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Device for attaching lifting, manoeuvring or securing mechanisms to containers or the like.

A device for attaching a lifting, manoeuvring or securing mechanism to a container or the like provided with an aperture (4) through a wall thereof comprises a housing (6) to be secured to the lifting mechanism, and attachment means (12) mounted in the housing (6). The attachment means (12) includes an elongate body portion (14) projecting from the housing (6) and movable axially relative thereto, and at least one locking portion (20) pivotally mounted to the outer end of the body portion (14) and movable between a rest position substantially in line with the body portion (14) and an operative position projecting radially beyond the body portion (14). With the locking portion (20) in its rest position, the body portion (14) is moved relative to the housing (6) to locate the locking portion (20) within the container, and the locking portion (20) is then pivoted to its operative position which is such as to prevent retraction of the body portion (14) and locking portion (20) from within the container.

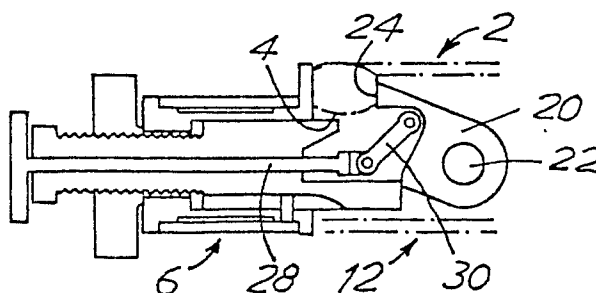


FIG. 7

DEVICE FOR ATTACHING LIFTING, MANOEUVRING OR SECURING MECHANISMS TO CONTAINERS OR THE LIKE

The present invention relates to devices for attaching lifting, manoeuvring or securing mechanisms to containers or the like, and in particular to containers provided with pre-formed apertures therein, such as those in the corner fittings of standard freight containers.

Standard freight containers are provided with corner fittings each of which comprises a hollow, generally box-shaped component provided with apertures in the outwardly facing walls thereof for receiving therein releasable securing means. Hereinafter, any reference to a corner fitting is to be understood as referring to a corner fitting of the above described type.

Whereas bottom corner fittings of such freight containers are primarily used for locating and securing the containers to transporting surfaces and to each other, using twistlocks or other locking means extending through the generally rectangular or elliptical apertures in the corner castings, the upper corner fittings are such as to permit lifting or manoeuvring of the containers.

More particularly, such lifting is usually achieved using a spreader equipped either with build-in twistlocks adapted to be received in the apertures in the upper walls of the upper corner fittings or with hooks which pass through the apertures in the upper walls of the upper corner fittings and through the apertures in the end walls of said corner fittings, said latter apertures commonly being known as 'hook holes'. The interiors of the upper corner fittings between the apertures in the upper walls and the end walls are shaped to accommodate the hooks, as are the hook holes themselves. Said hook holes are each of only slightly asymmetrical shape with no significant difference between the lengths of the major and minor axes and with little flat purchase area therearound within the fitting.

There is currently a need for a device to enable lifting, manoeuvring or securing of containers by attachment of lifting frames or the like to the end face of the container, and in particular by way of the apertures in the end walls of the upper corner fittings.

However, it will be appreciated that, because of the particular shape of the apertures in the end walls of the corner fittings, it is not practical to use conventional twistlock-type mechanisms to effect attachment of the lifting mechanism to the containers because of the limited purchase area available within the fittings for engagement by heads of the

twistlocks.

According to the present invention there is provided a device for attaching a lifting, manoeuvring or securing mechanism to a container or the like provided with an aperture through a wall thereof, the device comprising a housing adapted to be secured to the lifting mechanism, and attachment means mounted within said housing, the attachment means including an elongate body portion adapted to project from the housing and being movable axially relative to the housing, the outer end of the body portion having mounted thereto at least one locking portion pivotal relative to the body portion between a rest position in which it forms substantially a continuation of the body portion and an operative position in which it projects beyond the radial confines of the body portion, the arrangement being such that, with the housing substantially aligned with the aperture in the wall of the container with the or each locking portion of the attachment means in its rest position, the body portion and attached locking portion or portions are moved linearly and axially outwardly relative to the housing to locate the or each locking portion within the container, and the or each locking portion is pivoted to its operative position which is such as to prevent retraction of the body portion and the or each locking portion from within the container.

Although such an attachment device can be used in conjunction with any containers or the like provided with suitable receiving apertures therein, a preferred application of the device of the invention enables attachment of a lifting, manoeuvring or securing mechanism to standard I.S.O. freight containers by way of the end apertures in the conventional upper corner fittings provided on such containers.

Preferably the body portion of the attachment means comprises a hollow spigot to one end of which is pivotally mounted the or each locking portion, a push-rod extending through said spigot to be axially movable relative thereto, a link being provided between one end of the push-rod and the or each locking portion such that, on axial movement of the push-rod relative to the spigot and towards the or each locking portion, the or each locking portion is pivoted from its rest position to its operative position.

Conveniently the other end extent of the spigot projects from the housing and has an external screw-thread formed thereon, a correspondingly threaded hand-nut mounted on said other end extent of the spigot reacting between the spigot and the housing to enable controlled retraction of the

spigot and the or each locking portion relative to the housing whereby the or each locking portion can be locked against the inner face of the wall of the container.

Alternatively, linear movement of the spigot and the or each locking portion may be effected by pneumatically or hydraulically operated means.

In a preferred device, the or each locking portion is provided with abutment surfaces thereon, one to each side of the pivot point of the link with the or each locking portion, such that, with the or each locking portion in its operative position, one of said surfaces lies parallel with, and is urged against, the inner face of the wall of the container, and the other of said surfaces lies parallel with, and is urged against, an associated surface formed at or adjacent the end of the spigot.

The housing of the device may comprise an outer sleeve portion adapted to be secured to the lifting mechanism and in which is mounted an inner sleeve portion the angular position of which relative to said outer sleeve portion can be altered, the attachment means being mounted in the inner sleeve portion to be axially movable but rotatably fixed relative thereto.

Preferably the transverse cross-section of the body portion conforms substantially with the shape of the aperture in the container, while, with the spigot in its fully retracted position relative to the housing, the or each locking portion may be located in a position totally received within the housing or projecting outwardly from said housing.

By way of example only, an embodiment of the invention will now be described in greater detail with reference to the accompanying drawings of which Figs. 1 to 7 are longitudinal sections through a device according to the invention showing the operational sequence thereof.

Referring to the drawings, the illustrated device is primarily intended for attachment to a lifting frame or similar mechanism to enable said mechanism to be interconnected with the end face of a freight container whereby said container can be lifted, tilted or otherwise manoeuvred, or secured.

More particularly, the container includes an upper corner fitting shown in dotted lines and indicated generally at 2, the fitting including an aperture 4 in the end wall thereof. It is however to be appreciated that the device of the invention has application in conjunction with apertures other than in upper corner fittings and other than on freight containers.

The device comprises a housing indicated generally at 6 including an outer tubular sleeve portion 8 for rigid attachment to the lifting mechanism (not shown), and an inner sleeve portion 10 located within the portion 8 and rotatable relative thereto for reasons which will become apparent.

Mounted within the inner sleeve portion 10 is an attachment or locking mechanism indicated generally at 12 and including a hollow elongate spigot 14 axially movable but rotatably fixed relative to the sleeve portion 10. More particularly, a retaining pin 16 mounted in the sleeve portion 10 is received within an axial slot 18 formed in the periphery of the spigot 14 to prevent relative rotation between the components 10 and 14. Clearly other means could be provided to prevent said relative rotation, for example by providing corresponding cross-sections, other than circular, to the spigot 14 and the bore in the sleeve portion 10.

A locking cam 20 is mounted adjacent one end of the spigot 14 to be axially movable therewith but pivotal relative thereto about a pivot pin 22, the cam 20 being provided with upper and lower locking surfaces 24, 26 for reasons which will become apparent.

A push-rod 28 extends through the hollow interior of the spigot 14 to be movable axially relative thereto, a pivotal link 30 being provided between one end of the push-rod 28 and the pivotal cam 20. The other end of the push-rod 28 projects from the other end of the spigot 14 and carries a handle 32.

The other end extent of the spigot 14 projects from the housing 6 and is externally threaded, a correspondingly threaded hand-nut 34 being mounted on said extent outwardly of the housing 6.

The described device operates as follows. The outer sleeve portion 8 of the housing 6 is rigidly secured to the lifting mechanism (not shown) and the lifting mechanism is presented to the corner fitting 2 by appropriate manoeuvring of the lifting frame, the inner sleeve 10 and components mounted therein being rotated if necessary within the outer sleeve 8 to align the locking mechanism 12 with the aperture 4.

The locking mechanism 12 is in the inoperative or rest position shown in Figs. 1 to 4 with the push-rod 28 pulled outwardly away from the cam 20 such that said cam 20 forms a continuation of the spigot 14 and lies within the peripheral envelope of said spigot 14.

The spigot 14 itself is retracted within the housing 6 and the hand-nut 34 is located at the outer end of the screw-threaded extent of the spigot 14 as seen in Fig. 3.

With the front face of the sleeve portion 10 of the housing 6 abutting the front face of the corner fitting 2 and with the locking mechanism 12 aligned with the partially received within the aperture 4 in said fitting, said mechanism 12 is pushed axially towards the corner fitting.

In this position of the locking mechanism 12, the cam 20 is totally within the fitting 2 with its locking surfaces 24, 26 axially beyond the inner face of the end wall of the corner fitting 2.

The push-rod 28 is then pushed axially relative to the spigot 14 towards the corner fitting 2, either manually or by power-assisted means which may be, for example, hydraulically or pneumatically actuated, whereby the link 30 is pivoted, in turn to pivot the cam 20 from its normal rest position to an operative displaced position shown in Fig. 5 in which it projects laterally beyond the confines of the spigot 14 and the aperture 4. In this position of the cam 20, the locking surface 26 lies parallel with and engages an end face of the spigot 14 and the locking surface 24 lies parallel with but spaced from the inner face of the end wall of the corner fitting 2 surrounding the aperture 4, said surface 24 preferably being shaped to conform with the curved configuration of said inner face of the end wall.

The spigot 14 and associated components are then withdrawn relative to the corner fitting, for example manually, pneumatically or hydraulically, until the locking surface 24 of the cam 20 engages the corner fitting 2 as seen in Fig. 6, said co-operation between the cam 20 and the end wall of the corner fitting preventing removal of the device from the corner fitting and thus attaching the lifting frame to the container.

Secure clamping of the device to the corner fitting is effected by rotating the hand-nut 34 on the spigot 14 until it engages the end of the housing 6 and locks the end wall of the corner fitting 2 between the cam 20 and the housing 6.

In order to release the device from the corner fitting, the described operational sequence is reversed.

It will be appreciated that operation of the described device involves linear movement of the locking mechanism between inoperative and operative positions making it ideally suited to remote control. As mentioned above, movement of the various components parts may be effected in various different ways, such as manually, hydraulically, pneumatically or electrically.

The precise construction of the device may differ from that described and illustrated. In particular, the cam 20 may be pivoted between its rest and operative positions other than by a push-rod, for example by a lever attached to the cam.

Although the illustrated device is shown as incorporating a single locking portion in the form of a cam 20 pivotal in a vertical plane about the horizontal pivot pin 22, devices according to the invention may incorporate a plurality of locking portions pivotal in various planes. For example, a pair of barbs may be provided each pivotal in a horizontal plane about a vertical pivot pin to engage opposite side regions of the inner face of the end wall of the associated corner fitting. Clearly, a combination of horizontally and vertically pivotal

locking portions could be provided.

The illustrated device is shown as having a normal rest position in which the cam 20 projects forwardly of the housing 6, which is convenient for initial location purposes of the device relative to a fixed container. Alternatively, the device may have a normal rest position in which the or each locking portion is totally within the housing 6, thus permitting movement of a container closely past the housing 6 prior to location of the locking mechanism within the corner fitting thereof.

The relative rotatability of the sleeve portions 8 and 10 of the housing 6 caters for different height containers and ensures that the locking mechanism can be located in an optimum position relative to the corner fitting prior to initiating the operational sequence.

Although preferred for clamping a lifting frame to the upper corner fittings of a standard freight container, the device of the invention can be used to interconnect, either fixedly as in Fig. 7 or loosely as in Figs. 5 and 6, a lifting or like mechanism with any container or the like provided with a suitable aperture therein.

Claims

1. A device for attaching a lifting, manoeuvring or securing mechanism to a container or the like provided with an aperture (4) through a wall thereof, the device being characterised by a housing (6) adapted to be secured to the lifting mechanism, and attachment means (12) mounted within said housing (6), the attachment means (12) including an elongate body portion (14) adapted to project from the housing (6) and being movable axially relative to the housing (6), the outer end of the body portion (14) having mounted thereto at least one locking portion (20) pivotal relative to the body portion (14) between a rest position in which it forms substantially a continuation of the body portion (14) and an operative position in which it projects beyond the radial confines of the body portion (14), the arrangement being such that, with the housing (6) substantially aligned with the aperture (4) in the wall of the container with the or each locking portion (20) of the attachment means (12) in its rest position, the body portion (14) and attached locking portion or portions (20) are moved linearly and axially outwardly relative to the housing (6) to locate the or each locking portion (20) within the container, and the or each locking portion (20) is pivoted to its operative position which is such as to prevent retraction of the body portion (14) and the or each locking portion (20) from within the container.

2. A device as claimed in claim 1 in which the body portion of the attachment means (12) comprises a hollow spigot (14) to one end of which is pivotally mounted the or each locking portion (20), a push-rod (28) extending through said spigot (14) to be axially movable relative thereto, a link (30) being provided between one end of the push-rod (28) and the or each locking portion (20) such that, on axial movement of the push-rod (28) relative to the spigot (14) and towards the or each locking portion (20), the or each locking portion (20) is pivoted from its rest position to its operative position.

3. A device as claimed in claim 2 in which the other end extent of the spigot (14) projects from the housing (6) and has an external screw-thread formed thereon, a correspondingly threaded hand-nut (34) mounted on said other end extent of the spigot (14) reacting between the spigot (14) and the housing (6) to enable controlled retraction of the spigot (14) and the or each locking portion (20) relative to the housing (6) whereby the or each locking portion (20) can be locked against the inner face of the wall of the container.

4. A device as claimed in claim 2 in which linear movement of the spigot (14) and the or each locking portion (20) is effected by pneumatically or hydraulically operated means.

5. A device as claimed in any one of claims 2 to 4 in which the or each locking portion (20) is provided with abutment surfaces (24,26) thereon, one to each side of the pivot point of the link (30) with the or each locking portion (20), such that, with the or each locking portion (20) in its operative position, one of said surfaces (24) lies parallel with, and is urged against, the inner face of the wall of the container, and the other of said surfaces (26) lies parallel with, and is urged against, an associated surface formed at or adjacent the end of the spigot (14).

6. A device as claimed in any one of claims 1 to 5 in which the housing (6) comprises an outer sleeve portion (8) adapted to be secured to the lifting mechanism and in which is mounted an inner sleeve portion (10) the angular position of which relative to said outer sleeve portion (8) can be altered, the attachment means (12) being mounted in the inner sleeve portion (10) to be axially movable but rotatably fixed relative thereto.

7. A device as claimed in any one of claims 1 to 6 in which the transverse section of the body portion (14) conforms substantially with the shape of the aperture (4) in the container.

FIG. 1

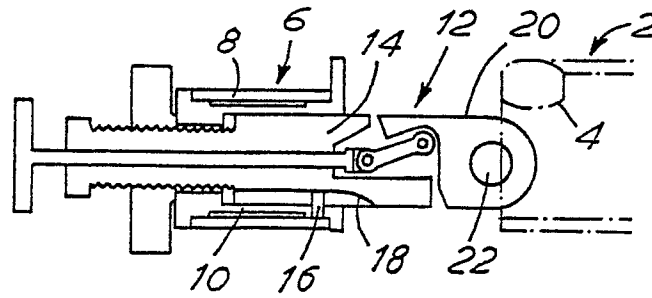


FIG. 2

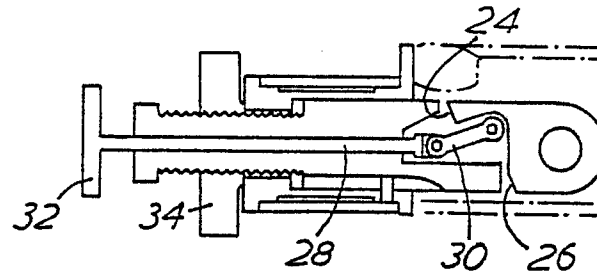


FIG. 3

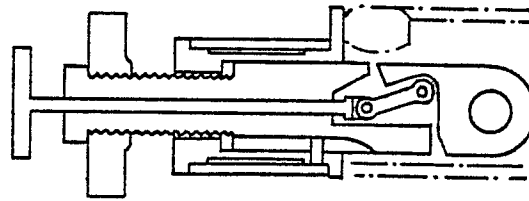


FIG. 4

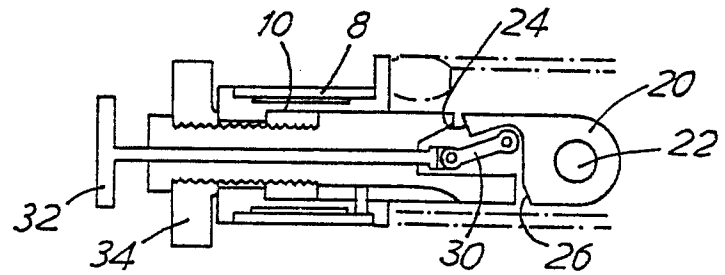


FIG. 5

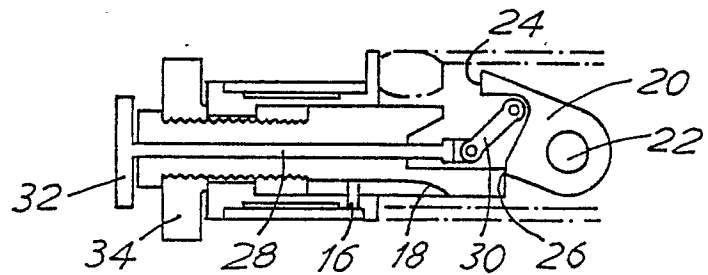


FIG. 6

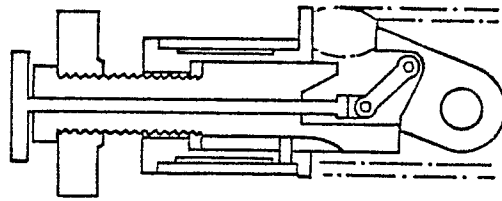


FIG. 7

