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(54) Title: PIPE HANDLING DEVICE

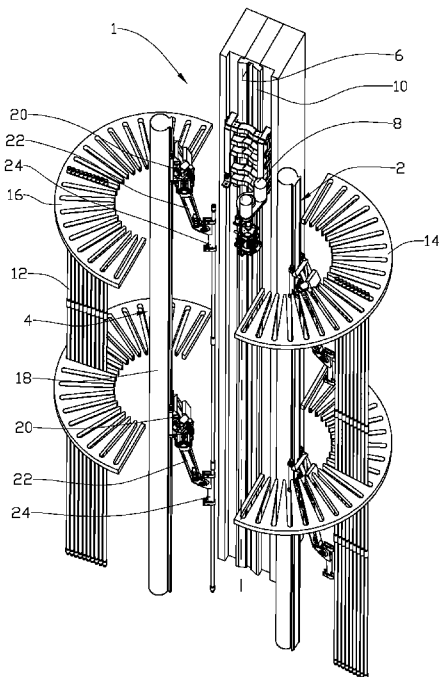


Fig. 1

(57) Abstract: A pipe handling device (1) on a drilling floor, the pipe handling device (1) including : - a first pipe handling machine (2) placed between a first pipe magazine (14) and the drilling centre (6); and - a second pipe handling machine (4) placed between a second pipe magazine (16) and the drilling centre (6), the first pipe handling machine (2) and the second pipe handling machine (4) both being arranged to carry pipes (12) between the drilling centre (6) and their respective first pipe magazine (14) and second pipe magazine (16), characterized by the first pipe handling machine (2) being rotatable around an axis substantially centrally in the first pipe magazine (14), and by the second pipe handling machine (4) being rotatable around an axis substantially centrally in the second pipe magazine (16).

**PIPE HANDLING DEVICE**

This invention relates to a pipe handling device. More particularly, it relates to a pipe handling device on a drilling floor where the pipe handling device is placed between a pipe magazine and a drilling centre.

5 When automating a drilling floor, on which pipes and other equipment are transferred between the drilling centre and preparation and storage positions by means of controlled manipulators, among other things, it is essential to increase the speed of operation. This is particularly relevant during so-called "tripping", in which a relatively large number of pipe lengths are to be fed out of and into a borehole.

10 It is also desirable to be able to utilize any area that is freed up because of, for example, automation, for the intermediate storage of pipes and other equipment.

The petroleum industry is relatively conservative with respect to the lay-out of a drilling floor, and therefore considerable innovative thinking and changes in terms of equipment have had to be carried out to achieve the efficiency and space utilization  
15 desired.

The invention has for its object to remedy or reduce at least one of the drawbacks of the prior art, or at least provide a useful alternative to the prior art.

The object is achieved through features which are specified in the description below and in the claims that follow.

20 A pipe handling device is provided on a drilling floor, the pipe handling device including:

- a first pipe handling machine placed between a first pipe magazine and a drilling centre; and
- a second pipe handling machine placed between a second pipe magazine and the  
25 drilling centre, the first pipe handling machine and the second pipe handling machine both being arranged to carry pipes between the drilling centre and their respective

machine being rotatable around an axis substantially centrally in the first pipe magazine, and by the second pipe handling machine being rotatable around an axis substantially centrally in the second pipe magazine.

5 The drilling floor can thereby be utilized considerably better than if there was only one pipe handling machine present, while, at the same time, the operations may be made more efficient by at least two pipe handling machines cooperating. Further, there will be no need for rotatable pipe magazines as said first and second pipe handling machines may be arranged to grip pipes in a pipe magazine without the magazine being rotated, as said first and second pipe handling machines are rotatable around axes  
10 substantially centrally in, respectively, the first and second pipe magazines. The pipe magazines may be formed in an arbitrary shape. This may be, for example, the shape of a full circle or semicircle, rectangle or square.

In one possible embodiment, at least one of the pipe magazines may be formed in a substantially semicircular shape.

15 The first pipe handling machine and the second pipe handling machine may be arranged on respective sides of the drilling centre. A solution like that has the effect of enabling the arrangement of one pipe rack on either side of the drilling centre.

In one embodiment of the pipe handling device, the first pipe handling machine and the second pipe handling machine may include a vertical, rotatable column, on which  
20 one or more dollies are arranged, individually movable in a vertical direction. The column may correspond to the axis around which said first and second pipe handling machines are rotatable. There may be, for example, two dollies individually movable in a vertical direction.

25 Thus, the device according to the invention enables a considerable improvement in both space utilization and efficiency.

In what follows, an example of a preferred embodiment is described, which is visualized in the accompanying drawings, in which:

Figure 1 shows a pipe handling device according to the invention in perspective;  
and

30 Figure 2 shows a plan of the pipe handling device of figure 1.

In the drawings, the reference numeral 1 indicates a pipe handling device which includes a first pipe handling machine 2 and a second pipe handling machine 4. The first

pipe handling machine 2 and the second pipe handling machine 4 are arranged on respective sides of a well centre 6.

A top-drive drilling machine 8 runs on a derrick guide 10 along the drilling centre 6.

5 The first pipe handling machine 2 is arranged to carry pipes 12 between a first pipe magazine 14 and the drilling centre 6, whereas the second pipe handling machine 4 is arranged to carry pipes 12 between a second pipe magazine 16 and the drilling centre 6.

10 In this preferred exemplary embodiment, each of the first and second pipe handling machines 2, 4 includes a rotatable column 18 mounted vertically, on which two dollies 20 are arranged, individually movable in a vertical direction. The columns 18 are placed substantially centrally in the pipe magazines 14, 16. In the exemplary embodiment shown, the pipe magazines 14, 16 are formed in a substantially semicircular shape. The number of dollies may be one or more. Each dolly is provided with an arm 22 which is provided with a pipe gripper 24 at its free end portion.

15 By means of the column 18, dolly 20, and arm 22, the pipe gripper 24 is brought into position at the pipe 12 to be gripped, and the pipe 12 is then moved by manoeuvring the same components to the desired position.

The column 18, dolly 20, arm 22, and pipe gripper 24 may be electrically or hydraulically operated and controlled in manners known *per se*.

## C l a i m s

1. A pipe handling device (1) on a drilling floor, the pipe handling device (1) including:
  - a first pipe handling machine (2) placed between a first pipe magazine (14) and the drilling centre (6); and
  - a second pipe handling machine (4) placed between a second pipe magazine (16) and the drilling centre (6), the first pipe handling machine (2) and the second pipe handling machine (4) both being arranged to carry pipes (12) between the drilling centre (6) and their respective first pipe magazine (14) and second pipe magazine (16), characterized in that the first pipe handling machine (2) is rotatable around an axis substantially centrally in the first pipe magazine (14), and that the second pipe handling machine (4) is rotatable around an axis substantially centrally in the second pipe magazine (16).
2. The pipe handling device (1) in accordance with claim 1, wherein the first pipe handling machine (2) and the second pipe handling machine (4) are arranged on respective sides of the drilling centre (6).
3. The pipe handling device (1) in accordance with claim 1 or 2, wherein the first pipe magazine (14) and the second pipe magazine (16) are formed in a substantially semicircular shape.
4. The pipe handling device (1) in accordance with claim 1, 2, or 3, wherein the first pipe handling machine (2) and the second pipe handling machine (4) include vertical, rotatable columns (18), on which one or more dollies (20) are arranged, individually movable in a vertical direction.
5. The pipe handling device (1) in accordance with claim 4, wherein, on the rotatable columns (18), two dollies (20) are arranged, individually movable in a vertical direction.

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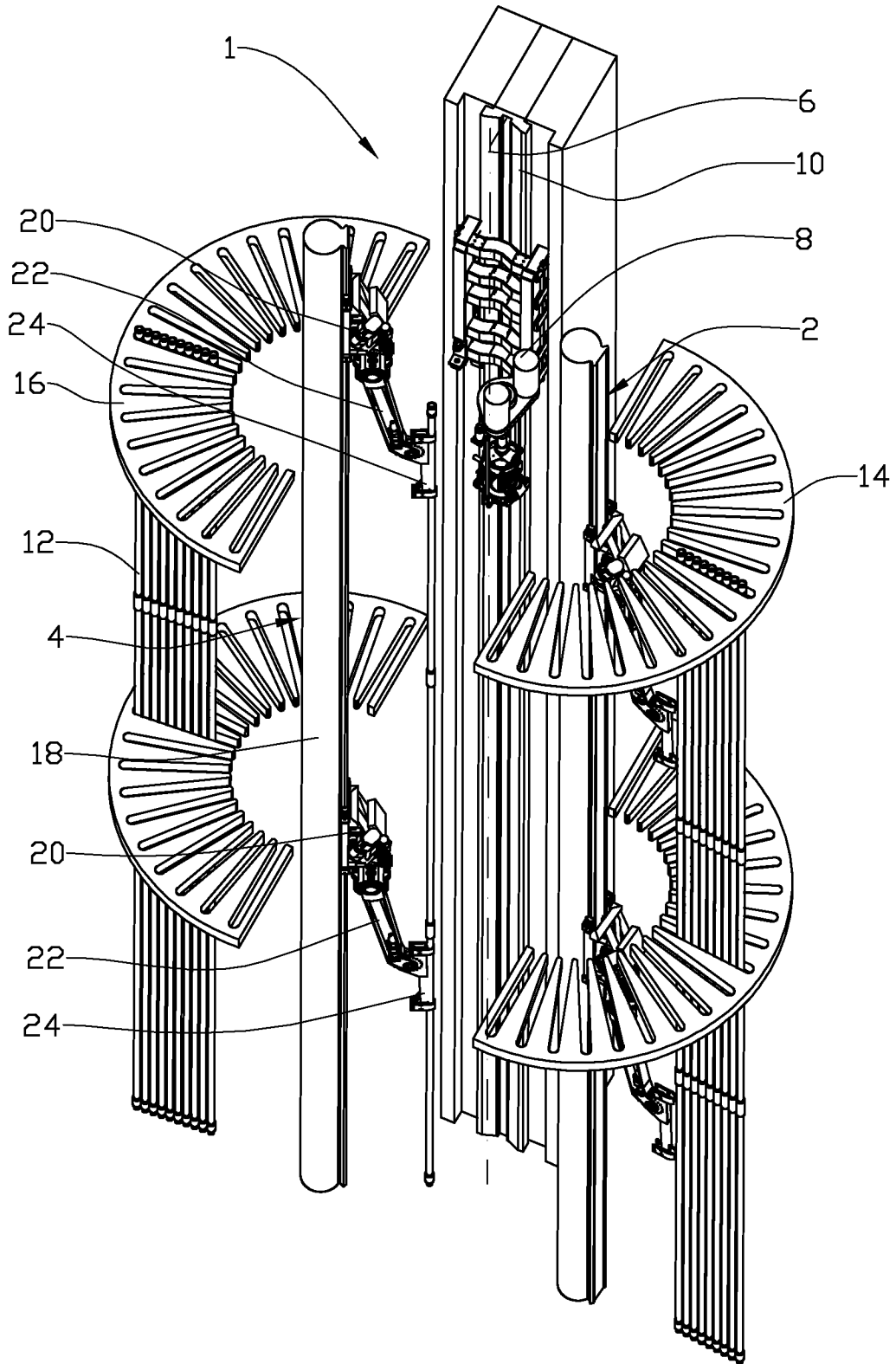


Fig. 1

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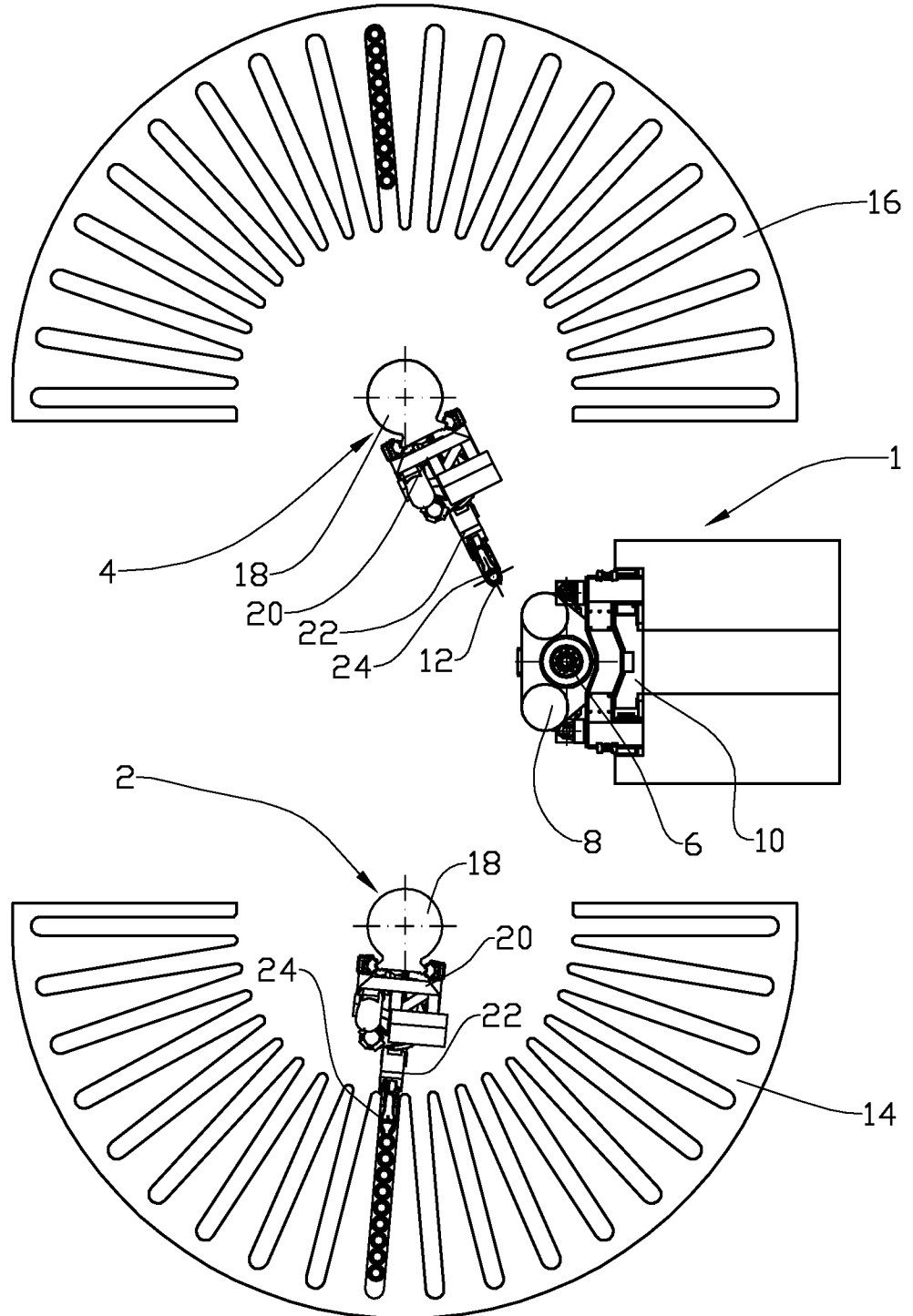


Fig. 2

## INTERNATIONAL SEARCH REPORT

International application No.  
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A. CLASSIFICATION OF SUBJECT MATTER IPC: see extra sheet 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) IPC: E21B Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched SE, DK, FI, NO classes as above Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, PAJ, WPI data		
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2009064194 A1 (ODIM JMC AS ET AL), 22 May 2009 (2009-05-22); whole document --	1-5
A	US 5244329 A1 (MCGILL JOHN ET AL), 14 September 1993 (1993-09-14); whole document --	1-5
A	US 4899832 A1 (BIERSCHIED JR ROBERT C), 13 February 1990 (1990-02-13); whole document --	1-5
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Date of the actual completion of the international search 08-08-2012		Date of mailing of the international search report 08-08-2012
Name and mailing address of the ISA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86		Authorized officer Christer Bäcknert Telephone No. + 46 8 782 25 00

**Continuation of:** second sheet

**International Patent Classification (IPC)**

**E21B 19/14** (2006.01)

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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