(12) UK Patent Application (19) GB (11) 2528833 (13) A

(43) Date of A Publication 10.02.2016

(21) Application No: 1410243.8

(22) Date of Filing: 10.06.2014

(71) Applicant(s):
Walter Stephen Weston
The Manse, 346 Walmersley Road, BURY, Lancashire, BL9 6QF, United Kingdom

(72) Inventor(s):
Walter Stephen Weston

(74) Agent and/or Address for Service:
Walter Stephen Weston
The Manse, 346 Walmersley Road, BURY, Lancashire, BL9 6QF, United Kingdom

(51) INT CL:
B66F 9/08 (2006.01) ***B66F 9/06*** (2006.01)
B66F 9/075 (2006.01) *B62D 51/04* (2006.01)

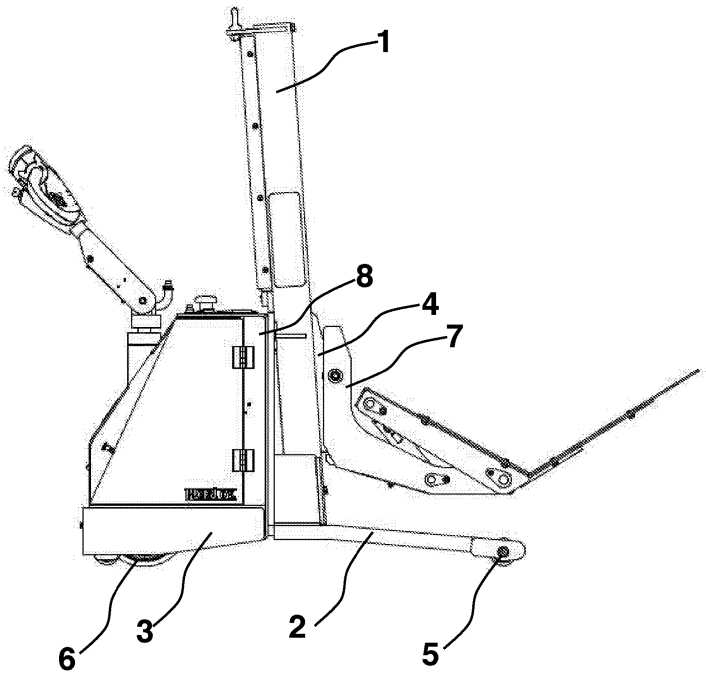
(56) Documents Cited:
GB 1242254 A **US 4217074 A**
"Wilmat Counterbalance Truck" dated 11/11/2010, available from http://www.counterbalancetrucks.co.uk/Wilmat%20Counterbalance%20Truck%2011-11-2010%201-13-PM_FINAL.pdf [Accessed 27/11/2015]

(58) Field of Search:
INT CL **B62D, B66F**
Other: **WPI, EPODOC, Internet**

(54) Title of the Invention: **Pedestrian stacker truck**
Abstract Title: **Lifting Truck with Static Inclined Mast**

(57) A pedestrian driven stacker truck with a fixedly mounted inclined mast 1 angled rearward towards the main body 8 of the lifting truck. The lifting or carrying attachment 7 can be a fork or roll carrying device or similar, and is connected to the lifting carriage 4 which moves the carrying attachment up and down the mast 1. As the carriage rises, the carrying attachment travels rearwards along the inclined path of the mast, and is also kept parallel to the ground by the asymmetric design of the lifting carriage. The legs 2 are fixedly mounted to the mast, and are angled upwards from the front wheel 5 to the point where they meet the mast. The underside of the base frame 3 is also angled upwards, from the rear wheel 6 to the point that it meets the mast. This provides an area of high ground clearance underneath the mast.

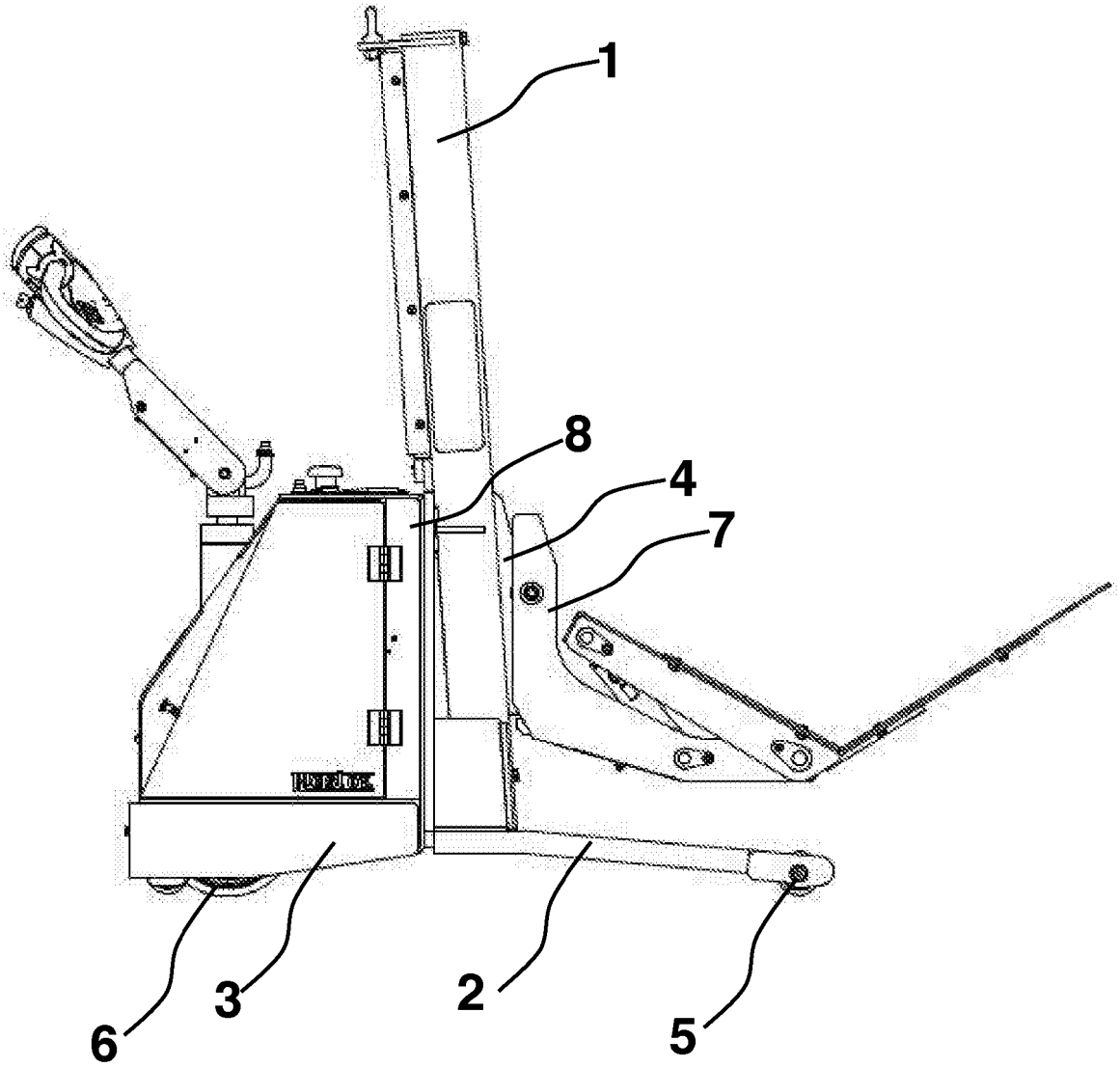
Drawing 1



GB 2528833 A

The claims were filed later than the filing date but within the period prescribed by Rule 22(1) of the Patents Rules 2007.

Pedestrian Stacker Truck: Drawing 1



Pedestrian Stacker Truck

The invention relates to a pedestrian operated lift truck, (commonly called, 'Stacker' trucks).

Pedestrian Stacker Trucks are commonly in use in large numbers throughout the world to carry goods and components, usually, but not exclusively, within factory, retail and commercial environments. They range from entirely manually powered and operated, to being driven by motors and/or engines of known design and controlled via steering Tiller Arms, or even remote control.

Pedestrian Stacker Trucks are usually, but not always, smaller than Counterbalanced, ride-on Fork-Lift Trucks of similar capacities and are often used to carry general goods and specific items close to the production areas in manufacturing plants, where the use of Counterbalanced Fork Lift Trucks could be hazardous to persons, equipment or infrastructure.

Therefore, Pedestrian Stacker Trucks are commonly supplied with one of a variety of travelling carriages of known designs, which are mechanically made to travel up and down the mast and are often fitted with customised attachments, such as Forks or Clamps, for carrying and/or manipulating items, for example, rolls of material, drums, boxes and components in confined work areas and warehouses.

Whereas a typical Counterbalanced Fork Truck relies on a large counterweight to maintain stability, Pedestrian Stacker Trucks commonly, but not always, gain their stability by increasing the length and/or spread of one or more legs that commonly protrude forward of the body and/or mast to reach out under, or around the load to be lifted.

The stability of most types of lift truck decreases as a given load is raised and many are fitted with masts capable of tilting backwards, so as to help bring the centre-of-gravity of the load backwards into what is commonly called, the 'Stability Triangle', defined as, "The area on a lift truck in which the load must be suspended, in order for the lift truck not to tip". However, the correct operation of the mast via the tilting mechanism, is most often operator controlled and open to error and there are many recorded incidents of lift trucks being tipped over because of incorrectly positioned masts.

An example of the invention will now be described, by referring to the accompanying drawing.

Therefore, the present invention proposes a Stacker Truck with a fixed mast 1 tilting backwards from its base at a fixed angle, fixedly attached to the main body 8 into which fits a travelling carriage 4 that tilts forward to the same value as the mast 1 tilts backwards, thus allowing standard attachments, for example, Forks of known design, or as in this example, a roll carrying attachment 7 to be fitted and travel, parallel to the ground as the carriage rises or falls. As the carriage 4 rises up the mast 1, the carriage

4 and therefore, any load it is carrying are transported backwards, bringing the centre-of-gravity of the load, into the 'Stability Triangle' of the lift truck. The angle of backward tilt of the mast 1and the maximum height of lift, are both to be considered when designing trucks featuring this invention, so that the combination of backward angle and lift height do not carry the centre-of-gravity of the carriage 4, with or without any load, so far backward that it shall pass outside of the aforementioned 'Stability Triangle'.

A further issue affecting the stability of lift trucks is deceleration, which can overcome the stability of a lift truck, particularly if the load is raised. There are many causes of deceleration, such as braking, or hitting obstacles. On a lift truck of known design that has a mast and rising carriage, increased stability occurs as the centre-of-gravity is lowered. Therefore it is desirable to keep the mass of the lift truck as low down as possible.

Many, but not all, pedestrian stacker trucks are designed to work indoors and on relatively flat and even floors and they are most often designed with a leg or legs protruding forward to improve stability. These legs must often, but not always, pass under items such as pallets or machine frames, in order for the load to be kept within the 'Stability Triangle' when carried, but also made accessible for loading/unloading. Therefore, the legs are commonly of limited height and depth and clearance from the floor.

This proximity to the floor can often cause the stacker truck to 'ground' if it passes over a raised obstacle, IE: cause the underside of the leg or legs, to touch the floor. For example if the stacker truck starts to go down a ramp, the leading wheel or wheels descend and, depending on the angle of the apex of the ramp if there is insufficient clearance height between the underside of the legs from the ground, then the Stacker Truck can become snagged on the apex, causing the stacker Truck to rapidly decelerate and/or stop suddenly.

An example of this part of the invention will now be described by referring to the accompanying drawing.

The present invention proposes that the leg 2 or legs 2 of the Stacker truck, are angled upwards from the front wheel 5 or wheels 5, to the mast 1 and the base frame 3 is also angled upwards from the rear wheel 6 or wheels 6, to the mast 1. Thus, when the stacker Truck is driven over the apex of an incline, the likelihood of the stacker Truck grounding, is significantly reduced.

Claims

1. A pedestrian truck comprising a body assembly fixedly mounted to a mast and leg assembly that houses a load carrying travelling carriage in the mast section, where the mast section is angled rearwards over the body assembly of the truck, in such manner that the load carrying travelling carriage when raised also moves rearwards, moving the load carrying travelling carriage and any load it carries, closer to the vertical centreline of the truck assembly.

2. A pedestrian truck according to claim 1, in which the mast section is fixedly mounted to the legs or leg assembly in such a way that the internal angle between the legs or leg assembly and mast section, is an obtuse angle.

3. A pedestrian truck according to claim 1, in which the load carrying travelling carriage that travels up and down the mast on bearings is an asymmetric structure, such that the outward facing section is angled forwards to the same number of degrees that the mast tilts rearwards, thus allowing the carriage to maintain its vertical plane as it rises or falls in the mast.

4. A pedestrian truck according to claim 1, in which underside of the legs or leg, are angled upwards from the front wheel, to the point at which they join to the mast, creating a higher clearance from the floor at the mast, relative to the clearance found at the front wheel.

5. A pedestrian truck according to claim 1, in which underside of the body assembly is angled upwards from the rear, to the point at which it is fixedly mounted to the mast, creating a higher clearance from the floor at the mast, relative to the clearance found at the rear of the body assembly.

Intellectual Property Office

Application No:	GB1410243.8	**Examiner:**	Miss Lisa Robinson
Claims searched:	1-5	**Date of search:**	30 November 2015

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1	"Wilmat Counterbalance Truck" dated 11/11/2010, available from http://www.counterbalancetrucks.co.uk/Wilmat%20Counterbalance%20Truck%2011-11-2010%201-13-PM_FINAL.pdf [Accessed 27/11/2015]
X,Y	X: 1; Y: 2, 4	GB 1242254 A (CROWN CONTROL CORP) See entire document, in particular figure 5
Y	2, 4	US 4217074 A (CROWN CONTROLS CORP) See claim 1(b) in particular, and figures

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

B62D; B66F

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, Internet

International Classification:

Subclass	Subgroup	Valid From
B66F	0009/08	01/01/2006
B66F	0009/06	01/01/2006
B66F	0009/075	01/01/2006
B62D	0051/04	01/01/2006