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ST-GERMAIN et al.

(54) **SIZE ADJUSTABLE PLATFORM FOR SCAFFOLDING**

(76) Inventors: **Andre ST-GERMAIN**, St-Bonaventure (CA); **Luc TESSIER**, St-Nicephore (CA)

Correspondence Address:
Franz BONSANG
c/o EQUINOX PROTECTION
410 - 1500, Du College
St-Laurent, QC H4L 5G6 (CA)

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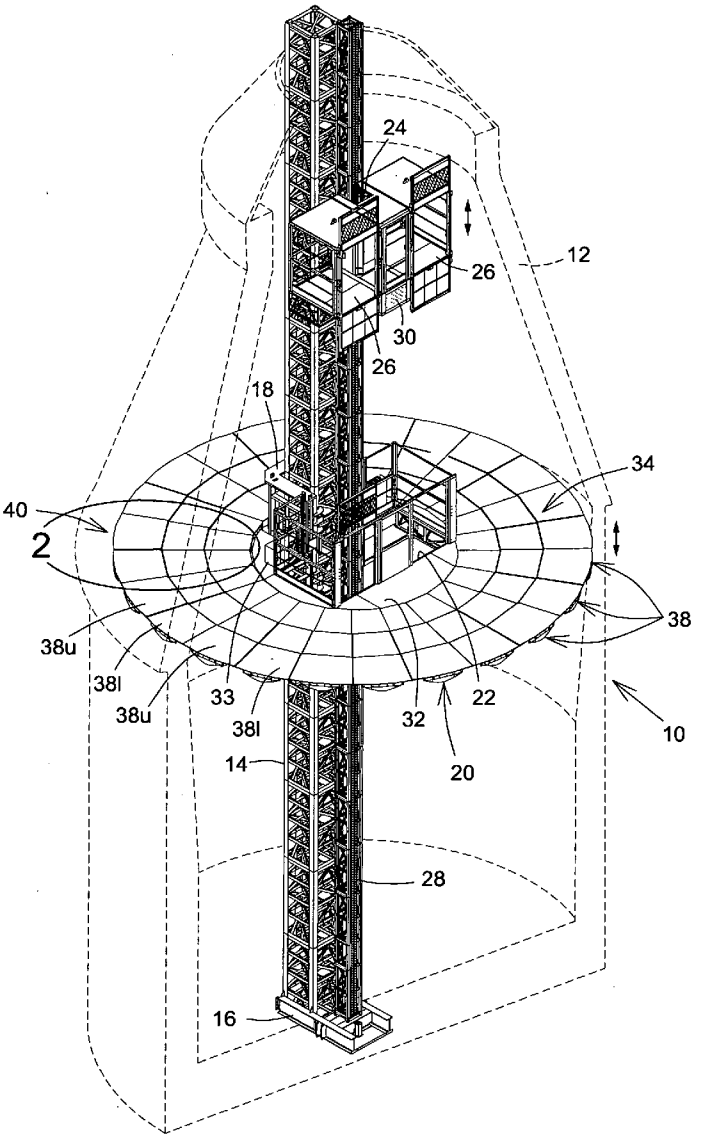
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(57) **ABSTRACT**

A size-adjustable platform for scaffolding comprises a plurality of overlapping sections extending from a central core, the sections including separate panels reciprocable with respect to the central core whereby the extent of the platform from the central core may be varied in size upon actuation of a ram or equivalent to cater for variable dimensions.



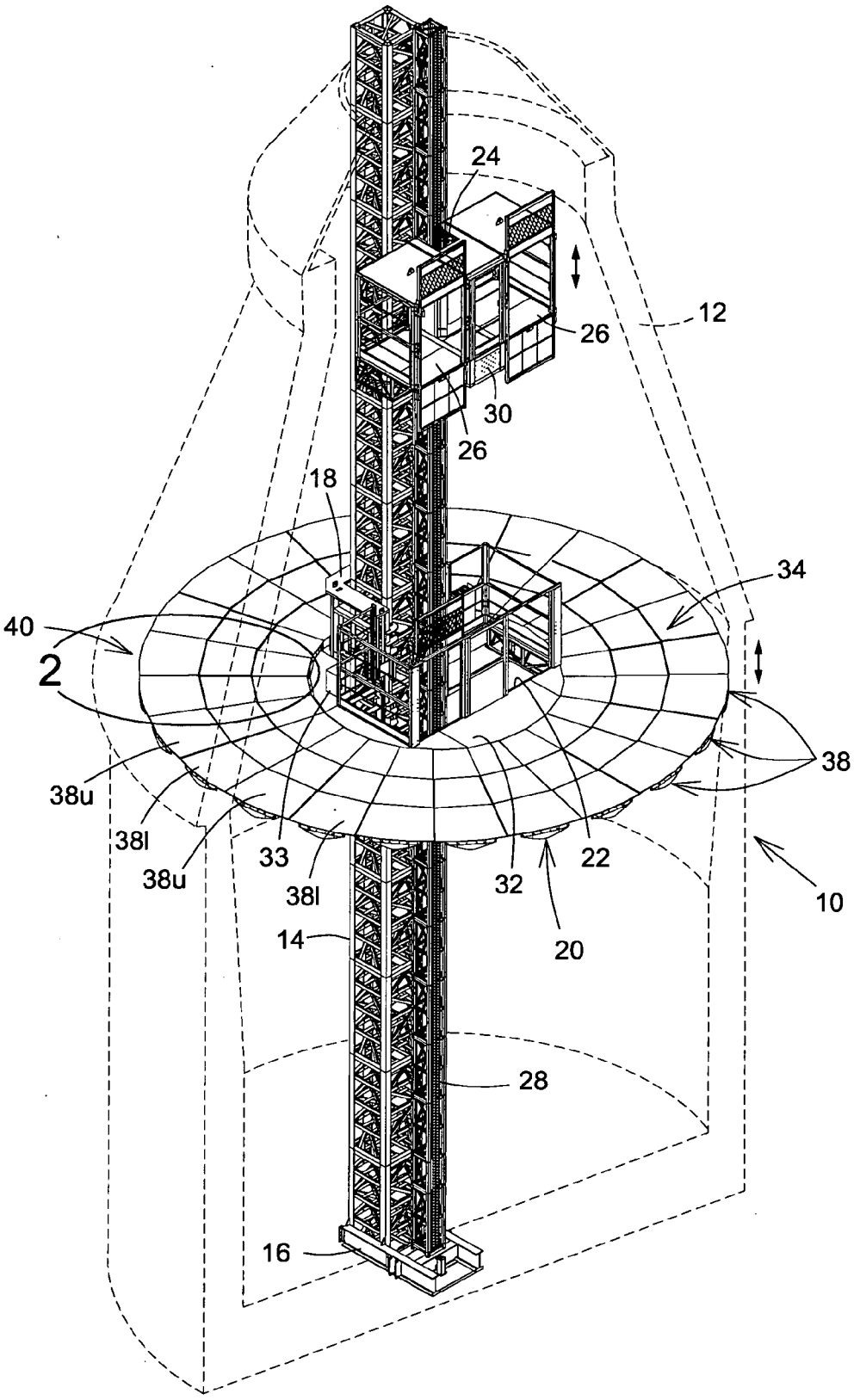


FIG.1

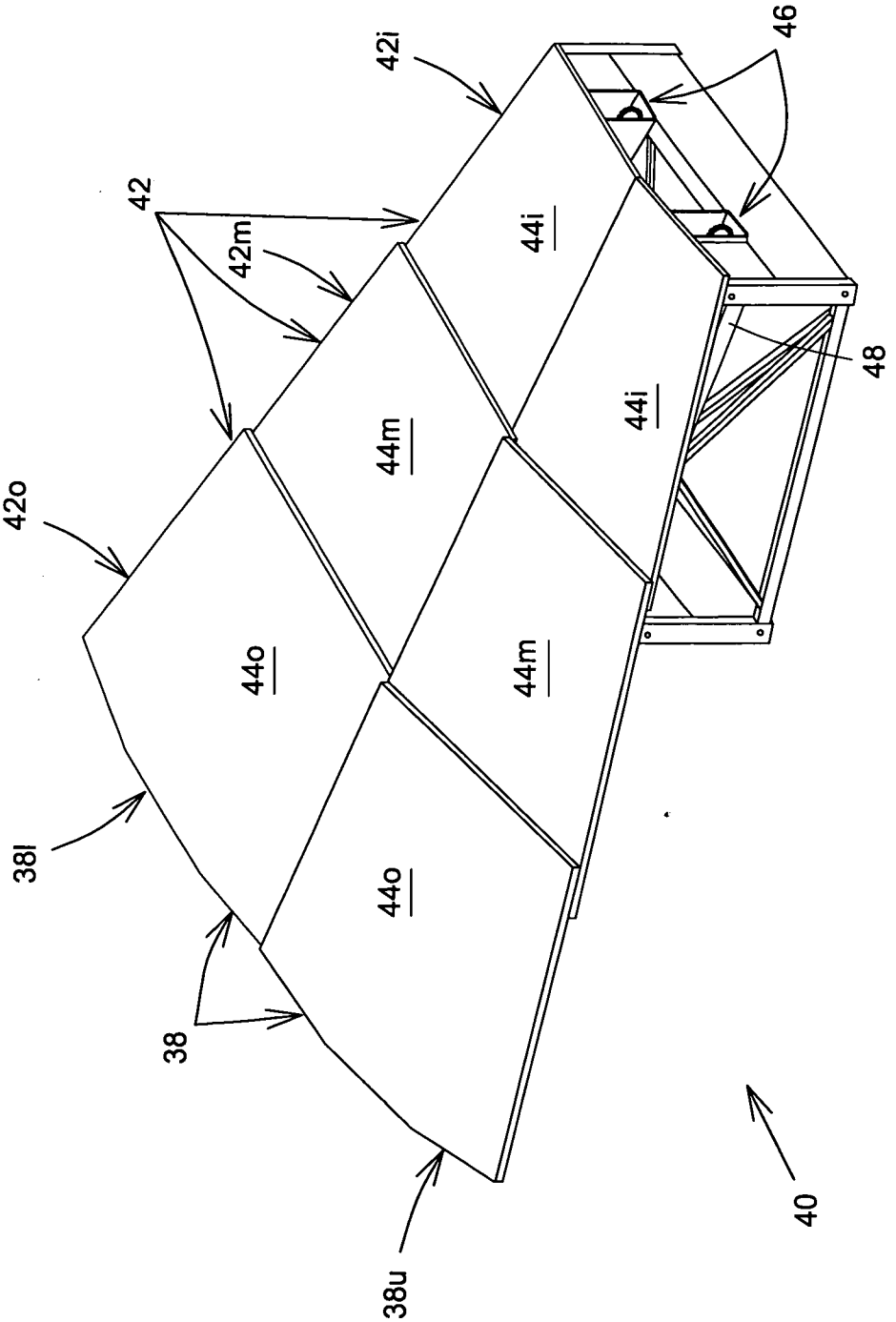


FIG.2

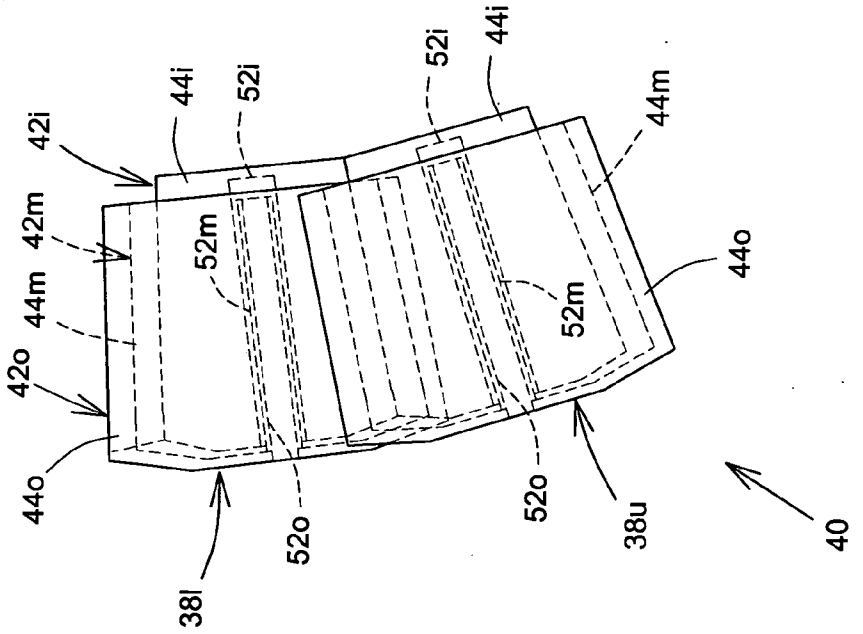

42i
42m
44m
42o
44o
38l
44i
52i
52m
52o
44i
52i
44m
52m
52o
44o
38u
40

FIG.4

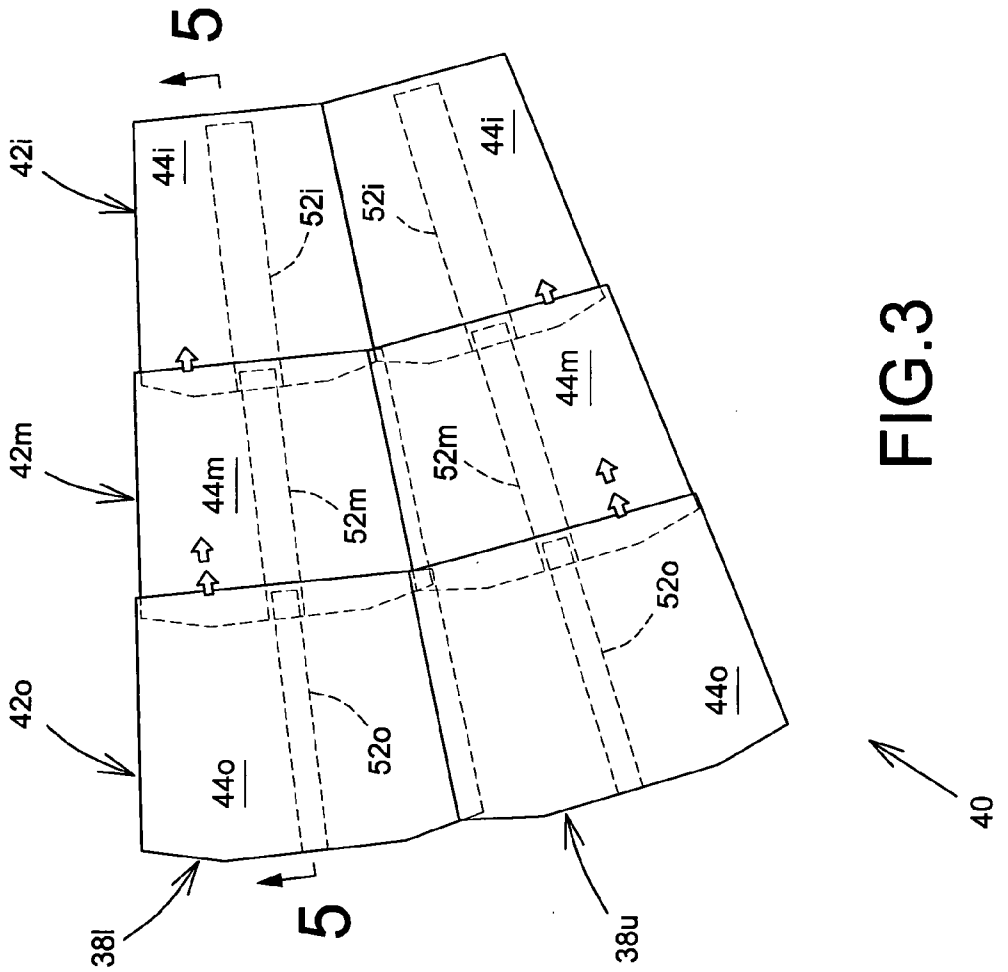

5
42i
44i
52i
42m
44m
52m
42o
44o
52o
38l
5
52i
44i
44m
52m
52o
44o
38u
40

FIG.3

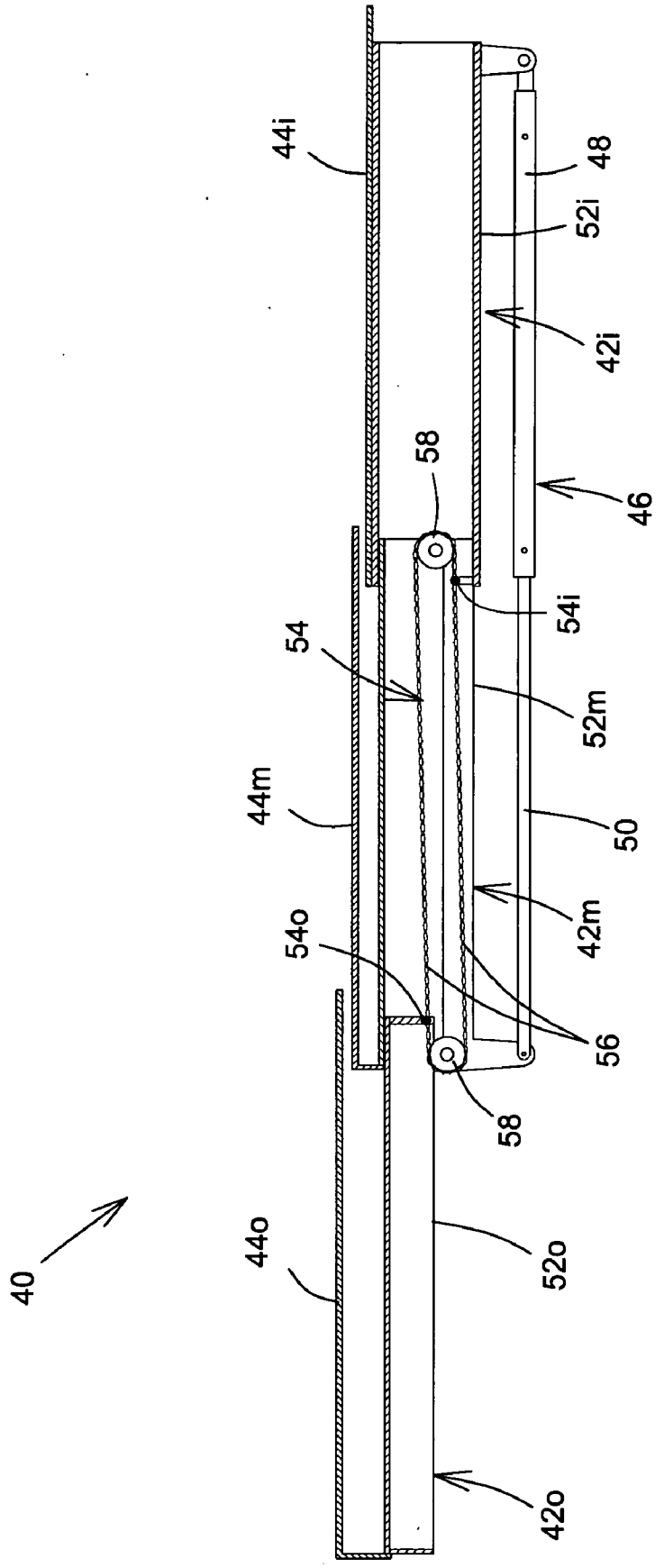


FIG.5

SIZE ADJUSTABLE PLATFORM FOR SCAFFOLDING

CROSS REFERENCE TO RELATED APPLICATION

[0001] Benefit of U.S. Provisional Application for Patent Ser. No. 60/929,044 filed on Jun. 8, 2007, is hereby claimed.

FIELD OF THE INVENTION

[0002] The present invention relates to scaffolding, and is more particularly concerned with a size-adjustable platform for use therewith.

BACKGROUND OF THE INVENTION

[0003] It is known in the art of scaffolding to have a work platform that is displaceable in a translational manner, towards and away from an adjacent wall surface, as shown in U.S. Pat. No. 6,095,285 of one of the present inventors and granted on Aug. 1, 2000.

[0004] However, this type of displaceable platform leaves an area uncovered when being displaced, which is not well suited for application where the platform needs to be selectively either enlarged or reduced in size to adapt to the varying available space between the supporting tower structure and the adjacent wall surface to be worked on and along which the platform is being displaced. This is especially applicable when the platform is at least partially annular in shape, such as when located inside a furnace tower, chimney, silo or the like with a constantly varying diameter along its axial length, for the cleaning and/or maintenance and/or construction of the inside wall thereof.

[0005] Accordingly, there is a need for an improved work platform for scaffolding and the like.

SUMMARY OF THE INVENTION

[0006] It is therefore a general object of the present invention to provide an improved work platform for scaffolding and the like.

[0007] An advantage of the present invention is that the work platform is expandable to follow the contour and/or profile of a surface, including obstacles and/or discontinuities thereof, along which the platform is being rectilinearly displaced.

[0008] Another advantage of the present invention is that the work platform is radially and telescopically expandable with a plurality of radial sections.

[0009] A further advantage of the present invention is that the work platform is made of a plurality of adjacent circumferential sections independently expandable and retractable with respect to one another.

[0010] A further advantage of the present invention is that the work platform is easily and quickly mounted on and dismounted from a site.

[0011] According to a first aspect of the invention there is provided a size-adjustable platform for scaffolding comprising a non-expandable portion securable to a movable part of the scaffolding, an expandable section releasably mounted on the non-expandable portion, and an actuating mechanism adapted selectively to move the said expandable section relative to the non-expandable portion thereby to adjust the size of the platform.

[0012] The size-adjustable platform may be of annular shape for surrounding scaffolding erected vertically at the centre of the platform.

[0013] The size-adjustable platform may in the alternative be of rectilinear shape extending orthogonally from scaffolding erected at a margin of the platform.

[0014] According to a further aspect of the present invention, there is provided a size-adjustable platform for scaffolding, comprising at least a fixed first panel and a movable second panel mounted adjacent one another, and an actuating mechanism connected to the first and second panels and adapted to selectively reciprocate the second panel with respect to the first panel thereby to expand or reduce a size of the platform.

[0015] The platform may include a third panel movably mounted on the second panel opposite the first panel, and a synchronizing mechanism connected to the first, second and third panels to synchronize displacement of the third panel relative to the second panel with the displacement of the second panel relative to the first panel.

[0016] The platform may conveniently be of annular form and each panel may be of segmental shape with the second panel overlying the first and when provided the third panel overlying the second.

[0017] Advantageously the third or outer circumferential panels are arranged in pairs of sections, and each pair includes an upper circumferential section and a lower circumferential section secured one to the other side-by-side. Each circumferential section preferably includes a plurality of radially and telescopically expandable radial sections, each adjacent pair being independently expandable one from the other.

[0018] Adjacent pairs of outer circumferential panels overlap one another in alternating manner with each upper circumferential section being adjacent two lower circumferential sections and vice-versa, the arrangement being such that in either extended or retracted mode a continuity of surface is achieved.

[0019] The actuating mechanism may be hydraulically or pneumatically powered and may thus comprise an actuating ram interconnecting the first and second panels. In an alternative embodiment a screw drive may be provided to effect reciprocating relative movement between the panels.

[0020] The synchronizing mechanism is associated with the actuating mechanism and comprises for example chains interconnecting the first and third panels, the chains being reeved over appropriate sprockets associated with the second panels.

[0021] The synchronizing mechanism may further incorporate telescoping beams which slide within one another and are mounted beneath respective panels, whereby upon actuation of the actuating mechanism relative movement is achieved in synchrony such that relative movement is smooth with the outer panel moving twice as fast as the middle panel in relation to the first fixed panel.

[0022] A controller for the actuating mechanism is advantageously provided on the non-extendable part of the platform.

[0023] It will be understood that whilst the specific embodiment of the invention has been defined in terms of an annular platform, a rectilinearly-shaped platform also falls within the scope of the present invention. Other objects and advantages of the present invention will become apparent from a careful

reading of the detailed description provided herein, with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] Further aspects and advantages of the present invention will become better understood with reference to the description in association with the following Figures, in which similar references used in different Figures denote similar components, wherein:

[0025] FIG. **1** is a top perspective view of a scaffolding assembly having a work platform in accordance with an embodiment of the present invention;

[0026] FIG. **2** is an enlarged perspective view taken along line **2** of FIG. **1**, showing a pair of platform circumferential sections with their respective three radial sections in a fully extended configuration;

[0027] FIG. **3** is a top plan view of the pair of platform circumferential sections of FIG. **2**;

[0028] FIG. **4** is a view similar to FIG. **3**, showing the pair of platform circumferential sections with their respective three radial sections in a fully retracted configuration; and

[0029] FIG. **5** is a schematic section view taken along line **5-5** of FIG. **3**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0030] With reference to the annexed drawings the preferred embodiments of the present invention will be herein described for indicative purpose and by no means as of limitation.

[0031] Reference is now made to FIG. **1**, there is shown a scaffolding assembly **10** typically centrally and axially mounted inside a large chimney **12** for cleaning or maintenance of the internal wall surface thereof. The scaffolding assembly **10** includes a main tower **14** supported at its base by a structure **16** mounted at the bottom of the chimney **12**, the assembly being typically further secured at its top portion to the chimney structure generally extending through the top opening of the chimney **12**. A main sleeve structure **18** surrounds the main tower **14** and is displaceable therealong and secured thereto at any selected location. A work platform, shown generally as **20**, in accordance with an embodiment of the present invention is releasably mounted onto the sleeve structure **18**, and defines an access opening **22** therethrough to allow for the passage of a secondary sleeve structure **24** with its secondary platform **26** attached thereto being displaceable along a secondary tower **28**, typically secured adjacent to the main tower **14**, via its displacement mechanism **30** (motor cage thereof shown) carried thereby. Both the main and secondary sleeve structures **18**, **24** have a respective axial slit opening therealong to allow for the passage of the tower-to-tower attachments (not shown) during displacement along their respective towers **14**, **28**.

[0032] The secondary sleeve structure **24** and platform **26** are generally used as an elevator to carry workers and/or materials to and from the work platform **20**. Similarly, the main sleeve structure **18** carries its own displacement mechanism (not shown). Alternatively, the secondary sleeve structure **24** and platform **26** could also be used as a freight elevator, to carry and displace the main sleeve structure **18** with the work platform **20** to different locations along the main tower **14** where it is secured thereto. In such a case, before displacement of the main sleeve structure **18**, the latter is connected to the secondary sleeve structure **24** before it is disconnected from the main tower **14**, and in reverse when the desired location is reached.

[0033] The access opening **22** extends through a non-expandable portion **32** of the work platform **20** releasably secured to the main sleeve **18**. The work platform **20** includes an expandable section **34** thereof and is releasably mounted onto the non-expandable portion **32**. The expandable portion **34** includes a plurality of adjacent circumferential platform sections **38** oriented towards a wall surface to be worked on such as the chimney internal wall. Each circumferential section **38** is radially expandable in order to allow adjustment of the work platform **20** to the varying section of the chimney **12**. Each circumferential section **38** covers an angular portion of an annular section of the work platform **20**, such that all circumferential sections **38** form an annular shaped outer portion of the platform **20**.

[0034] As shown more specifically in FIGS. **2**, **3** and **5**, circumferential sections **38** are typically arranged in pairs **40** for easy assembly of the platform **20**. Each pair **40** includes an upper circumferential section **38***u* and a lower circumferential section **38***l* secured to one another side-by-side. Each circumferential section **38** includes a plurality of radially and telescopically expandable radial sections **42**. Although each circumferential section **38** is independently expandable from each other, the two sections **38***u*, **38***l* of the same pair **40** are arranged and connected to simultaneously expand or retract, independently of any other pair **40**, in order to allow for local discontinuities or non-uniformity of the surrounding section wall of the chimney **12**.

[0035] For each circumferential section **38**, the radial sections **42** thereof (three of which are shown in the figures) are movable relative to each other in a radial direction, with the innermost radial section **42***i* being fixed relative to the adjacent structure **32**. As shown in FIGS. **2**, **3** and **5**, the two circumferential sections **38***u*, **38***l* of the pair **40** are shown in a fully extended configuration, with the middle panels **44***m* of the middle radial section **42***m* partially overlapping the corresponding inner panel **44***i*, and partially overlapped by the outer panel **44***o* of the corresponding outermost radial section **42***o* (the covered outlines being shown in dotted lines in FIG. **3**). Similarly, middle and outer panels **44***m*, **44***o* of the upper circumferential section **38***u* partially overlap the corresponding panels of the adjacent lower circumferential sections **38***l*, the one of the same pair **40** as well as the one of the adjacent pair **40**, such that the circumferential sections **38** alternate as upper and lower sections when assembled, as in FIG. **1** (with each upper circumferential section **38***u* adjacent two lower circumferential sections **38***l*, and vice-versa).

[0036] FIG. **4** shows the two circumferential sections **38***u*, **38***l* of the pair **40** in a fully retracted configuration, with most of the inner panels **44***i* being covered by the corresponding middle panels **44***m*, which are themselves mostly covered by the corresponding outer panels **44***o*, as highlighted by the dotted outlines.

[0037] The expansion actuating mechanism **46** of each circumferential section **38** is conveniently a hydraulic ram (although other mechanisms could be considered without deviating from the scope of the present invention) with the cylinder section **48** pivotally connected to a hollow inner beam **52***i* mounted under the inner panel **44***i*, and the piston section **50** connected to an inverted U-shaped middle beam **52***m* mounted under the middle panel **44***m*. An inverted U-shaped outer beam **52***o*, typically mounted under the outer

panel **44***o*, is movably connected to the middle beam **52***m* typically via a synchronizing mechanism **54** such as two chains **56** or the like, connected to the inner and outer beams **52***i*, **52***o* at points **54***i* and **54***o* respectively, and respective sprockets **58** or the like mounted on longitudinal ends of the middle beam **52***m* to allow for simultaneous radial displacements of the outer beam **52***o* relative to the middle beam **52***m* and of the middle beam **52***m* relative to the inner beam **52***i* via the radial actuation of the hydraulic ram **46**. Typically, the outer beam **52***o* axially slides inside the middle beam **52***m* which axially slides inside the inner beam **52***i*, in the radial direction of the work platform **20**. Accordingly, the outer panel **44***o* moves twice as fast as the corresponding middle panel **44***m* in relation to the corresponding inner panel **44***i*.

[0038] The controller **33** (schematically shown) of all the expansion actuating mechanisms **46** is conveniently located on the non-expandable portion **32** of the work platform **20** adjacent the main sleeve structure **18**.

[0039] Although not shown herein, it would be obvious to one skilled in the art that a similar size-expandable platform **20** could be arranged in a rectilinear manner instead of a curved and arcuate manner to allow accommodation within a chimney structure of different cross-sectional shape, without deviating from the scope of the present invention.

[0040] Although the present invention has been described with a certain degree of particularity, it is to be understood that the disclosure has been made by way of example only and is not limited to the features of the embodiments described and illustrated herein, but includes all variations and modifications within the scope and spirit of the invention as hereinafter claimed.

We claim:

1. A size-adjustable platform for scaffolding comprising a non-expandable portion securable to a moveable part of the scaffolding, an expandable section releasably mounted on the non-expandable portion, and an actuating mechanism adapted selectively to move the said expandable section relative to the non-expandable portion thereby to adjust the size of the platform.

2. A size-adjustable platform according to claim **1**, wherein the platform is of annular shape for surrounding scaffolding erected at the centre of the platform.

3. A size-adjustable platform according to claim **1**, wherein the platform is of rectilinear shape extending orthogonally from scaffolding erected at the margin of the platform.

4. A size-adjustable platform for scaffolding comprising at least a fixed first panel and a movable second panel mounted adjacent one another, and an actuating mechanism connected to the first and second panels adapted to selectively reciprocate the second panel with respect to the first panel thereby to expand or reduce a size of the platform.

5. A platform according to claim **4**, wherein the platform includes a third panel movably mounted on the second panel opposite the first panel, and a synchronizing mechanism connected to the first, second and third panels to synchronize displacement of the third panel relative to the second panel with the displacement of the second panel relative to the first panel.

6. A platform according to claim **5**, wherein the platform is of annular shape and each panel is of segmental shape with the second panel overlying the first panel and the third panel overlying the second panel.

7. A platform according to claim **5**, wherein the third panel is an outer circumferential panel and the outer circumferential panels of the platform are arranged in paired sections with each pair comprising an upper circumferential section and a lower circumferential section secured one to the other side-by-side.

8. A platform according to claim **7**, wherein each circumferential section comprises a plurality of radially and telescopically expandable sections, each adjacent pair being independently expandable one from the other.

9. A platform according to claim **7**, wherein adjacent pairs of outer circumferential panels overlap one another in alternating manner with each upper circumferential section being adjacent two lower circumferential sections and vice-versa, the arrangement being such that in both extended and retracted mode a continuity of platform surface is achieved.

10. A platform according to claim **5**, wherein the actuating mechanism is hydraulically powered and comprises an actuating ram extending between the first panel and the second panel.

11. A platform according to claim **10**, wherein each panel is provided therebeneath with a hollow beam, the ram extending between the first panel beam and the second panel beam and the synchronizing mechanism includes chains interconnecting the first and third panel beams and engaging sprockets mounted on the second panel beam, thereby allowing simultaneous radial displacements of the first, second and third panels with the beams telescoping relative to each other.

12. A platform according to claim **1**, wherein a controller for the actuating mechanism is provided on the non-extendable portion of the platform.

* * * * *