



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
12.07.2017 Bulletin 2017/28

(51) Int Cl.:
E02F 3/38 (2006.01)
E02F 3/36 (2006.01) **F16B 1/00 (2006.01)**

(43) Date of publication A2:
14.07.2010 Bulletin 2010/28

(21) Application number: **10150023.9**

(22) Date of filing: **04.01.2010**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **07.01.2009 JP 2009001590**
07.01.2009 JP 2009001604

(71) Applicant: **Hitachi Construction Machinery Co., Ltd**
Tokyo 112-0004 (JP)

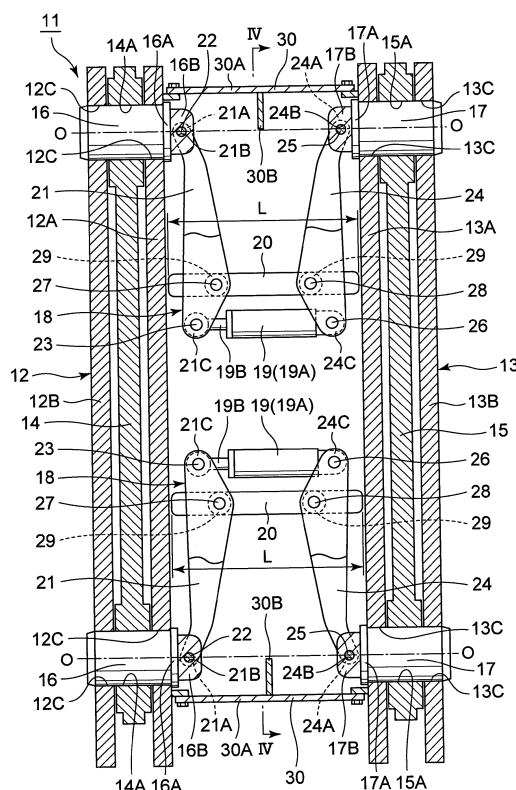
(72) Inventors:
• **Ogasawara, Manabu**
Ibaraki 300-0013 (JP)
• **Kudou, Takemasa**
Ibaraki 300-0013 (JP)
• **Ishii, Motohiro**
Ibaraki 300-0013 (JP)
• **Hoshino, Atsushi**
Ibaraki 300-0013 (JP)

(74) Representative: **MERH-IP Matias Erny Reichl**
Hoffmann
Patentanwälte PartG mbB
Paul-Heyse-Strasse 29
80336 München (DE)

(54) **Two-member connecting device**

(57) A pin inserting/withdrawing mechanism (18) which is provided between left and right first brackets (12), (13) is constituted by a hydraulic cylinder (19) disposed in such a manner as to be spaced apart from left and right connecting pins (16), (17) so as to be capable of extending and contracting in the same direction as the axis of the left and right connecting pins (16), (17); a floating link (20) disposed in a floating state between the left and right first brackets (12), (13); a left link (21) for connecting the left connecting pin (16) and the hydraulic cylinder (19) by means of the floating link (20); and a right link (24) for connecting the right connecting pin (17) and the hydraulic cylinder (19) by means of the floating link (20). In consequence, the left and right connecting pins (16), (17) respectively connected to one end sides (21A), (24A) of these left and right links (21), (24) move in the left-right direction in correspondence with the extension and contraction of the hydraulic cylinder (19). As a result, the left and right connecting pins (16), (17) can be smoothly inserted into or withdrawn from the left and right first brackets (12), (13) and the left and right second brackets (14), (15).

Fig. 3





EUROPEAN SEARCH REPORT

Application Number
EP 10 15 0023

5

10

15

20

25

30

35

40

45

50

55

1

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP S58 98532 A (CATERPILLAR MITSUBISHI LTD) 11 June 1983 (1983-06-11) * figures 1, 5, 7, 8 *	1-3	INV. E02F3/38 F16B1/00 E02F3/36
X	US 4 332 094 A (MIEGER ROLF) 1 June 1982 (1982-06-01) * figures 1, 2 and 2b *	1,2,4	
X	JP H02 104824 A (TAKAHASHI TAKAYUKI) 17 April 1990 (1990-04-17) * figure 1 and 3 *	1,5	
A	US 3 760 883 A (BIRK B) 25 September 1973 (1973-09-25) * figures 1, 2 *	6,7	
Y	JP 2001 288769 A (CATERPILLAR MITSUBISHI LTD) 19 October 2001 (2001-10-19) * figure 9 *	1,2,8,9	
Y	US 3 272 264 A (ANTOLINI HENRY S) 13 September 1966 (1966-09-13) * figures 1-3 *	10	
A		10	
		1	TECHNICAL FIELDS SEARCHED (IPC) E02F F16B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 June 2017	Examiner Bultot, Coralie
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			

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

EP 10 15 0023

5 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.

06-06-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP S5898532 A	11-06-1983	JP S636692 B2	10-02-1988
		JP S5898532 A	11-06-1983
US 4332094 A	01-06-1982	DE 2901923 B1	07-02-1980
		FR 2446795 A1	14-08-1980
		US 4332094 A	01-06-1982
JP H02104824 A	17-04-1990	NONE	
US 3760883 A	25-09-1973	CA 970559 A	08-07-1975
		US 3760883 A	25-09-1973
JP 2001288769 A	19-10-2001	JP 3567370 B2	22-09-2004
		JP 2001288769 A	19-10-2001
US 3272264 A	13-09-1966	NONE	