

ARRANGEMENT FOR LOCKING UNIT LOADS

An arrangement for locking unit loads by means of a latch plate in accordance with the preamble part of claim 1 is known from EP-A-189,054. A problem arising with this arrangement is that the locking point is substantially aligned with the front edge of the unit load, so that the latter is insufficiently secured against tilting about the front edge due to decelerations of the transport vehicle. Additional measures are required to prevent such tilting.

The known arrangement further provides that every single unit-load is arrested on two twistlocks or other locking members by means of a corresponding pair of latch plates. In the case of containers whose length - as measured in the direction of travel - is less than the distance between successive pairs of locking members this means that the available loading area cannot be used in an optimum way because there remains some space between every single unit load and the next.

US-A-4,163,425 discloses an arrangement which serves to anchor containers on the loading areas of vehicles, and reference is made to two containers being fixed by means of a common locking device. The arrangement, however, requires specially shaped anchoring elements on the loading area without which it is incapable to couple the containers directly with each other.

DE-B-1,761,766 further discloses a device for coupling two containers which has a latch mechanism shaped symmetrically with respect to the surface common to both containers. In spite of its comparatively expensive construction, however, the known mechanism does not permit unit loads coupled together to be locked at a reference point of the respective loading area. The same disadvantages apply to a further double-sided coupling latch known from US-A-4,431,368.

It is the object of the invention to provide an arrangement which permits two unit loads to be coupled together at minimum expenditure, which enables the coupled entire unit to be locked without tilting to locking elements common with transport vehicles, and simultaneously utilizes the respective available loading area to its optimum.

The solution of this object as provided by the invention is set forth in the characterizing part of claim 1. The symmetrically designed latch plate permits joint coupling of two unitloads disposed in one behind the other to a common locking member. Apart from the fact that the total of required latch plates is reduced and handling during locking is facilitated thereby, the locking point is shifted towards the centre of the overall arrangement due to the joint coupling of two loading units, whereby the overall arrangement is protected from tilting about either transverse edge.

Furthermore two unit loads are respectively disposed directly behind each other so that, other conditions being similar, double-sized spaces remain between successive pairs of loading units which spaces can be better utilized for accommodating other cargo.

The development of the invention as set forth in claim 2 is advantageous in respect of handling, because the latch plate can be completely pushed into the framework member of a container. Claim 3 results in a particularly simple design of the corner region, because the web portion necessary for hooking the loading unit to the latching plate is constituted by the corner fitting itself. The design of the latch plate as set forth in claims 4 to 6 is advantageous when twistlocks are used as locking members, because the upper surface of the latch plate extends parallel to the loading area; at the same time, the latch plate is suitably strengthened in the outer region of the recess encompassing the locking member. The embodiment of the invention as set forth in claim 7 offers the advantage that the latch plate can be inserted after the two

loading units have been pushed together and can be secured, as set forth in claim 8, to the locking member by pivoting, whereby mutual coupling of the two unit loads is brought about at the same time.

Embodiments of the present invention will be described in detail below with reference to the accompanying drawing, in which

Figure 1 is a perspective view of the contiguous corner portions of two mutually aligned containers disposed one behind the other on a loading area provided with a twist lock,

Figure 2 is a horizontal sectional view through Figure 1 showing the latch plate in the outwardly pivoted position, and

Figure 3 is a vertical sectional view along the line III-III in Figure 1, with the twistlock omitted.

The contiguous corner portions of two containers 10, 20 illustrated in Figure 1 are each provided with a corner fitting 11 and 21 of the type known from EP-A-97,269 and similarly also from EP-A-189,054 mentioned above. Each corner fitting 11, 21 includes three mutually orthogonal walls, Figure 1 respectively illustrating the vertical front walls 12, 22 and the lower horizontal walls 13, 23. The likewise vertical third walls 14, 24 of the two corner fittings 11, 21 are seen in the sectional view of Figure 2. The two containers are disposed back-to-back in such a way that the walls 14, 24 of the corner fittings abut one another while the walls 12, 22 are coplanar.

Each of the three walls 12, 13, 14 and 22, 23, 24 of the corner fittings 11 and 21, respectively, is provided with a

quarter-circular cutout the centre of which is located at the (imaginary) tip of the corner fitting. Together, these three cutouts define a corner opening 15, 25. The cutouts defining the corner opening 15, 25 need not be of quarter-circular shape but can have other shapes such as rectangular or square shape.

As shown in the drawing, the bottom framework members 16, 26 extending in longitudinal direction of the container are I-section members each having an upright central web 17, 27, a lower transverse flange 18, 28 and an upper transverse flange 19, 29. The further bottom framework members extending transversely to said framework members 16, 26, and the corner supports of the two containers are not detailed in the drawing.

Each of the longitudinally extending bottom framework members 16, 26 is inserted in part into the respective corner fitting 11 and 21 so as to end behind the respective corner opening 15, 25, and is welded to the inner surfaces of the vertical wall 12, 22 and the lower horizontal wall 13, 23.

Figure 1 also illustrates a twistlock 30 which is disposed on the loading surface on which the two containers 10, 20 are placed. Normally, the twistlock 30 included a base 31 fixed to the loading surface and a head 32 adapted to be rotated about a vertical central axis.

As shown in Figures 1 and 2, the containers 10, 20 are disposed on the loading surface in such a way that the plane S, which is perpendicular to the longitudinal direction of the framework members 16, 26 and in which the walls 14, 24 of the two corner fittings 11, 21 abut each other, passes through the centre of the twistlock 30, and the plane in which the two walls 12, 22 of the corner fittings 11, 21 are mutually aligned is disposed somewhat behind the twistlock 30.

The drawing also shows a latch plate 33 which includes a central latching portion 34 having an elongated recess 35 and

arms 36, 46 extending from either side and each having an outer hook portion 37, 47. The central latching portion 34, the two arms 36, 46 and the outer hook portions 37, 47 constitute a continuous rectilinear rear edge 38 which extends longitudinally of the framework members 16, 26 when the latch plate 33 is in one of its positions shown in the drawing.

The latch plate 33 is of symmetrical design in respect of its centre plane, said centre plane coinciding with the above-mentioned plane S in the latching position illustrated in Figure 2.

In the latching position of Figure 2, in which the main surface of the latching plate 33 is horizontal, the central latching portion 34 projects laterally from the common opening defined by the corner openings 15, 25 of the two corner fittings 11, 21. The recess 35 overlaps the base 31 of the twistlock 30 whose head 32 has been rotated to a position which is perpendicular to the base 31, whereby the latch plate 33 is locked relative to the loading surface.

The illustrated twistlock 30 is of the type used for corner fittings as specified in ISO 1161 on container vehicles and container ships. Accordingly, the shape of the recess 35 is matched with such corner fittings as specified in ISO 1161.

In the latching position illustrated on Figure 2 the two arms 36, 46 of the latch plate 33 rest on the bottom transverse flanges 18, 28 of the framework members 16, 26 and the hook portions 37, 47 engage behind the bottom web portions 12A, 22A of the vertical walls 12, 22 of the corner fittings 11, 21. Thereby the two containers are hooked to the latch plate 33 and coupled to each other.

As will be apparent from Figure 2, the latch plate 33 is designed in accordance with the corner fittings 11, 21 such that there is only little clearance for any movement of the containers 10, 20 in longitudinal direction. Although the arms 36, 46 are shown to be narrower than the space left

between the web portions 12A, 22A of the corner fittings 11, 21 and the vertical central webs 17, 27 of the framework members 16, 26 any movement of the containers 10, 20 in transverse direction is prevented by the fact that similar locking is provided at the corresponding location on the opposite side of the containers 10, 20.

Figure 3 shows the latch plate 33 in dashed lines in the latching position of Figure 2 (but without twistlock) and in full lines in a vertical position which is pivoted relative thereto by 90°. In order to permit such pivoting the outer contour of the central latching portion 34 of the latch plate 33 is designed such that it fits through the semi-circular (in Figure 2) section defined by the two corner openings 15, 25 of the corner fittings 11, 21.

In the released vertical position, which is illustrated in full lines in Figure 3, the latch plate 33 can be displaced in the longitudinal direction of the framework members 16, 26, for instance to the position shown in Figure 1, in which it may be removed from the framework member 16. To this end the space, which is defined by the two transverse flanges 18, 19 and the upright central web 17 of the framework member 16 and is disposed to the right of the web portion 12A, is exposed to the outside at least along the length of the latch plate 33.

In a modification it may be useful to expose this space to the outside only over a short length so that the latch plate 33 can be handled merely for being displaced while measures are provided for captively retaining the latch plate 33 in its released condition within the framework member 16.

It will also be apparent from the drawing that the recess 35 provided in the latching portion 34 of the latch plate 33 is defined on the outside thereof by a strip of material 39 welded to the latch plate 33. In the horizontal latching position illustrated in dashed lines in Figure 3, the strip of material 39 defines a downwardly directed pro-

jection having a height equal to the sum of the thickness of the material of the bottom transverse flange 18 of the framework member 16 and the thickness of the bottom wall 13 of the corner fitting 11. Therefore the upper surface of the latch plate 33 is horizontal in the latching position when the lower surface of the strip of material 39 rests on the loading surface 40 indicated in Figure 3.

In order to provide for free movement of the latch plate 33 in the released position within the framework member 16 (or 26) the maximum width of the plate, which as shown in Figure 2 is in the vicinity of the latching portion 34, must be less than the clear height of the central web 17, and the clear spacing between the web portion 12A and the central web 17 must be larger than the maximum thickness of the latch plate 33, i.e. larger than the width of the strip of material 39 which constitutes the enlargement.

In the above-described embodiment the invention has been explained with reference to the mutual coupling and locking of containers. The same measures may also be provided for transport platforms or other kinds of unit loads.



Claims

1. An arrangement for locking unit loads (10, 20), the lower frame members (16, 26) of which are connected via corner fittings (11, 21) each having a corner opening (15, 25), to a locking member (30) by means of a latch plate (33) movable longitudinally of a frame member (16), the latch plate (33) including a latching portion (34) adapted to be extended from the corner opening (15, 25) of a corner fitting (11, 21) and having a recess (35) for engaging the locking member (30), and a hook portion (37, 47) which, in the latching position of the latch plate, engages behind a web portion (12A, 22A) of the unit load (10, 20),

characterised in that, in the latching position, the plane (S) of the latch plate (33), that passes through the centre of the recess (35) and extends perpendicularly to the direction of movement, is in alignment with the outer transverse face of the corner fitting (11, 21), and that the latch plate (33) is formed essentially symmetrically with respect to this plane (S).

2. The arrangement of claim 1, characterised in that the frame members (16, 26) have I-shaped sections with an upright central web (17, 27), and that the maximum width of the latch plate (33) is less than the clear height of the central web (17, 27).

3. The arrangement of claim 2, characterised in that the web portion (12A, 22A) is a part (12, 22) of the corner fitting (11, 21) that overlaps the outer flange edges of the I-section frame member (16, 26).



4. The arrangement of claim 2 or 3, characterised in that the latching portion (34) of the latch plate (33) is provided, at the edge thereof which is the outer one in the latching position, with a downward projection having a height equal to the sum of the thicknesses of the lower I-section flange (18, 28) and the lower wall (13, 23) of the corner fitting (11, 21) and that the clear spacing between the web portion (12A, 22A) and the I-section central web (17, 27) is larger than the total thickness of the latching plate (33) in the vicinity of the projection.

5. The arrangement of claim 4, characterised in that the projection is constituted by a strip of material (39) welded to the latching portion (34).

6. The arrangement of claim 5, characterised in that the strip of material (39) confines the recess (35) outwardly.

7. The arrangement of any one of claims 2 to 6, characterised in that the space defined by the central web (17, 27) and the flanges (18, 19, 28, 29) of the I-section frame member (16, 26) at the outer side of the unit load (10, 20) adjacent the web portion (12A, 22A) is exposed along a length which corresponds at least to that of the latch plate (33).

8. The arrangement of any one of claims 1 to 7, characterised in that the corner opening (15, 25) and the latching portion (34) of the latch plate (33) are designed such that the latch plate (33) can be pivoted between its latching position and a position which is substantially perpendicular thereto.

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