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## Description

The invention relates to load handling vehicles of the kind which have a fixed load supporting platform and a lifting mast mounted on a carrier for traversing movement within the platform. In such vehicles a well is formed in the load supporting platform and the carrier is supported on rollers which run in C-shaped load-bearing channels mounted facing each other on either side of the well. Vehicles of this kind are generally known as Side-Lift Trucks.

Lateral guidance of the carrier in known vehicles is by means of side thrust rollers mounted on either side of the carrier and running on the vertical faces of the load-bearing channels. Such an arrangement is disclosed in US-A-3739931. In order to minimise 'walking' and jamming of the carrier it is necessary for the mounts for the side thrust rollers to be carefully shimmed so that the desired positioning of the side thrust rollers relative to the load supporting channels is precisely achieved. This arrangement also requires great accuracy in the alignment of the load bearing channels relative to one another.

The present invention does away with the need for conventional side thrust rollers mounted on both sides of the carrier and provides an arrangement whereby all the guidance of the carrier is tied to one side thereof and whereby the load bearing channels simply provide support tracks for the carrier supporting rollers and play no part in the lateral guidance of the carrier.

According to the present invention, there is provided a load handling vehicle comprising a frame which provides a load supporting platform in which a well is formed,

a lifting mast,  
a carrier on which the lifting mast is mounted for traversing movement of the platform within the well, a pair of horizontally extending C-shaped load-bearing channels mounted facing each other one on either side of the well with their webs substantially vertical, and  
carrier supporting rollers mounted on the carrier and running in the load-bearing channels;  
characterised in that guidance of the carrier in said traversing movement along the load bearing channels is provided by a single horizontally extending C-shaped guide channel mounted with its web substantially horizontal adjacent only one of the load-bearing channels and parallel thereto, and at least two guide rollers mounted on the carrier and running in the guide channel.

Movement of the carrier in one known vehicle of the type described is by means of hydraulic cylinders connected between the vehicle frame and the carrier. Such arrangements have inherent faults

such as undesirable 'walking' effects, slewing and jamming of the mast and dangerous load swing. Other systems use hydraulic motors instead of cylinders and use chains to drive the carrier; these systems suffer from problems of excessive hydraulic flow demand, lack of power for straightening loads, and complexity of maintenance and service of the motor itself.

According to a preferred feature of the invention, the carrier is moved by at least one extensible cylinder connected between the carrier and the frame and extending diagonally across the well. Preferably, a pair of such cylinders are provided connected one on each side of the carrier.

Such an arrangement of cylinders has been found to work very well with the carrier guidance arrangement provided by the present invention to provide a lifting vehicle in which the carrier can be smoothly and controllably moved across the platform without the disadvantages exhibited by prior arrangements.

An embodiment of the invention is described below with reference to the accompanying drawings in which:

FIGURE 1 is a diagrammatic plan view of part of a load handling vehicle; and

FIGURE 2 is a diagrammatic side view looking along the line of arrow A in Figure 1.

Figure 1 shows part of a Side-Lift Truck having a main frame provided mainly by a number of beams 1, 2, 3, 4, 5. The frame provides a flat load supporting platform 6 having a central well 7 formed therein. Mounted on the frame beams 1 and 2 on either side of the well are a pair of horizontally extending C-shaped load-bearing channels 9 and 10; the webs 11, 12 of the channels being substantially vertical.

A carrier 13 is mounted for traversing movement of the platform and is supported on rollers 14 which run on the lower horizontal flanges 15 of the channels 11, 12. It will be understood that the carrier supports an extensible mast for lifting and carrying loads; only the uprights 16 of the mast being shown in the drawings. The rollers 14 are mounted on lateral members 17, 18 of the carrier.

On one side of the well, a horizontally extending C-shaped guide channel 19 is mounted, with its web 20 substantially horizontal, adjacent the respective load-bearing channel 11. A pair of guide rollers 21 are mounted on the carrier 13 by means of a bracket 22. The rollers 21 are mounted to run in the guide channel 19 with a small clearance between the outer surface of the roller and the flanges 23 of the guide channel.

Correct positioning of the guide rollers 21 in the guide channel 19 can be achieved by vertical and horizontal adjustment of the bracket 22 such as by shimming. The inner surfaces of the flanges

23 may flare slightly such that the clearance between those surfaces and the guide roller can be adjusted by vertical movement of the guide roller.

Movement of the carrier along the channels 9 and 10 is effected by a pair of hydraulic cylinders 24 coupled between the carrier and the vehicle frame.

Guidance of the carrier is thus carried out only on one side thereof and the load-bearing channels simply provide support tracks for the rollers 14 by means of their lower flanges 15 and play no part in the lateral guidance of the carrier.

### Claims

1. A load handling vehicle comprising
  - a frame which provides a load supporting platform (6) in which a well (7) is formed,
  - a lifting mast (16),
  - a carrier (13) on which the lifting mast is mounted for traversing movement of the platform within the well,
  - a pair of horizontally extending C-shaped load-bearing channels (9, 10) mounted facing each other one on either side of the well with their webs (11, 12) substantially vertical, and carrier supporting rollers (14) mounted on the carrier and running in the load-bearing channels;
  - characterised in that guidance of the carrier in said traversing movement along the load bearing channels is provided by a single horizontally extending C-shaped guide channel (19) mounted with its web (20) substantially horizontal adjacent only one of the load-bearing channels and parallel thereto, and at least two guide rollers (21) mounted on the carrier and running in the guide channel.
2. A load handling vehicle as claimed in claim 1 wherein at least one extensible cylinder (24) is provided for moving the carrier along the load-bearing channels; the cylinder being connected between the carrier and the frame and extending diagonally across the well.
3. A load handling vehicle as claimed in claim 2 wherein a pair of such cylinders are provided connected one on each side of the carrier.
4. A load handling vehicle as claimed in any preceding claim wherein the guide rollers are mounted on the carrier with means for adjustment vertically and laterally of the carrier.

### Revendications

1. Véhicule de manutention de charges compre-

nant:

un cadre constituant une plate-forme (6) de support de charge dans laquelle un puits (7) est formé,

un mât de levage (16),

un transporteur (13) sur lequel le mât de levage est monté pour un mouvement traversant de la plate-forme dans le puits,

une paire de cornières de support de charge (9, 10) à section en C et s'étendant horizontalement, montées face à face de part et d'autre du puits, leurs fonds (11, 12) étant sensiblement verticaux, et

des galets (14) de support de transporteur montés sur le transporteur et roulant dans les cornières de support de charge;

caractérisé en ce que le guidage du transporteur pendant ledit mouvement traversant le long des cornières de support de charge est obtenu par une unique cornière de guidage à section en C (19) s'étendant horizontalement, montée de sorte que son fond (20) est sensiblement horizontal, adjacent à une seule des cornières de support de charge, et parallèle à cette dernière, et par au moins deux galets (21) montés sur le transporteur et roulant dans la cornière de guidage.

2. Véhicule de manutention de charges selon la revendication 1, dans lequel au moins un cylindre de longueur variable (24) est prévu pour déplacer le transporteur le long des cornières de support de charge; le cylindre étant fixé entre le transporteur et le cadre et s'étendant diagonalement en travers du puits.
3. Véhicule de manutention de charges selon la revendication 2, dans lequel une paire de tels cylindres sont prévus, chacun étant fixé d'un côté du transporteur.
4. véhicule de manutention de charges selon l'une quelconque des revendications précédentes dans lequel les galets de guidage sont montés sur le transporteur avec des moyens permettant des réglages verticaux et latéraux du transporteur.

### Patentansprüche

1. Lasthandhabungsfahrzeug umfassend
  - ein Gestell, welches eine lasttragende Plattform (6) in der ein Schacht (7) angeordnet ist,
  - einen Hubmast (16)
  - einen Mitnehmer (13), welcher an dem Hubmast angeordnet ist für eine traversierende Bewegung in bezug auf die

- Plattform innerhalb des Schachtes,
- ein Paar sich horizontal erstreckender C-förmiger Lastlager-Profile (9; 10), welche mit ihrer offenen Seite einander gegenüberliegend auf beiden Seiten des Schachtes mit im wesentlichen vertikalen Stegen (11; 12) angeordnet sind, und 5
  - Mitnehmertragrollen (14), die an dem Mitnehmer angeordnet sind, wobei diese in den Lastlager-Profilen laufen; 10
- dadurch gekennzeichnet, daß zur Führung des Mitnehmers während seiner traversierenden Bewegung entlang der Lastlager-Profile ein einzelnes horizontales C-förmiges Führungsprofil (19) angeordnet ist, welches mit seinem Steg (20) an eines der im wesentlichen sich horizontal erstreckenden Lastlager-Profile anliegt und parallel zu diesem verläuft und daß wenigstens zwei Führungsrollen (21) an dem Mitnehmer angeordnet sind, die in dem Führungsprofil laufen. 20
2. Lasthandhabungsfahrzeug nach Anspruch 1, dadurch gekennzeichnet, daß mindestens ein längenverstellbarer Zylinder (24) zur Bewegung des Mitnehmers entlang den Lastlager-Profilen vorgesehen ist, wobei durch den Zylinder der Mitnehmer mit dem Gestell verbunden ist und sich diagonal durch den Schacht erstreckt. 25 30
3. Lasthandhabungsfahrzeug nach Anspruch 2, dadurch gekennzeichnet, daß ein Paar von Zylindern angeordnet sind, wobei auf jeder Seite des Mitnehmers ein Zylinder vorgesehen ist. 35
4. Lasthandhabungsfahrzeug nach jedem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die an den Mitnehmer angeordneten Führungsrollen mit Mitteln zur vertikalen und seitlichen Einstellung versehen sind. 40 45 50 55.



Fig. 2.

