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APPLICATION FOR A STANDARD PATENT

I/WE, Josef KRINGS

b of Brahmsstrasse 1,
D-5138 Heinsberg
FED. REP. OF GERMANY

hereby apply for the grant of a standard patent for an invention
titled "AN APPARATUS (AND METHOD) FOR CENTRALLY INSTALLING A
SHORING COLUMN INTO A PREDRILLED 'GROUND HOLE"

which is described in the accompanying provisional/complete
specification.

Details of basic application(s):
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My/our address for service is care of CLEMENT HACK & CO., Patent
Attorneys, 140 William Street, Melbourne, Victoria, 3000,
Australia.

DATED this 23rd day of December 1982

To: The Commissioner of Patents.

PF/App/3/82

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CENTRING DEVICE FOR GUIDING A SHORING COLUMN INTO A PREDRILLED GROUND HOLE

Claim

1. A mechanism for centrically driving a shoring column into a predrilled ground hole, characterized in that in a ring-shaped supporting structure (1) having an outside diameter slightly smaller than the diameter of a drilled ground hole (20) and an inside diameter larger than the cross section of a shoring column (2) there are arranged a clamping device which comprises diametrically opposed elements (8, 9) and a number of centric-adjustment pistons (5, 13) which move through suitable holes (6, 14) in the wall of the supporting structure (1) and are loaded with a hydraulic fluid, and that the clamping device (8, 9) and the centric-adjustment pistons (5, 13) are connected with a remote-control device which can be placed near the ground hole (20) via suitable hoses (18, 19) and electrical control lines (17).
AN APPARATUS (AND METHOD) FOR CENTRALLY INSTALLING A SHORING COLUMN INTO A PREDRILLED GROUND HOLE

The following statement is a full description of this invention, including the best method of performing it known

TO BE COMPLETED BY APPLICANT

Name of Applicant: Josef KRINGS
Address of Applicant: Brahmstrasse 1,
D-5138 Heinsberg,
GERMANY

Actual Inventor:

Address for Service: CLEMENT HACK & CO.,
140 William Street,
Melbourne, Vic. 3000.
Australia.

Complete Specification for the invention entitled: "AN APPARATUS (AND METHOD) FOR CENTRALLY INSTALLING A SHORING COLUMN INTO A PREDRILLED GROUND HOLE"

The following statement is a full description of this invention, including the best method of performing it known to me:-
MECHANISM FOR CENTRALLY DRIVING A SHORING COLUMN INTO A PREDRILLED GROUND HOLE

The invention relates to a system for centrically driving a shoring column into a predrilled ground hole.

As is known, in the tie-back shoring system, also termed "Berlin shoring system", the beams or shoring columns of the supporting timbered walls are driven into predrilled ground holes. These ground holes can be 10 meters deep.

Heretofore, tie-back shoring systems have essentially been characterized by the fact that the supporting timbered walls had to be cut to size on the job site because, as a rule, it was extremely difficult to arrange the column spacings with such precision that prefabricated shoring boards could also be used. Thus, in the past only timber could be used as material for the shoring boards which, in turn, required a large number of columns, thus making the shoring system expensive.

Experiments to use, for example, reinforced concrete slabs which had to be set between channels built-up columns had not been successful, because this type of shoring system required the shoring boards to be wedged against the columns and required large tolerances in horizontal spacing and the columns needed oversized flanges to accommodate these tolerances. In addition, these systems were labor intensive, because the wedging had to be done manually, forcing the construction personnel to work under hazardous conditions in the unprotected excavations.

The object of the invention is to provide a method normally used in trench construction, which can be utilized in large excavations as well. The shoring columns generally equipped with interlocking guides create a reusable bracing
To accomplish this, an exact column setting in the predrilled ground hole is required so that proper plumbness can be assured. Drilling techniques are presently so well developed that it can be assumed that the spacings between the drilled holes can be kept within desired limits. The important thing now is to erect the shoring columns centric by maintaining equal distances in relatively large holes.

This object is achieved by means of the centric column setting system embodying the invention. The features of the system are set forth in claim 1.

The setting mechanism is attached to the column base by means of clamps and subsequently set into the ground hole. As soon as the column reaches the bottom of the hole, the centric-adjustment pistons are lowered. The centric-adjustment pistons are braced at the circumference of the ground hole and provide for centric setting of the column base.

The column will be fixed in vertical position using suitable alignment devices (e.g., laser beam). Thereafter, the column is set, for example, on top of a concrete foundation, mortar pad, or the like.

If later on the need arises to pull out the shoring system, this could be done with appropriate measures, such as separating the column base from the foundation. However, the techniques for such separation are not the subject of the invention.

The system according to the invention offers the advantage of using columns which can be used with positive fit in the prefabricated shoring plates, that is to say, in which a fixed position is achieved in a direction which is both
normal to their surface and along their vertical span. This will eliminate the need for wedging the shoring plates and, thereby, the expensive, labor-intensive, and hazardous working conditions during the setting operations of the horizontal members in unprotected excavations. It is also possible to work with large spans between the columns and, thus, with fewer columns and fewer predrilled ground holes, resulting in further savings and reduced construction time. In addition, the shoring materials can be utilized repeatedly, while using less personnel. This was not feasible in previous methods, where the shoring materials were frequently left in the ground.

The invention will now be described with reference to the accompanying drawings, in which:
- Figure 1 is a side view of the system embodying the invention in a partial vertical section taken along the line I-I in Figure 2;
- Figure 2 is a plan view in the direction II in Figure 1;
- Figure 3 is a "looking up" view in the direction III in Figure 1, and
- Figures 4 through 6 are schematic horizontal sections through the job site at various construction stages.

The system of the invention consists of a ring-shaped supporting structure 1 having an outside diameter slightly smaller than the diameter of a predrilled ground hole on the job site. The inside diameter of the supporting structure 1 is larger than the cross section of the shoring column 2 which is to be driven into the hole. The supporting structure 1 is equipped with a ring-shaped operating platform 3 with an inside diameter also larger than the cross section of the column 2.
The operating platform 3 carries a (preferably odd) number of hydraulically operated winches 4 placed in a radial arrangement and equipped with outwardly moving centric-adjustment pistons 5, whose outer ends are formed as parts of the lateral area of the supporting structure 1 and are arranged in suitable openings in the wall of the supporting structure 1.

The operating platform 3 has an adjustable positive stop 8 located in slotted holes 7 and capable of gripping on one side the shoring column 2. Facing the positive stop 8 diametrically is a hydraulically operated clamping piston 9. This piston is guided in a cylinder 10 mounted on the operating platform 3 and can engage the shoring column on the other side. The clamping piston 9 together with the positive stop 8 form a clamping arrangement. Underneath the operating platform 3 there is a steering block 11 to feed the individual hydraulically operated winches 4 and 10.

Underneath the operating platform 3 there are radially aligned lift winches 12 with centric-adjustment pistons 13 which can move outwardly through the wall openings 14 in the supporting structure 1 and are built like the centric-adjustment pistons 5. These centric-adjustment pistons 13 are used for preliminary centric positioning. The centric-adjustment pistons 5 located on the top of the operating platform 3 serve for fine centric positioning or corrective alignments.

The supporting structure 1 has on its upper side supporting eyes 15 in which engage the holding ropes 16. Furthermore, the necessary electrical energy supply cables 17 and 18 and the hydraulic lines/intended for reciprocating the hydraulic winches extend upwardly.
Figures 4 through 6 explain the operation of the system according to the invention.

First, the system 22 embodying the invention is placed near the perpendicular ground hole 20, into which is introduced a foundation compound on top of about 50 cm high wooden planks or the like. The centric-adjustment pistons 5 and 13 are then driven in so that the lateral area of the supporting structure 1 is smooth. The holding ropes 16 are stretched out sideways away from the supporting structure 1.

Subsequently, by means of a hoisting machine 23 a shoring column 2 is inserted from above vertically into the clear space between the positive stop 8 and the clamping piston 9 and set on the bottom of the ground hole. The winch 10 is now activated to ensure a fixed-end support for the shoring column 2.

Thereupon, the shoring column 2 with the system 22 clamped thereto is driven into the ground hole 20 (Figure 5) and lowered until it reaches the foundation fill 21. The holding ropes 16 are guided manually during this operation.
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through

22

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Figure 5)

The
operation.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A mechanism for centrically driving a shoring column into a predrilled ground hole, characterized in that in a ring-shaped supporting structure (1) having an outside diameter slightly smaller than the diameter of a drilled ground hole (20) and an inside diameter larger than the cross section of a shoring column (2) there are arranged a clamping device which comprises diametrically opposed elements (8, 9) and a number of centric-adjustment pistons (5, 13) which move through suitable holes (6, 14) in the wall of the supporting structure (1) and are loaded with a hydraulic fluid, and that the clamping device (8, 9) and the centric-adjustment pistons (5, 13) are connected with a remote-control device which can be placed near the ground hole (20) via suitable hoses (18, 19) and electrical control lines (17).

2. The mechanism as set forth in claim 1, characterized in that the number of centric-adjustment pistons (13, 15) for preliminary and fine centric adjustment is odd in each case.

3. The mechanism as set forth in claim 1 or 2, characterized in that the clamping device (8, 9) includes a positive stop (8) and a clamping piston (9) moving perpendicularly thereto.

4. The mechanism as set forth in claim 3, characterized in that the position of the positive stop (8) can be adjusted on the supporting structure (1).

Dated this 23rd day of December, 1982
Josef KRINGS
By His Patent Attorneys
CLEMENT HACK & Co.
Fellows Institute of Patent Attorneys of Australia