;
providing at least one stile member; and
releasably securing the at least one stile member to the at least one member of the scaffolding in a substantially vertical disposition to provide an access ladder for the scaffolding.

[0030] Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1A is a front view of a previously known frame section of a scaffolding incorporating a ladder;
Fig. 1B is a front view of an alternative previously known frame section of a scaffolding, incorporating a ladder;
Fig. 1C is a perspective view of a scaffolding, incorporating a further alternative previously known frame section including a ladder;
Fig. 2 is a perspective view of part of a scaffolding incorporating a scaffolding attachment in accordance with an embodiment of the present invention;
Fig. 3A is a plan view of the scaffolding attachment shown in Fig. 2;
Figs. 3B and 3C are front and side views respectively of a stile part of the scaffolding attachment of Fig. 3A;
Fig. 3D is a side view of a locking arm part of the scaffolding attachment of Fig. 3A;
Fig. 4A is a plan view of a scaffolding attachment in accordance with an alternative embodiment of the present invention;
Figs. 4B and 4C are front and side views respectively of a stile part of the scaffolding attachment of Fig. 4A; and
Fig. 4D is a side view of a locking arm part of the scaffolding attachment of Fig. 4A.

[0031] Arrangements of known scaffolding frame sections incorporating integral ladders are shown at Figs. 1A, 1B and 1C of the attached drawings. Fig. 1A shows a scaffolding frame section indicated generally by reference numeral 10, which comprises two spaced vertical tubes 12 and 14, and a number of horizontal bracing tubes 16 which are bolted to the tubes 12 and 14 via brackets 18, or may be welded to the tubes 12, 14. A ladder 20 is provided integrally with the frame section 10, and is welded to the frame 10 in gaps in the horizontal tubes 16. Fig. 1B shows a similar frame section 22 which is narrower than that of Fig. 1A.

[0032] Fig. 1C shows an assembled scaffolding indicated generally by reference numeral 24. The support 24 includes two front frame sections 26 which have

integral ladders 28. As can clearly be seen, the spacing of the rungs 30 of each ladder 28 is different from that of the horizontal bracing tubes 32.

[0033] Referring now to Fig. 2, there is shown a portion of a scaffolding indicated generally by reference numeral 34. The scaffolding portion 34 comprises front and rear frames indicated generally by reference numerals 36 and 38 respectively, and a number of a cross-bracing tubes such as tube 40, which connect the front frame 36 to the rear frame 38. For ease of clarity, Fig. 2 shows only one such cross-bracing tube 40. The scaffolding comprises a number of such scaffolding portions 34 which are inter-connected to successive scaffolding portions to provide a scaffolding of the required height. Hollow lower ends 42 of such a successive scaffolding portion are shown in Fig. 2, and are connected to the scaffolding portion 34 via male connectors 43 and 45. The front and rear frames 36 and 38 comprise support tubes 46 and 48 which are disposed substantially vertically when the scaffolding is assembled, and bracing tubes 50 and 52 which are welded to the support tubes 46 and 48, and are disposed substantially horizontally when the scaffolding is assembled. The tubes 50 and 52 provide support for the scaffolding under lateral loading.

[0034] A scaffolding attachment indicated generally by reference numeral 54 is connected to the front frame section 36 of the scaffolding portion 34. The scaffolding attachment 54 comprises a ladder portion 56, and left and right locking arms 58 and 60 respectively. The ladder portion 56 includes left and right stiles 62 and 64 respectively, which have recesses 72 therein (shown more clearly in Figs. 3B and 3C, as will be described in more detail below) for engaging the bracing tubes 50 and 52 of the front frame section 36. Ladder rungs 66 and 68 are welded to the left and right stiles 62 and 64. These rungs 66 and 68 are, in use, spaced alternately between the bracing tubes 50 and 52. The ladder portion 56 is locked to the frame section 36 by the left and right locking arms 58 and 60, which include recesses (shown more clearly in Fig. 3D) therein for engaging the bracing tubes 50 and 52) on the opposite sides of the tubes 50 and 52 to that which the ladder portion 56 engages. In this way, the ladder portion 56 and the locking arms 58 and 60 mutually cooperate so as to engage and surround the bracing tubes 50 and 52 of the frame section 36 in a close fit. In this embodiment the locking arms 58 and 60 are locked to the ladder portion 56 via a number of nut and bolt assemblies 70, to lock the scaffolding attachment 54 to the front frame section 36 in a releasably tight-fit, at any chosen location along the front frame section 36.

[0035] There follows a more detailed description of the scaffolding attachment of the present invention.

[0036] Referring now to Figs. 3A to 3D, the scaffolding attachment 54 of Fig. 2 is shown in more detail. Figs. 3B and 3C are front and side views respectively of the ladder portion 56 of the scaffolding attachment 54. The left and right stiles 62 and 64 are generally L-shaped in cross-section, and include recesses 72 which are generally U-shaped in cross-section, having a base 74 which is semi-circular, and of an internal diameter slightly larger than the outside diameter of the bracing tubes 50 and 52 of the front frame 36. The engaging recesses 72 are spaced along the stiles 62 and 64 at a distance equivalent to the spacing of the bracing tubes 50 and 52. This enables the ladder portion 56 to engage the bracing tubes 50 and 52 of the front frame 36.

[0037] The left and right locking arms 58 and 60 include engaging recesses 76, which are of substantially the same dimensions as the recesses 72, and which are spaced along the arms 58 and 60 in the same orientation as the recesses 72, so as to align with the recesses 72. The locking arms 58 and 60 are generally L-shaped in cross-section, and engage the bracing tubes 50 and 52 to surround the ladder portion 56, as shown in Figs. 2 and 3A. To lock the ladder portion 56 to the front frame section 36 and form the scaffolding attachment 54, the left and right locking arms 58 and 60 are connected to the ladder portion 56 via the nut and bolt assemblies 70. These assemblies 70 are received through apertures 78 in the arms 58 and 60, and apertures 80 in the ladder portion 56, which are aligned with the apertures 78. The recesses 76 engage the bracing tubes 50 and 52 of the frame section 36 such that, together with the ladder portion 56, the scaffolding attachment is securely coupled to the front frame section 36 when the locking arms 58 and 60 are connected to the stile portion 56. Thus the scaffolding attachment 54 forms an access ladder for the scaffolding portion 34, which is substantially prevented from sliding laterally along the bracing tubes 50 and 52, eg. by the interaction between the base 74 of recesses 72, and the base 82 of recesses 76.

[0038] In this way, a rung portion 84 of the tube 50, and a rung portion 86 of the tube 52 is defined between the stiles 62 and 64 of the ladder portion 56. These rung portions 84 and 86 enable a user of the scaffolding to ascend the scaffolding, utilising the rungs 66 and 68 and the rung portions 84 and 86 of the scaffolding attachment 54.

[0039] Referring now to Figs. 4A to 4D, there is shown an alternative scaffolding attachment 154, of similar structure to the scaffolding attachment 54 of Fig. 2, but of greater height, for use with scaffolding frame sections (not shown) of greater height than the frame sections 36 and 38 of Fig. 2. The scaffolding attachment 154 comprises a ladder portion 156, and locking arms 158 and 160 which lock the ladder portion 156 to the scaffolding frame section (not shown), in the same way as the scaffolding attachment 54 of Fig. 2 is locked to the frame section 36.

[0040] Various modifications may be made within the scope of the present invention.

[0041] For example, the rungs of the access ladder may be formed entirely by the bracing tubes of the scaf-

folding. The locking arms of the scaffolding attachment may include one or more of the ladder rungs. The locking arms may engage the ladder portion via a screw, retaining pin, or any other temporary fixing, enabling the scaffolding attachment to be easily removed from the scaffolding for maintenance, to be located in an alternative position upon the scaffolding, or to be removed and used with alternative scaffolding. The ladder portion may have an integral latch for engaging the scaffolding, which may be disengaged by the user to move the access ladder. The latch may be a spring-loaded latch or retaining arm, a retractable bolt or the like. The latch may be disengaged by a switch, button, lever, handle or the like.

[0042] The scaffolding attachment may equally be utilised upon scaffolding of the type comprising a series of tubular members which are temporarily connected via brackets, nut and bolt assemblies and the like.

Claims

1. A scaffolding attachment comprising at least one stile member and means for releasably securing at least one stile member to at least one scaffolding member.

2. A scaffolding attachment as claimed in claim 1 and including first and second stile members having at least one rung (tread) provided therebetween.

3. A scaffolding attachment as claimed in claim 2, wherein the securing means comprises at least one locking arm releasably fixable to one of the stile members.

4. A scaffolding attachment as claimed in claim 3, wherein the securing means comprises first and second locking arms releasably fixable to the first and second stile members.

5. A scaffolding attachment as claimed in either of claims 3 or 4, wherein the locking arm(s) is/are fixed to the/the respective stile member by locking means.

6. A scaffolding attachment comprising:

   at least one stile member adapted to engage at least
   a portion of scaffolding; and
   means for releasably fixing the at least one stile member to a member of the scaffolding so as to provide an access ladder for the scaffolding, wherein the member of the scaffolding acts as a rung of the ladder.

7. A scaffolding attachment as claimed in claim 6, wherein the member of the scaffolding is disposed substantially horizontally in use.

8. A scaffolding attachment as claimed in claim 7, wherein the member of the scaffolding is a tubular bracing member which forms part of the scaffolding.

9. A scaffolding attachment as claimed in claim 8, wherein there are at least two such members which are, in use, spaced vertically along the scaffolding.

10. A scaffolding attachment as claimed in any one of claims 6 to 9, wherein the stile member includes one or more rungs forming rungs of the ladder.

11. A scaffolding attachment as claimed in claim 10, wherein the members of the scaffolding and the rungs of the stile member form alternate rungs of the ladder.

12. A scaffolding attachment as claimed in any one of claims 6 to 9, wherein the members of the scaffolding form all of the rungs of the ladder.

13. A scaffolding attachment as claimed in any one of claims 6 to 11, wherein the means for fixing the stile member to a member of the scaffolding includes one or more rungs.

14. A scaffolding attachment as claimed in any one of claims 6 to 13, wherein the/each stile member includes a recess for engaging a member of the scaffolding.

15. A scaffolding attachment as claimed in any one of claims 6 to 14, wherein the scaffolding attachment comprises two stile members, each of which includes a recess for engaging a member of the scaffolding.

16. A scaffolding attachment as claimed in claim 14 or claim 15, wherein the recess is U-shaped in cross-section.

17. A scaffolding attachment as claimed in any one of claims 14 to 16, wherein the/each stile member includes at least two engaging recesses such that the/each stile member may engage two of the members of the scaffolding.

18. A scaffolding attachment as claimed in claim 15 when dependent upon claim 10, wherein the rungs of the stile member are connected at one end to one stile member, and at the other end to the other stile member.

19. A scaffolding attachment as claimed in claim 10, wherein the scaffolding attachment comprises only

one stile member, and the rungs of the stile member are connected at one end to the stile member, and at the other end to a member of the scaffolding which, in use, is disposed substantially vertically.

20. A scaffolding attachment as claimed in any one of claims 15 to 18, wherein the means for fixing the stile members to a member of the scaffolding comprises left and right locking arms, each advantageously having a recess for engaging the member of the scaffolding, and means for engaging a respective one of the stile members.

21. A scaffolding attachment as claimed in claim 20, wherein the recess is U-shaped in cross-section, and engages the member which is engaged by the stile member such that, together with the stile member, the scaffolding attachment engages and at least substantially surrounds the member of the scaffolding to form the access ladder.

22. A scaffolding attachment as claimed in either of claims 20 or 21, wherein the engaging means is a nut and bolt arrangement.

23. A scaffolding attachment as claimed in either of claims 20 or 21, wherein the engaging means is a screw, retaining pin or the like.

24. A scaffolding attachment as claimed in any one of claims 6 to 14, wherein the means for fixing the stile member is provided integrally with the stile member.

25. A scaffolding attachment as claimed in claim 24, wherein the means for fixing the stile member comprises a latching means.

26. A scaffolding attachment as claimed in claim 25, wherein the latching means is a spring-loaded latch, adapted to engage the member of the scaffolding to lock the scaffolding attachment to the scaffolding.

27. A scaffolding attachment as claimed in claim 26 when dependent upon claim 14, wherein the latch is formed in the engaging recess of the stile member.

28. A scaffolding attachment as claimed in either of claims 26 or 27, wherein the latching means is disengaged by a user disengaging the latch.

29. A scaffolding attachment as claimed in claim 26, wherein a switch, button, lever or handle is provided for the user to disengage the latching means.

30. A scaffolding attachment as claimed in claim 25, wherein the latching means comprises a retractable bolt.

31. A scaffolding attachment as claimed in claim 25 when dependent upon claim 14, wherein the latching means comprises a spring-loaded retaining arm formed at the entrance to the U-shaped recess.

32. A scaffolding including at least one scaffolding attachment in accordance with claim 1.

33. A scaffolding including at least one scaffolding attachment in accordance with claim 6.

34. A method of providing a scaffolding including an access ladder, the method comprising:

providing a scaffolding, which includes at least one member;
providing at least one stile member; and
releasably securing the at least one stile member to the at least one member of the scaffolding in a substantially vertical disposition to provide an access ladder for the scaffolding.

PRIOR ART

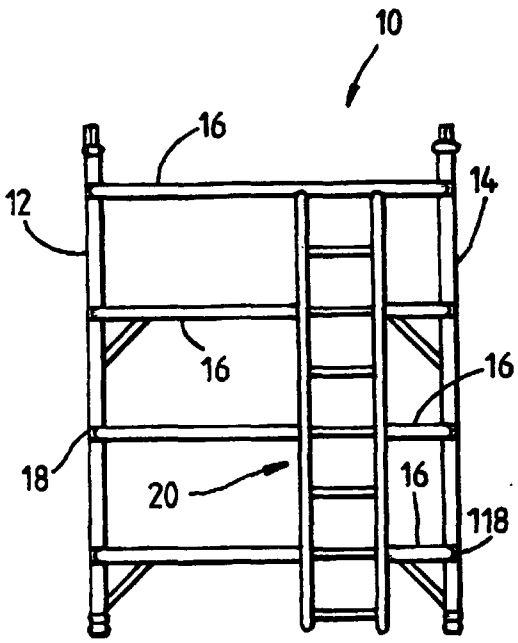

Fig. 1A

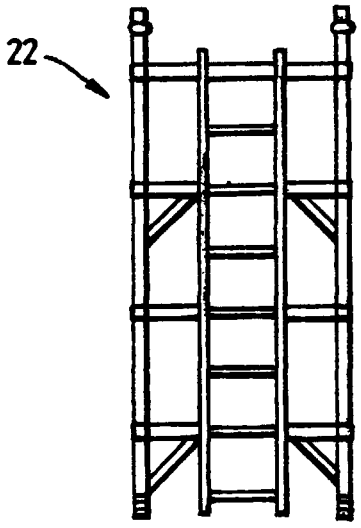

Fig. 1B

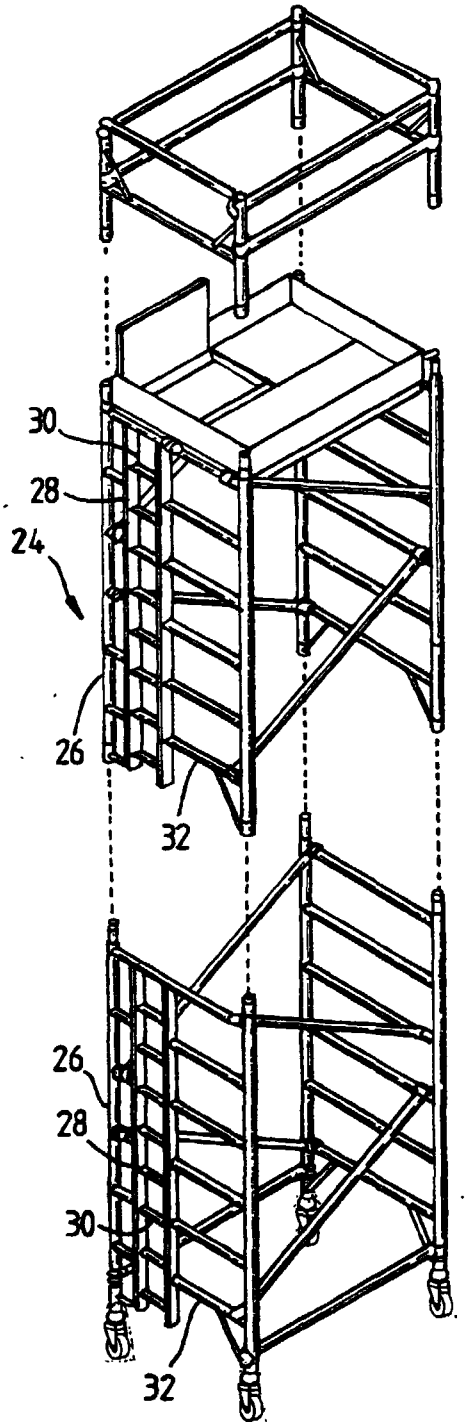

Fig. 1C

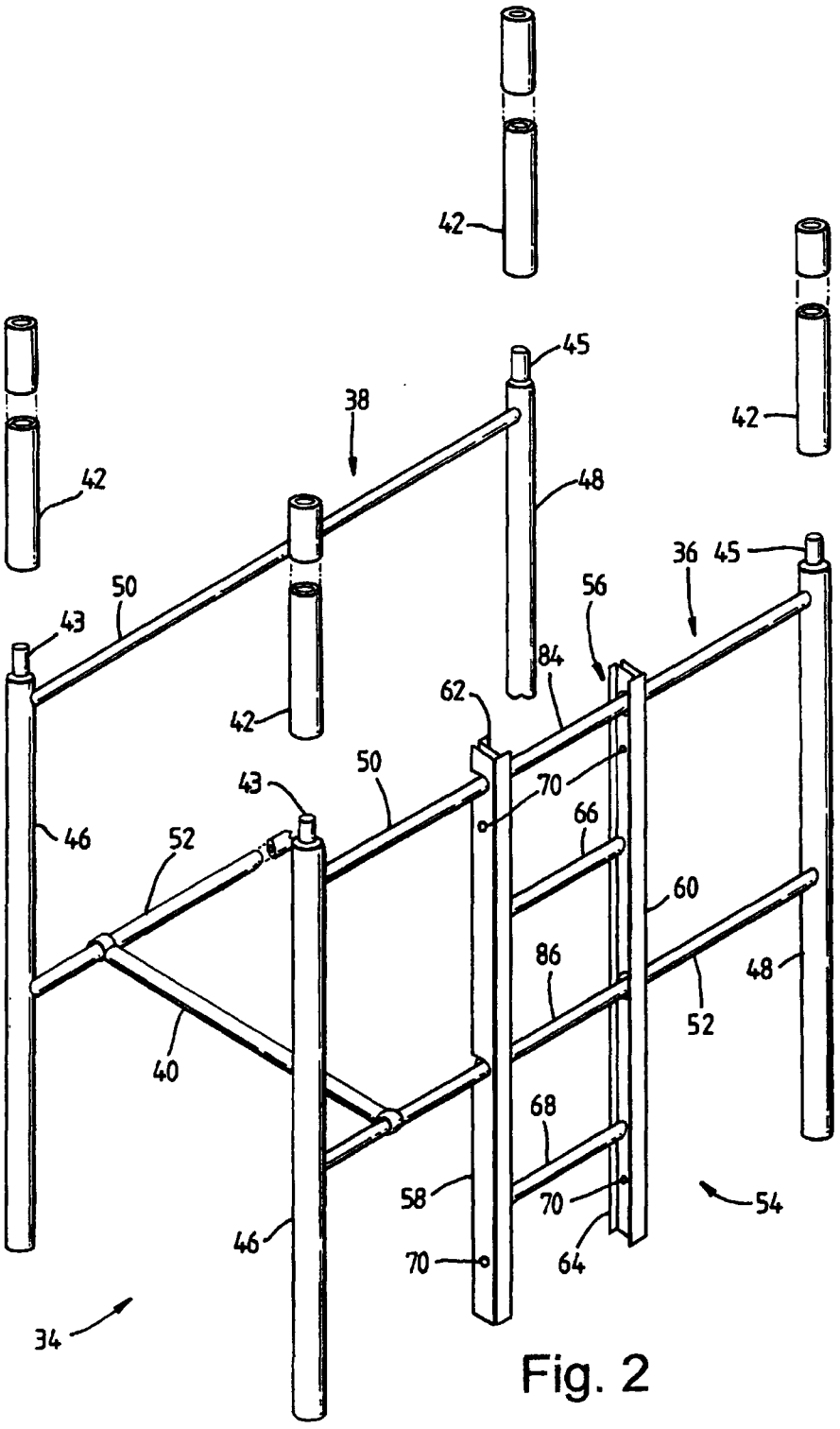
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Fig. 2

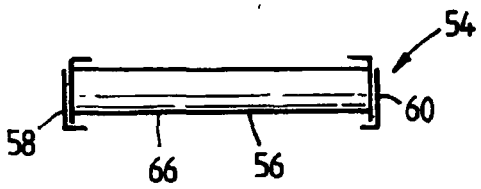

Fig. 3A

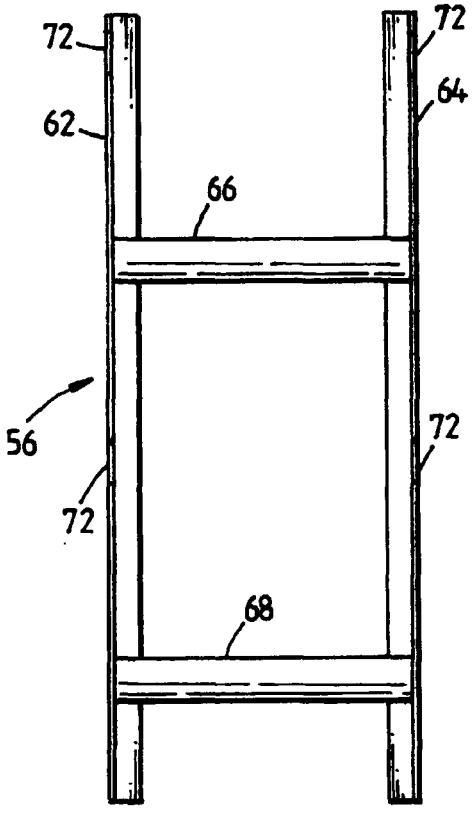

Fig. 3B

Fig. 3C

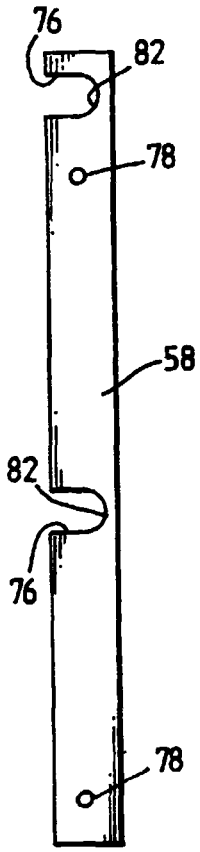

Fig. 3D

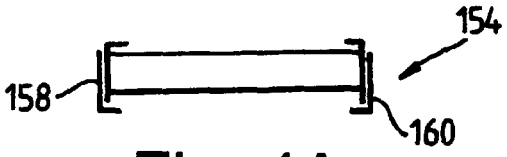

Fig. 4A

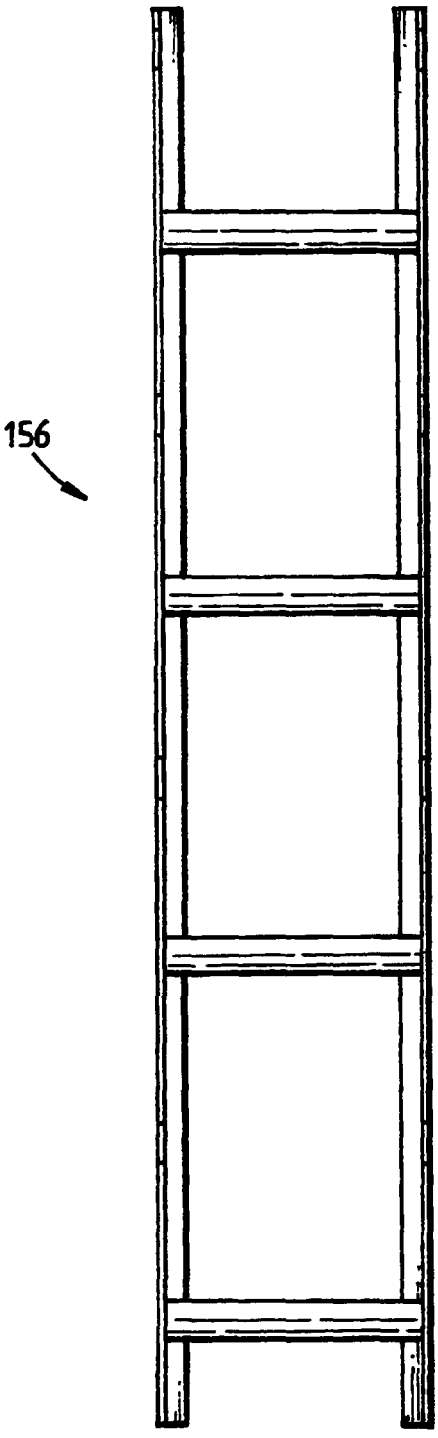

Fig. 4B

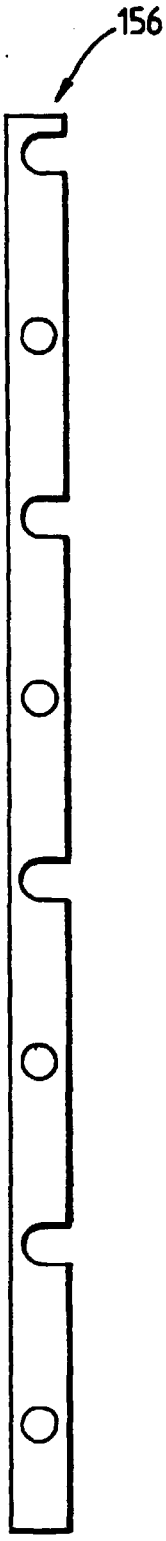

Fig. 4C

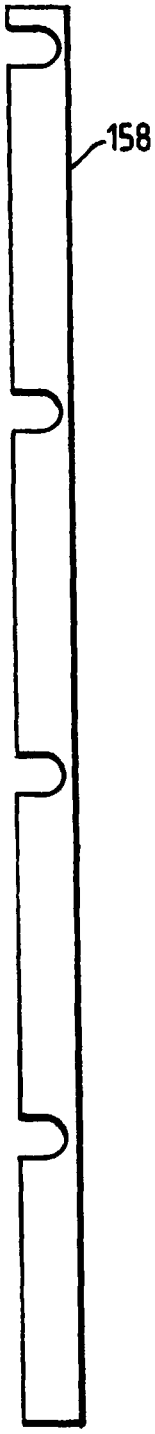

Fig. 4D