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(54) **PORTABLE FACILITY FOR THE MANUFACTURE OF PREFABRICATED CONCRETE ELEMENTS FOR CONCRETE TOWERS**

(57) The present invention relates to a portable facility for the manufacture of prefabricated concrete elements for concrete towers, which enables a reduction in the time and material employed in the start-up of said facility which enables the execution of the manufacture of the prefabricated concrete elements for concrete towers and enables, at each area of the same, the optimi-

sation of the use of the concrete necessary to withstand the stresses associated with the weight of the elements leaning on said areas, reducing the total surface area of the facility covered by the concrete and the time and resources necessary both for its start-up and its dismantling.

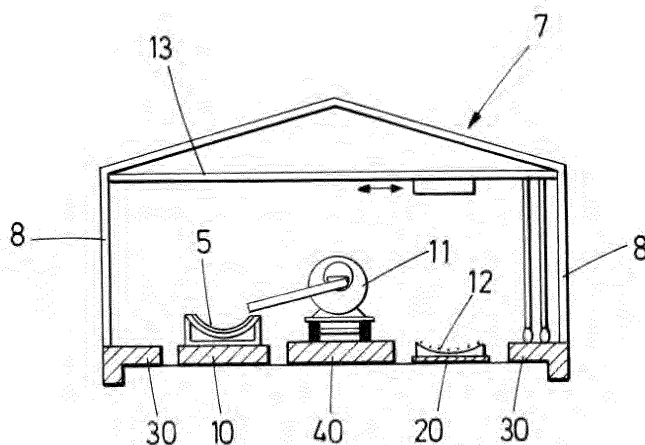


FIG.5

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a portable facility for the manufacture of prefabricated concrete elements for concrete towers, which enables a reduction in the time and material employed in the start-up of said facility which enables the execution of the manufacture of the prefabricated concrete elements for concrete towers.

[0002] The object of the invention is a portable facility for prefabricated concrete elements for concrete towers, which enables, at each area of the same, the optimisation of the use of the concrete necessary to withstand the stresses associated with the weight of the elements leaning on said areas, reducing the total surface area of the facility covered by the concrete and the time and resources necessary both for its start-up and its dismantling.

BACKGROUND OF THE INVENTION

[0003] In the field of wind turbine generators, the greater the height and power of the same, and consequently the thrust withstood by the tower, the greater the moment at the base of the same. In order to withstand the associated loads, it is expedient to employ a tower whose base diameter exceeds the maximum dimensions for transport by road; the towers are therefore usually manufactured from concrete voussoirs of transportable dimensions. Each voussoir is the result of dividing a tubular segment into several longitudinal segments. Placing several voussoirs adjacent to each other, a tubular segment or section of the tower is formed, where the tower consists of several tower segments thus assembled.

[0004] Internally, the voussoirs basically feature a metal structure or framework which confers to the voussoir the properties suited for traction, and another part being concrete, which provides the required structural properties against compression. In the manufacture of the same, in a first stage the metal framework is configured in accordance with the geometric specifications, and said framework is disposed within a mould featuring a base and a counter-mould for its closure, for the subsequent pouring of the concrete which will be cured, usually by steam, within said mould.

[0005] The forming of the framework is performed on a number of structures which act as patterns for the configuration of the framework of the prefabricated concrete elements, where the structure of a voussoir weighs approximately 10 times less than the total of the voussoir; therefore, the structure on which it is assembled likewise weighs approximately 10 times less than the mould where the formed structure is subsequently disposed.

[0006] Prefabricated modules are usually formed by using steam-curing moulds at a facility specifically prepared to this end, and are then transported by vehicle to site, the location where the tower is assembled and the

vertical and horizontal joints between modules are executed.

[0007] The vertical and horizontal joints of a modular tower are critical from the structural point of view, and furthermore determine the time employed in the erection of a tower. For this reason, the number of joints tends to be minimised, making the modules as large as possible, in such a way that road transport once again determines the size of said modules, which are constructed up to 20 m in length and 4 m in width. However, the resulting weight of each module may attain 50 tons, which increases considerably the cost of transporting the prefabricated elements from the location of their manufacture to the site where the tower is erected.

[0008] Furthermore, there are locations where wind resources are optimal, but the infrastructure to reach the same is not.

[0009] In order to avoid the transport of components of such considerable size and weight, portable facilities have been developed, especially conceived for the manufacture of prefabricated elements for wind turbine towers, which are installed in the proximity of the wind farm.

[0010] The Spanish patent ES2371960B1 reveals a portable facility where a concrete slab is disposed on the terrain, and on which the different equipment and materials used rest; this slab is formed directly on the compacted terrain, without anchorage or foundations. However, this slab is formed directly on the terrain and features the same characteristics at all areas of the facility.

[0011] The present invention reveals a portable facility for the manufacture of prefabricated concrete elements for concrete towers which resolves all the aforementioned drawbacks.

DESCRIPTION OF THE INVENTION

[0012] The present invention relates to a portable facility for the manufacture of prefabricated concrete elements for concrete towers which comprises a floor where at least one concreting area and at least one area for the configuration of the internal framework for the prefabricated concrete elements are disposed, and where the concreting area comprises at least one mould for the forming of the prefabricated concrete elements.

[0013] The floor further comprises a modular concrete slab disposed on the compacted terrain prior to the installation of the portable facility.

[0014] This modular concrete slab in turn comprises, at the concreting area, at least one concrete module configured to withstand the stresses associated with at least the weight of the mould for the forming of the prefabricated concrete elements and of the respective prefabricated element.

[0015] To this end, each concrete module features a sufficient surface area and thickness so that the terrain on which it rests will not give way due to the effect of the weight of the elements resting on the same.

[0016] In this way, the facility thus constituted enables

the optimisation of the use of concrete at each area, reducing the total surface area of the facility covered by said material, and the time and resources necessary for both its start-up and its dismantling, as the modular concrete slab is disposed only where required by the weight of the components.

[0017] Thus, optionally, the portable facility may comprise separation areas between the concrete modules of the concreting area comprised of a covering material covering the floor and isolating the internal atmosphere of the facility from pollutants which might be contained in the terrain, e.g. dust, in such a way that there may be concrete-free spaces between the concrete modules.

[0018] Optionally, the area for the forming of the internal framework of the prefabricated concrete element comprises at least one metal structure acting as a pattern for the forming of the framework of the prefabricated concrete elements.

[0019] Optionally, the modular concrete slab comprises, at the area for the forming of the framework, at least one concrete module configured to withstand the stresses associated with at least the weight of the metal structure and of the framework of the prefabricated concrete elements.

[0020] Also optionally, on the floor of the portable facility, an area for the traffic of persons and material-transporting vehicles may be disposed in an area annexed to the concreting area.

[0021] This area for the traffic of persons and material-transporting vehicles comprises either a layer of paving or metal sheets of transportable dimensions, in accordance with the load capability required at said area, or alternatively a layer of low load-bearing capability covering material, to prevent the pollution of the atmosphere of the facility in order not to affect the quality of the prefabricated concrete elements. Thus, the metal sheets can be re-used at other facilities after the dismantling of the same.

[0022] The portable facility for the manufacture of voussoirs for concrete towers thus constituted enables, at each area of the same, the optimisation of the use of the concrete necessary to withstand the stresses associated with the weight of the elements resting on said areas, reducing the total surface area of the facility covered by the concrete and the time and resources necessary for both its start-up and its dismantling.

DESCRIPTION OF THE DRAWINGS

[0023] As a supplement to the description made herein, and for the purpose of aiding the better understanding of the characteristics of the invention, in accordance with a preferred example of an embodiment of the same, a set of drawings is attached as an integral part of said description wherein, by way of illustration and not limitation, the following is portrayed:

Figure 1 depicts a schematic plan view of the port-

able facility for the manufacture of prefabricated concrete elements for concrete towers of the present invention.

Figure 2 depicts a sectional view at AA of Figure 1. Figure 3 depicts a perspective view of a concrete module of the modular concrete slab of the present invention, said concrete module withstanding the stresses associated with the weight of the mould for the forming of the prefabricated concrete elements and of the respective prefabricated element.

Figure 4 depicts a perspective view of several concrete modules of the modular concrete slab of the present invention, said concrete modules withstanding the stresses associated with the weight of the mould for the forming of the prefabricated concrete elements and of the respective prefabricated element.

Figure 5 depicts a sectional view, similar to that in Figure 2, where the area of the portable facility for the traffic of persons and of material-transporting vehicles is elevated.

Figure 6 depicts a sectional view, similar to that in Figure 2, where the area of the portable facility where at least one concrete module configured to withstand the stresses associated with at least the weight of the mould for the forming of the prefabricated concrete elements and of the respective prefabricated element is disposed, is seen to be partially sunk.

Figure 7 depicts a schematic plan view of the portable facility for the manufacture of prefabricated concrete elements for concrete towers of the present invention, in accordance with another example of an embodiment.

PREFERRED EMBODIMENT OF THE INVENTION

[0024] The present invention will be described in detail below, where the portable facility for the manufacture of prefabricated concrete elements for concrete towers comprises a floor on which the following are disposed: at least one concreting area (1), a configuration area (2) for the internal framework (12) of the prefabricated concrete elements, and a pedestrian and material-transporting vehicle traffic area (4) disposed in an area annexed to the concreting area (1), preferably between the concreting area (1) and the configuration area (2) for the internal framework (12), where the concreting area (1) comprises at least one mould (5) for the forming of the prefabricated concrete elements.

[0025] The portable facility further comprises a modular concrete slab disposed on the floor, which in turn comprises, at the concreting area (1), several concrete modules (10) configured to withstand the stresses associated at least with the weight of the mould (5) for the forming of the prefabricated concrete elements and of the respective prefabricated concrete element.

[0026] Each mould (5) for the forming of the prefabricated concrete elements may rest on a single concrete

module (10), where the concrete module is manufactured in situ, or may rest on several concrete modules (10).

[0027] This reduces the material employed for the adaptation of the floor of the facility and minimises the start-up time of the same, likewise enabling a reduction in the size of the concrete modules (10) to the extent where the modules forming the modular concrete slab may be elements of transportable dimensions. Thus, the dismantling of the facility can be total, and the majority of the materials used in the construction of the same can be re-used in the construction of another facility annexed to another wind farm.

[0028] The portable facility further comprises a structure (7) with a set of pillars (8) and at least one area (3) for the passage of hoists (13) and a support for the structure (7) disposed on the floor, which comprises foundations anchored to the terrain in the region of the pillars (8).

[0029] The configuration area (2) for the internal framework (12) of the prefabricated concrete elements comprises a number of metal structures (not portrayed) which serve as patterns for the forming of the framework of the prefabricated concrete elements.

[0030] The modular concrete slab comprises, at the framework configuration area (2), at least one concrete module (20) configured to withstand the stresses associated at least with the metal structure and the framework of the prefabricated concrete elements.

[0031] To this end, each concrete module features a sufficient surface area and thickness so that the terrain on which it rests will not give way due to the effect of the weight of the elements resting on the same.

[0032] The concrete modules (10) of the concreting area (1) are of a greater thickness than the concrete modules (20) of the framework configuration area (2), due to the fact that the weight of the metal structures which serve as patterns for the configuration of the framework, plus that of the framework (2) assembled upon them, is of a lesser order of magnitude than the weight of the moulds (5) and the prefabricated concrete elements; preferably, the concrete modules (10) of the concreting area (1) feature at least double the thickness than the concrete modules (20) of the framework configuration area (2); more preferably, the concrete modules (10) of the concreting area (1) feature a thickness of at least five times the thickness of the concrete modules (20) of the framework configuration area (2).

[0033] Optionally, in the framework configuration area (2), the floor comprises a number of supporting modules configured to withstand the stresses associated at least with the metal structure and the framework of the prefabricated concrete elements, and comprising at least one metal element.

[0034] The portable facility comprises a number of separations (9) between concrete modules (10) in the concreting area (1), where said separations (9) are comprised of a covering material (6) covering the floor and isolating the internal atmosphere of the facility from pollutants which might be contained in the terrain, such as

dust.

[0035] The area (4) for the traffic of persons and material-transporting vehicles comprises either a layer of paving (40) or metal sheets (not portrayed), or a layer of low load-bearing capability covering material.

[0036] The concrete modules (10) of the concreting area (1) feature a greater thickness than the supporting modules of the metal structures in the framework configuration area (2) due to the fact that the weight of said structures plus that of the framework (2) assembled upon them is of a lesser order of magnitude than the weight of the moulds (5) and the prefabricated concrete elements; preferably, the concrete modules (10) of the concreting area (1) feature at least double the thickness than the supporting modules for the metal structures in the framework configuration area (2); more preferably, the concrete modules (10) of the concreting area (1) feature a thickness of at least five times the thickness of the supporting modules for the metal structures in the framework configuration area (2).

[0037] The portable facility further comprises, external to its structure (7), an area for the stockpiling of completed prefabricated elements and an additional area for the stockpiling of raw materials, with areas for traffic between the two. In said stockpiling areas, the floor is comprised of a discontinuous slab of concrete, of a thickness suited to its necessary load-bearing capacity, this being greater in the stockpiling area for completed prefabricated concrete elements than in the stockpiling area for raw materials, and comprises platforms for traffic in the transit areas.

[0038] Of particular advantage is a disposition of a portable facility where the concreting area (1) is longitudinally disposed along the facility, and parallel with the same, the internal framework (12) configuring area (2), as portrayed in Figure 1, as it enables the use of travelling overhead hoists (13) which rest on continuous concrete slabs (30) disposed in two areas of passage for hoists and supports for the structure (7) of the portable facility (3), or conventional overhead hoists (13) which rest on the structure (7) of the portable facility and whose span covers one station of the concreting area (1) and one station of the internal framework (12) configuring area (2), understanding "station" to be the space occupied by one mould (5) and one metal structure. Thus, a reduction is produced in the number of overhead hoists (13) required, due to the fact that it is possible to combine longitudinal displacement by means of the wheels of the overhead hoist (13) with the transversal displacement of the carriage of the hoist, the concreting area (1) and the internal framework (12) configuring area (2) remaining between the areas of passage for hoists and supports for the structure (7) of the portable facility (3).

[0039] Specifically, of particular advantage is the disposition of a portable facility with two overhead hoists (13) such as that mentioned above in the case of a facility with 6 concreting stations with their respective moulds (5) and 6 internal framework (12) configuring stations.

[0040] The portable facility further comprises a means for the pouring of concrete into the moulds (5), comprised of concrete mixer trucks (11) from which the concrete is poured directly into the moulds (5). It is for this reason, so that said pouring means may surpass the height of the moulds (5), that the area (4) for the traffic of persons and material-transporting vehicles is elevated with regard to the concreting area (1), either because the moulds (5) are partially sunk, as may be seen in Figure 6, or because the area (4) for the traffic of persons and material-transporting vehicles is disposed at a higher level above the floor than the concrete modules (10) configured to withstand the stresses associated with at least the weight of the mould (5) for the forming of the prefabricated concrete elements and of the respective prefabricated element, as may be seen in Figure 5.

[0041] The means for the pouring of the concrete into the moulds (5) further comprises a continuous concrete pumping means comprised of a hopper, a pump and a network of ducts to supply the moulds (5) directly, with no need to transport the concrete to each station by means of the concrete mixer trucks.

[0042] In another example of an embodiment, depicted in Figure 7, the span of the travelling overhead hoists (13) which rest on the continuous concrete slabs (30) of the portable facility is greater than the length of the moulds (5), preferably of a magnitude such that, the moulds being located between the continuous concrete slabs (30), the space available enables the execution of the necessary works around the mould (5). Each overhead hoist (13) is used for the displacement of loads from at least two stations of the concreting area (1) and two stations of the internal framework (12) configuring area (2), understanding "station" to be the space occupied by one mould (5) and one metal structure.

[0043] Furthermore, the overhead hoists (13) are used not only to move the counter moulds and the framework of the prefabricated concrete elements, but also to move the completed prefabricated concrete elements to the stockpiling area (14) for completed prefabricated elements. Preferably, each overhead hoist (13) is used for the displacement of the completed prefabricated elements from at least two stations of the concreting area (1) to two stockpiling areas (14) for completed prefabricated elements, which preferably are disposed adjacent to the concreting area (1) and the internal framework (12) configuring area (2).

[0044] As may be seen in Figure 7, the stations of the concreting area (1) and of the internal framework (12) configuring area (2) are preferably covered by an awning (15), while the stockpiling areas (14) for completed prefabricated elements are in the open. The overhead hoists (13) enable the stockpiling of completed prefabricated elements not only horizontally but also vertically, by means of the vertical displacement of the same, in order to reduce the space required for the facility. For vertical stockpiling, chocks, which may be made of concrete, are used between completed prefabricated elements.

[0045] In this way, the facility thus configured is modular, and achieves an optimised flow of materials. The continuous arrow indicates the direction of displacement of the overhead hoist (13) for the flow of completed prefabricated elements and of the framework. The dotted arrow indicates the direction of flow of the supply of concrete to the moulds (5) by the concrete pouring means.

[0046] Furthermore, and preferably, said portable facility comprises one overhead hoist (13) for every two prefabricated elements. If it is required to manufacture more prefabricated elements, a parallel facility is disposed, such as that described in this example of an embodiment portrayed in Figure 7. In said Figure 7 a facility with three modules may be seen, each module comprising at least one overhead hoist for the displacement of prefabricated elements and of frameworks between two concreting areas (1) and two internal framework (12) configuring areas (2), likewise two stockpiling areas (14) for completed prefabricated elements. Manufacturing modules thus configured enable an optimised sizing of the manufacturing facility.

Claims

1. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, comprising a floor on which the following are disposed: at least one concreting area (1) and at least one configuration area (2) for the internal framework (12) of the prefabricated concrete elements, where the concreting area comprises at least one mould (5) for the forming of the prefabricated concrete elements, **characterised in that** the floor comprises a modular concrete slab which in turn comprises, at the concreting area (1), at least one concrete module (10) configured to withstand the stresses associated at least with the weight of the mould (5) for the forming of the prefabricated concrete elements and of the respective prefabricated concrete element.
2. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 1, **characterised in that** each mould (5) for the forming of the prefabricated concrete elements rests on a single concrete module (10).
3. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 1, **characterised in that** each mould (5) for the forming of the prefabricated concrete elements rests on several concrete modules (10).
4. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in any of the preceding claims, **character-**

ised in that on the floor of the portable facility, an area (4) for the traffic of persons and material-transporting vehicles is disposed in an area annexed to the concreting area (1).

5. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 4, **characterised in that** the area (4) for the traffic of persons and material-transporting vehicles is disposed between the concreting area (1) and the internal framework (12) configuring area (2).

6. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in any of the preceding claims, **characterised in that** it comprises a structure (7) with a set of pillars and in that at least one area for the passage of hoists and a support for the structure (7) is disposed on the floor; said structure comprises foundations anchored to the terrain in the region of the pillars (8).

7. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in any of the preceding claims, **characterised in that** the configuring area (2) for the internal framework (12) of the prefabricated concrete element comprises at least one metal structure which acts as a pattern for the configuration of the framework of the prefabricated concrete elements.

8. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 7, **characterised in that** the modular concrete slab comprises, in the framework configuring area (2), at least one concrete module (20) configured to withstand the stresses associated with at least the weight of the metal structure and of the framework of the prefabricated concrete elements.

9. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 7, **characterised in that** the floor comprises, in the framework configuring area (2), a number of supporting modules, configured to withstand the stresses associated with at least the weight of the metal structure and of the framework of the prefabricated concrete elements, comprising at least one metal element.

10. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in any of the preceding claims, **characterised in that** the floor comprises a covering material (6) at the separations (9) between the concrete modules (10) of the concreting area (1).

11. A portable facility for the manufacture of prefabricat-

ed concrete elements for concrete towers, as claimed in either of claims 4 or 5, **characterised in that** the area for the traffic of persons and material-transporting vehicles comprises either a layer of paving (40) or metal sheets, or a layer of low load-bearing capability covering material.

12. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 9, **characterised in that** the concrete modules (10) of the concreting area (1) are of greater thickness than the supporting modules for the metal structures in the framework configuration area (2).

13. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 12, **characterised in that** the concrete modules (10) of the concreting area (1) feature a thickness at least double that of the supporting modules for the metal structures in the framework configuration area (2).

14. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 12, **characterised in that** the concrete modules (10) of the concreting area (1) feature a thickness at least five times that of the supporting modules for the metal structures in the framework configuration area (2).

15. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 8, **characterised in that** the concrete modules (10) of the concreting area (1) feature a thickness greater than that of the concrete modules (20) of the framework configuration area (2).

16. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 15, **characterised in that** the concrete modules (10) of the concreting area (1) feature a thickness at least double that of the concrete modules (20) of the framework configuration area (2).

17. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 15, **characterised in that** the concrete modules (10) of the concreting area (1) feature a thickness at least five times that of the concrete modules (20) of the framework configuration area (2).

18. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 6, **characterised in that** it further comprises, external to its structure (7), an area for the stockpiling of completed prefabricated elements

and an additional area for the stockpiling of raw materials, with areas for traffic between the two, where the floor, in said stockpiling areas, is comprised of a discontinuous slab of concrete.

19. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 18, **characterised in that** the thickness of the discontinuous slab of concrete in the area for the stockpiling of completed prefabricated elements is greater than that of the slab in the area for the stockpiling of raw materials.
20. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claims 5 and 6, **characterised in that** the concreting area (1) is disposed longitudinally along the facility, and parallel with the same is the internal framework (12) configuring area (2), and **in that** the facility further comprises travelling overhead hoists (13) which rest on continuous concrete slabs (30) disposed in two areas of passage for hoists and supports for the structure (7) of the portable facility (3), or conventional overhead hoists (13) which rest on the structure (7) of the portable facility and whose span covers one station of the concreting area (1) and one station of the internal framework (12) configuring area (2), understanding "station" to be the space occupied by one mould (5) and one metal structure.
21. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 20, **characterised in that** it comprises two overhead hoists, 6 concreting stations with their respective moulds (5) and 6 internal framework (12) configuring stations.
22. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 21, **characterised in that** it further comprises a means for the pouring of concrete into the moulds (5).
23. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claims 4 and 22, **characterised in that** the means for the pouring of concrete into the moulds (5) is comprised of concrete mixer trucks from which the concrete is poured directly into the moulds (5).
24. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 23, **characterised in that** the area (4) for the traffic of persons and material-transporting vehicles is elevated with regard to the concreting area (1), either because the moulds (5) are partially sunk, or because the area (4) for the traffic of persons

and material-transporting vehicles is disposed at a higher level above the floor than the concrete modules (10).

- 5 25. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 22, **characterised in that** the means for the pouring of concrete into the moulds (5) further comprises a continuous concrete pumping means comprised of a hopper, a pump and a network of ducts to supply the moulds (5) directly.
- 10 26. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claims 5 and 6, **characterised in that** the concreting area (1) is disposed longitudinally along the facility, and parallel with the same is the internal framework (12) configuring area (2), and **in that** the facility further comprises travelling overhead hoists (13) which rest on continuous concrete slabs (30) disposed in two areas of passage for hoists and supports for the structure (7) of the portable facility (3), or conventional overhead hoists (13) which rest on the structure (7) of the portable facility and whose span is greater than the length of the moulds (5), and each overhead hoist (13) is displaceable in order to execute the displacement of loads from at least two stations of the concreting area (1) and two stations of the internal framework (12) configuring area (2), understanding "station" to be the space occupied by one mould (5) and one metal structure.
- 15 27. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 26, **characterised in that** the overhead hoists are displaceable from the stations of the concreting area (1) and the stations of the internal framework (12) configuring area (2) to a stockpiling area (14) for completed prefabricated elements.
- 20 28. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in claim 27, **characterised in that** each overhead hoist is displaceable from at least two stations of the concreting area (1) to two stockpiling areas (14) for completed prefabricated elements, disposed adjacent to the concreting area (1) and the internal framework (12) configuring area (2).
- 25 29. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in either of claims 27 to 28, **characterised in that** the stations of the concreting area (1) and the stations of the internal framework (12) configuring area (2) are covered, while the stockpiling areas (14) for completed prefabricated elements are in the open.
- 30 35 40 45 50 55

30. A portable facility for the manufacture of prefabricated concrete elements for concrete towers, as claimed in any of claims 26 to 29, **characterised in that** the overhead hoists are configured to execute the stockpiling of completed prefabricated elements not only horizontally but also vertically. 5
31. A plant for the manufacture of prefabricated concrete elements for concrete towers, **characterised in that** it comprises at least two portable facilities for the manufacture of prefabricated concrete elements for concrete towers, as claimed in any of claims 26 to 30. 10

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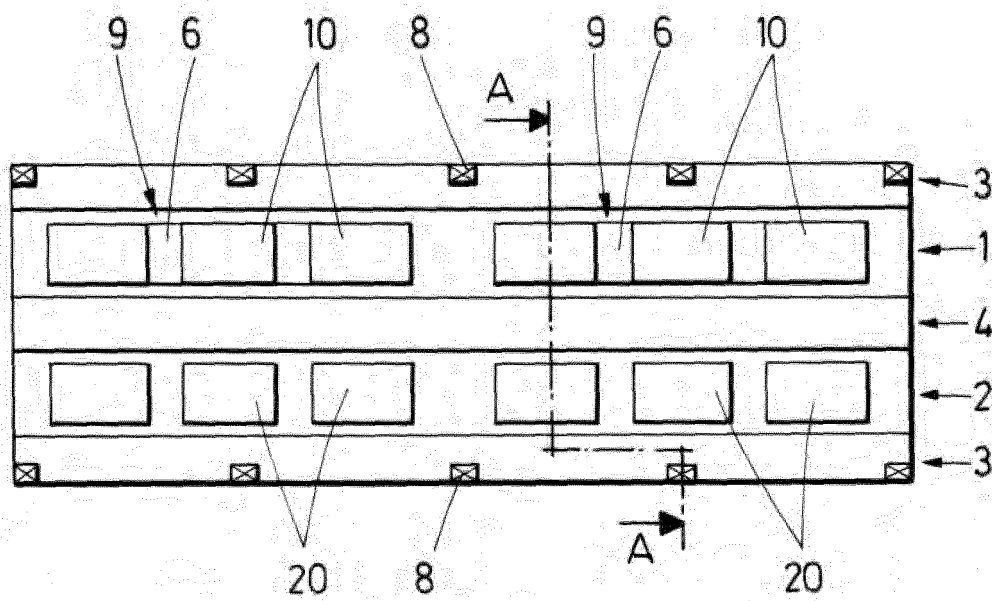


FIG.1

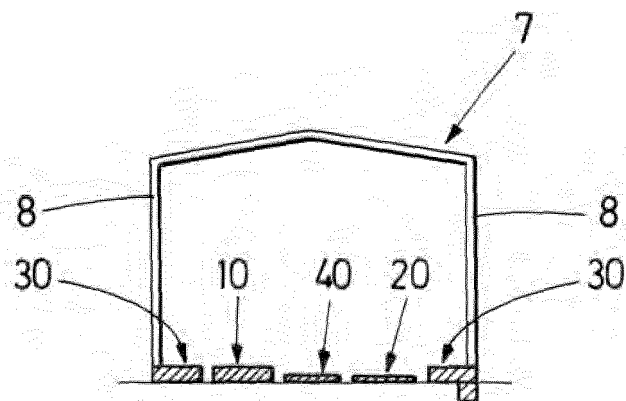


FIG.2

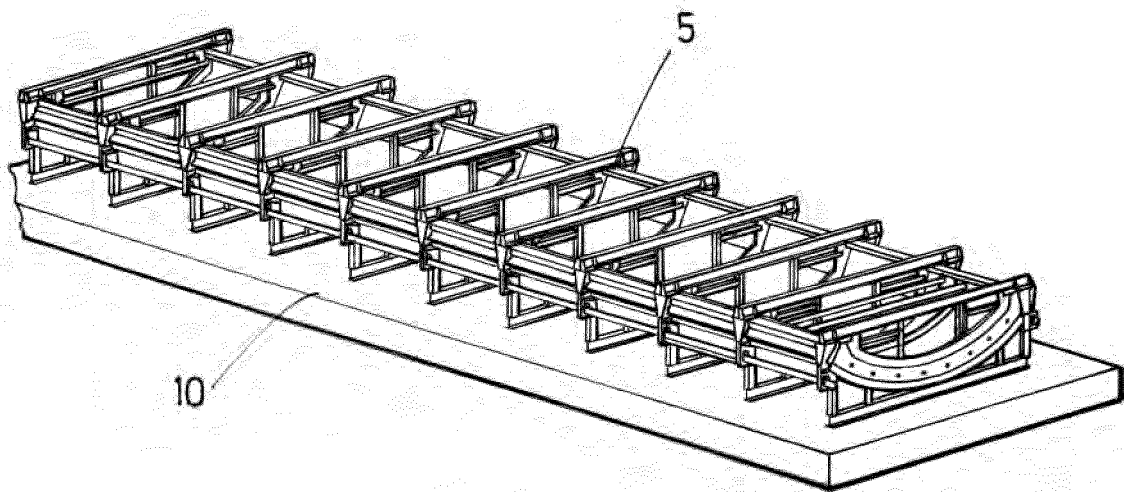


FIG. 3

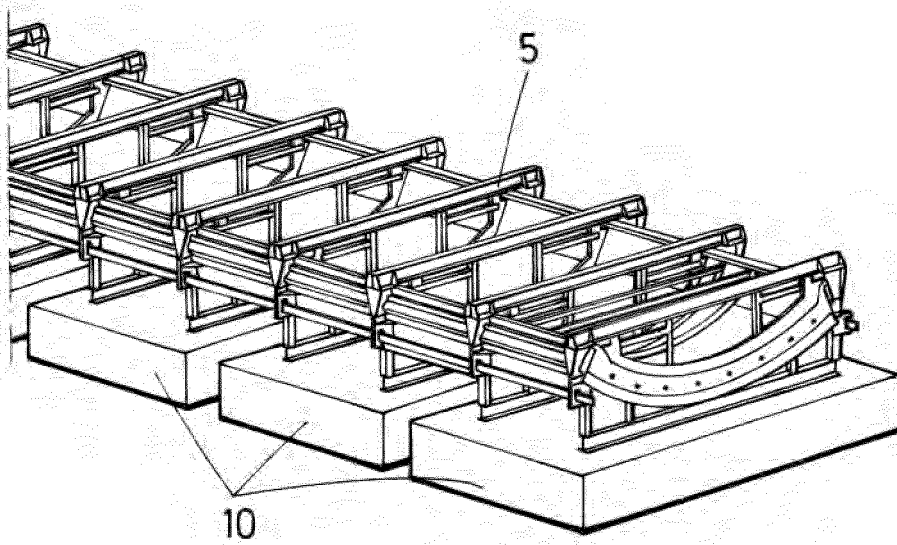


FIG. 4

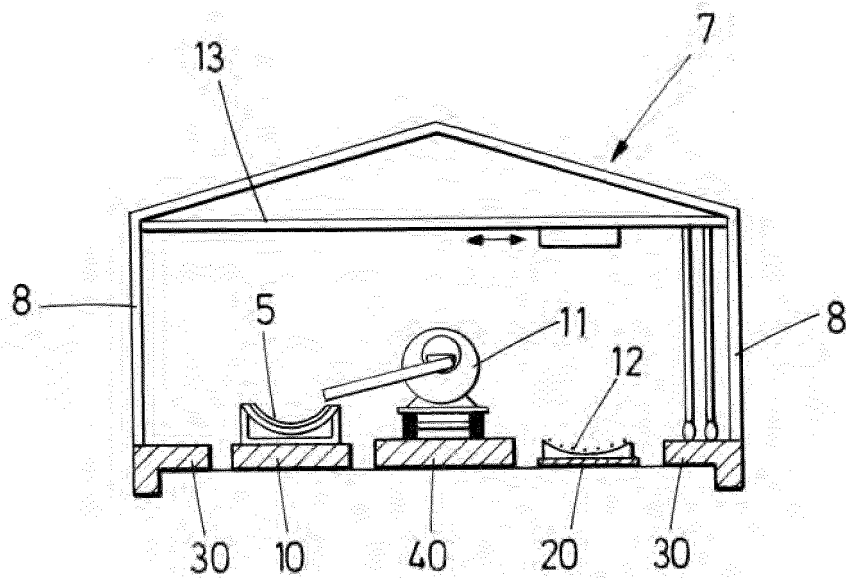


FIG.5

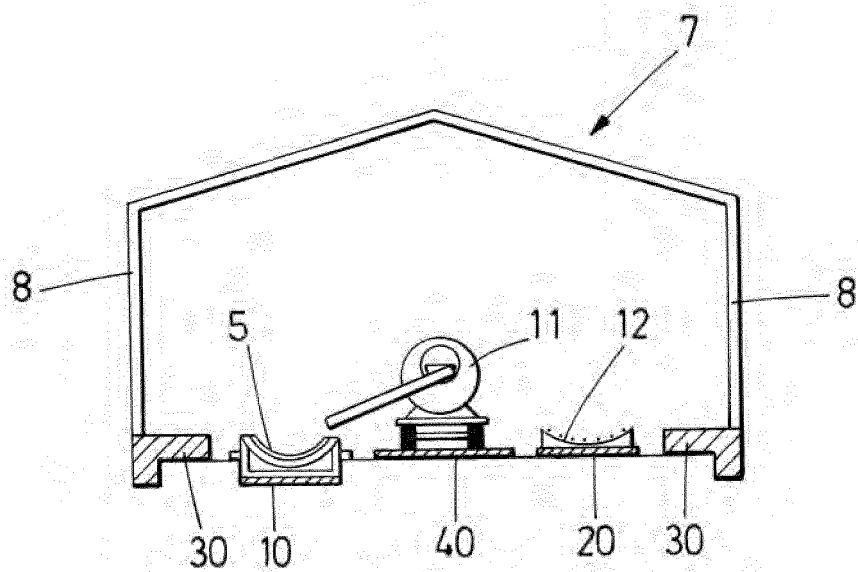


FIG.6

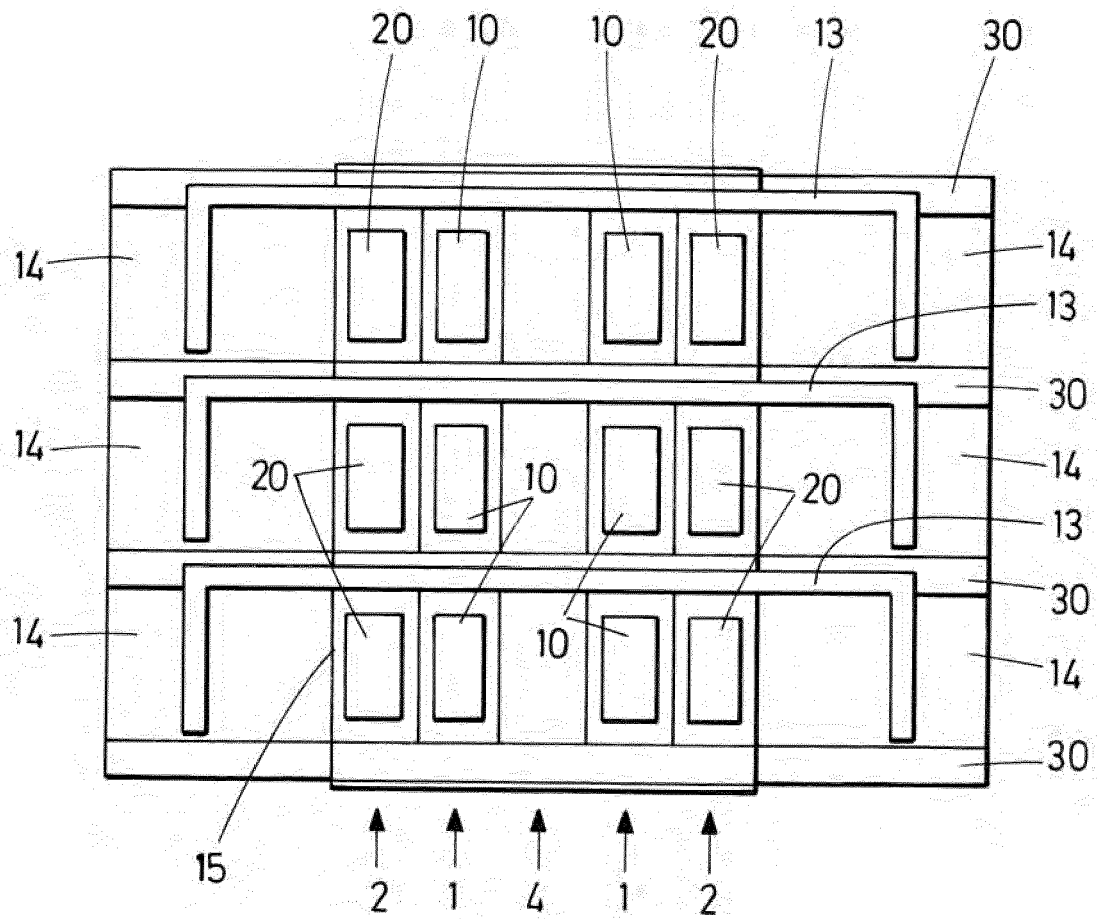


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 15 16 5971

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Place of search The Hague		Date of completion of the search 14 September 2015	Examiner Voltz, Eric
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