(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 385 214 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
10.10.2018 Bulletin 2018/41

(51) Int Cl.:
B66F 9/08 *(2006.01)* ***B66F 9/12*** *(2006.01)*

(21) Application number: **17166055.8**

(22) Date of filing: **11.04.2017**

(84) Designated Contracting States:
AL 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 RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **06.04.2017 US 201715480715**

(71) Applicant: **Hyster-Yale Group, Inc.**
Fairview, OR 97024 (US)

(72) Inventor: **STENT, Mark**
Frimley, Surrey, GU16 7SG (GB)

(74) Representative: **Hess, Peter K. G.**
Bardehle Pagenberg Partnerschaft mbB
Patentanwälte, Rechtsanwälte
Prinzregentenplatz 7
81675 München (DE)

(54) SIDEPLATE FOR FORK CARRIAGE

(57) A carriage for a forklift truck comprises a frame (40); a first sideplate (30) secured to the frame (40), the first sideplate (30) comprising an upper portion (80), an intermediate portion (90), and a lower portion (100) with a guide attached to the upper portion (80) and a guide attached to the lower portion (100); a second sideplate (35) secured to the frame (40), the second sideplate (35) comprising an upper portion (85), an intermediate portion (95), and a lower portion (105) with a guide attached to the upper portion (85) and a guide attached to the lower portion (105); wherein the first and second sideplates (30) are constructed and shaped such that when the first and second sideplates (30, 35) are secured to the frame (40) a distance "D" between the intermediate portions (90, 95) of the first and second sideplates (30, 35) is greater than a distance "d" between the upper portions (80, 85) of the first and second sideplates (30, 35).

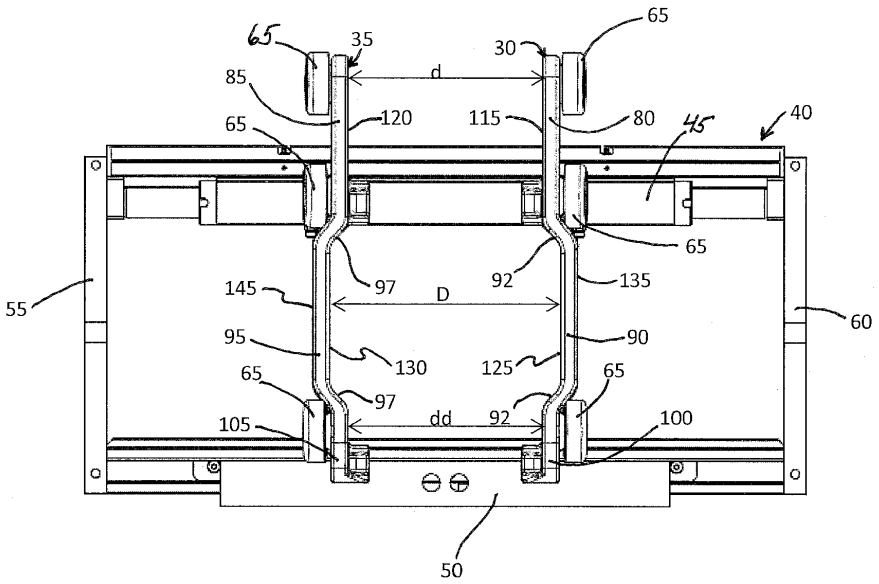

Fig. 3

EP 3 385 214 A1

Description

Technical Field

Fork carriages for forklift trucks.

Background

[0001] A typical forklift carriage sideplate is illustrated in Figure 1. Sideplate 1 includes rollers 4 that fit within mast channel 5 to enable the forklift carriage to be vertically movable. As shown in Figure 1, sideplate 1 is a generally vertical element of a fork carriage.

Summary

[0002] The present inventor has recognized that typical sideplates for forklift carriages are formed in a substantially linear manner for (1) ease of manufacturing and (2) load bearing capacity. The present inventor also recognized that sideplates may be shaped differently such that a portion of a sideplate is contained within a mast channel such that the portion is hidden from the view of an operator located at the operator station of the forklift. The present inventor also recognized that such shaped sideplates maintain an acceptable strength of the sideplate and do not substantially increase manufacturing difficulty. For example, such sideplates may be manufactured by casting, forging, additive manufacturing, welding, machining, or other suitable manner.

Brief Description of the Drawings

[0003]

Figure 1 illustrates a prior art sideplate for a forklift carriage.

Figure 2 illustrates an orthogonal, rear view of a forklift carriage with sideplates.

Figure 3 illustrates a rear view of the carriage with sideplates of Figure 2.

Detailed Description

[0004] With reference to Figure 1, sideplate 30 and sideplate 35 are attached to frame 40 to form a carriage that supports front end equipment for a forklift truck. Frame 40 comprises a top horizontal crossbar 45 and a lower horizontal crossbar 50 that are connected by a left a vertical crossbar 55 a right vertical crossbar 60. Each of the sideplates 30, 35 are secured to the top horizontal crossbar 45 and to the lower horizontal crossbar 50.

[0005] Each of the sideplates 30, 35 carries a plurality of guides, such as rollers 65, that facilitate moving the frame 40 in a vertical direction with respect to mast rails 70 and 75. Each sideplate 30, 35 comprises a 1st upper portion 80, 85, respectively, a 2nd intermediate portion 90, 95, respectively, and a 3rd lower portion 100, 105, respectively. The rollers 65 are attached to the upper portions 80, 85 and to the lower portions 100, 105 of the sideplates 30 and 35.

[0006] Each roller 65 fits within a vertical channel 110 of mast rails 70 and 75. The upper portions 80, 85 of the sideplates 30 and 35 are shaped and constructed such that when the rollers 65 are within the mast channels 110 the upper portions 80 and 85 are held externally of the mast channels 110. Likewise, the lower portions 100, 105 of the sideplates 30 and 35 are shaped and constructed such that when the rollers 65 are within the mast channels 110 the lower portions 100 and 105 are held externally of the mast channels 110. However, the intermediate portions 90 and 95 of the sideplates 30 and 35 are shaped and constructed such that when the rollers 65 are within the mast channels 110 the intermediate portions 90 and 95 are also within the mast channels 110.

[0007] Sideplates 30 and 35 are shaped and constructed such that when the rollers 65 are within the mast channels 110 a distance "d" between an interior surface 115 of upper portion 80 and an interior surface 120 of upper portion 85 is less than a distance "D" between an interior surface 125 of intermediate portion 90 and an interior surface 130 of intermediate portion 95. Optionally, a distance "dd" between interior surfaces of lower portions 100, 105 may be greater than distance "d", equal to distance "d", or less than distance "d". Optionally, an exterior surface 135 of intermediate portion 90 does not contact the back wall 140 of mast rails 70 and an exterior surface 145 of intermediate portion 95 does not contact the back wall 150 of mast rails 75 when the rollers 65 are within mast channels 110. Optionally, a wear plate, rubbing strep, dry lubricant, or wet lubricant to be included if there is contact between exterior surface 135 and back wall 140, or between exterior surface 145 and back wall 150.

[0008] A width "w" of the intermediate portions 90 and 95 is less than a width "W" of the mast channels 110. Optionally, the interior surface 125 of intermediate portion 90 and the interior surface 130 of intermediate portion 95 are contained within each of the mast channels 110 such that when the rollers 65 are contained within the mast channels 110 the operator of a fork lift truck cannot see the interior surfaces 125 and 130 because they are blocked from view by the rear wall 155 of the mast channel 70 and by the rear wall 160 of the mast channel 75. Thus, all or substantially all of the intermediate portions 90 and 95 are hidden from the view of an operator when an operator is located in the operator compartment of a fork lift truck.

[0009] Optionally, the upper portions 80 and 85 and the lower portions 100 and 105 may have a width that is equal to, less than, or greater than the width "w".

[0010] Optionally, the intermediate portion 90 is considered to be within mast channel 110 when no part of intermediate portion 90 breaks a plane 72 formed by an inner edge 165 of the front wall 170 and an inner edge 175 of the rear wall 155 of mast channel 70. However, transition portions 92 of the intermediate portion 90 that

connect the intermediate portion 90 to the upper portion 80 and the lower portion 100 of the sideplate 30 will break the plane 72. Likewise, and optionally, the intermediate portion 95 is considered to be within mast channel 110 when no part of intermediate portion 95 breaks a plane 77 formed by an inner edge 185 of the front wall 190 and an inner edge 195 of the rear wall 160 of mast channel 75. Likewise, transition portions 97 of the intermediate portion 95 that connect the intermediate portion 95 to the upper portion 85 and the lower portion 105 of the sideplate 35 will break the plane 77. In other embodiments, portions of, or all of, the interior surfaces 125 and 130 may break the plane 72 and 77, respectively, preferably whilst maintaining "D" as a larger distance than "d".

[0011] The foregoing is a detailed description of illustrative embodiments of the invention using specific terms and expressions. Various modifications and additions can be made without departing from the spirit and scope thereof. Therefore, the invention is not limited by the above terms and expressions, and the invention is not limited to the exact construction and operation shown and described. On the contrary, many variations and embodiments are possible and fall within the scope of the invention which is defined only by the claims that follow.

Claims

1. A carriage for a forklift truck comprising:

a frame;
a first sideplate secured to the frame, the first sideplate comprising an upper portion, an intermediate portion, and a lower portion with a guide attached to the upper portion and a guide attached to the lower portion;
a second sideplate secured to the frame, the second sideplate comprising an upper portion, an intermediate portion, and a lower portion with a guide attached to the upper portion and a guide attached to the lower portion;
wherein the first and second sideplates are constructed and shaped such that when the first and second sideplates are secured to the frame a distance "D" between the intermediate portions of the first and second sideplates is greater than a distance "d" between the upper portions of the first and second sideplates.

2. A carriage for a forklift truck according to claim 1, wherein:

the first and second sideplates are constructed and shaped such that when the guides attached to the upper portions and lower portions of the first and second sideplates are within vertical channels of a mast the intermediate portions of the first and second sideplates are within the vertical channels of the mast.

3. A carriage for a forklift truck according to claim 2, wherein the guides comprise rollers.

4. A carriage for a forklift truck according to claim 1, wherein:

a width "w" of the intermediate portion of the first sideplate is less than a width "W" of a channel of a mast that is configured to bear the carriage; and
a width "w" of the intermediate portion of the second sideplate is less than a width "W" of a channel of the mast that is configured to bear the carriage.

5. A carriage for a forklift truck according to claim 1, wherein:

the first and second sideplates are constructed and shaped such that when the first and second sideplates are secured to the frame the distance "D" between the intermediate portions of the first and second sideplates is greater than a distance "dd" between the lower portions of the first and second sideplates.

6. A carriage for a forklift truck according to claim 5, wherein:

the distance "d" and the distance "dd" are equal.

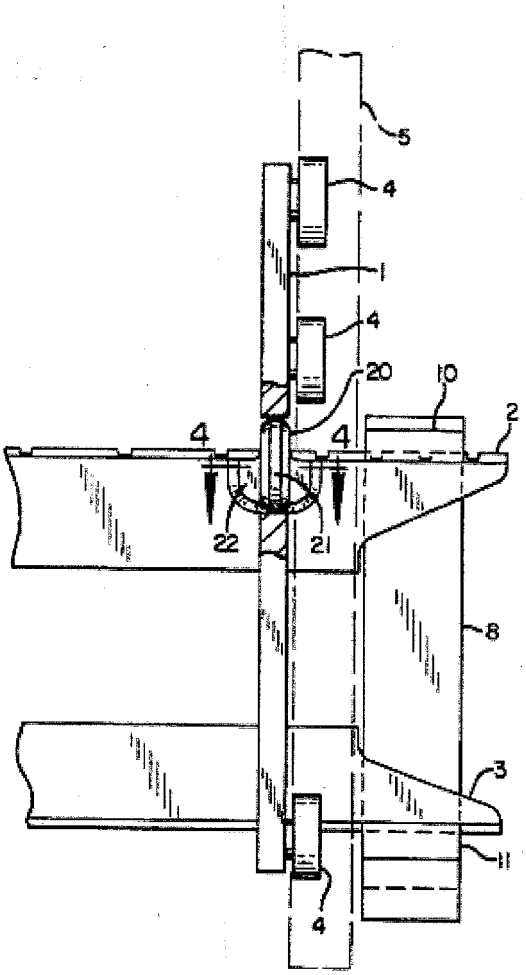

Fig. 1

(prior art)

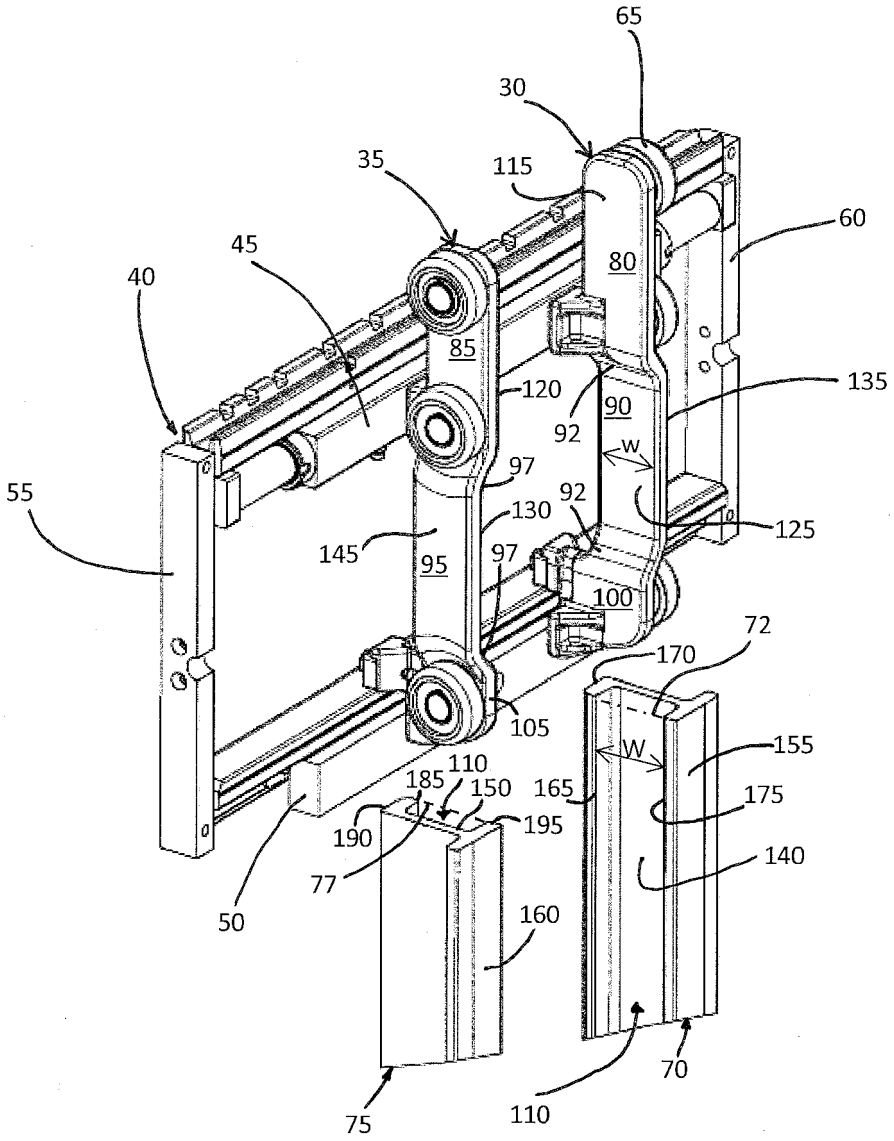
65
30
35
115
60
45
80
40
85
135
120
90
92
w
97
55
92
130
125
145
95
97
100
72
170
105
155
W
110
185
150
165
175
190
195
140
77
50
160
70
75
110

Fig. 2

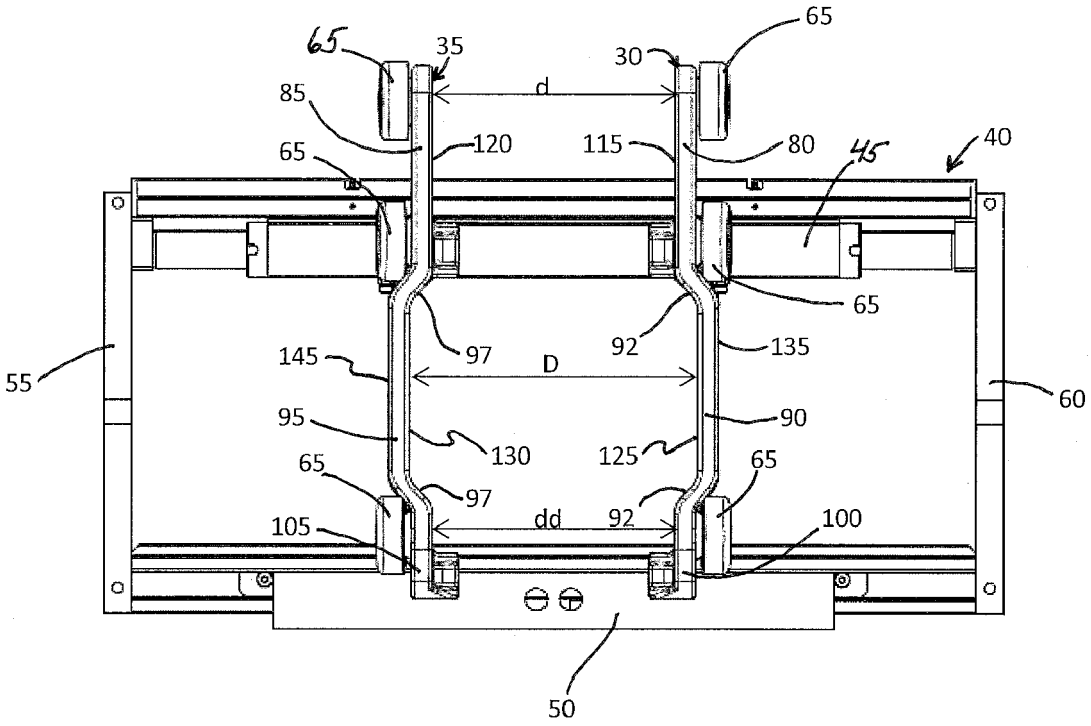
65
65
35
30
d
85
120
115
80
45
40
65
65
97
92
135
145
D
55
60
95
90
130
125
65
65
97
105
dd
92
100
50

Fig. 3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 17 16 6055

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	DE 100 18 990 A1 (LINDE AG [DE]) 18 October 2001 (2001-10-18)	1-3,5,6	INV. B66F9/08
Y	* column 1, line 3 - line 4 * * column 1, line 65 - line 66 * * column 2, line 9 - line 12 * * column 2, line 36 - line 38 * * paragraph [[0030]] * * figures 1, 4 * -----	4	B66F9/12
Y	US 5 145 034 A (MILES KEVIN L [US]) 8 September 1992 (1992-09-08) * column 1, line 10 - line 20 * * column 2, line 45 - line 47 * * figures 1, 3 * -----	4	

TECHNICAL FIELDS SEARCHED (IPC)
B66F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 November 2017	Colletti, Roberta

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 17 16 6055

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.

07-11-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 10018990 A1	18-10-2001	DE 10018990 A1	18-10-2001
		EP 1201595 A2	02-05-2002
		JP 2001302193 A	31-10-2001
US 5145034 A	08-09-1992	NONE	

EPO FORM P0459

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