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(54) **Lift truck with a support leg arrangement**

(57) The present invention relates to a lift truck comprising a chassis (1) having a support leg arrangement (3) to enhance the stability of the lift truck, wherein the support leg arrangement (3) comprises two horizontal support legs (5a-b), wherein each support leg (5a-b) extends in the longitudinal direction, and is separated from the other in the lateral direction, of the lift truck, and wherein a load wheel assembly (7a-b) is removably mounted to each support leg (5a-b), whereby a support leg width is defined as the lateral distance between the load wheel assemblies (7a-b), wherein the load wheel assemblies (7a-b) are mountable to both a longitudinal outer side (29a-b) and a longitudinal inner side (19a-b) of the support leg (5a-b) for adjusting the support leg width.

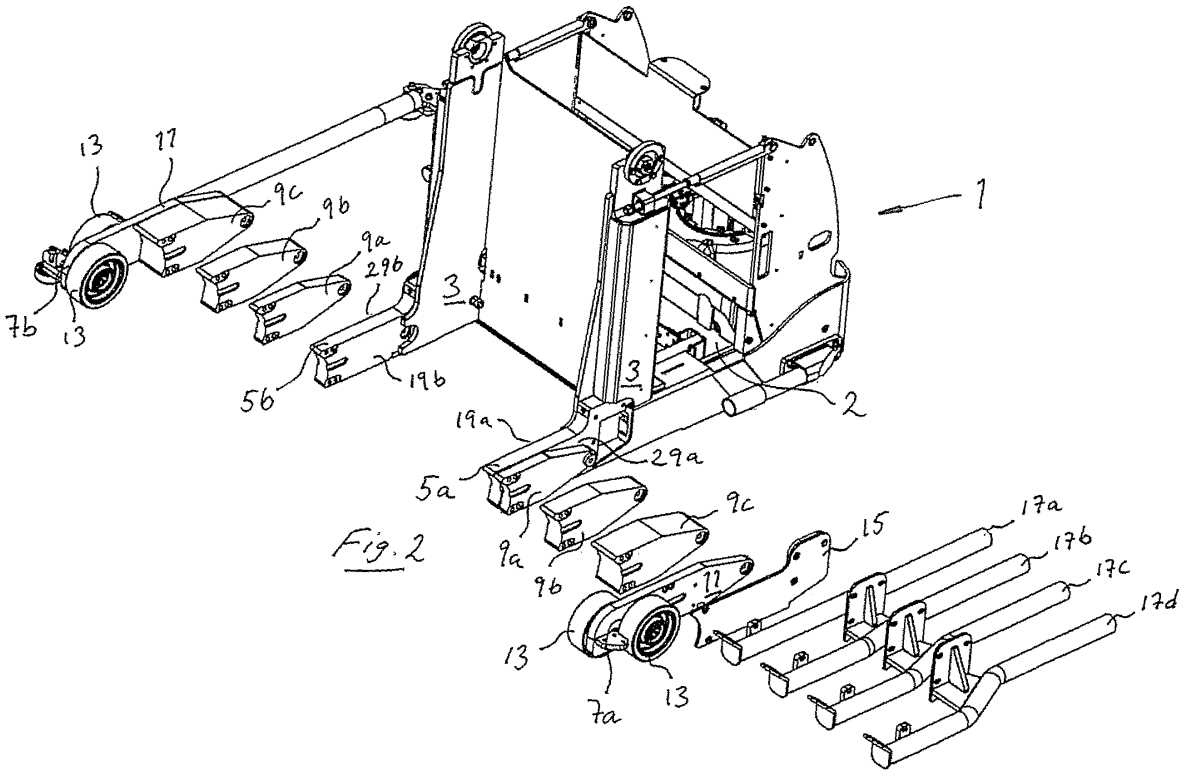

Fig. 2

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a lift truck according to the preamble of claim 1.

BACKGROUND OF THE INVENTION

[0002] Some lift trucks types, such as narrow aisle trucks are provided with a support leg arrangement to enhance the stability of the lift truck. The support leg arrangement comprises two horizontal support legs, wherein each support leg extends in the longitudinal direction, and is separated from the other in the lateral direction, of the lift truck. Each support leg also comprises a load wheel assembly which is mounted to the support leg.

[0003] A support leg width is defined as the lateral distance between the load wheel assemblies and determines the lateral stability of the lift truck during lifting situations. The support leg width is in turn determined by the customer application, e.g. aisle width, Thus, it is important to optimize the support leg width in dependence of the customer application, so that a maximal lateral stability can be achieved. Concerning lift trucks which are rented, they require a support leg arrangement that can be reconfigured to the requirements of a new customer, e.g. a different aisle width.

[0004] EP 1502 895 A1, US 6 138 796 and EP 1 466 860 A2 all disclose lift trucks having such reconfigurable support leg arrangements. The support leg width can be reconfigured, but requires support legs of different size and dimensions. This is disadvantageous, since support legs are bulky and heavy parts which are difficult to shift. It is also expensive to keep differently sized and dimensioned support legs in stock.

OBJECT OF THE INVENTION

[0005] An object of the present invention is to provide a lift truck where the support leg width can be reconfigured in a flexible, simple and inexpensive way.

SUMMARY OF THE INVENTION

[0006] This object is achieved by means of a lift truck as initially defined and with features according to the characterising portion of claim 1.

[0007] Since the load wheel assemblies are mountable to both a longitudinal outer side and a longitudinal inner side of the support leg for adjusting the support leg width a more simple way of reconfiguring the support leg width is achieved, since the load wheel assemblies simply have to be shifted from one side to an other.

[0008] In the case where the load wheel assemblies are mounted to the longitudinal outer sides of the support legs, a spacer element is mountable between the support leg and the load wheel assembly, Thus, yet a simple way of reconfiguring the support leg width is achieved, since only the spacer elements have to be replaced, not the support legs as in the prior art. This is a more cost effective solution, since differently dimensioned support legs do not have to be kept in stock. Moreover, the reconfiguration is more easily accomplished since only the load wheel assemblies need to be removed from the chassis, not the whole support leg arrangement as in the related art documents during reconfiguration.

[0009] Preferably, the support leg arrangement forms an integral part of the chassis of the lift truck. Hereby the same basic chassis can be used irrespective of desired support leg width, whereby the support leg width can be determined at a late stage of the lift truck assembly process.

[0010] Suitably, the spacer element can be of different width. Hereby different support leg widths can easily be obtained.

[0011] Preferably, spacer elements of different width have the same overall shape and configuration except for the width. Hereby mounting of the wheel assembly is facilitated.

[0012] Suitably, the load wheel assembly comprises a mounting plate and two load wheels, wherein the mounting plate and the spacer elements are mounted to the support leg by means of a common bolt connection. Hereby mounting or dismounting of the load wheel assembly is simplified.

[0013] Preferably, the load wheels are mounted on different sides of the mounting plate. Hereby the load on the bolt connection is reduced.

[0014] Suitably, the load wheels are mutually displaced in the longitudinal direction of the lift truck. Hereby the lift truck becomes more stable.

[0015] Preferably, an elongated protective element extends rearwardly from the load wheel assembly and connects to the chassis of the lift truck. Hereby the load wheel assembly is protected against collisions if, e.g. the lift truck is moving backwards.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The present invention will now be described with reference to accompanying drawings, on which:

Fig. 1 shows a perspective view of a lift truck according to the invention.

Fig. 2 shows an exploded view of the support leg arrangement in fig. 1.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0017] Fig. 1-2 show a lift truck 1 in the form of a narrow aisle truck according to the present invention. A support leg arrangement 3 is formed as an integral part of the chassis 1, which means that the support leg arrangement

3 is welded, or by any other means permanently fixed, to the chassis body. The support leg arrangement 3 supports and makes the lift truck more stable during lifting operations. The support leg arrangement 3 comprises a left 5a and a right 5b support leg (as seen in the forward direction of the lift truck), which are located in a common horizontal plane. Both support legs 5a-b extend forwardly in a longitudinal direction of the lift truck, and are separated from each other in the lateral direction of the lift truck. A left and a right load wheel assembly 7a-b are removably mounted, by means of a not shown bolt connection, to the outer 29a-b or inner 19a-b longitudinal sides of the left and right support legs 5a-b, respectively. Each load wheel assembly 7a-b is mounted with or without a spacer element 9a-c being disposed between the support leg 5a-b and the load wheel assembly 7a-b.

[0018] Each load wheel assembly 7a-b comprises a mounting plate 11 and two load wheels 13. The load wheels 13 are resting on the ground so that the support leg arrangement 3 and the load wheel assemblies 7a-b together support the lift truck. Hereby, a support leg width is defined as the lateral distance between the load wheel assemblies 7a-b. The load wheels 13 are positioned and secured on different sides of the mounting plate 11, but are also somewhat mutually displaced in the longitudinal direction of the lift truck so as to increase the stability of the lift truck.

[0019] Three spacer elements 9a-c are shown for each load wheel assembly 7a-b. They have the same shape and configuration except for the width or thickness, which varies for all three spacer elements 9a-c, Therefore, the spacer elements 9a-c are mounted to the support legs 5a-b using the same bolt connection as the load wheel assemblies 7a-c. Since the spacer elements 9a-c are of different width, the various spacer elements provide the support leg arrangement 3 with different support leg widths, as they are mounted between the support leg 5a-b and the load wheel assembly 7a-b. As shown in fig. 2 three different support leg widths can be achieved by means of the three spacer element 9a-c. On the other hand, it is also conceivable to omit the spacer elements 9a-c and mount each load wheel assembly 7a-b directly to the outer side 29a-b of the support leg 5a-b. Hereby, a more narrow support leg width is achieved compared to the case where a spacer element 9a-c is employed. It is also conceivable to mount the load wheel assemblies 7a-b to the longitudinal inner sides 19a and 19b, instead of the outer sides 29a, 29b, of the support legs 5a-b. Thus, an even more narrow support leg width will be achieved. However, no spacer elements 9a-c are required in that case.

[0020] On the outer side of each load wheel assembly 7a-b a cover plate 15 is provided, as well as elongated protective elements 17a-d. The protective elements extend rearwardly from each load wheel assembly 7a, 7b and connect to the chassis 1 of the lift truck. The protective elements 17a-d serve to protect the load wheel assemblies 7a, 7b from collisions when the lift truck is moving backwards.

[0021] Four protective elements 17a-d are shown in fig. 2, where each protective element corresponds to a different chassis width and/or support leg width, since they can be mounted on different distances from the chassis. Each protective element 17a-d comprises a tube element 17a-d which extends along the left and right longitudinal sides of the chassis I past a battery compartment 2. The protective elements can be easily formed into desired shapes so that they follow the contour of the chassis I, e.g. be provided with tube bends, depending on the distance it is positioned relative the chassis I.

[0022] Instead of using spacer elements of different width it is conceivable to use more than one spacer element 9a-c, i.e. connecting them in series, so as to reconfigure the support leg width.

Claims

1. Lift truck comprising a chassis (1) having a support leg arrangement (3) to enhance the stability of the lift truck, wherein the support leg arrangement (3) comprises two horizontal support legs (5a-b), wherein each support leg (5a-b) extends in the longitudinal direction, and is separated from the other in the lateral direction, of the lift truck, and wherein a load wheel assembly (7a-b) is removably mounted to each support leg (5a-b), whereby a support leg width is defined as the lateral distance between the load wheel assemblies (7a-b), **characterised in that** the load wheel assemblies (7a-b) are mountable to both a longitudinal outer side (29a-b) and a longitudinal inner side (19a-b) of the support leg (5a-b) for adjusting the support leg width.

2. Lift truck according to claim 1, where the load wheel assemblies (7a-b) are mounted to the longitudinal outer sides (29a-b) of the support legs (5a-b), a spacer element (9a-c) is mountable between the support leg (5a-b) and the load wheel assembly (7a-b).

3. Lift truck according to claim 1 or 2, wherein the support leg arrangement (3) forms an integral part of the chassis (1) of the lift truck.

4. Lift truck according to claim 2 or 3, wherein the spacer element (9a-c) can be of different width.

5. Lift truck according to any of claim 2-4, wherein spacer elements (9a-c) of different width have the same overall shape and configuration except for the width.

6. Lift truck according to any of claim 2-5, wherein the load wheel assembly (3) comprises a mounting plate (11) and two load wheels (13), wherein the mounting plate (11) and the spacer elements (9a-c) are mounted to the support leg (5a-b) by means of a common

bolt connection.

7. Lift truck according to claim 6, wherein the load wheels (7a-b) are mounted on different sides of the mounting plate (11).

8. Lift truck according to claim 6 or 7, wherein the load wheels (13) are mutually displaced in the longitudinal direction of the lift truck.

9. Lift truck according to any of claim 1-8, wherein an elongated protective element (17a-d) extends rearwardly from the load wheel assembly (3) and connects to the chassis of the lift truck.

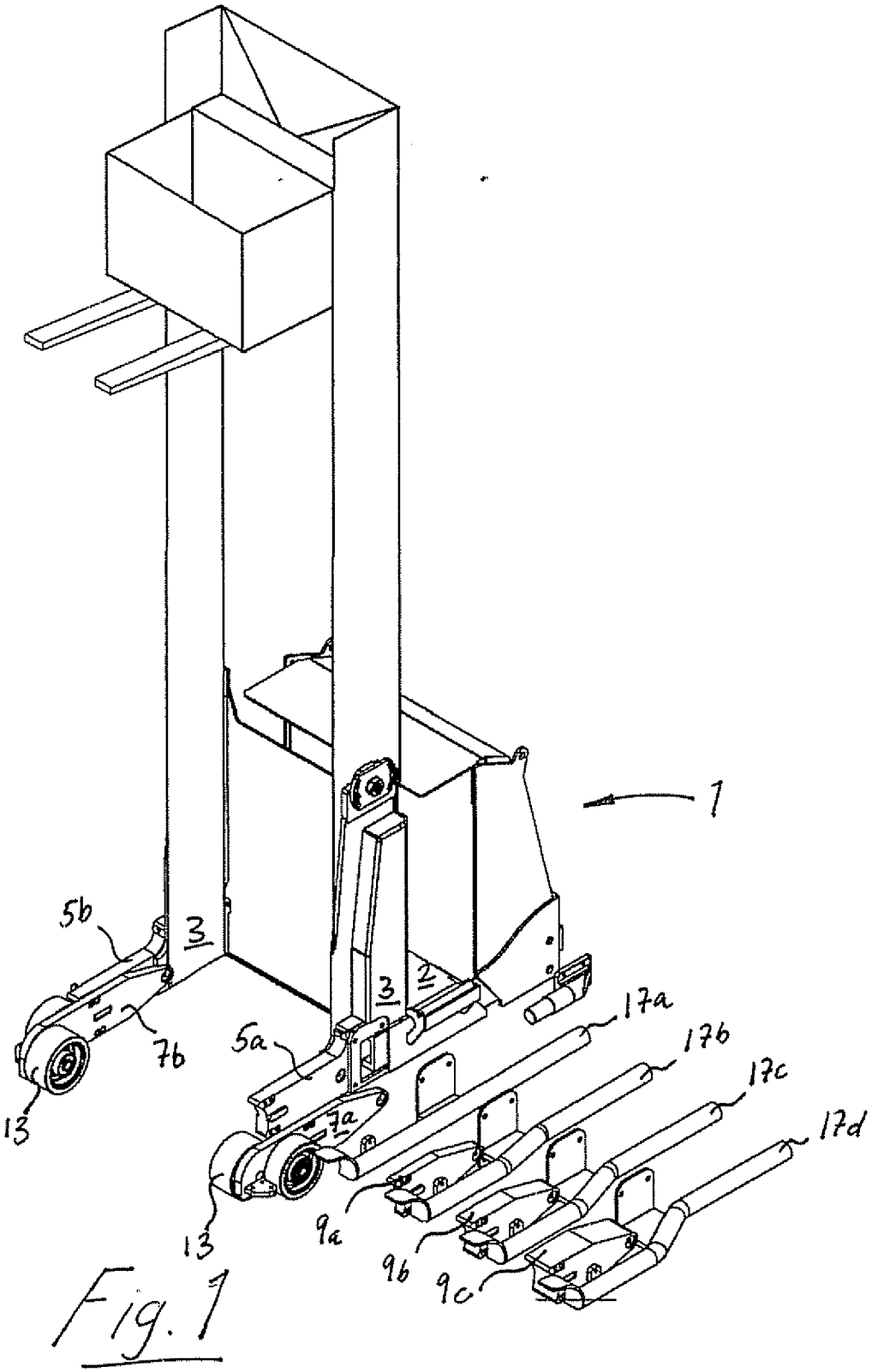

Fig. 1

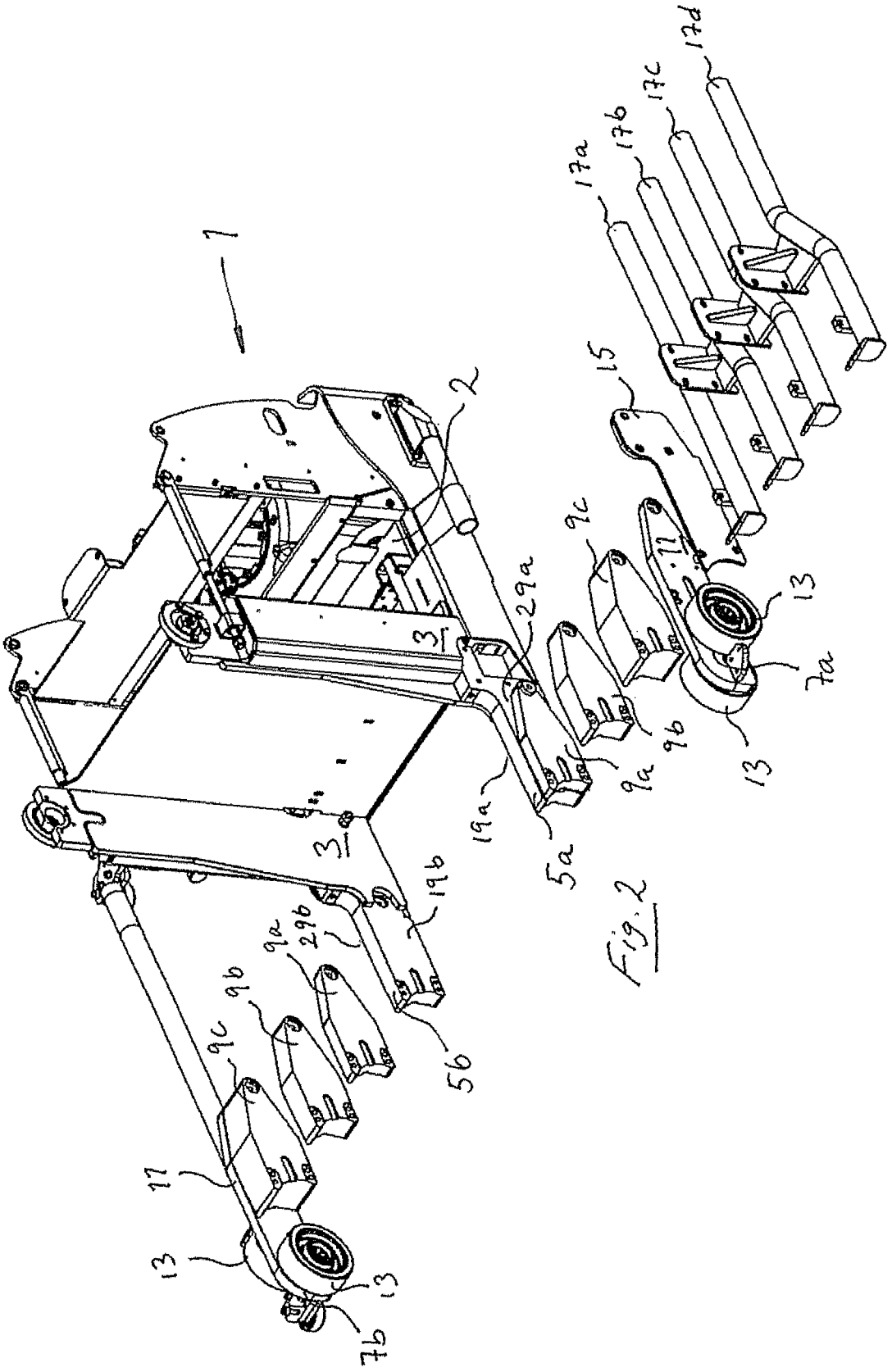
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Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 06 12 1422

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 299 05 609 U1 (TASBACH [DE]; JUHRIG [DE]) 29 July 1999 (1999-07-29) * page 1, line 1 - page 7, line 3; figures 1-4 * -----	1-9	INV. B66F9/075
A	US 6 551 050 B1 (KALLEVIG BRUCE E [US] ET AL) 22 April 2003 (2003-04-22) * abstract; figures 1-3 * -----	1-9	

TECHNICAL FIELDS SEARCHED (IPC)

B66F
F15B
G01N

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 April 2007	Blumenberg, Claus

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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17-04-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29905609 U1	29-07-1999	NONE	
US 6551050 B1	22-04-2003	NONE	

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1502895 A1 **[0004]**
- US 6138796 A **[0004]**
- EP 1466860 A2 **[0004]**