(54) Title: A SCAFFOLDING MODULE AND METHOD OF ERECTING SAME

Scaffolding module comprising one or more substantially planar frames (3, 15) to receive building materials; each frame (3, 15) is supported, in use, in a substantially horizontal position by four substantially parallel support members (2) and each frame (3, 15) and the support members (2) are pivotable relative to each other. Hence, the module (1) can be folded between a reduced volume storage configuration in which each frame (3, 15) lies alongside the support members (2) and an operational configuration in which each frame (3, 15) extends substantially perpendicularly to the support members (2). A method of erecting scaffolding using the described modules is also disclosed.
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A SCAFFOLDING MODULE AND METHOD OF ERECTING SAME

TECHNICAL FIELD

The present invention relates to scaffolding including a scaffolding module, and to a method of erecting scaffolding using the module. It is to be understood that references herein to scaffolding and erection thereof also includes a reference to formwork for concrete and erection thereof.

BACKGROUND ART

There are many systems of scaffolding available for use by the construction industry and all of them use the same basic components to erect the scaffolding. These basic components, namely standards, ledgers, transoms, platform boards, adjustable screwbases and braces, are required in great numbers and are interconnected with one another to achieve the desired height and configuration necessary for a particular application. The erection procedure using these individual components usually demands that one level of scaffolding be completed at a time and then each subsequent level is built upon the previous one. Similarly, it is conventional when disassembling scaffolding to remove the individual components in reverse order to that used during the erection procedure.

Clearly, the known scaffolding systems require considerable time and manpower to erect or take down which causes significant cost to be incurred and delays commencement of work.

It is also readily apparent that because there are so many individual components required in such scaffolding systems it is extremely easy for parts to be misplaced which necessarily incurs significant replacement costs and can lead to delays in the erection procedure. Additionally, during both erection and disassembly it is extremely inconvenient, particularly at great heights, for workmen to handle and remove the individual components from the scaffolding. Accordingly, there is a great tendency to allow components to drop or fall, especially when sections are being dismantled since this is quicker than lowering
them. These actions can create serious accidents and damage to the individual components, both of which lead to additional costs being potentially incurred.

Moreover, the transportation, sorting and storage of large volumes of individual components adds even further to loss of time and manpower, as well as loss of storage space and general inconvenience.

It is the object of the present invention to provide a scaffolding module and a method of scaffolding which will overcome, or substantially ameliorate, the abovementioned disadvantages.

**DISCLOSURE OF THE INVENTION**

According to one aspect of the present invention there is disclosed a scaffolding module comprising at least one substantially planar frame to receive building materials and bear the weight of workmen; said frame being supported, in use, in a substantially horizontal position by a plurality of substantially parallel support members; wherein said frame and support members are pivotable relative to each other to permit said module to be folded between a reduced volume storage configuration in which said frame lies alongside said support members and an operational configuration in which said frame extends substantially perpendicularly to said support members.

Preferably, the frame comprises a portion of a substantially planar platform. In some preferred instances, the planar platform is releasably engageable with the frame.

As well, it is preferable that the upper and lower ends of the support members are adapted to releasably engage the lower and upper ends respectively of corresponding support members of like modules positioned above and below the module in a stack of like modules.

It is also preferable that attachment means be provided to secure each module (possibly within a stack), in use, to like modules (possibly within an adjacent stack) positioned adjacent thereto.

Further, it is preferable that, in use, a shield be located in a substantially vertical position on the side of
the platform remote from the workface to prevent objects
falling from the platform and out of the module.

In addition, it is also preferable, where a module is
to be used as a street hoarding which provides a pedestrian
thoroughfare with overhead protection around urban
construction sites, that appropriate counterweighting and
bracing of the module be provided to ensure stability
thereof and safety therefrom for the public.

According to another aspect of the present invention
there is disclosed a method of erecting scaffolding using
the above described modules, said method comprising the
steps of unfolding said module from the reduced volume
storage configuration, securing said platform in the
operational configuration, and, if necessary, subsequently
raising said module into its final upright position.

BRIEF DESCRIPTION OF THE DRAWINGS

Some embodiments of the present invention will now be
described with reference to the drawings in which:
Fig. 1 is a perspective view of the module of a first
embodiment in the operational configuration including two
detailed views;
Fig. 2a is a side elevation of the module of Fig. 1 in
the reduced volume configuration;
Fig. 2b is a side elevation of the module of Fig. 1 in
a partially reduced volume configuration;
Fig. 2c is a side elevation of the module of Fig. 1 in
the operational configuration but unraised;
Fig. 2d is a side elevation of the module of Fig. 1
being raised;
Fig. 3 is a cross sectional view in the direction
III-III of Fig. 1;
Fig. 4 is a side elevation in the direction of arrow
IV of Fig. 3;
Fig. 5 is a cross sectional view similar to that of
Fig. 3, but in respect of the module of a second embodiment; and
Fig. 6 is a perspective view of the module of a third
embodiment in the operational configuration.
BEST MODE OF CARRYING OUT THE INVENTION

As illustrated in Fig. 1, the preferred embodiment of the scaffolding module 1 includes four substantially vertical support members 2 on which are pivotally mounted three substantially horizontal platforms 3. Each of said platforms 3 is pivoted by link bolts 4 to each of the support members 2 and is retained in the operational configuration by securing bolts 5 which pass through both plates 6 and support members 2.

As can be best seen in the two detailed views of Fig. 1 and Fig. 4, when the securing bolts 5 are removed, the support members 2 are able to pivot in the direction of arrow A and thus brought into proximity with both one another and the platforms 3. In this way a reduced volume storage configuration (Fig. 2a) is achieved, with the module 1 being foldable from the operational configuration illustrated in Fig. 1 into the storage configuration of Fig. 2a.

As indicated in Fig. 4, by dashed lines, in the storage configuration, the support members 2 are received by recesses 7 formed in the side ends 12 of platforms 3.

Turning now to Figs. 2a, 2b, 2c and 2d, a module 1 can be raised from the reduced volume storage configuration, by pivoting the platforms 3 in the direction of arrows B by the action of a crane sling 10 which releasably engages lugs 8 attached to the upper pair of support members 2 (Figs. 2b and 2c).

To retain the module 1 in the operational configuration, securing bolts 5 are inserted through plates 6 and support members 2 (Figs. 2c and 2d). Thereafter, the sling 10 can then releasably engage lugs 9 on the lower pair of support members 2 and one of the lugs 8 in close proximity thereto. Then, the whole module 1 is lifted in the direction of arrow C so as to be both upright and positioned in a predetermined location. In this regard, it is noted that the ends of support members 2 are adapted to releasably engage and releasably receive the ends of support members 2 of like modules positioned above and below the
module 1 in a stack of similar modules 1.

With regard to Fig. 2d, it is noted that once a module 1 in the operational configuration is upright and has been located in the predetermined position, it can be further secured by passing a link (not illustrated) between the lugs 8 of adjacent modules 1.

It will be seen from Fig. 3 that the plates 6 are curved to match the curvature of the support members 2 and this ensures that when the securing bolts 5 are inserted through both plates 6 and support members 2, that the abutment between the surfaces of the support member 2 and the plate 6 is tight, stable and non-slipping.

It will also be seen that a wire mesh 11 (Figs. 1 and 3) is located between the pair of support members 2 remote from the workface. The mesh 11 extends over substantially the whole length of that face of the module 1 between the pair of support members 2 to ensure that bricks, tools and even workmen do not fall out of the module 1 to the ground below.

With reference to Fig. 5, the plate 6, support members 2, wire mesh 11 and platforms 3 are substantially as described above in relation to Fig. 3. However, a single plate 6 is located between the support member 2 and platform 3 which eliminates the need for the recesses 7 (Fig. 3) and an extra external plate 6 (Fig. 3). This, obviously, leaves a gap between co-planar platforms 3 of adjacent like modules 1 but a hinged flap 13 is attached to one end of each platform 3 so that, in use, the flap can be moved from a position adjacent to the platform it is attached to and brought into contact with the platform of the adjacent module. Thereafter, a pair of spring steel slides 14 can be fixedly located around the sides of the pair of support members 2 (illustrated in phantom) adjacent to the side of the first module by outward slide action (Arrow D).

Turning now to Fig. 6, the module 1, support members 2, link bolts 4, securing bolts 5 and plates 6 are substantially as described above in relation to Fig. 1. However, as the module 1 is intended for use with concrete
formwork (not illustrated) there is no wire mesh 11 (Fig. 1) present and three substantially horizontal frames 15 are pivotally mounted on the support members 2. If desired, the space defined by each frame 15 can be covered by a corresponding removable surface panel 16.

The foregoing describes only one embodiment of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the present invention. For example, a multi-component scaffolding kit can be utilized to obtain the substantial advantage of the invention. In this regard, individual components are assembled so as to create the module 1 in the reduced volume storage configuration (Fig. 2a) or a similar configuration thereabouts prior to raising of the module 1 into the operational configuration (Fig. 1).
CLAIMS

1. A scaffolding module comprising at least one substantially planar frame adapted to receive building materials and bear the weight of workmen; said frame being supported, in use, in a substantially horizontal position by four substantially vertical support members; wherein said frame and support members are pivotable relative to each other to permit said module to be folded between a reduced volume storage configuration in which said frame lies alongside said support members and an operational configuration in which said frame extends substantially perpendicularly to said support members.

2. A scaffolding module as claimed in claim 1 wherein said frame comprises a portion of a substantially planar platform.

3. A scaffolding module as claimed in claim 2 wherein said platform is releasably engaged with said frame.

4. A scaffolding module as claimed in claim 1 wherein the upper and lower ends of said support members are adapted to releasably engage the lower and upper ends respectively of corresponding support members of like modules positioned above and below said module and a stack of like modules.

5. A scaffolding module as claimed in claim 4 wherein said upper end and/or said lower end of at least one of said support members include an end receiving portion comprised of a sleeve fitted to said upper end and/or said lower end which extends beyond, and is outwardly flared away from, the free end(s) of said support member.

6. A scaffolding module as claimed in claim 1 wherein a shield is located on that side of said module remote from the work face and substantially perpendicular to said frame.

7. A scaffolding module as claimed in claim 1 wherein an attachment means is provided which is adapted to releasably engage a pair of said modules in side by side relationship.

8. A scaffolding module as claimed in claim 7
wherein said attachment means comprises at least one pair of lugs, each one of said lugs having a bore therein, and being located on each one of at least one pair of adjacent support members, each one of said support members of said pair being positioned in an adjacent module, and a releasably engageable securing link adapted to pass through said bore and thereby secure each of said pair of lugs.

9. A scaffolding module as claimed in claim 1 wherein a bridging means is provided between each adjacent pair of modules, said bridging means comprising a connector hingedly attached to a first module at one end to a side wall of said frame between a pair of adjacent support members; said connector being foldable between a storage position in which said connector substantially abuts against an uppermost surface of said frame of said first module and a use position in which said connector substantially abuts against an uppermost surface of said frame of a like second module positioned adjacent thereto.

10. A scaffolding module as claimed in claim 9 wherein said connector includes at least one releasably engageable locking means attached to the free end of said connector which, in use, retains said connector in said use position by engagement with at least one said support member of said adjacent like module closest to said module.

11. A scaffolding module as claimed in claim 10 wherein said locking means comprises a spring steel slide which has an engagement portion which is slidable between a non-use position substantially adjacent to said connector and a use position in which said engagement portion is substantially adjacent said support member.

12. A scaffolding module as claimed in claim 1 or 2 wherein the lowermost one of said modules in a stack of like said modules is adapted to be used as a street hoarding module, the lowermost ends of said support members of said lowermost module being counter weighted and having additional bracing means adapted to engage said support members to thereby ensure stability of said lowermost module.

13. A method of erecting scaffolding using a
scaffolding module as claimed in any one of claims 1 to 12, said method comprising the steps of unfolding said module from a reduced volume storage configuration, securing said frame in the operational configuration, and, if necessary, subsequently raising said module into its final upright position.
ORIGINAL
5 SHEETS, SHEET 1

FIG. 1

SUBSTITUTE SHEET
ORIGINAL
5 SHEETS, SHEET 2

FIG. 2a
FIG. 2b
FIG. 2c

SUBSTITUTE SHEET
INTERNATIONAL SEARCH REPORT

International Application No. PCT/AU 85/00229

I. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl. 4  E04G 1/34

II. SEARCHED CLASSIFICATION

Minimum Documentation Searched

Classification System  Classification Symbols

IPC  E04G 1/34

Documentation Searched other than Minimum Documentation

to the Extent that such Documents are Included in the Fields Searched

AU: IPC E04G 1/34, 1/14, 1/15

III. DOCUMENTS CONSIDERED TO BE RELEVANT

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<tr>
<th>Category</th>
<th>Citation of Document, with indication, where appropriate, of the relevant passages</th>
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<td>A</td>
<td>GB,A, 1271442 (KOTTGEN &amp; CIE) 19 April 1972 (19.04.72)</td>
<td>(1-4)</td>
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<td>X</td>
<td>US,A, 3221837 (FISHER) 7 December 1965 (07.12.65)</td>
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IV. CERTIFICATION

Date of the Actual Completion of the International Search: 28 November 1985 (28.11.85)
Date of Mailing of this International Search Report: 09 December 1985 (09.12.85)

International Searching Authority: Australian Patent Office

Signature of Authorized Officer: C.A. TARRANT

Form PCT/ISA/210 (second sheet) (January 1985)
This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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