A lateral container grabber has at least two supporting pins for the container which are pushed from the side of the long vertical side of the container into the corner pieces. Power cylinders act between the frame structure of the lateral grabber and securing levers. A spring is used to move the securing levers into their closed position while power cylinders move the securing levers into their open position.

4 Claims, 4 Drawing Figures
LATERAL CONTAINER GRABBER HAVING CARRYING PINS AT THE UPPER CORNERS OF THE CONTAINERS

The present invention concerns a lateral container grabber, with securing means, wherein the pins supporting the container engage with two corner pieces on the upper corners of a long side of the container, and which lateral grabbers are intended, above all, for use in connection with the lifting carriage of a carrier.

In previous practice, containers have commonly been lifted with so-called top lift means, by which the container is grabbed from above by the corner pieces on its four top corners. The gripping means together with their securing means have been mounted in connection with a special lifting frame. Since the spacing of the corner pieces on containers tends to change in the course of time, difficulties have been experienced in making four separate gripping means simultaneously enter the corner pieces. A contributory circumstance has been the fact that the mutual fit of the gripping elements and of the apertures in the corner pieces has to be rather close in order that reliable securing might be achieved by turning the supporting pins of the gripping means about their axis. Owing to the above, and other, reasons a practice has been adopted wherein the containers are lifted, particularly, by the aid of carriers with side grabbers, which most commonly have been arranged to support the container by the lower edge of its long side, in which instance the upper edge of the container is only acted upon by supports which prevent the container from turning during the lifting process.

The aim of the present invention is to provide a simple and reliably operating lateral container grabber with securing means, with which the container is lifted only by the corner pieces of two of its upper corners, whereby deformations of the container have less effect than before on the ease of engaging the grabbers with the corner pieces. The invention is mainly characterized in that the lateral grabber consists of two container supporting pins having a guiding surface tapering at its end, which are pushed into the corner pieces from the side of the long vertical side of the container, and that to the lateral grabber securing levers have been pivotally attached immediately above the supporting pins, these levers having a securing member which enters from above into positive engagement with the same corner pieces of the container as said supporting pins.

The invention is described in detail with reference to the embodiment example presented in the figures of the attached drawing.

FIG. 1 shows, in elevational view, a carrier with its lifting equipment, in connection with which a lateral grabber for the container according to the invention has been employed.

FIG. 2 shows the same as FIG. 1, as seen from above.

FIG. 3 is a lateral view, partly sectioned, of a detail of the invention.

FIG. 4 shows the hydraulic circuit diagram of the automatic releasing arrangement of the lateral grabber according to the invention.

The lateral grabber according to the invention with its securing means is intended to be used, in particular, in connection with the lifting attachment of a carrier.

The lateral grabber 5 is attached to the lifting carriage of a carrier, previously known in itself, of the lifting attachment. The lateral grabber 5 has been composed of a frame structure substantially vertical in its position of use, on both upper corners of which supporting pins 6 for the container 4 and securing levers 7 have been fitted, by which the container 4 is grabbed from the side of its long side by its corner pieces. The corner pieces are standard components known in prior art and therefore no clarification of their detailed design is required.

The supporting pins 6 enter the apertures in the corner pieces of the container 4 from the long vertical side. The securing levers 7 ensure positive attachment of the supporting pins 6 by engaging with the same corner pieces as the supporting pins, from above. The lower part of the vertical side of the container 4 rests against the frame structure of the side grabber 5, and no other supporting means are required in this case.

FIG. 3 illustrates a more detailed embodiment example of the supporting pins 6 and of the securing levers 7 and other securing means. The supporting pins 6 have been provided with a tapering, most appropriately conical, guiding surface, which centres the supporting pin 6 in the aperture of the corner piece of the container 4. The securing levers 7, which are located immediately above the supporting pins 6, have been pivotally attached to the frame structure of the lateral grabber 5. The securing levers 7 are actuated by action means, by the aid of which the securing levers 7 can be made to assume their open and locked positions. The securing levers 7 have on their end opposite to the pivotal point, projections which constitute securing members, these members entering in their locking position the apertures of the corner pieces of the container 4 from above.

The action means operating the securing levers 7 may be carried out, for instance, by inclusion of a spring-loaded power cylinder 8. The power cylinder 8 has been mounted to act between the frame structure of the lateral grabber 5 and the securing lever 7. When pressure is supplied to the power cylinder 8, the spring 11 is compressed and the securing lever 7 goes into the open position, thus permitting the supporting pins 6 to be pushed into the corner pieces of the container 4. When the pressure of the power cylinder 8 is released, the traction exerted by the piston rod 10 and spring 11 causes the securing lever 7 to be thrown into its closed position, whereby the securing member enters the aperture of the corner piece. Both securing levers 7 with their power cylinders and other action and control means have been arranged to operate separately, independent of each other.

In the scope of the present invention such means are included which constitute an automatic release receiving its action pulse when the supporting pins are in their places in the supporting position (FIG. 3) in the corner pieces of the container 4. The sensing element of the automatic release consists of a releasing pin 9 mounted with slide fit in the frame structure of the lateral grabber 5 and urged into its outer position e.g., by a spring, one such releasing pin being placed immediately adjacent to each supporting pin. When the supporting pins 6 are pushed into the corner pieces, the releasing pins 9 are pushed inwardly by the sides of the container 4. When one or the other supporting pin 6 has been pushed fully into its supporting position, the releasing pin 9 has simultaneously been pushed fully in, whereby it delivers an actuating pulse to means which release the pressure from the power cylinder 8,
whereby the securing lever is released to go into its closed position. This can be arranged, for instance, by providing a mechanical connection between the releasing pin 9 and the valve 13 of the automatic release (FIG. 4). In the hydraulic circuit diagram of FIG. 4 the entity constituted by the spring-loaded power cylinder has been denoted with 12. It is a characteristic of the automatic release device that both securing levers 7 are independently released into their closed positions, whereby reliable securing of the load is attained even if the supporting pins 6 should enter the corner pieces at different times, when the frame structure of the lateral grabber 5 is obliquely positioned with reference to the container 4.

The automatic release may be carried out by means of a hydraulic circuit according to FIG. 4, comprising an automatic release valve 13, which releases the pressure of the power cylinder 8 when release occurs, a disengaging valve 14, which is operated by the driver of the carrier 1 when it is desired to move the securing levers 7 into the open position, a pressure accumulator 15, a check valve 16, a pressure valve 17, a pump 18, a filter 19 and a tank 20. The mode of operation of the hydraulic circuit is entirely self-explanatory and is not more closely described for this reason.

It is a characteristic of the automatic release according to the invention that even if for some reason, such as conduit failure, the pressure should fall, the securing levers 7 will not open but instead remain in their closed position under effect of the springs 11, and the container obviously cannot fall in this event either.

I claim:

1. A carrier vehicle having a lifting carriage and a lateral container grabber connected with said carriage for holding a container, means for vertically shifting said carriage, said grabber comprising a vertically extending frame structure, at least two supporting pins, vehicle drive means for moving the vehicle forward and thereby pushing said pins into the corners of a container, securing levers pivotally mounted upon said frame structure directly above said pins and adapted to engage the same corners of the container, power cylinders connected between said frame structure and said securing levers, and at least one spring connected with said securing levers for biasing them toward and holding them in a closed position, said power cylinders moving said securing levers against the action of the said spring to a non-engaging or open position.

2. A lateral container grabber in accordance with claim 1, comprising automatic release means moving said securing levers into a closed position under the action of said spring when said supporting pins are located in the corners of the container.

3. A lateral container grabber in accordance with claim 2, wherein said release means comprise a releasing pin carried by said frame structure and a valve connected with one of said power cylinders, said releasing pin being shifted when said supporting pins are moved into the corners of the container and transmitting an actuating pulse to said valve causing said valve to release the pressure of the power cylinder, whereby securing levers are released to move into their closed positions.

4. A lateral container grabber in accordance with claim 3, comprising a disengaging valve adapted to apply pressure to said power cylinders for moving the securing levers into said open position.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,809,270 Dated May 7, 1974

Inventor(s) Lahja Arvid Peltonen

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet insert

-- [30] Foreign Application Priority Data

Finland May 25, 1971 Ser. No. 1436/71 --.

Signed and sealed this 29th day of October 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR. C. MARSHALL DANN
Attesting Officer Commissioner of Patents