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[Continued on next page]

(54) Title: WORK VEHICLE ROBOTIC PLATFORM

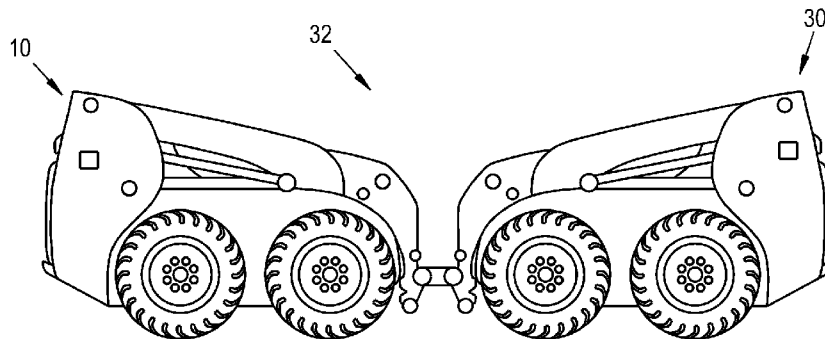


Fig. 3

(57) Abstract: A robotic control system for a vehicle having a chassis and a drive system carrying the chassis. The robotic control system including a controller configured to control the drive system. The controller being further configured to at least one of auto-load the vehicle onto a trailer, preclude tipping of the vehicle, stabilize yaw of the vehicle, simulate Ackerman steering, balance the vehicle on two wheels, retrieve an other vehicle, transfer a payload from the vehicle to the other vehicle, coupling of at least one other vehicle to the vehicle, retrieval or movement of a container using either relative sensing or absolute position referencing, profile cutting of plants, and 3D print cement.

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Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *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))*

— *with information concerning request for restoration of the right of priority in respect of one or more priority claims (Rules 26bis.3 and 48.2(b)(vii))*

(88) Date of publication of the international search report:

14 May 2015

INTERNATIONAL SEARCH REPORT

International application No PCT/US2014/055180

A. CLASSIFICATION OF SUBJECT MATTER
 INV. E02F3/34 E02F9/20
 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)
 E02F B25J G05D A01D

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	US 4 769 700 A (PRYOR TIMOTHY R [CA]) 6 September 1988 (1988-09-06) column 14 - column 15; figures 1,11,12 -----	1,11,13, 23
X	FR 2 894 948 A1 (SARL JOUANNET SARL [FR]) 22 June 2007 (2007-06-22) claim 1; figures -----	1,13
X	US 3 762 478 A (CUMMINS P) 2 October 1973 (1973-10-02) column 1; figures 1,2 -----	1,11,13, 23
X	US 2012/185091 A1 (FIELD TIMOTHY G [US] ET AL) 19 July 2012 (2012-07-19) the whole document -----	1,7,8, 11-13, 19,20, 23,24
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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

23 January 2015

Date of mailing of the international search report

01/04/2015

Name and mailing address of the ISA/
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Laurer, Michael

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2014/055180

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 798 162 A2 (HS PENTA SRL [IT] H S PENTA S R L [IT]) 1 October 1997 (1997-10-01)	1,7,8, 12,13, 19,20,24
Y	the whole document -----	9,21
Y	US 4 047 486 A (PABSDORFF MELVIN) 13 September 1977 (1977-09-13) figures	9,21
X	US 7 896 113 B1 (RAMIREZ FERNANDO [US]) 1 March 2011 (2011-03-01) the whole document -----	1,13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/055180

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.: 10, 22(completely); 1, 7-9, 11-13, 19-21, 23, 24(partially)
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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.:
1, 7-9, 11-13, 19-21, 23, 24(all partially)

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, 7-9, 11-13, 19-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art
wherein the robotic vehicle may auto-load onto a trailer;

2. claims: 1, 7-9, 11-13, 19-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art
wherein tipping of the robotic vehicle is precluded;

3. claims: 1, 7-9, 11-13, 19-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art
wherein yaw of the robotic vehicle is stabilized;

4. claims: 1, 7-9, 11-13, 19-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art
wherein Ackermann steering of the robotic vehicle is simulated;

5. claims: 1, 7-9, 11-13, 19-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art
wherein the robotic vehicle is balanced on two wheels;

6. claims: 1-9, 11-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art
wherein another vehicle may be retrieved by the robotic vehicle or
wherein a pay load may be transferred by the robotic vehicle from another vehicle;

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

7. claims: 1-9, 11-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art wherein another vehicle may be coupled to the robotic vehicle;

8. claims: 1, 7-9, 11-13, 19-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art wherein a container may be retrieved using either relative or absolute position referencing;

9. claims: 1, 7-9, 11-13, 19-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art wherein the robotic vehicle is intended for profile cutting of plants;

10. claims: 1, 7-9, 11-13, 19-21, 23, 24(all partially)

directed to a robotic vehicle or system having common features of claims 1 and/or 13 which are commonly known from the prior art wherein the robotic vehicle is intended for 3D print cement;

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 10, 22(completely); 1, 7-9, 11-13, 19-21, 23, 24(partially)

Dependent claims 10 and 22 refer to the same potential inventions of claims 1 and 13 which are already present in said independent claims. This renders claims 10 and 22 unclear and incompatible with their respective independent claims (Article 6 PCT) and no meaningful search is possible.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/055180

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4769700	A	06-09-1988	NONE

FR 2894948	A1	22-06-2007	NONE

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