



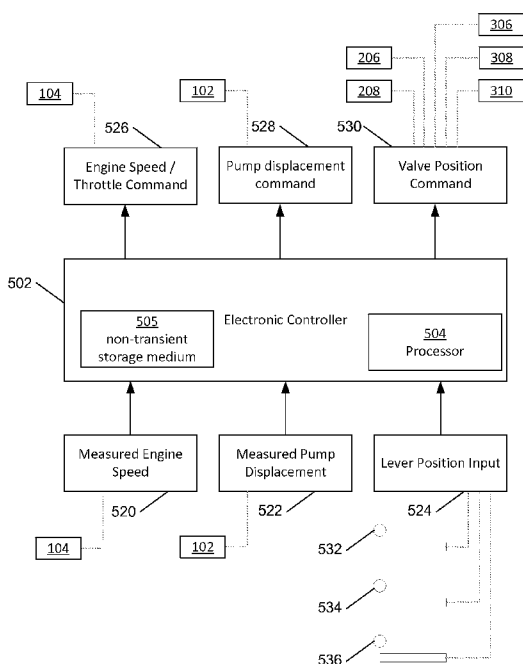
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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[Continued on next page]

(54) Title: METHOD FOR OBTAINING A FULL RANGE OF LIFT SPEEDS USING A SINGLE INPUT

FIG. 6



(57) Abstract: A method for operating a work attachment (52) of a work machine (50) with a single input (532) is disclosed. In one step of the method, an indication is received that operation of a work circuit in a hydraulic system is to be activated. Upon this indication, the hydraulic system may be placed in a work circuit primary mode in which a pump is placed in fluid communication with the work circuit. The method also includes receiving a lifting lever position (506, 524) and correlating the lifting lever position to a required lifting speed. The method further includes automatically controlling at least two of an engine (104) speed (504), a pump (102, 108) displacement (522), and a lifting control valve (530) to satisfy the required lifting speed. Additionally, the operation of the engine speed, pump displacement and lifting control valve (530) may be sequentially staged in predefined zones of operation.

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- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/US2013/020839

A. CLASSIFICATION OF SUBJECT MATTER  
INV. B66F9/22 E02F9/22  
ADD.  
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)  
B66F E02F F15B  
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 101 28 582 A1 (LINDE AG [DE]) 19 December 2002 (2002-12-19) paragraph [0027] - paragraph [0035]; figures -----	1-3
X	JP 2001 097693 A (KOMATSU FORKLIFT) 10 April 2001 (2001-04-10) paragraph [0013] - paragraph [0020] paragraph [0033]; figures -----	1-3
X	EP 2 071 196 A1 (KOBLECO CONSTRUCTION MACHINERY [JP] KOBELCO CONSTR MACHINERY LTD [JP]) 17 June 2009 (2009-06-17) the whole document -----	1-10

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search  
**16 April 2013**

Date of mailing of the international search report  
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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2013/020839

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see additional sheet(s)

### Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10

is directed to the known method of claim 1 wherein in the "automatically controlling"-step the control/correction elements are further specified, such as "a flow condition set point" is correlated to the desired "lifting speed" and "the at least two" control/correction elements are set with respect to said flow condition set point (claim 2), or "the engine speed" or "the pump" tilting is held "at a constant minimum setting (claim 3).

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2. claim: 11

is directed to the known method of claim 1 wherein the work circuit and thus the hydraulic system of the work machine is further specified in the step before the "automatically controlling"-step. This step "before" is characterised by a pump-communicated or pump-isolated mode (claim 11).

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3. claims: 12-14

directed to the known method of independent claim 12 including the step of dependent claim 13 as potential special technical features, and is thus directed to a method for operating a work attachment of a work machine with the step of automatically controlling at least one of an engine speed, a pump displacement, and a lifting control valve to satisfy the required lifting speed wherein the the engine speed is automatically controlled.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/020839

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 10128582	A1	19-12-2002	NONE
JP 2001097693	A	10-04-2001	NONE
EP 2071196	A1	17-06-2009	EP 2071196 A1 17-06-2009
			EP 2426363 A1 07-03-2012
			JP 4844363 B2 28-12-2011
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