LATERAL CONTAINER GRABBER HAVING CARRYING PINS AT THE LOWER CORNERS OF THE CONTAINER

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UNITED STATES PATENTS
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ABSTRACT

A lateral container grabber is carried by a lifting carriage of a carrier and is adapted to engage a container having apertures at its corners. The grabber has upper guiding pins and lower supporting pins. The guiding pins engage upper corner pieces of the container. Each of the supporting pins is connected with a swingable lever and has a tapering end to facilitate its entry into an aperture of the container. The supporting pins are also connected with locking cylinders.

3 Claims, 4 Drawing Figures
LATERAL CONTAINER GRABBER HAVING CARRYING PINS AT THE LOWER CORNERS OF THE CONTAINER

The present invention concerns a lateral container grabber with securing means, wherein container supporting pins turnable by means of a locking cylinder or equivalent engage with two corner pieces on the lower corners of one long vertical side of the container and wherein the container is supported by the upper corner pieces of its long side against turning by the aid of guiding pins, and which lateral grabber is intended for use, above all, in connection with the lifting carriage of a carrier.

When using lateral grabbers of the kind described above, it is most appropriate first to insert the guiding pins in the apertures of the upper corner pieces of the long side of the container from above, whereby at the same time the supporting pins will be positioned closely adjacent to the apertures of the lower corner pieces of the container. Since deformations of the container cause changes in the spacing of the corner pieces, difficulties are encountered in making immovably mounted supporting pins enter the apertures of the corner pieces, especially since the mutual fit of the apertures and the turnable supporting pins is fairly close in order to provide reliable locking.

The aim of the invention is to provide a lateral container grabber of simple design which is more rapidly and easily attachable to the container than equivalent devices of prior art and by means of which the drawbacks pointed out above are avoided. The scope of the present invention further comprises means by the aid of which the lateral grabber is simply adaptable to different container heights, as well as means for locking the supporting pins within the corner pieces. The invention is mainly characterized in that the supporting pins have been mounted in connection with the lower part of the frame structure of the lateral grabber by mediation of levers which are turnable in the direction of the plane defined by the frame structure, about a pivot pin, so that the supporting pins by virtue of a tapering guiding surface provided on their ends find their way into the apertures of the container corner pieces when the lateral grabber is being attached to a container.

The invention is clarified 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 lifting attachment, in connection with which a lateral container grabber according to the invention has been employed.

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

FIG. 3 shows a detail of the lateral grabber according to the invention, as seen from the front of the carrier, and FIG. 4 shows the same, as seen from the side of the carrier.

The lateral container grabber 5 consists of a frame structure, which has been affixed to the lifting carriage 3 of the lifting attachment 2 of a carrier 1. The design of the lifting carriage has been disclosed in greater detail, for instance, in our pending U.S. Pat. application Ser. No. 256,593.

On the lower part of the frame structure of the lateral grabber there have been mounted, by mediation of a lever 7, supporting pins 8 previously known in themselves, which for the purpose of locking have a cross section which is substantially e.g. oval, and the ends of which have been provided with a tapering, most appropriately conical, guiding surface. After the supporting pin 8 has been introduced into the corner piece of the container 4, the supporting pin 8 is turned about its axis, whereby it is locked in the corner piece in a manner previously known in itself.

In both upper corners of the frame structure of the lateral grabber 5 guiding pins 6 have been placed, which when the container 4 is being attached are first inserted from above into the apertures of the corner pieces on the upper corners of the container 4, whereupon attachment of the supporting pins 8 takes place. The guiding pins 6 are advantageously mounted on a slide which is movable in the vertical plane with reference to the frame structure of the lateral grabber 5. This displacement is accomplished by the aid of double action power cylinders 9, whose pistons have two definite extreme positions, corresponding to two different container heights. By this means the lateral grabber 5 can be simply adapted to two different container heights, for instance, to fit 8 ft. and 8.5 ft. containers.

According to the invention, both supporting pins 8 have been attached to the lower part of the frame structure of the lateral grabber 5 by mediation of a lever 7, which is turnable in the direction of the plane defined by the frame structure of the lateral grabber 5 about a pivot pin 10 in a given angular sector. The lever 7 is freely suspended from the pivot pin 10, whereby when the lateral grabber 5 is being attached to a container 4 the lever 7 automatically finds, under effect of the guiding surface on the supporting pin 8, a position such that the supporting pin 8 may easily enter the aperture of the corner piece of the container 4. In this manner the effect, with reference to the mounting of the supporting pins 8, of changes in the spacing of the corner pieces of the container 4 is simply eliminated.

While the supporting pins 8 are being pushed into the corner pieces, the vertical edge of the container simultaneously presses against locking pins 12 placed immediately adjacent to the supporting pins 8, and when the supporting pin 8 is in its proper supporting position within the corner piece (FIG. 1), the locking pin 12 delivers an actuating pulse to the locking cylinder 11, which turns the supporting pin 8 about 90° about its axis, and locking of the supporting pin takes place. The locking of each supporting pin 8 may thus take place at different times in the event that the frame structure of the lateral grabber 5 is pushed towards the container 4 in a somewhat oblique position.

When, after lifting and transporting, it is desired to detach the container 4 from the lateral grabber 5, the driver of the carrier 1 delivers an actuating pulse to the locking cylinders 11, which then turn the supporting pins 8 into the open position, whereupon the supporting pins 8 can be disengaged from the corner pieces of the container 4.

1. A grabber carried by a lifting carriage of a vehicle carrier and adapted to laterally engage a container, said grabber comprising a frame, guiding pins, means supporting said guiding pins upon an upper portion of said frame, said guiding pins being adapted to engage upper corners of the container and to prevent any turning thereof, levers pivotally mounted about pivot axes
upon a lower portion of said frame for pivoting movement in a plane parallel to said frame structure, a separate supporting pin carried by each lever, each of said supporting pins having a tapered end adapted to engage an aperture in the lower corners of the container when the grabber is being attached to a container, and locking means connected with said supporting pins for turning same.

2. A grabber according to claim 1, wherein the first-mentioned means comprise a slide located upon an upper edge of said frame and carrying said guiding pins, and double action power cylinders connected with said slide for moving the slide in a vertical plane.

3. A grabber according to claim 2, wherein the second-mentioned means comprise locking cylinders connected with said supporting pins and locking pins carried by said levers and adapted to deliver an actuating pulse to said locking cylinders to turn the supporting pins into their closed positions.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,817,414 Dated June 18, 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. 1437/71 --.

Signed and sealed this 29th day of October 1974.

(SEAL)
Attest:

McCoy M. Gibson Jr. C. Marshall Dann
Attesting Officer Commissioner of Patents