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(54) A side-lift yoke for handling containers

(57) The present invention relates to a side-lift yoke for handling two mutually stacked containers from respective sides thereof. The side-lift yoke includes a first upper pair of locking devices (6) which are intended to engage with locking openings (14) in the lower corners of the upper container (7) on the respective side of the container, and a second pair of lower locking devices (6) which are intended to engage with locking openings (14) in the upper corners of the lower container (7) on respective sides of the container. The upper pair of locking devices and the lower pair of locking devices can be movably withdrawn from the plane extending through the support surfaces (5) of the side-lift yoke that coact with the lower container (17), independently of the other pair.

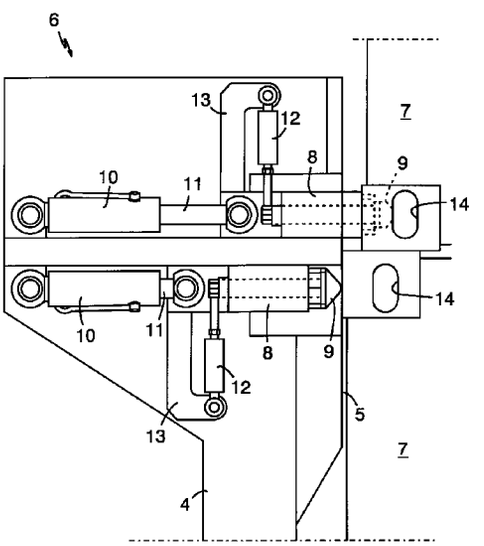

FIG.3

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Description

The present invention relates to a method and an arrangement pertaining to side-lift yokes for handling mutually stacked empty containers from the sides thereof.

With the object of rationalizing the handling of empty containers, it has become usual to transport two containers at a time, with one container stacked on the other. All corners of this type of container are provided with elongated openings by means of which the containers can be handled with the aid of hooks or with the aid of so-called twist-locks that form part of a lifting yoke. The side-lift yokes used to handle two mutually stacked containers comprise, in principle, a horizontal frame which includes vertical carrier beams at respective ends thereof. Mounted centrally of the frame is a truck-lift coupling that can be lengthened or shortened in accordance with the container length. Respective carrier beams include support surfaces which are brought into engagement with the container sides, and a top-mounted locking hook for insertion into the upper locking opening of the bottom container. The two containers can thus be lifted and transported with the add of a truck-lift through the medium of the side-lift yokes.

The safety rules governing the handling of two mutually stacked containers have become more stringent with time, and it is now no longer permitted to transport stacked containers with the upper container stacked loosely on the lower container. Different types of locking devices have therefore been proposed, in an endeavour to meet these requirements. In addition to guiding the upper container on the lower container with the aid of guide flanges mounted on the tops of the containers, the side-lift yoke and carrier beams respectively have been provided wish two superposed locking hooks, of which the bottom hook is intended to lock in the upper locking opening of the container and the top hook is intended to lock in the bottom locking opening of the top container, the intention being to hold the top container firmly to the bottom container. One problem in this regard is that when stacking containers, the upper container will not always be positioned in correct alignment with the lower container. This will cause the locking openings to be offset in relation to one another, meaning that in the case of carrier beams that are provided with twin locking hooks it is not possible to insert one of these locking hooks into one of the locking openings. As a result, it is necessary to bring the upper container into correct alignment with the lower container before this type of side-lift yoke can be made ready for lifting the containers, which is a time-consuming task.

An object of the present invention is to facilitate the handling of two mutually stacked empty containers and to shorten container handling times. This object is achieved by means of the present invention, which has the characteristic features set forth in the following Claims.

The invention will now be described in more detail with reference to an exemplifying embodiment thereof and also with reference to the accompanying drawings, in which **Fig. 1** illustrates a known side-lift yoke which includes an inventive arrangement; **Fig. 2** is a side view of the side-lift yoke; **Fig. 3** is a more detailed view of the inventive arrangement and shows the arrangement in a movement phase; **Fig. 4** illustrates the inventive arrangement in another movement phase; and **Fig. 5** illustrates the twist-lock principle by way of explanation only.

Fig. 1 thus illustrates a known side-lift yoke comprised of a horizontal frame 1 and a lifting device 2 which is located in the centre of the frame and which is used to couple the yoke to an automotive vehicle, such as a truck or the like. The yoke further comprises vertical carrier beams 4 which are mounted on the ends of beams 3, these beams being telescopically movable in the frame 1. Each carrier beam 4 includes a respective upper and lower support surface 5 which are intended to abut the longitudinal sides of the container when locking the side-lift yoke. The side-lift yoke is also provided with a locking device 6 at the top of each carrier beam 3, this locking device being described below in more detail with reference to the actual invention. The side-lift yoke as such is known to the art and will include a suitable hydraulic system among things, and will not therefore be described in more detail here.

The inventive locking device is shown in more detail in Figs. 3 and 4. The reference numeral 7 in Figs. 3 and 4 identifies the upper corner of a corner-reinforced lower container and the bottom corner of a corner-reinforced upper container which rests or the lower container The inventive locking device comprises two mutually independent and horizontally movable cylindrical locking bolts 8, each having a head 9 which is elongated when seen in cross-section or the bolt. Respective locking bolts 8 are moved horizontally by means of a hydraulic cylinder 10, which is connected to the locking bolt 8 with the aid of a piston and piston rod 11. Respective locking bolts 8 can also be twisted through 90° with the aid of a hydraulic cylinder which includes a piston and piston rod, together referenced 12. This piston rod is mounted excentrically at the inner end of the locking bolt 8, and functions to twist the bolt through 90° as aforementioned. The hydraulic cylinder 12 is connected to a bracket 13 which is connected to the locking bolt 8 and which together with the hydraulic cylinder 12 is operative in moving the bolt 8 when said bolt is manoeuvered by the hydraulic cylinder 10. By way of explanation, it can be mentioned that the locking bolt 8 with its undercut, elongated head 9 forms what is generally known in the art as a "twist-lock".

The corner reinforcements at respective corners of each container include elongated locking openings 14 on each upper side of each container. In this connection, reference is made to Fig. 5 which illustrates one such locking opening in a container 7 schematically and shows a locking bolt 8 and its head 9 inserted in the opening. The elongated head and its opening-adapted shape

enables the head to be inserted into the locking opening 14. When the locking bolt is twisted, the head will grip behind the defining edges of the locking opening 14 and therewith lock the bolt to the container, and in the illustrated case lock the container to the side-lift yoke.

The invention functions in the following manner. Fig. 3 shows a lower container 7 and an upper container 7 which rests on top of the lower container 7 and which when stacking the containers has been placed out of longitudinal alignment and, although not evident from the drawing, may have also been placed out of lateral alignment with the lower container. The vertical carrier beams 4 of the side-lift yoke have been placed against the bottom container 7, the two locking bolts 8 being fully retracted inwardly of the side surface 5 during this operation. With the aid of the hydraulics 10, 11, the truck driver handling the side-lift yoke is able to move the upper locking bolts 8 outwardly of the support surface 5 and into the bottom locking openings 14 of the upper container 7, whereafter the bolts 8 are twisted through 90° so as to lock the upper container to the side-lift yoke. The truck driver is now able to move the upper container 7 both laterally and longitudinally with the aid of the side-lift yoke, so as to bring the upper container into full alignment with the lower container, as shown in Fig. 4. When the truck driver has positioned the upper container 7 correctly on the lower container with the aid of the upper pair of locking bolts 8, the lower pair of locking bolts 8 are moved outwardly of the support surface 8 with the aid of the hydraulics (10, 11) and twisted through 90°, therewith locking the lower container 7 to the side-lift yoke. Both containers 7 are herewith locked to the side-lift yoke and can be lifted and transported safely with the support surfaces 5 of the carrier beams in abutment with the sides of the container.

The invention thus enables the upper container to be brought into correct alignment with the lower container and the containers thereafter locked together, with the aid of the side-lift yoke. This has not earlier been possible, and it has previously been necessary either to ensure that the containers are stacked while in precise alignment with one another or to bring the upper container into alignment with the lower container in some way or another. The invention thus provides for simple and speedy handling of mutually stacked empty containers.

Although the invention has been described with reference to a "twist-lock", it will be understood that other types of extendable and retractable locking devices can be used.

Claims

1. A method of handling two mutually stacked containers from a respective side thereof with the aid of a side-lift yoke, **characterized** in that the side-lift yoke is locked to the two lower corners of the upper container on a respective side thereof and, when necessary, the upper container is brought into alignment with the lower container with the aid of the side-lift yoke, whereafter the side-lift yoke is locked at the two upper corners of the lower container on said side while continuing to lock the side-lift yoke to the upper container.

2. A side-lift yoke arrangement for handling two mutually stacked containers from a respective side thereof, **characterized** in that the side-lift yoke includes a first upper pair of locking devices (8) which are intended to engage with locking openings (14) in the bottom corners or the upper container (7) on said respective side, and a second pair of lower locking devices (8) which are intended to engage with locking openings (4) in upper corners of the lower container (7) on said respective side, wherein the upper pair of locking devices and the lower pair of locking devices can be withdrawn from the plane extending through support surfaces (5) on the side-lift yoke that coact with the lower container (7), independently of the other pair.

3. An arrangement according to Claim 2, **characterized** in that each of the locking devices includes a cylindrical bolt (8) which has an undercut head (9) of elongated shape in cross-section, wherein the head (9) is intended for insertion into a locking opening (14) of a container (7), and wherein each cylindrical bolt (8) is movable axially towards and away from respective container sides and can be twisted through 90° for engagement of the head in the locking opening.

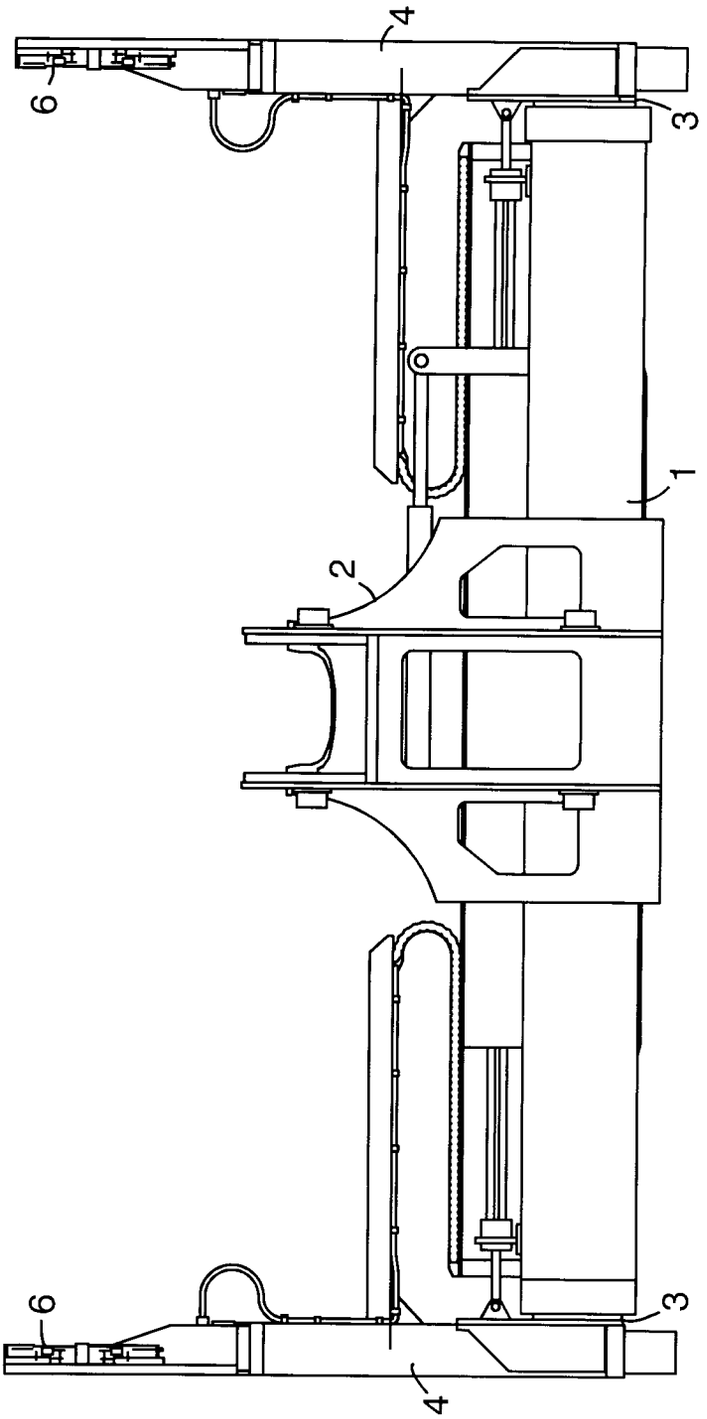

FIG.1

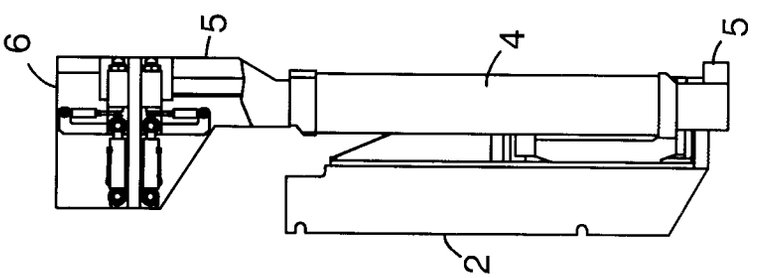

FIG.2

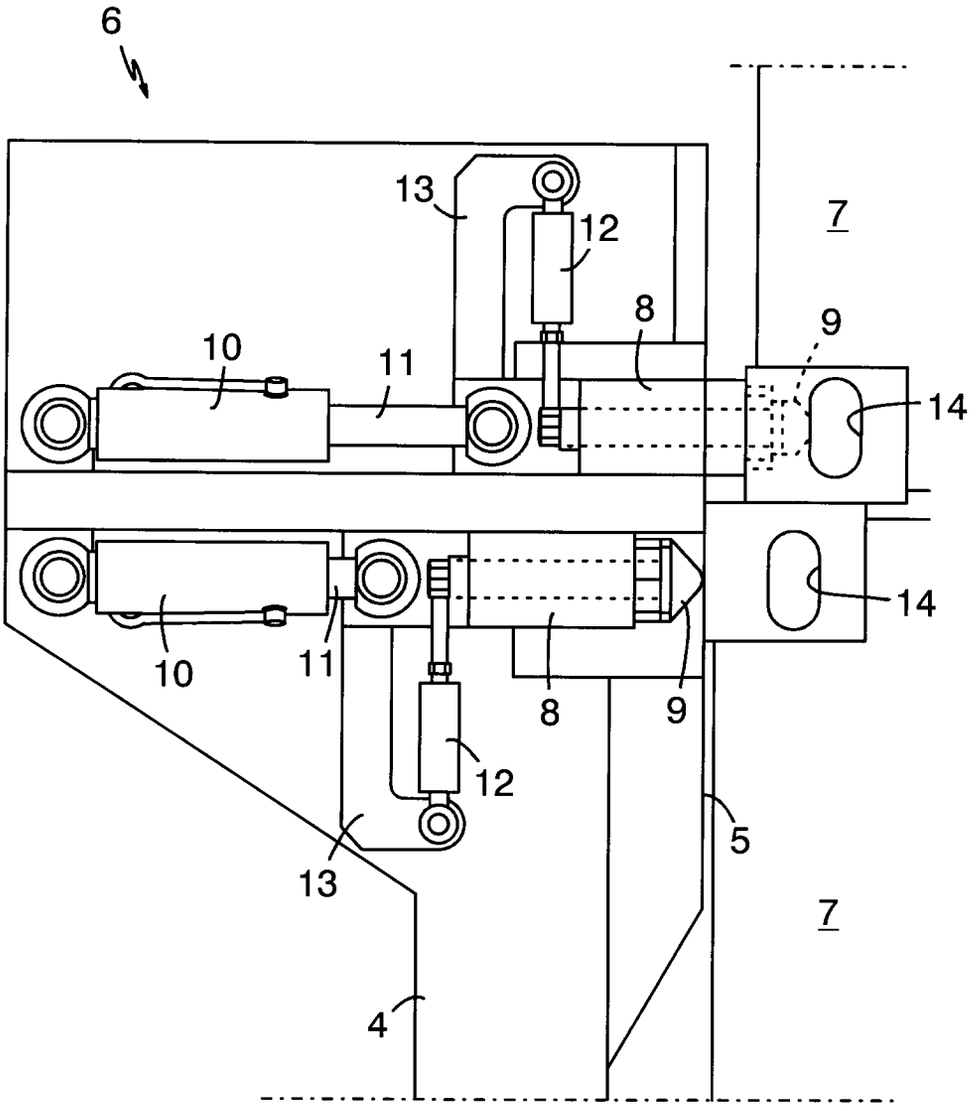

FIG.3

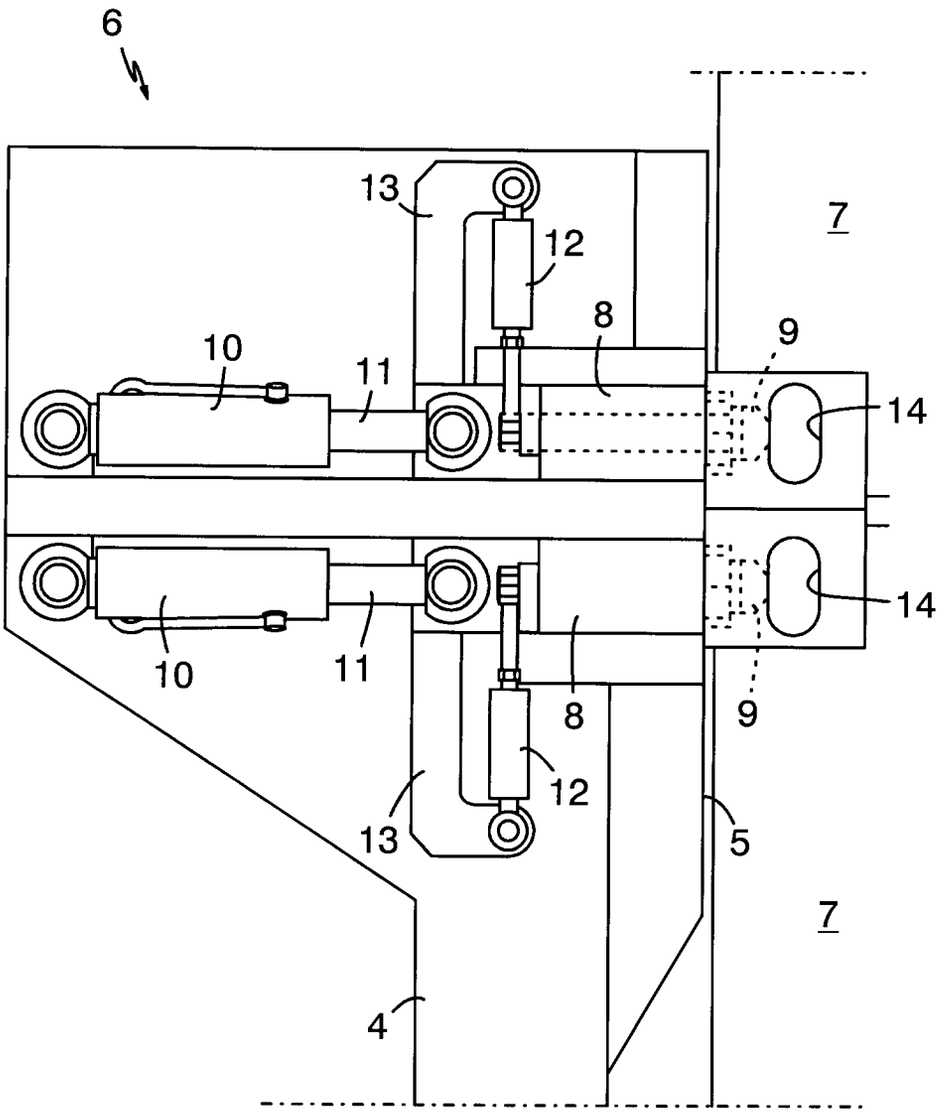

FIG.4

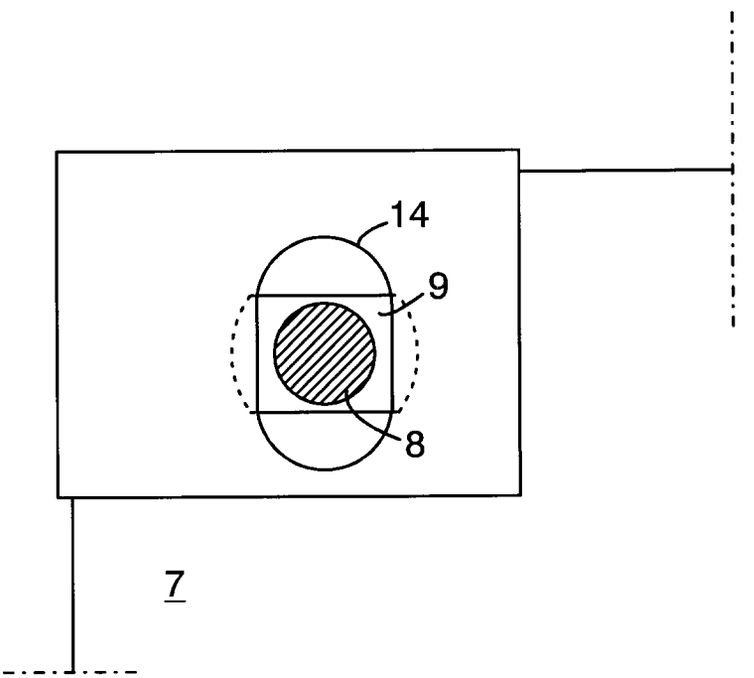

FIG.5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 85 0142

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
P,A	EP-A-0 638 512 (MANDIGERS) * the whole document * ---	1,2	B66F9/18
A	EP-A-0 183 320 (KUIKEN) * page 2, line 2; claims 1-4; figures 2-4 * ---	1,2	
A	EP-A-0 148 418 (KALMAR) ---		
A	US-A-4 449 882 (PERROTT) ---		
A	DE-A-30 24 659 (DREHTAINER CONSULTING) ---		
A	US-A-4 824 318 (DONES) -----		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
B66F B66C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	16 November 1995	Thomas, C

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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