

(19)



(11)

**EP 1 785 548 A2**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**16.05.2007 Bulletin 2007/20**

(51) Int Cl.:  
**E04G 5/00 (2006.01)**

(21) Application number: **06023551.2**

(22) Date of filing: **13.11.2006**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR**

Designated Extension States:  
**AL BA HR MK YU**

(72) Inventor: **Owens, Andrew Charles Birmingham B5 6QL (GB)**

(74) Representative: **Gregory, Timothy Mark TM Gregory & Co Carlton House 26 Billing Road Northampton NN1 5AT (GB)**

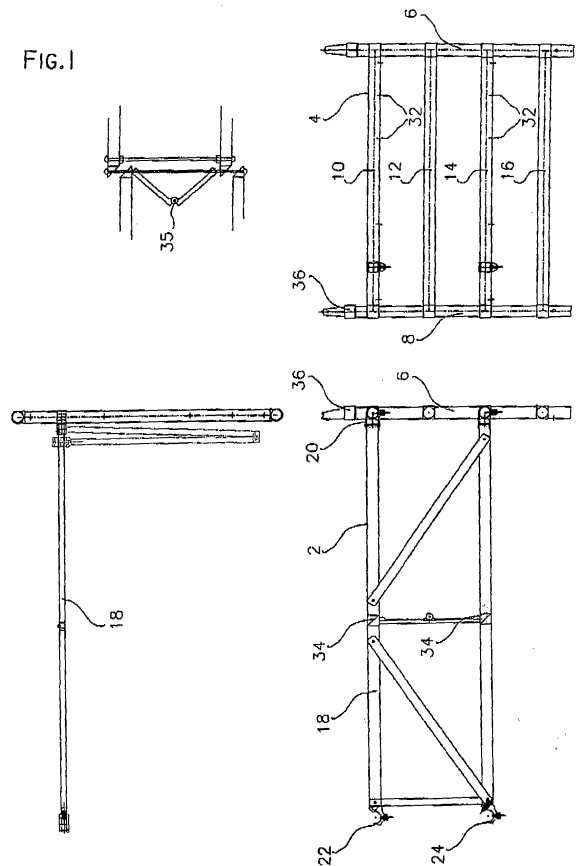
(30) Priority: **11.11.2005 GB 0522999**

(71) Applicant: **Owens, Andrew Charles Birmingham B5 6QL (GB)**

**(54) Scaffolding tower with integral safety features**

(57) The scaffolding tower system has a guardrail system including an integral safety barrier, permanently attached to the scaffolding structure. The safety barrier is adjustable to accommodate required permitted dimensional variations. The scaffolding structure is arranged such that the perimeter guard rail system protects all faces of the structure and irrespective of the position and level at which the platform units are installed, the operatives are protected from falling.

FIG.1



**EP 1 785 548 A2**

## Description

**[0001]** Scaffolding has long been used in industry for gaining access to high and awkward locations. Whilst scaffolding provides a safe environment for operatives to work this is not always the case for the persons erecting and dismantling scaffolding structures. Various systems exist for providing temporary safety guard rails in advance of the erection of the scaffolding tower but they are often difficult to install and adjust. Recent changes in legislation require that scaffolding erectors / dismantlers are provided with guard-rail protection at all times whilst erecting, altering and dismantling scaffolding. Many of the existing safety systems and methods are difficult to use correctly and may not provide guardrail protection in accordance with the current and future safety and design regulations.

**[0002]** This invention relates to a scaffolding tower system whereby the guardrail system comprises an integral safety barrier which is permanently attached to the scaffolding structure and cannot be removed from the structure whilst the structure remains erected. The safety barrier is adjustable to accommodate the required permitted dimensions for various tower height and platform width configurations.

**[0003]** According to the present invention, there is provided a scaffolding structure comprising multiple identical frame units incorporating an end frame and a side guard frame pivotally connected together and incorporating connecting means for connecting the frame members together vertically such that when assembled to form a scaffolding structure guard rails are provided at such a frequency as to provide guard rail protection at all possible platform levels.

**[0004]** Preferably the width between guard rails may be varied to allow for various combinations of platform position and platform width.

**[0005]** Advantageously guarding frames at the base of the tower structure may be stowed to one side of the tower such that alternative components may be added to provide an access aperture for entering inside the tower structure.

**[0006]** The lowest level of the frame units may incorporate integral stabilisers for providing additional stability when building scaffolding towers to great height.

**[0007]** The scaffolding structure is arranged such that the perimeter guard rail system protects all faces of the structure irrespective of the position and level at which the platform units are installed such that the operatives are protected from falling at all times.

**[0008]** An embodiment of the invention will now be more particularly described with reference to the following drawings, in which:-

Fig.1 shows a front elevation, side elevation and plan view of a scaffolding frame assembly and an additional elevation of the frame locking device.

Fig.2 shows partial side and end elevations of the pivoting, sliding connection;

Fig.3 shows a partial side elevation of a sliding hook connection;

Fig.4 shows a front elevation, side elevation and plan view of a scaffolding tower structure during assembly;

Fig.5 shows a side elevation of tower end frames and deck units during relocation; and

Figs.6 and 6a show a front elevation, side elevation and plan view of a scaffolding tower structure during assembly and an elevation of alternative frames used at the base level.

**[0009]** The scaffold device comprises a scaffolding frame (2) which incorporates an end frame (4) comprising vertical frame members (6,8) and multiple, horizontal frame members (10-16) forming a ladder like structure. Each scaffolding end frame incorporates a side guard frame (18) which together with the end frame forms two adjacent sides of a perimeter guarding system. The side guarding frame is pivotally connected to the scaffolding frame member at one end by a pivotable connection member (20) and incorporates hook members (22,24) at the other end. The lower hook connection (24) incorporates a releasable hook mechanism (26) for connecting the end of the scaffolding frame to another scaffolding frame. The pivotable connections and the hook members are free to slide along the horizontal frame members and incorporate plunger mechanisms (28,30) which locate into holes (32) in the horizontal frame members such that the side guarding frame may be positioned at predetermined locations enabling the protection offered to be close to the position of the platform units requiring guarding, ensuring that dimensional regulations are complied with.

**[0010]** The side guard frame incorporates lockable hinge mechanisms (34) which when unlocked (35) permits the guard frame to be folded for ease of handling and transportation and which may be used to lock the frame in its deployed mode.

**[0011]** At one end of the scaffolding frames, jointing pieces (36) are attached and subsequent vertical additions to the scaffolding structure may be releasably connected thereto.

**[0012]** Scaffolding platform units (40) are provided which may be releasably attached to the scaffolding horizontal frame members. The platform units may be positioned on any rung position to provide a level working platform. The platform incorporates hook devices (42) for the support of the platform unit at the desired position. The hook devices are pivotally connected (44) to the platform frame. The hook members are free to rotate downwards from the horizontal position and incorporate a re-

turn device which causes the hooks to be held in an upwardly rotated manner.

[0013] The return device may comprise a spring mechanism or may comprise a counterbalance mechanism to provide the return action.

[0014] For facilitate operation the hooks may be connected together in pairs.

[0015] The platform units may incorporate a hinged trapdoor (46) such that access to the platform may be gained by climbing the end frame rungs and passing through the trapdoor.

[0016] To position the platform unit on the tower structure the platform unit is first placed on the tower at a convenient level. The platform unit may then be raised at one end (position 1 or position 2) such that the hooks make contact with the horizontal member immediately above the hooks whereby further raising movement causes the hooks to rotate out of the way allowing the platform unit to pass the horizontal member(s). After passing the horizontal member(s) the hooks return to their original position and the platform hooks may be located onto the horizontal frame member. This procedure is continued at opposite ends of the platform unit (position 3) until the desired height is reached and the platform unit is horizontal (position 4). To prevent unintentional or unauthorised repositioning of the platform unit, locking devices may be deployed to prevent the hooks from being detached from the structure.

[0017] The safe erection of the tower structure is accomplished by first attaching castor wheels (50) or levelling jacks onto the lower end of two scaffolding frames (52). The guard frames are deployed from the folded position and the pivot locking device (34) is operated. The scaffolding frames are arranged to form a rectangle and the hook ends are located into the receiving holes on the opposite frames thus connecting the pair of scaffolding frames together.

[0018] A second pair of frames (54) are located onto the jointing pieces of the first pair of frames and the guarding frames are then deployed, locked and the hook ends are located and locked onto the opposite frames as in the first instance.

[0019] A platform unit may be installed in the tower at the third or fourth rung level to provide a safe platform from which to continue erection.

[0020] A third pair of scaffolding frames (56,58) are then located onto the jointing pieces of the second pair of frames and similarly deployed, locked and coupled together.

[0021] At each stage of construction the scaffolding frames provide a continuous safe perimeter guard at all levels within the tower structure.

[0022] The platform unit may be raised in the tower such that a higher platform position is provided from which further construction may be safety performed.

[0023] During erection further platform units can be added from ground level and each of the platform units may then be raised or lowered as required from the

ground or from the platform below.

[0024] During construction it is usual to use a single platform unit to provide access within the tower structure. When a working platform for carrying materials is required then an additional platform unit is positioned alongside the first platform.

[0025] The guarding frame may be repositioned to allow the full platform width to be used. The locating pins securing the sliding pivots and the sliding hooks attached to the guarding frames may be retracted and the guard frames may be repositioned along the horizontal member located. The pins are relocated into a receiving holes in the horizontal members at the predetermined positions, as shown (60).

[0026] To safely climb the scaffold tower it is required to enter the tower structure at the base of the tower and then climb up using the horizontal rungs of the frames.

[0027] The multiple horizontal members at base level may make it inconvenient to gain access to the inside of the framework. Therefore the lowest level of the tower may incorporate an auxiliary frame unit (70) with an access aperture to enable easier access to the inside of the tower.

[0028] Alternatively the guard frames on one face of the first or first and second levels of the tower may be stowed in the folded position and an additional lattice beam member (72) may be incorporated forming an access aperture.

[0029] Additional releasable components forming stabilisers may be attached to the tower base to provide a larger base area to assist is the stability of Free-standing tower structures. These stabilisers may form an integral part of double height base frame units which may simplify erection procedures.

In use the erection and dismantling of the combined scaffolding frame and guardrail barriers may be accomplished from within the perimeter guarding assembly thus ensuring that the structure is always erected from a place of safety.

### Claims

1. A scaffolding structure comprising a plurality of substantially identical frame units, each incorporating an end frame and a side guard frame pivotally connected thereto **characterised in that** connection means for connecting the frame units one to another, such that when assembled to form a multi-level scaffolding structure, guard rails are provided at substantially each said level.
2. A scaffolding structure as claimed in claim 1, **characterised in that** the width between guard rails may be varied.
3. A scaffolding structure as claimed in claim 1, **characterised in that** guard frames at the base of the

tower structure may be stowed to one side of the tower such that alternative components may be added to provide an access aperture for entering inside the tower structure.

- 5
4. A scaffolding structure as claimed in claim 1, **characterised in that** the lowest level of the frame units incorporate integral stabilisacers for providing additional stability when building scaffolding towers to great height. 10
5. A scaffolding structure as claimed in claim 1, further comprising releasable hook means with retractably locking means enabling the relocation of the guard rail members to predetermined positions within the structure without disconnection of the hook means from the horizontal frame members. 15
6. A scaffolding structure as claimed in claim 5, **characterised in that** wherein a lockable pivot means to enable folding guard frames to be locked in a deployed position. 20
7. A scaffolding structure further comprising a platform unit incorporating pivotably connected hook means such that, when the platform unit is raised, the hook mechanisms fold away from the obstructing horizontal frame member and after passing the obstruction the hooks re-deploy to be located onto the required frame member. 25  
30
8. A scaffolding structure as claimed in claim 7, **characterised in that** the hook mechanism incorporates a locking device to prevent the accidental disconnection of the platform hook means from the scaffolding structure. 35

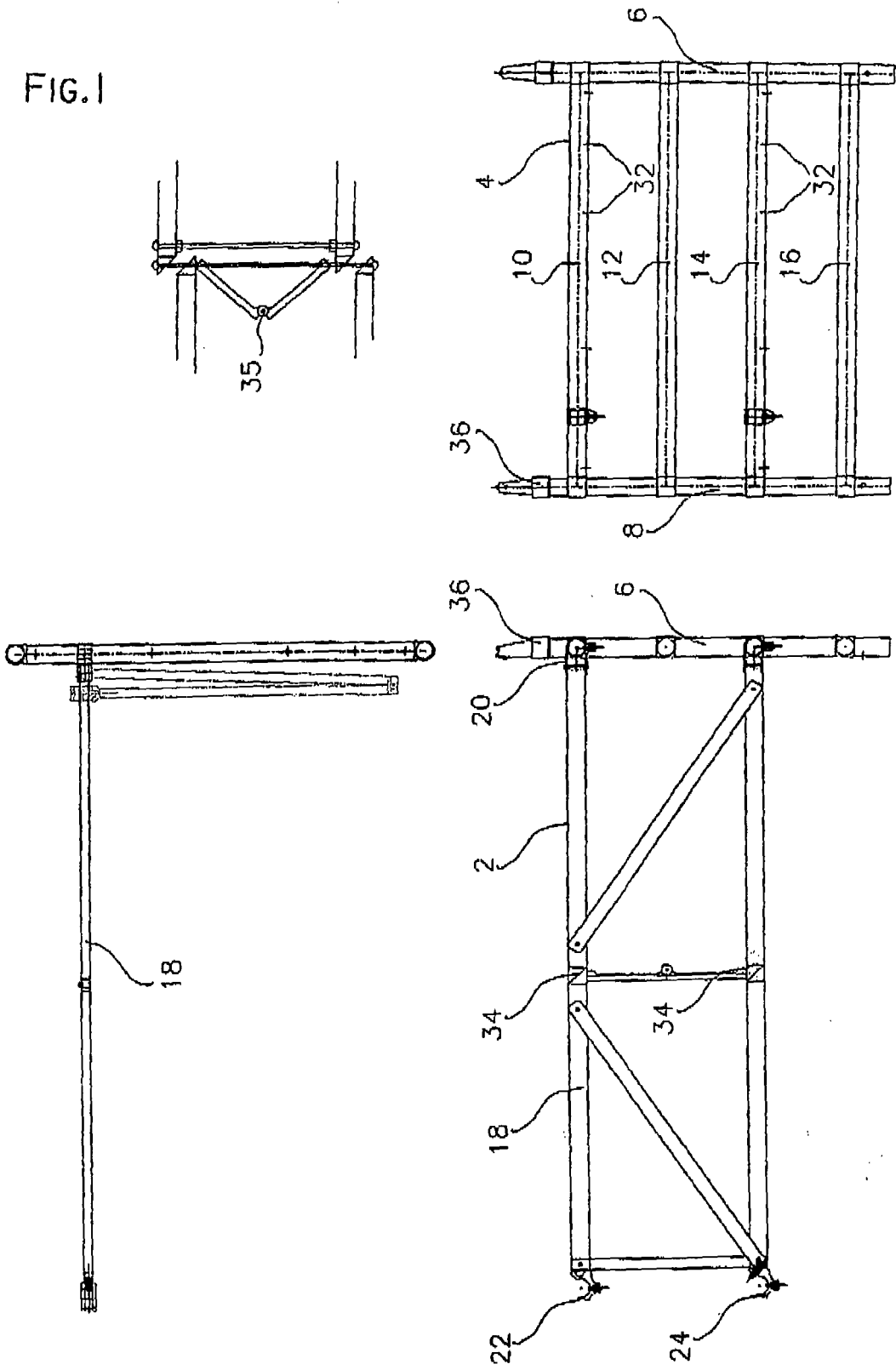
40

45

50

55

FIG. 1



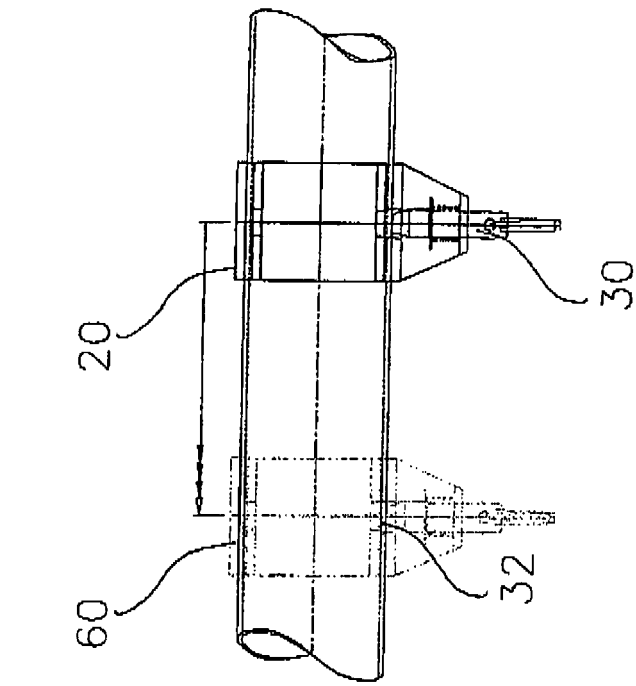


FIG. 2

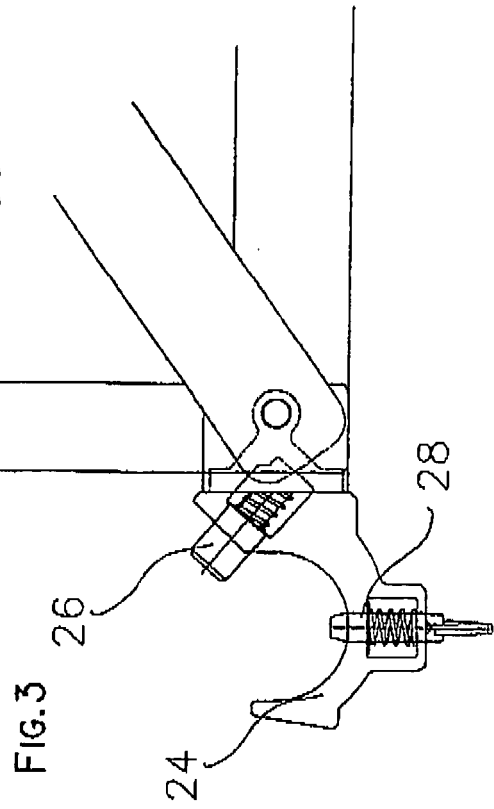
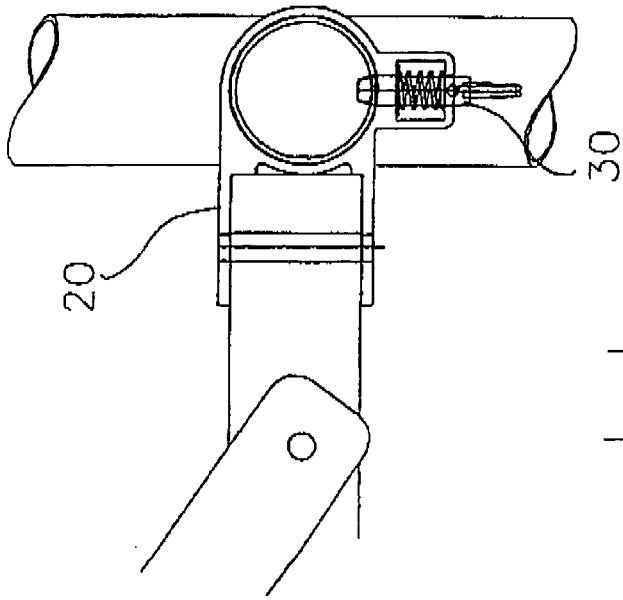


FIG. 3

FIG. 4

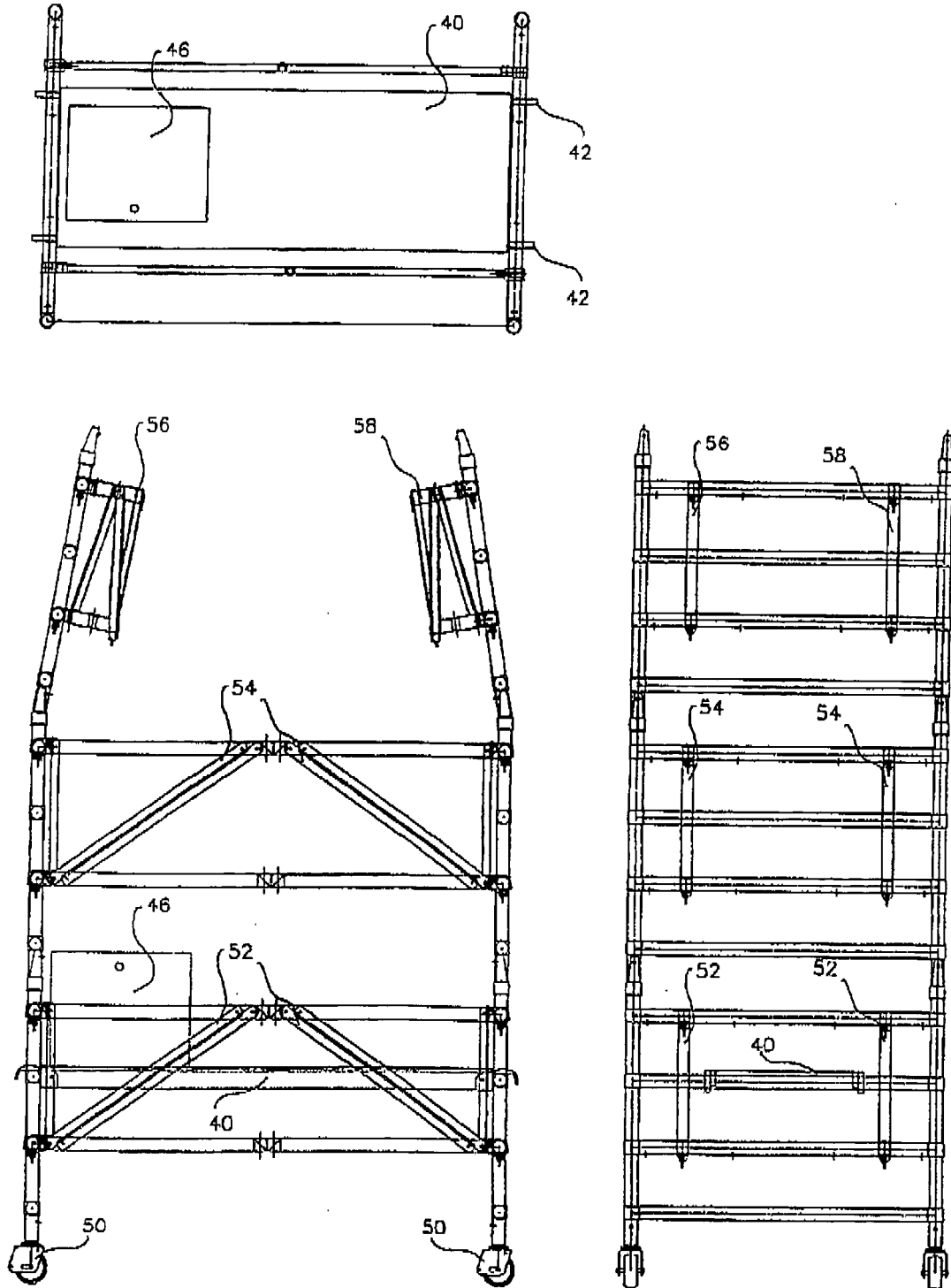


FIG.5

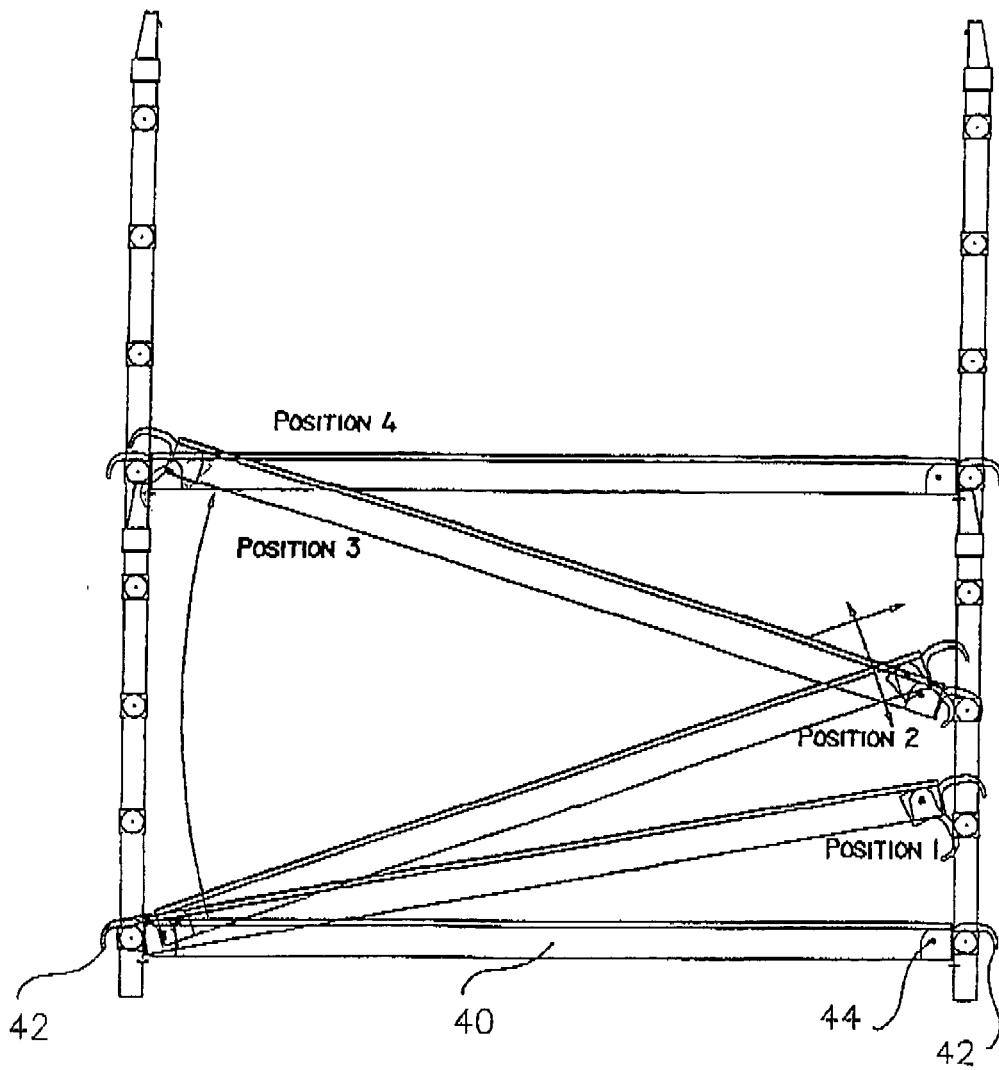




FIG.6

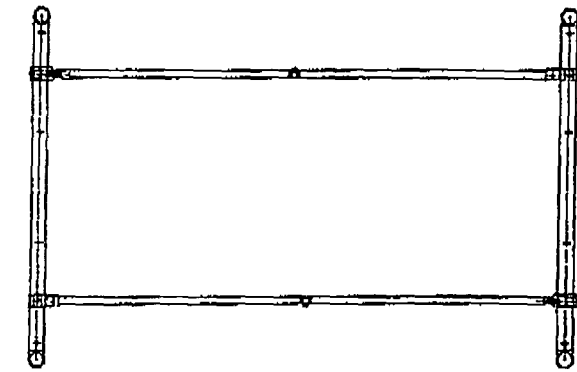


FIG.6A

