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(54) **SYSTEM FOR SUPPORTING DIVERSE EQUIPMENT AT A HEIGHT**

(57) This system that comprises a tower with a bottom plate (1) for securing to the ground, on which there is mounted by means of a side hinge (2) a collapsible post (3), for supporting the piece of equipment (E), with the possibility of collapsing between the vertical working position and the collapsed position; with said side hinge comprising (2) two plates (21) secured to the opposite ends of the post and the bottom plate and which have on their periphery a plurality of holes (22) for retaining post (3) in the vertical position and a driving cylinder (4) secured between two anchoring points (5) on bottom plate (1) and post (3), arranged on the same hinging side as side hinge (2), with said driving cylinder (4) being provided with connections (41) for possibly coupling a portable unit (6) for raising and collapsing the tower.

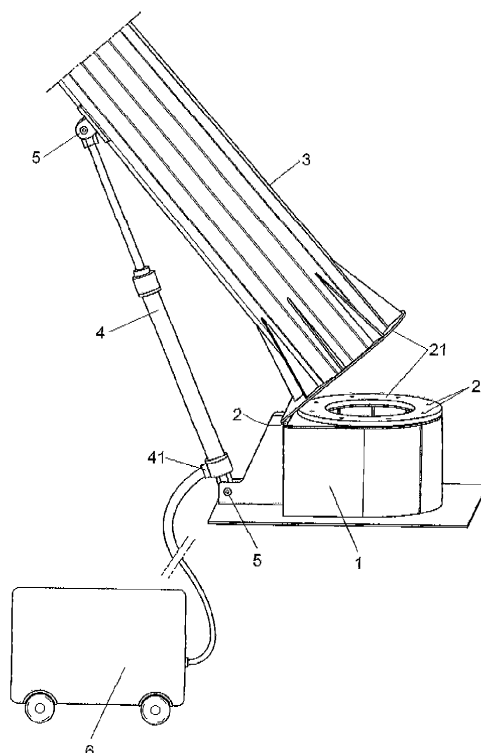


Fig. 2

Description

Aim of the invention

[0001] This Invention relates to a system for supporting various equipment at a height, of the type comprising a tower for supporting the equipment in question, aimed at being secured to the ground; with said system having characteristics that permit access to said equipment easily and efficiently, without having to climb up to the tower.

The invention application field.

[0002] This system is applicable to the sector for manufacturing equipment and infrastructures for supporting various equipment at a height.

Background of the invention.

[0003] At present it is usual to place various equipment at considerable heights, for example telecommunication antennae, surveillance equipment, lighting panels, wind generators and others. A tower of these characteristics can reach heights of approximately 40 metres without much difficulty, using fixed metallic structures for this purpose.

[0004] This represents a considerable problem, as installing and maintaining the equipment assembled on the top end of the tower can be complicated as it is difficult to access.

[0005] In some cases these towers have a ladder enabling the operator to access the equipment at the top, but said access is dangerous and requires that the operator be suitably fit and that he uses safety equipment, which increases the maintenance costs and time required.

[0006] In other cases, the equipment is awkward and its components make it compulsory to use cranes to carry out maintenance operations, and sometimes this is difficult if the tower is installed in places that are not easily accessible by road, such as for instance, on mountain tops. In this situation, if possible, with the equipment they place small fixed cranes that lift the materials. This increases the cost of the installation considerably and limits the equipment's capacity to be placed in a tower.

[0007] The applicant of this invention is not aware of the existence of any prior art that satisfactorily resolves the problem described.

Description of the invention

[0008] The system for supporting various equipment at a height, which is the object of this invention, has a series of technical characteristics aimed at facilitating the installation, maintenance and repair of equipment supported at a height.

[0009] The system is of the type comprising a tower secured to the ground, with a vertical post of a certain

height and at the top end of which there is placed the equipment to be supported.

[0010] According to the invention, the tower comprises:

- a bottom plate for securing to the ground, on which there is mounted by means of a side hinge the collapsible post, for supporting the equipment, with the possibility of collapsing between the vertical working position and the collapsed position; said side hinge comprising two plates secured at the opposite ends of the post and the bottom plate and which have on their periphery a plurality of coinciding holes for assembling screws that fasten and retain the post in the vertical working position with respect to the bottom plate, and
- a driving cylinder secured between two anchoring points on the bottom plate and the post, arranged on the same hinging side as the side hinge, with said driving cylinder being provided with connections for the energy supply thereof.

[0011] The system comprises, to complement the tower, a portable unit that can be coupled to the driving cylinder connections for raising and collapsing the tower.

[0012] This system therefore allows the tower post to move between a vertical position and a collapsed position, close to the ground, by driving the cylinder with the portable unit, whereby the operator can work directly on the equipment assembled on the post without having to climb up the tower.

[0013] This represents a great advantage over other conventional towers, as assembly and access are more comfortable and require less effort, making it possible for the operator or operators working on the installation or maintenance to have greater mobility. Also it avoids the need to use large cranes and eliminates the space and movement limitations particular to working at a height, from the design of the tower for access purposes.

[0014] The driving cylinder can be driven hydraulically, pneumatically, electrically, mechanically or any other way, at all events providing the portable unit with the type of energy required to drive it when raising or collapsing the post. The arrangement on the cylinder of the connections needed for coupling the portable unit allows the operator to transport said portable unit to drive various towers, insofar as it is necessary, which reduces the manufacturing and maintenance costs of said towers during the regular maintenance tasks on the equipment installed thereon.

[0015] The side hinge comprises two plates secured at the opposite ends of the post and bottom plate and on their periphery they have coinciding holes for assembling screws to fasten and retain the post in the vertical working position with respect to the bottom plate. This way once the post is arranged in the vertical position by the driving cylinder, said plates are secured, guaranteeing that the post is firmly secured in the vertical position and allowing

the operator to disconnect the portable unit, for supplying energy, from the driving cylinder and use it in other similar towers.

[0016] The tower post is made up of various consecutive sections, conveniently flanged at the opposite ends, with its modular constitution making it possible to form post of different heights. In an example, the tower is approximately 40 metres tall and is designed to support a piece of equipment weighing approximately 4 tonnes, with the sections measuring between 6 and 12 metres long to facilitate transport from the factory and assembly in situ.

[0017] According to the invention, the driving cylinder anchoring points on the post and bottom plate are formed of pin joints and the corresponding pins, which allow said end to rotate correctly during the operation to raise and collapse the tower post.

Description of the figures.

[0018] To complement the description provided and in order to facilitate the understanding of the characteristics of the invention, a set of drawings is attached to this invention which, in a non-limiting, illustrative way, represent the following:

Figure 1 shows an elevation view of the system with the tower in the vertical position.

Figure 2 shows a detail of the join between the lower bottom plate and the top post of the tower in an intermediate collapsed position.

Preferred embodiment of the invention

[0019] As can be seen in the referenced figures, the system for supporting various equipment at a height comprises a tower with a bottom plate (1) for securing to the ground, which is joined by a side hinge (2) to a post (3) that supports a piece of equipment (E), which is secured to the top end thereof.

[0020] Side hinge (2) comprises two plates (21) secured at the opposite ends of post (3) and bottom plate (1) and which on their periphery have a plurality of coinciding holes (22) for assembling screws to fasten and retain the post in the vertical working position with respect to bottom plate (1).

[0021] The tower comprises a driving cylinder (4), in this case a hydraulic cylinder, secured between anchoring points (5) of bottom plate (1) and post (3). Said driving cylinder (4) is provided with connections (41) for possibly coupling a portable unit (6) for supplying energy, in this case a hydraulic unit that can be easily transported and reused in other towers.

[0022] Anchoring points (5) on driving cylinder (4) are formed in this case by pin joints secured to side points on bottom plate (1) and post (3), which are traversed by anchoring pins on the corresponding end of the driving cylinder, which is oblique, and which when retracted

causes post (3) to collapse into the horizontal position.

[0023] Post (3) is made up of various consecutive sections (31), joined at opposite ends by flanges (32), with the set of sections (31) forming a hollow post (3) with a conical shape.

[0024] Once the nature of the invention has been described sufficiently, and also a preferred embodiment, for all intents and purposes it is noted that the materials, shape, size and arrangement of the elements described can be modified providing that this does not imply altering the essential characteristics of the invention that are claimed below.

Claims

1. System for supporting various equipment at a height, of the type comprising a tower secured to the ground, for supporting at the top end thereof a piece of equipment (E) to be supported, **characterised in that:**

The tower comprises:

- a bottom plate (1) for securing to the ground, on which there is assembled by means of a side hinge (2) a collapsible post (3), for supporting the piece of equipment (E), with the possibility of collapsing between the vertical working position and the collapsed position; with said side hinge (2) comprising two plates (21) secured at the opposite ends of the post and the bottom plate and which have on their periphery a plurality of coinciding holes (22) for assembling screws to fasten and retain post (3) in the vertical working position with respect to bottom plate (1), and
- a driving cylinder (4) secured between two anchoring points (5) on bottom plate (1) and post (3), arranged on the same hinging side as side hinge (2), with said driving cylinder (4) being provided with connections (41) for supplying it;

And **in that** the system also comprises a portable unit (6) that can be coupled to connections (41) of driving cylinder (4) to raise and collapse the tower.

2. System, according to claim 1, **characterised in that** post (3) is made up of various consecutive sections (31).
3. System, according to any of the preceding claims, **characterised in that** anchoring points (5) of driving cylinder (4) on post (3) and bottom plate (1) are made up of pin joints and the respective pins.

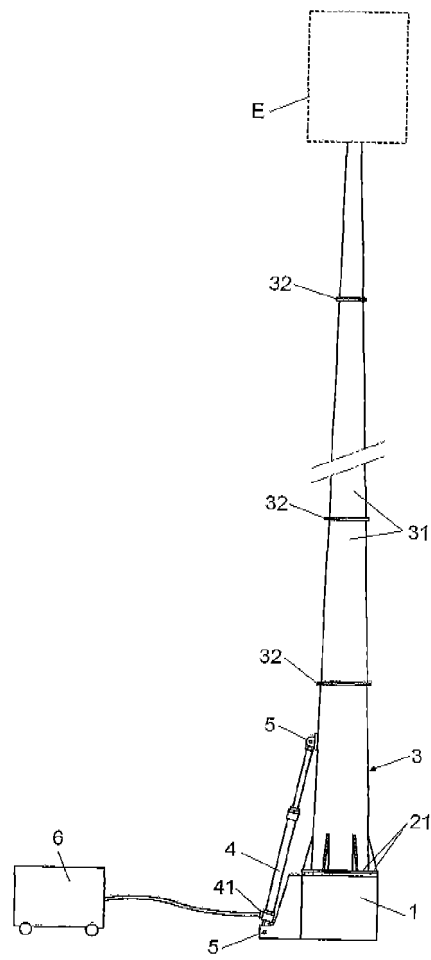


Fig. 1

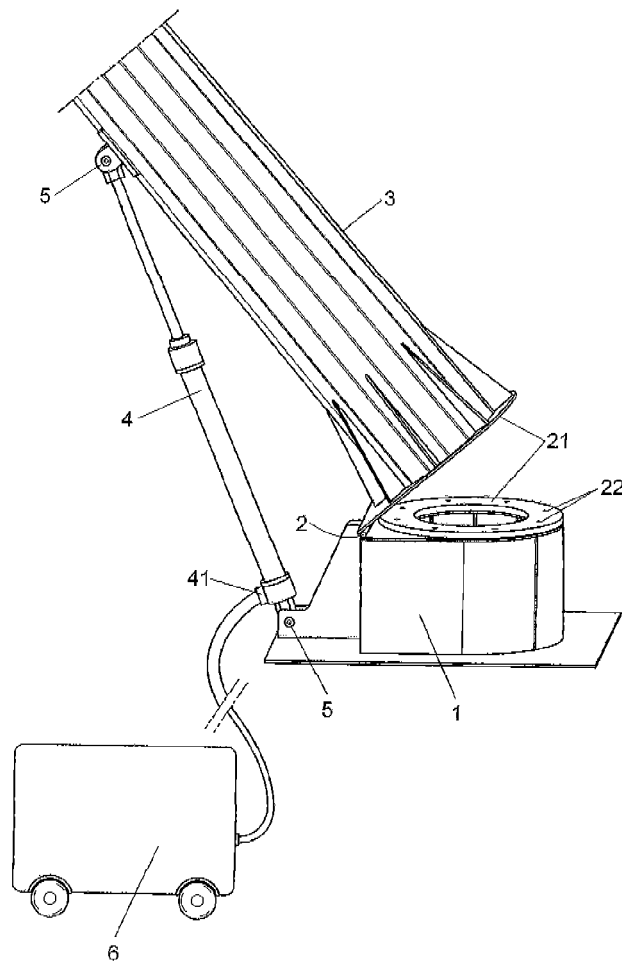


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2010/000477

A. CLASSIFICATION OF SUBJECT MATTER

E04H12/18 (2006.01)**E04H12/34** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search
26/07/2011Date of mailing of the international search report
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Name and mailing address of the ISA/

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International application No.

PCT/ES2010/000477

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