TRANSLATION

Locking Arrangement For A Unit Load

The invention relates to an arrangement for locking a unit load, i.e. a container or a flat, to a locking element by means of a locking plate, in accordance with the first part of claim 1.

Such an arrangement is part of the state of the art according to the non-prepublished EP-A2-0 189 054. There, the locking plate is movable in the longitudinal direction of a lower container frame member and projects outwardly from the area of a corner fitting. As with other, conventional locking devices, the locking point is disposed in the vicinity of the front or rear container edge. In order to eliminate the risk of tilting about the respective front or rear container edge in case of vertical accelerations, which must be taken into account in particular with road vehicles, further securing measures in addition to locking by means of two ISO twistlocks must be provided.

It is an object of the present invention to provide aa arrangement by means of which medium-size unit loads may be locked at only two points in such a way that the risk of tilting is eliminated even in case of vertical accelerations.

The solution to this object according to the invention is set forth in claim 1. Accordingly, the locking plate used for fixing to the respective locking element engages a fork-lift opening which is provided on the side of the unit load in spaced relationship from the two corners thereof. The locking plate and the opening are matched to each other such that a wider portion of the locking plate abuts the outer or inner surface of the opening. Since the same locking is provided at both lateral lower frame members of the unit load, the latte is fixed in the transverse direction. Further, since fork-lifting openings regularly provided in containers and flats are utilized for engagement by the locking plate, commonly available unit loads can be locked by said locking plate with-

out requiring special equipment. The unit load will be disposed partly in front of and partly behind the locking point and will thus be secured against tilting about both its front and rear edges. The locking plate may be of simple configuration and inexpensive to manufacture, and at the same time permit easy handling in operation.

Advantageous embodiments of the invention are characterised in the dependent claims. The configuration of claim 2 results in a still safer locking of the unit load even at one locking plate which, in this case, engages behind the outer wall of the fork-lift opening and may be released from that opening by just an upward movement which may be either a purely translational or a tilting motion.

The further developmentsments according to claims 3 to 5 are related to preferred uncomplicated and easy-to-handle configurations of the locking plate. Claim 6 relates to a suitable arrangement of the opening that cooperates with the locking plate, and claims 7 and 8 relate to advantageous shapes of that opening for achieving a secure anchoring. The development of claim 9 results in a particularly easy manufacture and handling of the locking plate.

Preferred embodiments of the invention will be explained below with references to the drawings, in which

Fig. 1 is a perspective view showing a medium-size container secured to a locking element,

Fig. 2 is a partial view of a lower frame member of the container of Fig. 1 with a locking plate being inserted and locked by means of a twist-lock,

Figs. 3 and 4 illustrate other configurations of the locking plate,

Fig. 5 shows another embodiment of the container frame member with a fork-lift opening provided therein for accommodating a locking plate; and

Fig. 6 illustrates another configuration of the locking plate shown in engagement with a fork-lift opening.

The container shown in Fig. 1 includes a frame the individual frame members of which are interconnected by corner fittings. The lower frame members 10 extending in the longi-

tudinal direction of a truck floor indicated in Fig. 1 are penetrated by two fork-lift channels at positions intermediate the corner fittings 9. One of these channels is utilized for fixing the container to locking elements as are provided on loading floors of land crafts for shipping ISO and other large containers.

Fig. 2 is a perspective view showing a portion of a lower frame member 10. The outer wall 11, which is remote from the container, is provided with a rectangular opening 12 having its major length extending in the longitudinal direction of the frame member. In this embodiment, the frame member 10 is constituted by a rectangular tube, and the opening 12 in the wall 11 is aligned with an equal-sized opening 14 in the opposite inner vertical wall; both openings 12 and 14 form channels for the insertion of fork-lift arms. In this case, the top flange of the frame member 10 is provided for static reasons with a reinforcing plate (not illustrated) in the vicinity of the openings 12 and 14.

A locking plate 15 is placed in the opening 12 of the frame member 10. According to Fig. 2 the locking plate 15 has a trapezoidal shape, the rear edge 16 of the locking plate 15 being longer than its front edge 17 and longer than the bottom edge 13 of the opening 12. The portion 15a of the locking plate 15 which projects from the opening 12 is formed with an elongated hole 18 for engagement with a twistlock 19 as provided for securing large containers. Fig. 2 shows the twistlock 19 in its locked position. The front edge 17 of the locking plate 15 is provided with a downwardly bent web 23 the height of which is equal to the spacing between the bottom edge 13 of the opening 12 and the loading floor of the vehicle.

In operation, when the container has been placed onto the loading floor, the rear portion 15b of the locking plate 15 is inserted into the opening 12, wherein the rear edge 16 of the locking plate 15 is aligned with the diagonal of the opening 12, the length of which is slightly larger than the maximum width of the inner portion 15b of the locking plate 15. To facilitate insertion while achieving secure anchoring, the locking plate 15 is rounded off at 24 on its portion 15b engaging

in the opening 12. The locking plate 15 may thus be first inserted into the opening 12 with its rear right-hand tip, as viewed in Fig. 2, and then, in its diagonal orientation, be rotated with the rounded-off portion farther inwards. Then, the locking plate 15 is lowered until it rests on the bottom edge 13 of the opening 12, in passing the hole 18 over the twistlock 19 which is at first in a position rotated about 90° relative to the position illustrated in Fig. 2. By rotating the twistlock 19 to the position shown in Fig. 2, the locking plate 15 is then biassed against the bottom edge 13 of the opening 12 with the web 23 being biassed against the loading floor, whereby the container is locked in place.

Since the fork-lift channel is provided in the longitudinally extending lower container frame member intermediate the two corner fittings, the described type of locking prevents tilting of the container about its front and rear edges. Due to the fact that, as usual, locking in accordance with Fig. 2 is provided also at the opposite longitudinally extending container frame member, the container is secured also against tilting about any longitudinal axis.

In the alternative configuration shown in Fig. 3, the portion 25a of the locking plate 25 which projects from the opening 12 of the container frame member 10 is offset by lateral cut-outs 26 relative to the portion 25b engaging in the opening. In this case both portions of the locking plate may be rectangular, wherein the portion 25a projecting from the opening and provided with the hole 18 is somewhat shorter than the bottom edge 13 of the opening 12, while the other portion 25b is longer than said edge 13 but slightly shorter than the diagonal dimension of the opening 12. To facilitate rotation into the opening 12, the inner portion 25b of the locking plate 25 is again rounded off at 24.

The locking plate 35 shown in Fig. 4 differs from the locking plate 25 of Fig. 3 in that the lateral cut-outs are configurated as slots 36.

Figure 5 shows part of a container frame member 20 in the form of an I-beam having in its central web 21 an opening 22 defining a fork-lift channel. In contrast to Fig. 2, the

opening 22 is provided at its upper edge with a slot 27 of a length exceeding that of the opening 22. In this case, the wider rear portion of the locking plate 15, 25 or 35 may be passed horizontally through the slot 27 and the plate then lowered vertically.

In the modification of Fig. 6, the locking plate 45 has a wider outer portion 45a provided with the hole 18 for engaging the twistlock 19 and a narrower straight portion 45b for insertion into the opening 12. The portion 45b is somewhat smaller, and the portion 45a is wider, than the opening 12. In this case, the container is secured against displacement towards the twist lock 19. Since fork-lift openings 12 are usually provided at corresponding locations on both lower longitudinal container frame members 20, the same locking as shown in Fig. 6 may be performed on the opposite side of the container with the result that the container, just as in the embodiment of Fig. 2, is secured against both movement in either lateral direction and tilting about any transverse axis.

CLAIMS

1. An arrangement for locking a unit load to a locking element (19) by means of a locking plate (15) which has a first portion (15b) for engagement in an opening (12) provided in the lower area of the unit load, and an aperture (18) for engagement with the locking element (19) in its second portion (15a) projecting from said opening (12),

characterized in

that the opening (12) is part of a fork-lift channel extending through a lateral lower frame member (10) of the unit load at a position spaced from the two corners (9) thereof, and

that one of the two portions (15a, 15b) of the locking plate (15) is longer in the longitudinal direction of the frame member (10) than the lower edge (13) of the opening (12).

2. The arrangement of claim 1, characterized in that the first portion (15b) of the locking plate (15) is longer in the longitudinal direction of the frame member (10) than the lower edge (13) of the opening (12), and that the opening (12) and locking plate (15) are shaped such that the locking plate (15) is adapted to be released from its locking position, in which it extends substantially parallel to the bottom plane defined by the unit load, by being lifted relative to the opening (12).

3. The arrangement of claim 2, characterized in that the locking plate (15) has a trapezoidal shape.

4. The arrangement of claim 2, characterized in that the second portion (25a) of the locking plate (25, 35) is set off from the first portion (25b) by lateral cut-outs (26, 36).

5. The arrangement of any of claims 2 to 4, characterized in that the first portion (15b) of the locking plate (15) is chamfered or rounded off (24) on one side.

6. The arrangement of any of claims 2 to 5, characterized in that the opening (12, 22) is formed in the central web (21) of an I-section beam (20).

7. The arrangement of any of claims 2 to 6, characterized in that the upper edge of the opening (22) is formed by a slot (27) the length of which in the longitudinal direction of the frame member (20) exceeds the width of the opening (22).

8. The arrangement of any of claims 2 to 6, characterized in that the interior diagonal dimension of the opening (12) is larger than the maximum width of the locking plate (15).

9. The arrangement of claim 1, characterized in that the first portion (45b) of the locking plate (45) in the longitudinal direction of the frame member (20) is shorter, and its second portion (45a) is longer than the lower edge (13) of the opening (12).