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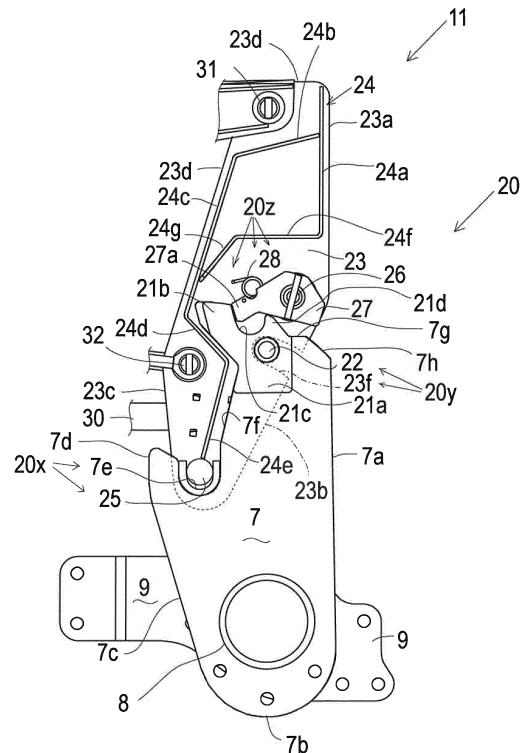
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(54) **LOADER ATTACHMENT SYSTEM**

(57) A loader attachment system (20) is configured so as to detachably attach a loader to a vehicle (1) by detachably attaching a mast (11) of the loader to a loader mount (7) fixed on the vehicle (1). The loader attachment system (20) includes a support device (20x), a location device (20y), and an engagement device (20z). The support device (20x) is configured to support the mast (11) on the loader mount (7) so that the mast (11) is rotatable relative to the loader mount (7). The location device (20y) is configured to locate the mast (11) supported on the loader mount (7) by the support device (20x) at an attachment position. The engagement device (20z) is configured to engage the mast (11) at the attachment position with the loader mount (7) so as to prevent the mast (11) from rotating in a direction to detach the mast (11) from the loader mount (7). The support device (20x), the location device (20y) and the engagement device (20z) are configured independent of one another.

Fig. 11



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EUROPEAN SEARCH REPORT

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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 S59 43560 U (.) 22 March 1984 (1984-03-22) * figures 1-8 *	1,2	INV. E02F3/36 E02F3/627
X	GB 2 044 724 A (DEERE & CO) 22 October 1980 (1980-10-22) * figures *	1,2	
X	US 5 620 297 A (MAHANEY F ALLEN [US]) 15 April 1997 (1997-04-15) * figures 1-6 *	1,2	
X	JP H02 109854 U (.) 3 September 1990 (1990-09-03) * figures *	1,2	
X	DE 35 17 151 A1 (FENDT & CO XAVER [DE]) 13 November 1986 (1986-11-13) * figures 1-3 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			E02F
-The present search report has been drawn up for all claims-			
Place of search Munich		Date of completion of the search 11 July 2017	Examiner Laurer, Michael
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	

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

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Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

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No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

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LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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see sheet B

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All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

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As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

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Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

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None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

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1, 2

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The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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1. claims: 1, 2

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directed to the known loader attachment system of claim 1, wherein as potential special technical features the support device (20x) includes: a pivot (25) serving as a fulcrum of the rotation of the mast (11) relative to the loader mount (7); and a receptacle (7e) receiving the pivot (25), wherein one of the loader mount (7) and the mast (11) includes the pivot (25), and the other of the loader mount (7) and the mast (11) includes the receptacle (7e), wherein the location device (20y) includes: a projection (22); and a groove (23f) extended along a locus of the projection (22) during the rotation of the mast (11) relative to the loader mount (7), wherein one of the loader mount (7) and the mast (11) includes the projection (22), and the other of the loader mount (7) and the mast (11) includes the groove (23f), wherein the rotation of the mast (11) relative to the loader mount (7) moves the projection (22) in the groove (23f), and wherein a position where the projection (22) abuts against a deep end of the groove (23f) is defined as the attachment position. The therefrom resulting technical effects are: The loader mast is exactly supported and guided through mounting on the loader mount. The objective technical problem to solve may be formulated as: Improve mounting of a loader on a vehicle.

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2. claims: 3-5

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directed to the known loader attachment system of claim 1, wherein as potential special technical features the engagement device (20z) includes: a tooth (21b) provided on the loader mount (7); a pawl (27) pivoted on the mast (11); an overcenter spring (28) interposed between the pawl (27) and the mast (11); and a release handle (29) pivoted on the mast (11) so that the pawl (27) and the release handle (29) are rotatably centered on a common axis (26), wherein the release handle (29) is rotatable from a lock position (27L) to engage the pawl with the tooth (21b); wherein, when the pawl (27) engages with the tooth (21b), the spring (28) biases the pawl (27) in a direction to engage the pawl (27) with the tooth (21b), and wherein, when the release handle (29) is rotated from the lock position (27L), the pawl (27) rotates around the common axis (26), and the overcenter spring (28) changes a direction of its force so as to bias the pawl (27) in another direction to rotate the pawl (27) apart from the tooth (21b), thereby keeping the pawl (27) disengaged from the tooth (21b). The therefrom resulting technical effects are: The loader mast may be automatically latched to the loader mount through mounting on the loader mount and assists disengagement of the loader during dismounting. The



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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objective technical problem to solve may be formulated as:
Improve latching and unlatching of a loader on a vehicle.

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

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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.

11-07-2017

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP S5943560 U	22-03-1984	JP S636266 Y2 JP S5943560 U	22-02-1988 22-03-1984
GB 2044724 A	22-10-1980	CA 1136093 A DE 3005594 A1 FR 2449392 A1 GB 2044724 A IT 1188906 B MX 156761 A US 4264264 A ZA 8001063 B	23-11-1982 28-08-1980 19-09-1980 22-10-1980 28-01-1988 30-09-1988 28-04-1981 30-09-1981
US 5620297 A	15-04-1997	NONE	
JP H02109854 U	03-09-1990	JP H0730767 Y2 JP H02109854 U	19-07-1995 03-09-1990
DE 3517151 A1	13-11-1986	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82