



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
02.01.2004 Bulletin 2004/01

(51) Int Cl.7: **B66C 13/08**

(43) Date of publication A2:
13.08.2003 Bulletin 2003/33

(21) Application number: **03002160.4**

(22) Date of filing: **03.02.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT SE SI SK TR**
Designated Extension States:
AL LT LV MK RO

- **Monzen, Tadaaki, Mitsubishi Heavy Ind., Ltd. Nishi-ku, Hiroshima-shi, Hiroshima-ken (JP)**
- **Nishioka, Masaki, Mitsubishi Heavy Ind., Ltd. Nishi-ku, Hiroshima-shi, Hiroshima-ken (JP)**
- **Toyohara, Takashi, Mitsubishi Heavy Ind., Ltd. Nishi-ku, Hiroshima-shi, Hiroshima-ken (JP)**

(30) Priority: **08.02.2002 JP 2002032887**

(71) Applicant: **Mitsubishi Heavy Industries, Ltd. Tokyo (JP)**

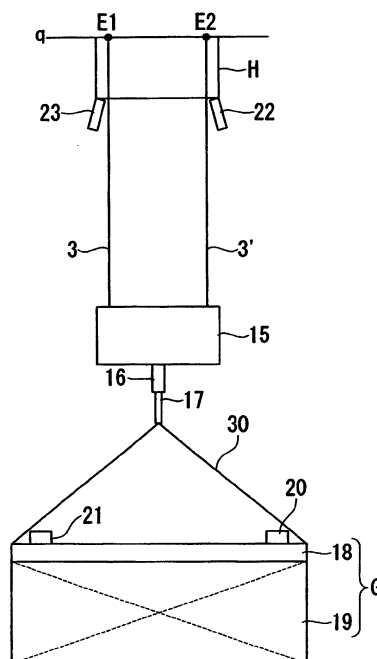
(74) Representative: **HOFFMANN - EITLÉ
Patent- und Rechtsanwälte
Arabellastrasse 4
81925 München (DE)**

(72) Inventors:
• **Yoshioka, Nobuo, Mitsubishi Heavy Ind., Ltd. Nishi-ku, Hiroshima-shi, Hiroshima-ken (JP)**

(54) **Device and method for controlling rotation of container**

(57) A device for controlling the rotation of a container used for a crane which includes a jib (2) for hanging a container (19) via a lifting attachment (15) and a rope (3), the device rotating the container by rotating the rope using a rotation motor (16). The device includes a container rotation angle obtaining unit (22,23); a lifting attachment rotation angle obtaining unit; a control computing unit (50) which computes a motor control command value based on an equation relating to a deviation between a target rotation angle and the rotation angle of the container, an angle of the lifting attachment member, and the motor control command value; a rotation motor control unit which drives the rotation motor; and a feedback control unit which performs feedback control on the rotation angle of the container and the angle of the lifting attachment member so that the rotation angle of the container matches the target rotation angle of the container.

FIG. 2





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 00 2160

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	DE 199 07 989 A (HOFER EBERHARD ;SAWODNY OLIVER (DE)) 7 October 1999 (1999-10-07) * figures 4,6-9 * * page 4 - page 15 * ---	1,3-6,9, 10	B66C13/08
P,A	DE 100 64 182 A (LIEBHERR WERK NENZING) 8 May 2002 (2002-05-08) * page 4 - page 28 * * figures 2-10 * ---	1,3-6,9, 10	
A	EP 1 063 194 A (SIEMENS AG) 27 December 2000 (2000-12-27) * paragraph '0022! - paragraph '0030! * * figures * ---	1	
A	US 6 092 678 A (TAKAOKA TOSHIYUKI ET AL) 25 July 2000 (2000-07-25) * figures 3-6 * * column 5, line 33 - column 8, line 12 * ---	1,2,7,8	
A	DE 198 26 695 A (SIEMENS AG) 23 December 1999 (1999-12-23) * figures 3,4 * * column 4, line 25 - column 5, line 41 * ---	1,9,10	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B66C
A	EP 0 027 507 A (SIEMENS AG) 29 April 1981 (1981-04-29) * figures 2-7 * ---	1	
A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 096 (M-469), 12 April 1986 (1986-04-12) -& JP 60 232330 A (MITSUBISHI JUKOGYO KK), 19 November 1985 (1985-11-19) * abstract; figures 3-6 * ---	1,9,10	
-/--			
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		31 October 2003	Guthmuller, J
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03 02 (P04C01)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 00 2160

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 394 147 A (REEL SA) 24 October 1990 (1990-10-24) * claims 1,2 * * figures 2-6 * ---	1,9,10	
A	FR 2 461 676 A (CASTERAN JEAN) 6 February 1981 (1981-02-06) -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Place of search THE HAGUE		Date of completion of the search 31 October 2003	Examiner Guthmuller, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 B2 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 03 00 2160

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-10-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 19907989	A	07-10-1999	DE 19907989 A1	07-10-1999
DE 10064182	A	08-05-2002	DE 10064182 A1	08-05-2002
			WO 0232805 A1	25-04-2002
			EP 1326798 A1	16-07-2003
EP 1063194	A	27-12-2000	EP 1063194 A2	27-12-2000
US 6092678	A	25-07-2000	JP 11349280 A	21-12-1999
			KR 2000005812 A	25-01-2000
DE 19826695	A	23-12-1999	DE 19826695 A1	23-12-1999
EP 0027507	A	29-04-1981	DE 2933861 B1	10-07-1980
			EP 0027507 A1	29-04-1981
			JP 56033387 A	03-04-1981
			NO 802458 A	23-02-1981
JP 60232330	A	19-11-1985	JP 1993026 C	22-11-1995
			JP 6006451 B	26-01-1994
EP 0394147	A	24-10-1990	FR 2645846 A1	19-10-1990
			AT 94850 T	15-10-1993
			DE 69003432 D1	28-10-1993
			EP 0394147 A1	24-10-1990
FR 2461676	A	06-02-1981	FR 2461676 A1	06-02-1981