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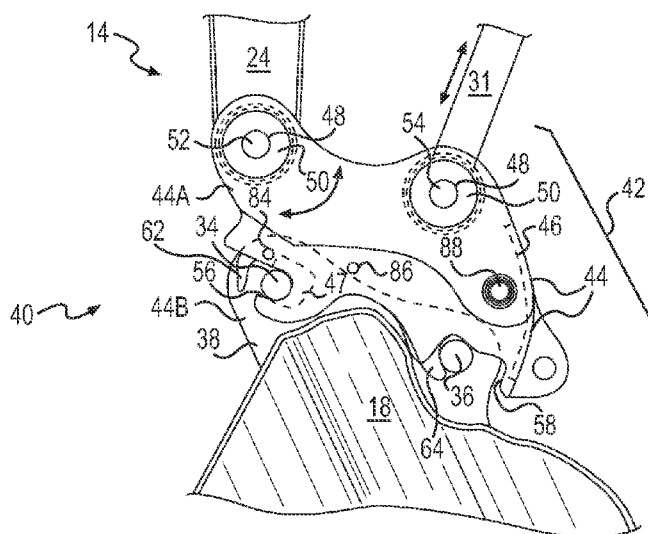


FIG. 2

(57) Abstract: A tool coupler assembly for a machine is disclosed. The tool coupler assembly may have a coupler frame, a first latch, a second latch, and a hydraulic actuator connected to move the second latch relative to the first latch and the coupler frame. The hydraulic actuator may have a first chamber, a second chamber, and a pressure valve with a check element movable to allow a flow of fluid into the first chamber based on a pressure of fluid in the first chamber, and a pressure regulating element movable to allow a flow of fluid out of the first chamber based on a pressure of fluid in the second chamber. The tool coupler assembly may additionally have a first pilot passage configured to communicate fluid from the second chamber with the pressure-regulating element, and a second pilot passage configured to communicate fluid from the first chamber with the pressure-regulating element.



A. CLASSIFICATION OF SUBJECT MATTER***E02F 3/96(2006.01)i, E02F 3/36(2006.01)i***

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)

E02F 3/96; G05G 5/08; B25G 3/18; E02F 3/40

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: coupler, tool, attachment, actuator, cylinder, latch, valve, pressure, regulating, check.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009-0007465 A1 (ROBL TROY CURTIS et al.) 08 January 2009 See claims 1-7 and figures 1-4.	1-20
A	US 6902346 B2 (KENNETH M. STEIG, JR. et al.) 07 June 2005 See claims 1-3 and figures 3-7.	1-20
A	JP 10-082066 A (MARUJIYUN JUKO KK) 31 March 1998 See claims 1-2 and figures 1-5.	1-20
A	JP 09-209391 A (KONAN DENKI KK) 12 August 1997 See claim 1 and figures 1-3.	1-20
A	JP 2000-001872 A (JAKUTEI ENGINEERING KK) 07 January 2000 See claims 1-3 and figures 1,4.	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0007465 A1	08.01.2009	AU 2008-275755 A1 AU 2008-275755 A1 CN 101688381 A EP 2167738 A2 JP 2010-532438 A JP 2010-532438 T JP 2010-532438 T US 7984575 B2 WO 2009-009000 A2 WO 2009-009000 A3 WO 2009-009000 A3	15.01.2009 15.01.2009 31.03.2010 31.03.2010 07.10.2010 07.10.2010 07.10.2010 26.07.2011 15.01.2009 22.05.2009 15.01.2009
US 6902346 B2	07.06.2005	US 2003-0175072 A1 US 2005-0214105 A1 US 2009-0311086 A1 US 7594776 B2	18.09.2003 29.09.2005 17.12.2009 29.09.2009
JP 10-082066 A	31.03.1998	None	
JP 09-209391 A	12.08.1997	JP 02-793165 B2 JP 2793165 B2 US 05692325A A	19.06.1998 03.09.1998 02.12.1997
JP 2000-001872 A	07.01.2000	JP 4007686 B2	14.11.2007