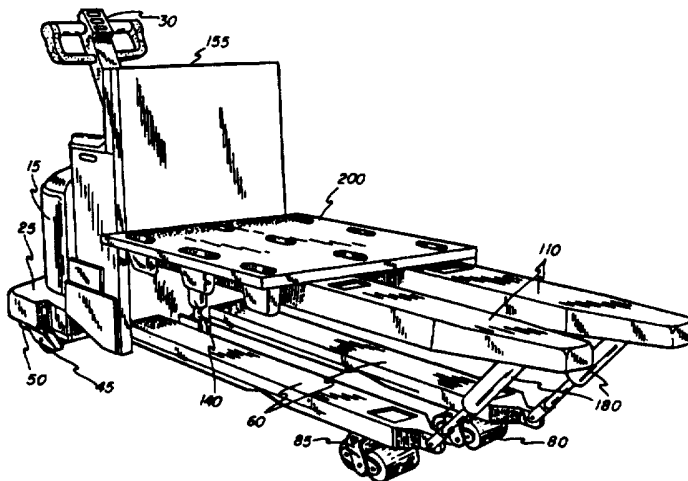




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>B66F 9/12, 9/22</b>	<b>A1</b>	(11) International Publication Number: <b>WO 96/31431</b> (43) International Publication Date: 10 October 1996 (10.10.96)
<p>(21) International Application Number: PCT/US96/03109</p> <p>(22) International Filing Date: 6 March 1996 (06.03.96)</p> <p>(30) Priority Data: 08/415,556                      3 April 1995 (03.04.95)                      US</p> <p>(71) Applicant: CROWN EQUIPMENT CORPORATION [US/US]; 40 South Washington Street, New Bremen, OH 45869 (US).</p> <p>(72) Inventors: MAGOTO, Daniel, C.; 4242 Miller Road, Russia, OH 45363 (US). METZGER, Gerald, R.; 500 W. Butler, Coldwater, OH 45828 (US).</p> <p>(74) Agents: FORGRAVE, Edward, P. et al.; Biebel &amp; French, 2500 Kettering Tower, Dayton, OH 45423 (US).</p>		<p>(81) Designated States: CA, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p><b>Published</b> <i>With international search report.</i> <i>With amended claims.</i></p>

(54) Title: AUXILIARY LIFTING FORKS FOR EXTENDED-LENGTH PALLET TRUCKS



## (57) Abstract

An improved pallet truck, having an extended length pair of forks (110) capable of supporting multiple, side-by-side pallets which may be raised well above the floor to assist an operator in an order selection operation, includes a first fork lifting mechanism (70) connected to one end of a pair of primary forks (60). A pair of load wheels (80) are mounted on levers at another end of the forks (60) and are mechanically connected to the first fork lifting mechanism (70) which causes the other end of the primary forks (60) to be raised from a lower level to an upper level simultaneously with the raising of the first end thereby to maintain the primary forks (60) level while lifting the maximum capacity of the truck. A pair of secondary forks (110) are mounted above the primary forks (60) and are movable from a nested position with respect to the first forks (60) to a raised position by a second fork lifting mechanism (120) carried by the primary forks (60). The ends of the secondary forks (110) are supported by a pair of hydraulic cylinders (180) attached between the secondary forks (110) and the primary forks (60), thus providing support and rigidity to the secondary forks (110) while they are in a raised position.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

## AUXILIARY LIFTING FORKS FOR EXTENDED-LENGTH PALLET TRUCKS

### BACKGROUND OF THE INVENTION

This invention relates to an improved pallet truck having an  
5 extended length pair of forks capable of supporting multiple, side-by-side,  
pallets which may be raised well above the floor to assist an operator in an  
order selection operation.

In a typical order selection or stock picking operation using a  
pallet truck, an operator often starts with an empty pallet carried on the  
10 forks of a pallet truck onto which a load is accumulated, one item or  
carton at a time as he or she moves through the aisles of the warehouse  
until a completed order has been assembled. The operator moves the truck  
either by riding or walking to the desired location, picks the desired item  
from a rack and places it on the pallet. A truck with extended length  
15 forks that can carry two or more pallets side by side on its forks improves  
efficiency and logistics; however, such trucks generally have forks that can  
raise only approximately six to nine inches above the floor. One such  
pallet truck is a Series PE Rider Pallet Truck manufactured by Crown  
Equipment Corporation, the assignee of the present invention. The height  
20 of the forks may be adjusted from a lowermost position, where the bottoms  
of the pallets are in contact with the floor and the forks are clear of the  
underneath surface of the pallets, to a raised position, where the pallets  
have been lifted clear of contact with the floor and are free to move about  
a warehouse.

25 Order selecting trucks provided with a high lift mechanism,  
ones that raises the pallet eighteen inches or more above the floor, can  
assist the operator in loading a pallet quickly and conveniently. Existing  
trucks of this type, however, only provide a fork length sufficient to handle  
a single pallet. It would be desirable in some circumstances to provide an  
30 order picking truck where multiple pallets, at least two, can be placed in

excess of twelve inches, and preferably in excess of eighteen inches, above the floor, while the load on the pallets is fully supported until the order selecting operation is complete and the pallets lowered to the floor.

#### SUMMARY OF THE INVENTION

5 This invention relates to an improved pallet truck having a pair of extended length forks capable of supporting a multiple side-by-side pallets well above the floor to assist an operator in an order selection operation.

The present invention includes a pallet truck provided with a  
10 pair of forks having a length from one end to another sufficient to hold multiple industry standard pallets in a side-by-side relationship. A fork lifting mechanism is carried by the truck and positions the forks from a lower position, where the pallets carried thereby are in contact with the floor, to an upper position, in excess of twelve inches above the floor. A  
15 fork support mechanism supports the other end of said forks as the forks are raised and lowered by the fork lifting mechanism.

More specifically, in a preferred embodiment of the invention, two sets of forks are employed. The first set of forks is conventional, that is, they are similar to those used in a conventional pallet  
20 truck, being capable of raising a pallet from the floor to a position clear of the floor with the outer ends of these forks supported by load wheels attached to levers which maintain the forks parallel with the floor. A pair of upper or secondary forks are placed over, preferably in nesting relation to, the first set of forks. The fork lifting mechanism includes a first fork  
25 lifting mechanism, which is supported on the body of the pallet truck for raising the lower forks, and a second fork lifting mechanism, which is supported on and carried by the first or primary forks for raising the secondary forks from their nested position to a convenient height for the operator. A support mechanism for the upper forks is attached between

those forks and the ends of the lower to support the upper forks while they are in a raised position.

When the upper forks are lowered into nesting relation with the lower forks, the truck functions similarly to a conventional pallet truck in terms of loading and unloading pallets. When the extended length  
5 secondary forks are raised, their ends are supported by hydraulic cylinders which provide rigidity and support, thus minimizing bending and movement of the fork ends. A hydraulic system insures that the pallets remains level, even during unequal loading since the stabilizing cylinders are isolated after  
10 lift.

In operation, an operator activates a Raise button on the truck which activates a solenoid to power a motor-hydraulic pump package. The pump and associated manifold supplies high pressure hydraulic fluid or oil to the rest of the system. An adjustable relief valve controls over-  
15 pressure and limits the maximum load lifting capability. A check valve prevents reverse hydraulic fluid flow. The lifting of the lower forks is done by a first fork lifting mechanism, a conventional low lift pallet truck mechanism using a hydraulic cylinder and four bar linkage to raise a pair of primary or lower forks and to adjust the load wheel support arms. In  
20 this lifting range, the maximum capacity load of the pallet truck can be lifted.

Once the lower forks are fully raised, at approximately six to nine inches of lift, an electrical switch is activated by the first or lower fork lift mechanism and hydraulic valves are actuated to isolate the lower  
25 fork lift cylinder from the hydraulic circuit. The hydraulic fluid is then diverted through an adjustable pressure reducing valve which limits the load which can be lifted above the lower forks. The hydraulic fluid is supplied simultaneously to a hydraulic cylinder in the second fork lifting mechanism and a flow divider block which supplies equal volume to each fork tip  
30 support or stabilizing cylinder. Once the desired height is reached, the

operator disengages the Raise button and the hydraulic valves and components isolate each of the cylinders to provide a rigid fork platform.

To lower, the operator activates a Lower button on the truck which in turn activates the lowering solenoid and hydraulic valves to allow  
5 hydraulic fluid to return to the reservoir from the mast and tip cylinders.

One benefit of this invention is that it allows the operator to position the pallet higher from the floor. Starting with an empty pallet, the operator may raise the forks to their maximum height with the pallet at least twelve, and preferably eighteen to twenty-four inches off the floor,  
10 and as stock is added to the pallets, the forks may be lowered to maintain a desired stacking height while all forks are rigidly supported.

Once the second fork lifting mechanism is fully lowered, it engages an electrical switch to deactivate hydraulic valves and allow hydraulic fluid from the first fork hydraulic cylinder to return to the  
15 reservoir and complete the lowering cycle.

Accordingly, it is an object of this invention to provide an improved pallet truck having a pair of extended length forks capable of supporting a multiple side-by-side pallets well above the floor to assist an operator in an order selection operation.

It is another object of this invention to provide a method of  
20 order selecting using pallet truck provided with forks of extended length capable of supporting multiple side-by-side pallets, the method including the steps of placing one or more pallets on the forks, raising one end of the forks in excess of twelve inches above the floor, supporting the other  
25 end of the forks to provide a stable platform while items are accumulated on the pallets, lowering the forks to place the pallets in contact with the floor, and backing the pallet truck from under the loaded pallets.

It is a further object of this invention to provide a pallet truck operating on the floor of a warehouse for order selecting, the truck  
30 comprising a truck body, a pair of forks having a length from one end to

another sufficient to hold a multiple, side-by-side industry standard pallets, a fork lifting mechanism carried by the truck body and supporting one end of the forks for positioning the forks from a lower position, less than approximately four inches above the floor, to an upper position, in excess  
5 of twelve inches above the floor, and a fork support mechanism for providing support to the other end of the forks as the forks are positioned by the fork lifting mechanism.

It is a still further object of this invention to provide a pallet truck comprising a truck body, a first fork lifting mechanism carried by the  
10 truck body, a pair of primary forks having a first end attached to the fork lifting mechanism, load wheels positioned at a second end of the primary forks, a load wheel lifting mechanism responsive to the first fork lifting mechanism for causing the second end of the primary forks to be raised from a lower level to an upper level simultaneously with the raising of the  
15 first end thereby to maintain the primary forks level, a pair of secondary forks mounted above the primary forks, a second fork lifting mechanism carried by the primary forks for raising a first end of the secondary forks from a lower position to a raised position, and a support mechanism attached to the secondary forks to support the secondary forks while in a  
20 raised position.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a rider pallet truck provided with stabilized extended secondary forks constructed according to the present invention;

5 Fig. 2 is a side elevational view of the rider pallet truck shown in Fig. 1;

Fig. 3 is a cross-sectional view of the upper or secondary forks, taken along line 3-3 in Fig. 2;

10 Fig. 4 is a cross-sectional view of the lower or primary forks, taken along line 4-4 in Fig. 2;

Fig. 5 is a perspective view showing the lift mechanism for the lower forks, and the linkage rod controlling the position of the load wheels;

15 Fig. 6 is a side elevational view of the truck constructed according to the present invention showing the upper and lower forks nested and in their lowermost position;

Fig. 7 is a side elevational view of the truck constructed according to the present invention showing the upper and lower forks nested and in a raised position, sufficient to raise a pallet above the floor;

20 Fig. 8 is a schematic of the hydraulic system for the present invention; and

Fig. 9 is an electrical schematic diagram of the electrical system for the present invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings which illustrate a preferred embodiment of this invention, and particularly to Figs. 1 and 2, an extended length rider pallet truck 10 includes a power unit 15, which includes a motor (not shown) providing power to a drive wheel 20, a platform 25 on which an operator may ride, a control handle 30 for controlling the direction and speed of the truck, an operator grab bar 35 with function controls 40. A pair of castors 45 are placed outside the drive wheel. The truck is normally driven power unit first, or to the left as shown in Fig. 2, although the truck may also be moved in the reverse direction when desired. A bumper or debris guard 50 is placed under the truck to protect the drive wheel 20 and castors 45 from damage.

A pair of primary or lower forks 60 are supported on a first fork lifting mechanism 70 which can raise the lower forks 60 from their lowermost position to an upper level approximately nine inches above the floor. The first fork lifting mechanism is a basic four-bar arrangement with a primary hydraulic cylinder 75 (Fig. 5) providing the lifting force. A typical pallet truck of this type can lift 6000 to 8000 pounds.

A load wheel 80 is placed at the outer end of each lower fork 60. The load wheel lifting mechanism 85 includes arms 87 connected to linkage rods 90 which cause the wheels to lower and support the lower forks as they are lifted. A battery 100 is carried at the heel end 62 of the lower forks and will be raised and lowered with the forks 60.

A pair of secondary or upper forks 110 are positioned above the lower forks 60 and are carried by a second fork lifting mechanism 120 mounted on the lower forks 60. The second lifting mechanism includes a mast structure 125 formed from stationary channel members 130 and vertically movable channel members 135 which are guided by rollers (not shown). A secondary hydraulic lift cylinder 140 (shown in Fig. 8) provides lifting power sufficient to raise the upper forks 110 up to

approximately twenty-four inches above the floor 150. A vertical wall 155 is placed between the heel end 160 of the upper forks 110 and the lifting mechanism.

Ends 170 of the upper forks 110 are stabilized by a second  
5 fork supporting mechanism 180, including hydraulic cylinders, that are connected between the ends of the upper forks and the ends 185 of the lower forks 60. It is to be understood that the stabilizing hydraulic cylinders 180 do not necessarily have to be connected to the ends of the upper forks, but it is preferred that they be connected to the ends of the  
10 lower forks since this provides a convenient mounting point.

The upper forks 60 are shown as being double length, that is, they can support a pair of typical industry standard 40 by 48 inch pallets, but it is to be understood that the forks may be made longer, if desired. In some applications, the pallet length need only be as long as the  
15 narrow side of one pallet plus 75% of a second pallet. Thus, it is only required that the forks be of sufficient length to support at least two pallets. While only a single pallet 200 is shown on the upper forks 110 in Fig. 1, it is to be understood that multiple, side-by-side pallets may be carried on the forks. As shown, the pallet 200 is a block style pallet that  
20 includes a plurality of blocks or legs 202 that descend from an upper platform 204. The spacing between blocks 202 is standard and permits the forks of a pallet truck to pass freely therebetween.

As shown in the cross sectional views of Figs. 3 and 4, the upper fork 110 is a C-shaped member provided with a reinforcing strip  
25 112. A hydraulic line 210 from the power unit 15 to the stabilizing cylinders 180 may be carried in the space formed between the strip 112 and the fork 110. The lower fork 60 is also provided with a reinforcing strip 62. The inside dimension D1 of the upper fork is greater than the outside dimension D2 of the lower fork 60, thus allowing the two fork  
30 sections to nest.

In operation, the forks 60 and 110 are initially in a lowered position, as shown in Fig. 6. In this position, the forks may be placed under a pallet or a pallet previously on the forks may be deposited. The height of the upper surface of the upper forks is below the lower surface of a pallet in this configuration.

In Fig. 7, the forks are raised to a first position. This represent the upper level position of the forks of a conventional pallet truck, such as the Crown PE Series Rider Pallet Truck, when a pallet is placed on the forks. The load wheel 80 is lowered by action of the linkage rod 90, which is connected to the first lifting mechanism 70 (Fig. 5). In this position, the upper surface of forks 110 is about nine inches above the floor, and thus the bottom of pallets carried on the forks will be clear of the floor, thus enabling the pallets to be moved. In this position, the load wheels are extended and support the outer ends of the forks, as is conventional with a PE Series Rider Pallet Truck.

When the upper forks 110 are raised to their maximum height, as shown in Fig. 1, the upper surface of the forks will be approximately twenty-four inches or more above the floor. In this position, the operator may conveniently load the pallet from stock from racks adjacent the truck. The upper fork may be placed at any convenient height, from nine to twenty-four inches, depending on the desire of the operator.

A hydraulic schematic drawing of the improved pallet truck is shown in Fig. 8. This schematic is similar to the hydraulic schematic used in a conventional PE Series Pallet Truck but includes two additional features, namely a secondary lift cylinder 140 and the two stabilizing or fork tip cylinders 180. Hydraulic fluid is provided to the system from power unit 215, which includes a pump-motor unit, to a manifold 220. The secondary lift cylinder 140 will only be provided with hydraulic fluid after the primary lift cylinder 75 has reached its height limit, as indicated by the

dotted lines showing the upward movement of the primary lift cylinder engaging the limit switch LMS1. During downward movement, hydraulic pressure will be released from the primary lift cylinder only after the secondary lift cylinder has reached its lower travel limit, as indicated by  
5 the full line depiction, and limit switch LMS2 is actuated. Hydraulic device 225, including flow divider valve FDV and valves SV4 and SV5, insures that both stabilizing cylinders 180 receive the same hydraulic flow.

The electrical schematic diagram of the truck is shown in Fig. 9. Power to the circuit is provided by the battery 100 through fuses  
10 F1 and F2. When the operator closes the key switch KYS, battery power is made available to the fork raise switch RAS, the fork lower switch LOS and the brake switch BRS. Forward travel is controlled by forward travel switch FS and reverse travel is controlled by reverse travel switch RS. Switches RAS and LOS are available on the control handle 30 and controls  
15 40 on operator grab bar 35, the brake switch BRS is controlled by the vertical position of the control handle 30, and the forward and reverse switches are controlled by twist grips on the control handle. This electrical configuration is conventional on a Series PE Rider Pallet Truck. In  
20 addition, limit switch LMS1 is fully closed when the lower or primary forks 60 are in their fully raised position, and limit switch LMS2 is shown with the upper or secondary forks 110 in their home, or lowered or nested, position.

While the form of apparatus herein described constitutes a preferred embodiment of this invention, it is to be understood that the  
25 invention is not limited to this precise form of apparatus and that changes may be made therein without departing from the scope of the invention, which is defined in the appended claims.

--CLAIMS--

1. A pallet truck operating on the floor of a warehouse for order selecting, said truck comprising  
a truck body,  
5 a pair of forks having a length from one end to another sufficient to hold a multiple, side-by-side industry standard pallets,  
a fork lifting mechanism carried by said truck body and supporting one end of said forks for positioning said forks from a lower position, less than approximately four inches above the floor, to an upper  
10 position, in excess of twelve inches above the floor, and  
a fork support mechanism for providing support to said other end of said forks as the forks are positioned by said fork lifting mechanism.
  
2. The pallet truck of claim 1 wherein said one end of said forks are mounted as a cantilever on said fork lifting mechanism.
  
3. The pallet truck of claim 1 wherein the length of said forks is at least approximately 72 inches.

4. A pallet truck comprising  
a truck body,  
a first fork lifting mechanism carried by said truck body,  
a pair of primary forks having a first end attached to said  
5 fork lifting mechanism,  
load wheels positioned at a second end of said primary forks,  
a load wheel lifting mechanism responsive to the first fork  
lifting mechanism for causing said second end of said primary forks to be  
raised from a lower level to an upper level simultaneously with the raising  
10 of said first end thereby to maintain said primary forks level,  
a pair of secondary forks,  
a second fork lifting mechanism for raising a first end  
of said secondary forks from a lower position to a raised position, and  
a support mechanism attached to said secondary forks to  
15 support said secondary forks while in a raised position.

5. A pallet truck comprising  
a truck body,  
a first fork lifting mechanism carried by said truck body,  
a pair of primary forks having a first end attached to said  
5 fork lifting mechanism,  
load wheels positioned at a second end of said primary forks,  
a load wheel lifting mechanism responsive to the first fork  
lifting mechanism for causing said second end of said primary forks to be  
raised from a lower level to an upper level simultaneously with the raising  
10 of said first end thereby to maintain said primary forks level,  
a pair of secondary forks mounted above said primary forks,  
a second fork lifting mechanism carried by said primary  
forks for raising a first end of said secondary forks from a lower position  
to a raised position, and  
15 a support mechanism attached to said secondary forks to  
support said secondary forks while in a raised position.

6. The pallet truck of claim 5 wherein said support mechanism  
includes a support hydraulic cylinder placed between each secondary fork  
and its corresponding primary fork, and wherein said second lifting  
mechanism includes a hydraulic lifting cylinder, said pallet truck further  
5 including a hydraulic circuit for supplying hydraulic pressure to said  
hydraulic lifting cylinder and said support hydraulic cylinders whereby said  
secondary forks are supported from their lower position to their fully raised  
position.

7. The pallet truck of claim 5 wherein said support hydraulic cylinders are connected between the ends of said primary forks and the ends of said secondary forks.

8. The pallet truck of claim 5 wherein said secondary forks have a length equal to or greater than that needed to support at least two industry standard pallets.

9. The pallet truck of claim 5 wherein said secondary forks are mounted directly above said primary forks and are configured to nest with said primary forks when in their lower position.

10. A method of order selecting using pallet truck provided with forks of extended length capable of supporting multiple side-by-side pallets, the method including the steps of

placing one or more pallets on the forks,

5 raising one end of the forks in excess of twelve inches above the floor,

supporting the other end of the forks to provide a stable platform while items are accumulated on the pallets,

10 lowering the forks to place the pallets in contact with the floor, and

backing the pallet truck from under the loaded pallets.

**AMENDED CLAIMS**

[received by the International Bureau on 5 August 1996 (05.08.96);  
original claims 1,4 and 5 amended; remaining claims  
unchanged (4 pages)]

1. A pallet truck operating on the floor of a warehouse for order selecting, said truck comprising
  - a truck body,
  - a pair of forks having a length from one end to another sufficient
- 5 to hold multiple, side-by-side industry standard pallets,
  - a fork lifting mechanism carried by said truck body and supporting one end of said forks for positioning said forks from a lower position, less than approximately four inches above the floor, to an upper position, in excess of twelve inches above the floor, and
- 10 a fork support mechanism for providing support to said other end of said forks as the forks are positioned by said fork lifting mechanism.
  
2. The pallet truck of claim 1 wherein said one end of said forks are mounted as a cantilever on said fork lifting mechanism.
  
3. The pallet truck of claim 1 wherein the length of said forks is at least approximately 72 inches.

-16-

4. A pallet truck comprising  
a truck body,  
a first fork lifting mechanism carried by said truck body,  
a pair of primary forks having a first end attached to said fork  
5 lifting mechanism,  
load wheels positioned at a second end of said primary forks,  
a load wheel lifting mechanism responsive to the first fork lifting  
mechanism for causing said second end of a primary forks to be raised from a  
lower level to an upper level simultaneously with the raising of said first end  
10 thereby to maintain said primary forks level,  
a pair of secondary forks,  
a second fork lifting mechanism for raising a first end of said  
secondary forks from a lower position to a raised position, and  
a support a second end of support mechanism attached to said  
15 secondary forks to support of said secondary forks while in a raised position.

-17-

5. A pallet truck comprising  
a truck body,  
a first fork lifting mechanism carried by said truck body,  
a pair of primary forks having a first end attached to said fork  
5 lifting mechanism,  
load wheels positioned at a second end of said primary forks,  
a load wheel lifting mechanism responsive to the first fork lifting  
mechanism for causing a second end of said primary forks to be raised from a  
lower level to an upper level simultaneously with the raising of said first end  
10 thereby to maintain said primary forks level,  
a pair of secondary forks mounted above said primary forks,  
a second fork lifting mechanism carried by said primary forks for  
raising a first end of said secondary forks from a lower position to a raised  
position, and  
15 a support mechanism attached to said secondary forks to support  
said secondary forks while in a raised position.

6. The pallet truck of claim 5 wherein said support mechanism  
includes a support hydraulic cylinder placed between each secondary fork and its  
corresponding primary fork, and wherein said second lifting mechanism includes  
a hydraulic lifting cylinder, said pallet truck further including a hydraulic circuit  
5 for supplying hydraulic pressure to said hydraulic lifting cylinder and said  
support hydraulic cylinders whereby said secondary forks are supported from  
their lower position to their fully raised position.

7. The pallet truck of claim 5 wherein said support hydraulic  
cylinders are connected between the ends of said primary forks and the ends of  
said secondary forks.

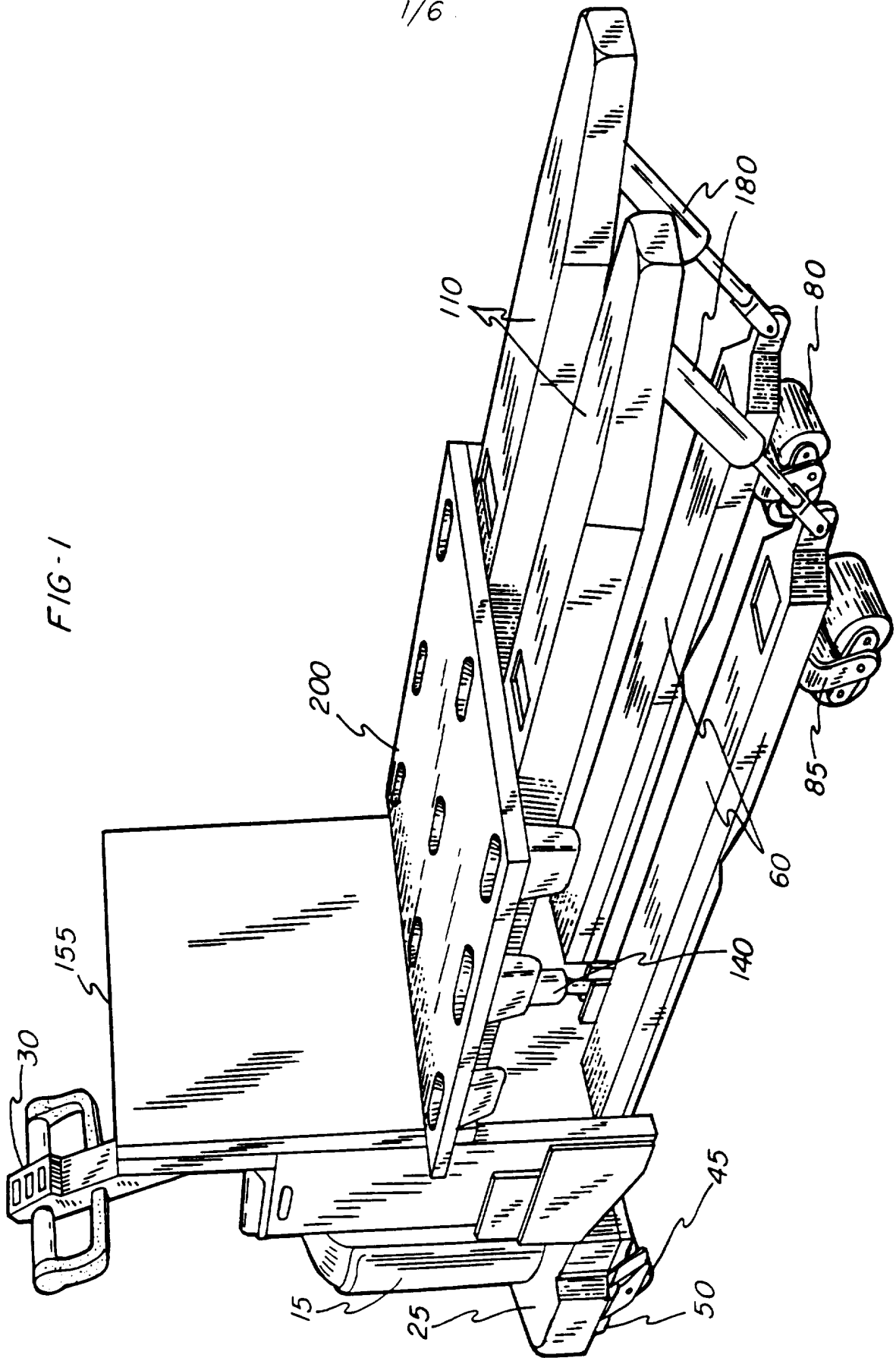
8. The pallet truck of claim 5 wherein said secondary forks have a length equal to or greater than that needed to support at least two industry standard pallets.

9. The pallet truck of claim 5 wherein said secondary forks are mounted directly above said primary forks and are configured to nest with said primary forks when in their lower position.

10. A method of order selecting using a pallet truck provided with forks of extended length capable of supporting multiple side-by-side pallets, the method including the steps of

- 5 placing one or more pallets on the forks,
- raising one end of the forks in excess of twelve inches above the floor,
- supporting the other end of the forks to provide a stable platform while items are accumulated on the pallets,
- lowering the forks to place the pallets in contact with the floor,
- 10 and
- backing the pallet truck from under the loaded pallets.

1/6



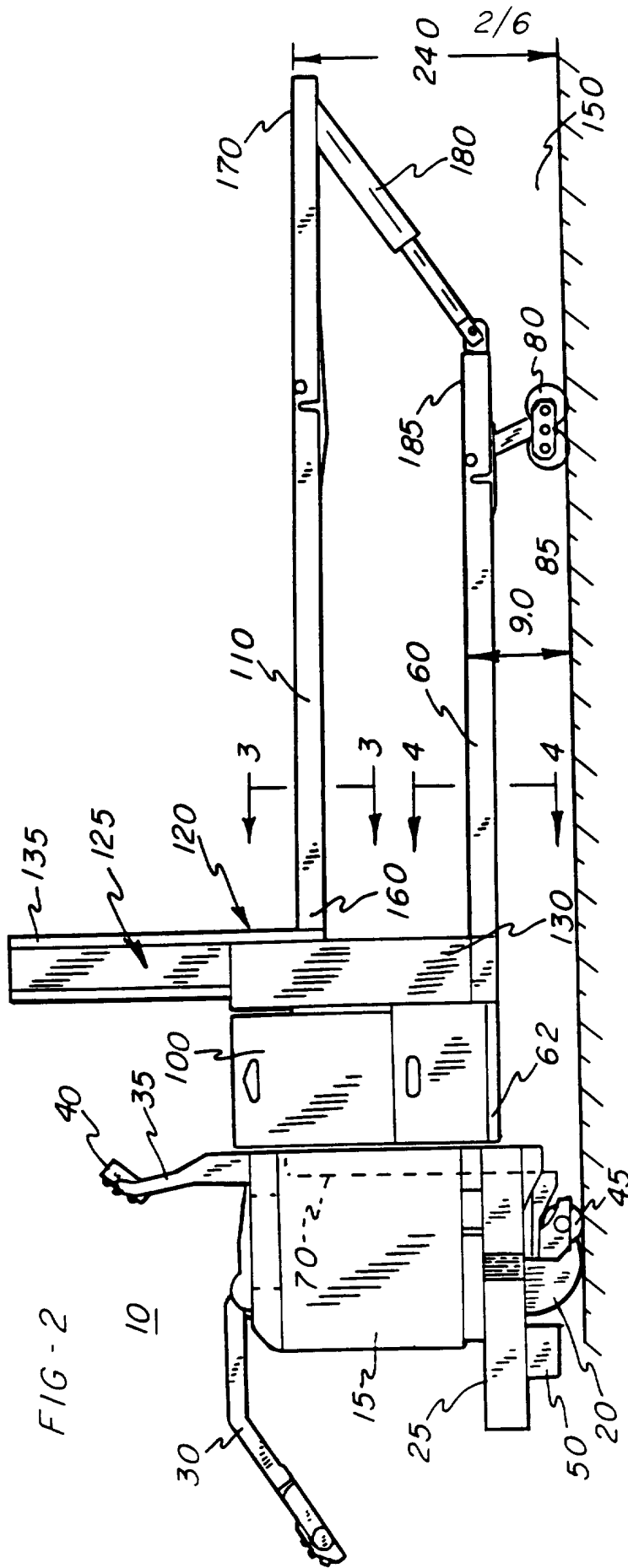


FIG-2

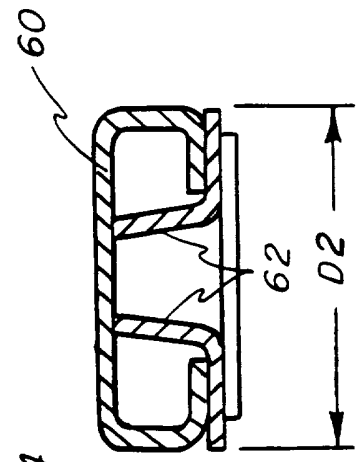


FIG-4

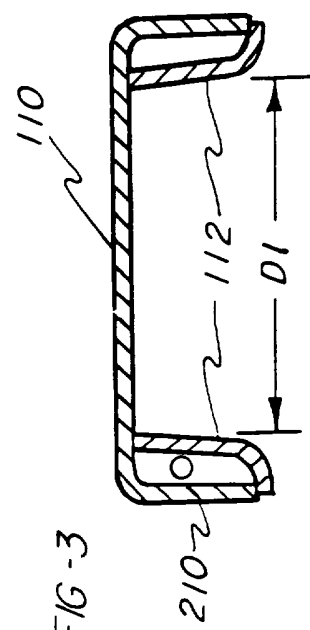
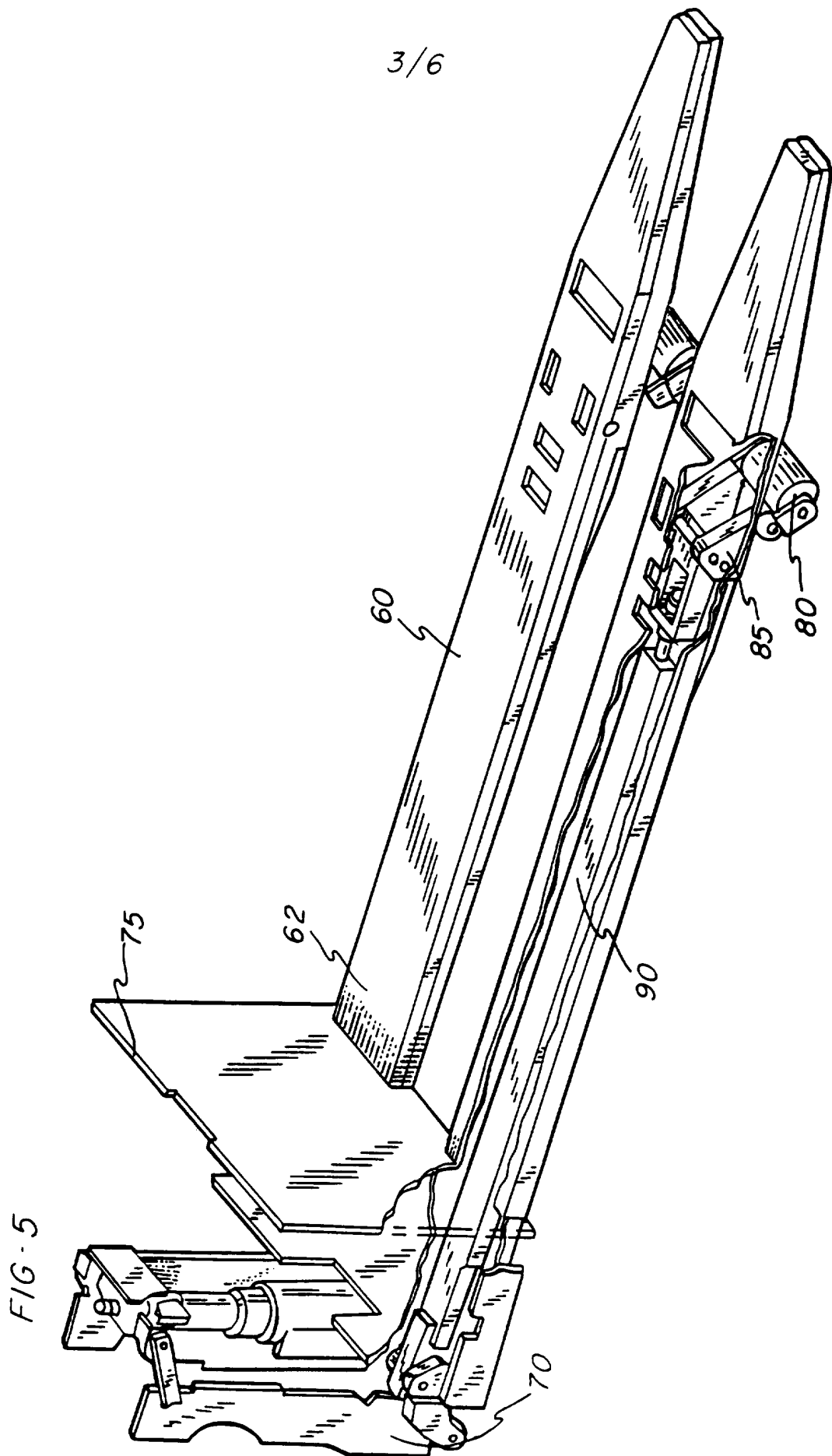
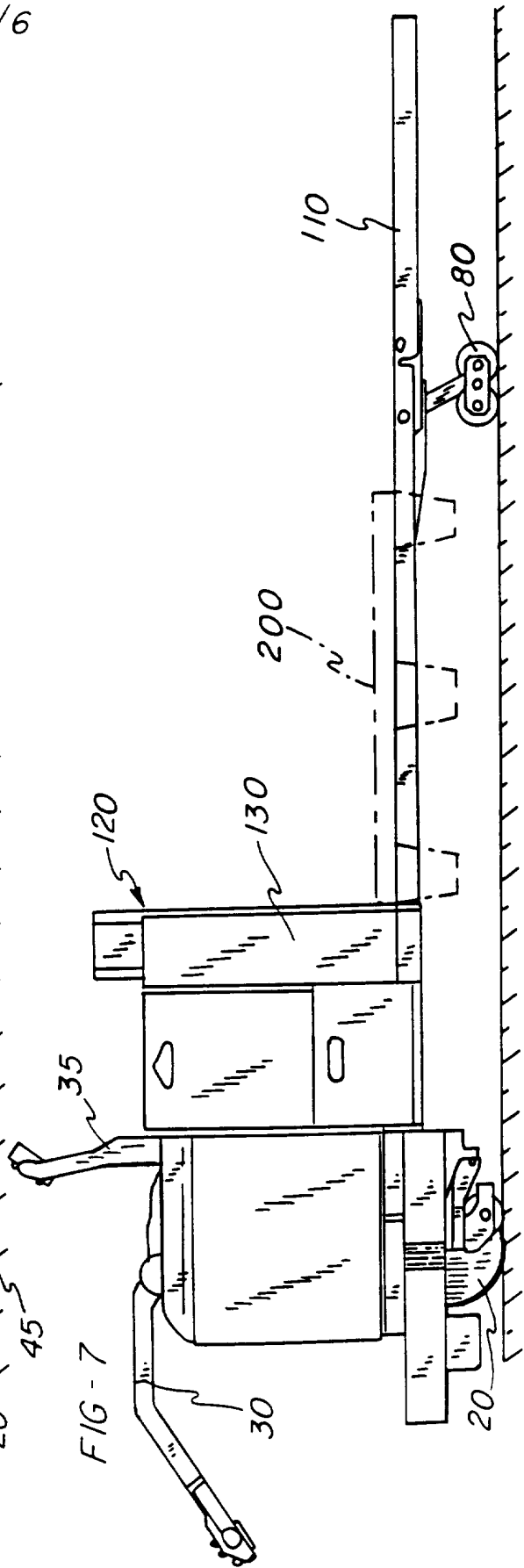
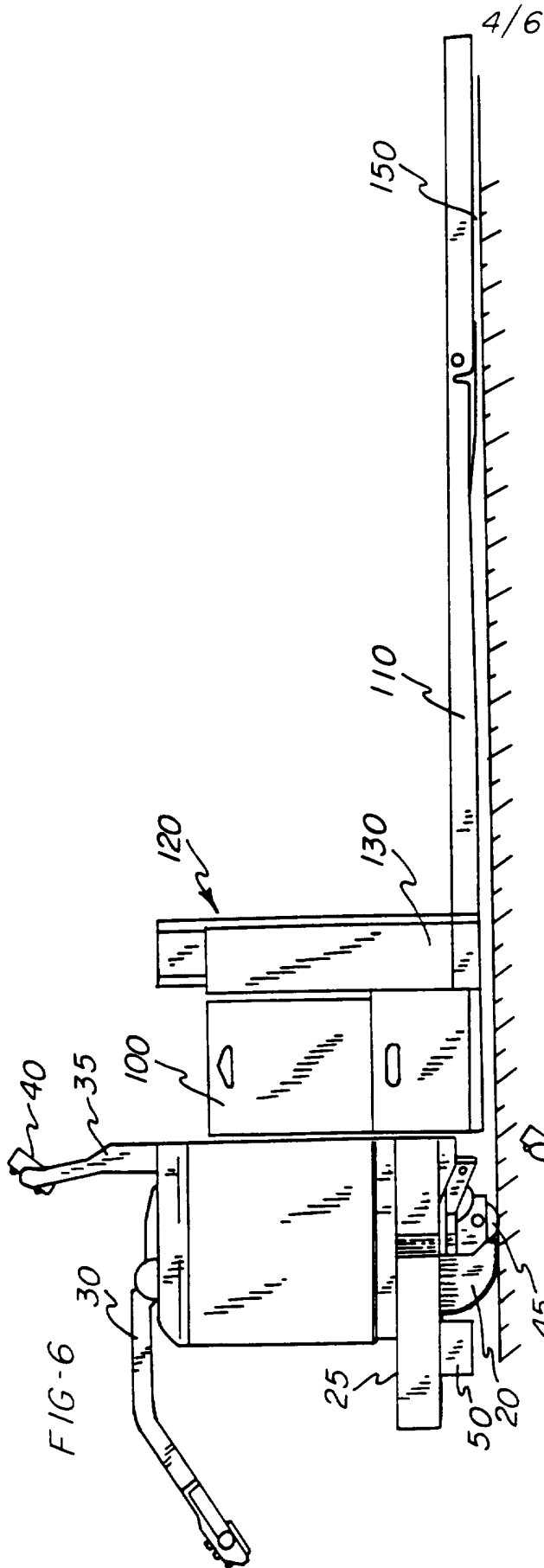


FIG-3

3/6







6/6

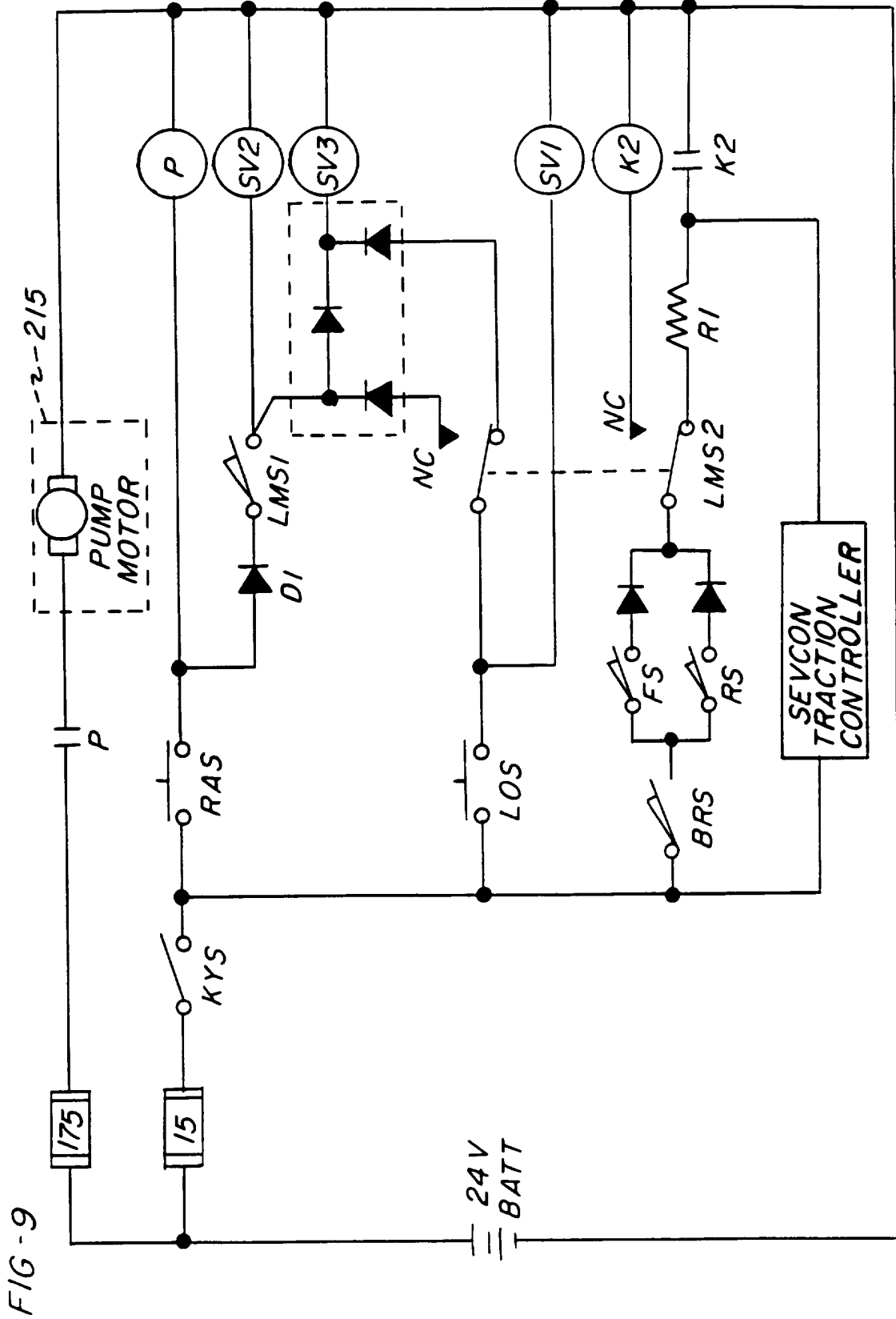


FIG - 9

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/US96/03109

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) :B66F 9/12, 9/22

US CL :187/234, 237

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 187/234, 237, 231, 232, 233, 238

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Clark Equipment Company Brochure, "Gas and Electric Fork Trucks and Industrial Tooling Tractors," 19 December 1949, page 25.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
NONE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- - Y	US, A, 3,265,158 (Constable) 08 September 1966, see the entire document.	4 ----- 1-3 and 10
Y	Clark Equipment Company Brochure, "Gas and Electric Fork Trucks and Industrial Towing Tractors," 19 December 1949, page 25.	1-3 and 10
A	US, A, 2,520,857 (Schreck) 29 August 1950, see the entire document.	1-10
A	FR, A, 2574773 (Matthelie et al) see the entire document.	1-10

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 24 APRIL 1996	Date of mailing of the international search report 06 MAY 1996
--	---

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer <i>William E. Terrell</i> WILLIAM E. TERRELL Telephone No. (703) 308-1113
---	--