

**PALLET-LIKE BASE FRAME FOR A TRANSPORT AND STORAGE
CONTAINER AND TRANSPORT AND STORAGE CONTAINER
COMPRISING SUCH A BASE FRAME**

5 The present invention relates to a pallet-like base frame for a transport and storage container for liquids and to a transport and storage container comprising such a base frame, the base frame having a base for supporting an inner container accommodated in a metal outer jacket, which is preferably a cage, corner legs, and middle legs.

10 A pallet-like base frame for a transport and storage container is known from EP 2 426 067 A1, said base frame having a base for supporting an inner container of the transport and storage container, which is connected via corner and middle legs to a base frame, which forms a ground contact surface of the transport and storage container. All components of
15 the known pallet-like base frame are made of metal, so the base frame is characterized by particular stability.

Furthermore, the known pallet-like base frame serves as a base frame for transport and storage containers which have an inner container accommodated in an outer jacket on the base of the base frame and can be dis-
20 posed on top of one another in a stack, the base frame, which is a tubular frame, enabling easy access to the spaces formed between the stacked transport and storage containers although they are stacked.

However, the particular robustness of the known base frame, which is particularly advantageous in terms of the long service life of the known
25 pallet-like base frame, can lead to increased wear in contact with conveyor equipment, which is often in the form of conveyor rollers, conveyor belts or the like, which is why, in order to reduce wear, a switch has been made to using base frames made entirely of plastic or base

frames which have both components made of a plastic material and components made of metal.

A composite pallet of this type is known from WO 2007/087857 A1, which is provided with a metal base, which is connected to a base frame or runners made of plastic via corner and middle legs made of plastic. The use of plastic enables low-wear contact between the pallet-like base frame and a conveyor system. Nevertheless, the known pallet-like base frame is less robust due to the plastic material used. Furthermore, it has been found that contact of the plastic material with a conveyor device can easily result in abrasive wear of the plastic material due to friction, so the pallet-like base frame is subject to progressive wear when used in conveyor devices. In addition, the removed plastic material can contaminate an environment of the conveyor device in question in an undesirable manner, for example in the form of what is referred to as microplastics.

Therefore, the object of the present invention is to propose a pallet-like base frame and a transport and storage container comprising such a base frame which has a high stability or great robustness while enabling conveying on a conveying device with as little wear as possible.

This object is attained by a pallet-like base frame having the features of claim 1 and a transport and storage container having the features of claim 20.

The pallet-like base frame for a transport and storage container for liquids comprises a base for supporting an inner container accommodated in a metal outer jacket, which is preferably a cage, corner legs, and middle legs, wherein the corner legs and the middle legs are disposed on runners and connect the runners to the base, the runners each forming a ground contact surface and being made of sheet metal.

According to the invention, it is therefore provided that the ground contact surface of the base frame is made of metal or sheet metal. The fact

that the pallet-like base frame rests on a ground via runners means that the ground contact surface of the base frame is many times larger than would be the case with a base frame with a surrounding metal tube or a frame profile. In this case, the weight of the transport and storage container is distributed across a large area of the ground contact surface, resulting in a comparatively lower contact force per unit area and enabling low-wear conveying of the pallet-like base frame with a conveyor system. In addition, unwanted abrasion of plastic material on the pallet-like base frame can be avoided. The corner legs, the middle legs and/or the base can basically be made of any suitable material, such as wood, plastic or the like.

The runners can be provided with stiffening corrugations extending along the runners, and the stiffening corrugations can form lower flanges that form the ground contact surface. The stiffening corrugations can basically be of any shape relative to a cross section of the runner in question and can extend along the runners or in the direction of a longitudinal axis of the runner in question. One or a plurality of stiffening corrugations, for example three stiffening corrugations, can be formed. The stiffening corrugations can run essentially along the entire length of the runner in question or only along part of the runner in question. The lower flanges can run flat or parallel to a ground or the base of the base frame so that the ground contact surface formed by the lower flanges of the runners is as large as possible.

The stiffening corrugations can be provided with webs that run between the upper flanges and the lower flanges of the stiffening corrugations. The upper flanges can basically have any cross-sectional shape, as they do not primarily serve to come into contact with a surface. The webs can extend in a straight or curved shape between the upper flanges and the lower flanges. The upper flanges and the lower flanges together with the webs can be trapezoidal, arched or undulated relative to a cross section of the runner in question. A transition between the webs, the upper

flanges and the lower flanges can present a radius. When shaped in this manner, the runners can be made from a comparatively thin metal sheet that is particularly light and resistant to bending.

The runners can at least partially have an edge web. Longitudinal edges
5 of the runners can be formed by lower flanges, in which case an edge web can also be formed on the lower flanges. The edge web can run along the entire length of a runner or only along part thereof. It is also possible for the edge web to be interrupted in sections.

The runners can have, at least in sections, a traversable sill and/or a
10 ramp, where the height of the runner in question above the ground contact surface is reduced. In this case, the height of the runner in question above a surface can be reduced in such a manner that a conveyor means, such as a pallet truck, can easily drive over the runner. If the runners have an edge web, the latter can be interrupted in the area of the travers-
15 able sill. Alternatively or additionally, a ramp can be formed on the runner so that the conveyor means can be moved over the runner more easily. The traversable sill can also be formed by the fact that any stiffening corrugations present in the area of the traversable sill are comparatively low. For example, stiffening corrugations that have a reduced height in
20 the area of the traversable sill can be provided.

The corner legs, the middle legs and/or the base can be made of metal. If the corner legs and the middle legs are also made of metal, the pallet-like base frame is particularly robust and stable. The pallet-like base frame can also be free of plastic material.

25 The runners can each have weld projections and/or through holes of a screwed connection to the corner legs and the middle legs. Each of the runners can have a plurality of weld projections. The weld projections can be embossed into the sheet metal of the runners. In particular, the weld projections can be formed at the respective ends of the runners and,
30 if necessary, in a middle area of the runners, for example for a

connection to corner legs and/or middle legs. This also makes it possible to simply weld the runners to the corner legs and/or the middle legs in particular. Alternatively or additionally, it is also possible for the corner legs and the middle legs to be connected to the runners using screws.

- 5 This is particularly advantageous if the corner legs and the middle legs are not made of metal.

The corner legs, the middle legs and/or the runners can be designed as one-piece deep-drawn bodies made of sheet metal. This allows the number of parts of the base frame to be reduced as far as possible. The corner legs, the middle legs and the runners can also be produced cost-effectively in large quantities by deep-drawing sheet metal.

The runners can be symmetrical. This makes it possible to further reduce the number of different parts of the base frame and simplify the assembly of the base frame. The runners can each be axially symmetrical or point-symmetrical so that a runner can be positioned in any manner relative to a middle leg or a corner leg, for example. In this case, the runners can also of an identical design, regardless of whether the runner in question is mounted on a particular side of the base frame. Alternatively, the runners can also be asymmetrical.

- 20 The base frame can have two outer runners only or one middle runner and two outer runners. The middle runner and the two outer runners can be disposed parallel to each other. The middle runner can then be disposed between the two outer runners. If the runners are symmetrical, the two outer runners can be designed identically. This simplifies the manufacture of the base frame.

The middle runner can form a central leg of the base frame. The central leg can be formed, for example, by embossing the central leg into the middle runner. In this case, the middle runner can have an arched or roof-shaped central leg in its center. For example, the central leg can be formed by two flanks which deviate from a longitudinal extension of the

middle runner and thus form a U- or V-shaped elevation of the middle runner.

Two opposing middle legs can be connected to each other via a base traverse or the base traverse can form the two opposing middle legs. The base traverse can be formed in the manner of a runner as a one-piece deep-drawn body made of sheet metal and have stiffening corrugations. The base traverse can be configured in such a manner that it connects two opposing middle legs, which in turn are one-piece deep-drawn bodies made of sheet metal. In this case, the base traverse is comparatively flat. Alternatively, the base traverse can form the two opposing middle legs if the base traverse has middle-leg bodies at its respective longitudinal ends, the middle-leg bodies themselves having a U-shaped or V-shaped cross section relative to a longitudinal axis of the middle runner. In this case, the middle leg in question can have a base wall, an outer flank wall and an inner flank wall. The base wall and the flank walls can be formed at axial end regions of the middle leg in a plane transverse to a longitudinal axis of the middle leg and form a U-shaped edge web.

A central leg of the base frame can be detachably connected directly to the base traverse. A bowl-shaped recess which extends in the direction of the central leg can be formed in the base traverse. This allows the weight of the inner container to be advantageously transferred to the middle leg via the base traverse. The detachable connection can be a screwed connection, for example. The screwed connection can be simply formed by a single, central sheet-metal screw.

It is therefore also advantageous if a form-fitting rotation lock is formed between the central leg and the base traverse. In this case, the middle runner, which is screwed to the base traverse, can be prevented from moving or rotating relative to the base traverse. A position of the middle runner relative to the base traverse can be securely fixed so that the middle runner can be pre-assembled with the base traverse. The rotation lock can be cost-effectively formed, for example, by tabs formed in the

middle runner and engaging holes in the base traverse or vice versa. The tabs can be formed by embossing and the holes can be formed by punching. If the middle runner and the base traverse are produced by deep-drawing, the tabs or the holes can be formed during deep-drawing without an additional step.

The middle runner can be welded to a middle leg and screwed directly to a bowl-shaped middle leg formed opposite thereof by the base. The middle runner can be welded to the middle leg by resistance butt welding, for example. In this case, the middle leg can be permanently fixed to one end of the middle runner so that the middle runner and the middle leg together form a module of the base. If the base has a bowl-shaped middle leg, i.e., the middle leg is molded into the base, the base or the middle leg formed therein can simply be screwed to the middle runner when assembling the base frame.

The outer runners can be welded to the corner legs and/or the middle legs. For example, the outer runners can be welded by resistance butt welding. The outer runners can be connected to the corner legs by means of, for example, two, preferably four, weld spots. The corner legs can thus be securely and immovably disposed on the outer runners. Furthermore, the middle legs can also be welded to the outer runners by means of at least two weld spots. If the middle legs are formed by a base traverse, a component group consisting of the corner legs, the middle legs and the outer runners can be formed, which can be formed and handled in just a few steps as part of a manufacturing process for the base frame.

Furthermore, the connections of the base to the corner legs and the middle legs can be detachable connections. In this case, the base frame can be composed of two to three modules, which are joined in a final assembly step to form the base frame. For example, one module can be composed of outer runners with corner legs, middle legs and a base traverse, another module can be composed of a middle runner with a middle leg, and a third module can be formed by the base, in which case the base can

also form a middle leg. If the connections between the corner legs, the middle legs and the runners are formed by welding, the corner legs and the middle legs can be precisely positioned or fixed in their intended position for being connected to the base. This makes it easy to screw the
5 base to the corner legs and the middle legs in a final assembly step. This screwing step can also be carried out in such a manner that an outer jacket of a transport and storage container is screwed with these screws at the same time.

The runners can form the corner legs and/or the middle legs of the base
10 frame. In this case, it is no longer necessary to connect the corner legs and/or the middle legs to the runners. The corner legs and/or the middle legs can be formed, for example, by embossing the corner legs and/or the middle legs into outer runners. In this case, the runner in question can have an arched or roof-shaped middle leg in its center. For example, the
15 corner legs can each be formed by two flanks which deviate from a longitudinal extension of the runner and thus form a U- or V-shaped elevation of the runner.

Outer edges of the ground contact surface of the runners can be configured in such a manner that the outer edges are at least partially over-
20 lapped laterally by the corner legs and the base frame can be inserted with the outer edges inside an inner edge of an upper frame profile of the outer jacket of the transport and storage container. In this case, the base frame is configured in such a manner that a transport and storage container provided with the base frame can be stacked with other transport
25 and storage containers of essentially the same type. The runners can be configured in such a manner that an upper transport and storage container is centered on a lower transport and storage container or the base frame of the upper transport and storage container is centered on an upper frame profile of the lower transport and storage container. Since the
30 runners can be at least partially inserted within the inner edge of the upper frame profile, horizontal movement of the upper transport and

storage container on the lower transport and storage container can essentially be prevented. Accordingly, the runners fit inside the inner edges with their outer edges in such a manner that a form fit can be achieved in a horizontal direction.

- 5 The transport and storage container for liquids according to the invention comprises a plastic inner container having four side walls, a lower and an upper bottom, a closable filling neck formed on the upper bottom and a discharge port formed on the lower portion of a side wall and having a tap fitting and a metal outer jacket, which is preferably a cage, for
10 receiving the inner container and a pallet-like base frame according to the invention. Further embodiments of a transport and storage container are apparent from the descriptions of features of the claims dependent on claim 1.

Hereinafter, a preferred embodiment of the invention is explained in
15 more detail with reference to the drawings.

- Fig. 1** is an isometric illustration of an embodiment of a transport and storage container;
- Fig. 2** is an isometric illustration of a module of a base frame of the transport and storage container of **Fig. 1**;
- 20 **Fig. 3** is an isometric illustration showing a bottom view of the base frame of **Fig. 1**;
- Fig. 4** is an isometric illustration of an outer runner des base frame of **Fig. 3**;
- Fig. 5** is an isometric illustration of a middle runner of the base
25 frame of **Fig. 3**;
- Fig. 6** is a detail view of the middle runner of **Fig. 5**;
- Fig. 7** is a cross-sectional view of the middle runner of **Fig. 5**;

Fig. 8 is a cross-sectional view of the der outer runner of **Fig. 4**;

Fig. 9 is a detail view of the base frame of **Fig. 3**;

Fig. 10 is a second detail view of the base frame of **Fig. 3**;

Fig. 11 is a third detail view of the base frame of **Fig. 3**;

5 **Fig. 12** is a fourth detail view of the base frame of **Fig. 3**;

Fig. 13 is a sectional view of the base frame of **Fig. 3**;

Fig. 14 is a sectional view of a stack of transport and storage container according to **Fig. 1**.

A combined view of **Figs. 1** to **14** shows a transport and storage container 10 for liquids with a pallet-like base frame 11. The transport and storage container 10 has a plastic inner container 12 with four side walls 13, 14, 15, 16, a lower bottom 17 and an upper bottom 18, a closable filling neck 19 formed on the upper bottom 18 and a discharge port 20 formed on the lower portion of a side wall 13 and having a tap fitting 21 and a metal outer jacket 23, which is a cage 22 and serves to accommodate the inner container 12 and the pallet-like base frame 11. The outer jacket 23 has an upper frame profile 24 and a lower frame profile 25, which is screwed to the pallet-like base frame 11.

Fig. 3 shows a bottom view of the base frame 11, which is composed of a base 26 for supporting the inner container 12 accommodated in the outer jacket 23, corner legs 27, middle legs 28, 29, 30, a central leg 31, two outer runners 32, a middle runner 33 and a base traverse 34. The base frame 11 is made entirely of metal in the case at hand. **Fig. 2** shows an assembly module 35, which does not include the base 26.

25 A combined view of **Figs. 4** and **8** shows one of the outer runners 32, which has stiffening corrugations 36 with webs 27. The webs 37 run between upper flanges 38 and lower flanges 39 of the stiffening

corrugations 36. The lower flanges 39 each form a ground contact surface 40 of the base frame 11, which usually comes into contact with a ground (not shown). Furthermore, the outer runner 32 has an edge web 41 in sections. A height of the outer runner 32 above the ground contact surface 40 is reduced in a portion 42. The edge web 41 is also interrupted in portion 42. Portion 42 thus forms a traversable sill 43 for a lift truck, for example. Furthermore, weld projections 44 and 45 for forming a welded connection with the corner legs 27 and the middle legs 28, respectively, are formed in the outer runner 32.

A combined view of **Figs. 5, 6** and **7** shows the middle runner 33, which also has stiffening corrugations 46. Here too, webs 47 run between upper flanges 48 and lower flanges 49, which in turn form the ground contact surface 40 of the base frame 11. In a portion 50, a height of the middle runner 33 is reduced compared to the ground contact surface 40 with the result that a traversable sill 51 is formed. Furthermore, the middle runner 33 has weld projections 52, which serve to weld the middle runner 33 to the middle leg 29. Moreover, the middle runner 33 forms the U-shaped central leg 31. The central leg 31 is formed by two flanks 53 of the middle runner 33, which extend towards a horizontal portion 54. Tabs 55 and a central through hole 56 are formed in the horizontal portion 54 or the upper flanges 48.

Fig. 9 shows the corner foot 27 with the outer runner 32 in an assembly configuration with weld spots 57 formed at the weld projections 44.

Fig. 10 shows the outer runner 32 with a middle leg 28 which, like the opposite middle leg 28, is formed in one piece by the base traverse 34. Here, weld projections 45 are connected to the middle leg 28 by weld spots 58.

Fig. 11 shows the middle runner 33 in an assembly configuration with the middle leg 29, which is formed in one piece here. Here, weld

projections 52 of the middle runner 33 are connected to the middle leg 29 via weld spots 59.

Fig. 12 shows an assembly configuration of the middle runner 33 with the base 26, the base 26 having the bowl-shaped middle leg 30 embossed
 5 into the base 26. Here, a screwed connection 60 is formed between the middle runner 33 and the middle leg 30 using a screw (not shown). Furthermore, the base 26 is also screwed to the corner legs 27 and the middle legs 28 and 29.

Fig. 13 shows a cross-sectional view of the middle runner 33 on the horizontal portion 54 together with the base traverse 34 in an assembly configuration. The base traverse 34 has an arch 61 facing away from the base 26. Two through holes 62, into which the tabs 55 are inserted, are formed in the base traverse 34. Furthermore, a screw 63 is screwed into a protuberance 64 in a center of the base traverse 34 through the through
 10 hole 56 of the middle runner 33. Since the tabs 55 are inserted into the through holes 62, a form-fitting rotation lock 65 is formed.

Fig. 14 shows a partial sectional view of a stack 66 of transport and storage containers 10. In particular, outer edges 67 of the ground contact surface 40 are formed in such a manner that the latter is inserted within
 20 an inner edge 68 of the upper frame profile 24. The upper frame profile 24 or its flattened top 69 serves here to support an underside 70 of the core legs 27 or the middle legs 28 and 29.

Claims

1. A pallet like base frame (11) for a transport and storage container (10) for liquids, the base frame comprising a base (26) for supporting an inner container (12) accommodated in a metal outer jacket (23), which is preferably a cage (22), corner legs (27), and middle legs (28, 29, 30),
characterized in that
the corner legs and the middle legs are disposed on runners (32, 33) and connect the runners to the base, the runners each forming a ground contact surface (40) and being made of sheet metal.
2. The base frame according to claim 1,
characterized in that
the runners (32, 33) have stiffening corrugations extending along the runners (36, 46), the stiffening corrugations forming lower flanges (39, 49) which form the ground contact surface (40).
3. The base frame according to claim 2,
characterized in that
the stiffening corrugations (36, 46) have webs (37, 47) extending between upper flanges (38, 48) and the lower flanges (39, 49) of the stiffening corrugations.
4. The base frame according to any one of the preceding claims,
characterized in that
the runners (32, 33) at least partially have an edge web (41).
5. The base frame according to any one of the preceding claims,
characterized in that

the runners (32, 33) have, at least in sections, a traversable sill (43, 51) and/or a ramp, where the height of the runner in question above the ground contact surface (40) is reduced.

6. The base frame according to any one of the preceding claims,
5 characterized in that
the corner legs, the middle legs and/or the base are made of metal.
7. The base frame according to any one of the preceding claims,
characterized in that
the runners (32, 33) each have weld projections (44, 45, 52) and/or
10 through holes of a screw connection with the corner legs and the
middle legs.
8. The base frame according to any one of the preceding claims,
characterized in that
the corner legs (27) and/or the runners (32, 33) are one-piece deep-
15 drawn bodies made of sheet metal.
9. The base frame according to any one of the preceding claims,
characterized in that
the runners (32, 33) are symmetrical.
10. The base frame according to any one of the preceding claims,
20 characterized in that
the base frame (11) has two outer runners (32) or a middle runner (33) and two outer runners (32).
11. The base frame according to claim 10,
characterized in that

the middle runner (33) forms a central leg (31) of the base frame (11).

12. The base frame according to claim 10 or 11,
characterized in that
5 two opposite middle legs are connected via a base traverse, or the
base traverse (24) forms the two opposite middle legs (28).
13. The base frame according to claim 12,
characterized in that
a central leg (31) of the base frame (11) is detachably connected di-
10 rectly to the base traverse (24).
14. The base frame according to claim 13,
characterized in that
a form-fitting rotation lock (65) is formed between the central
leg (31) and the base traverse (24).
- 15 15. The base frame according to any one of claims 10 to 14,
characterized in that
the middle runner (33) is welded to a middle leg (29) and directly
screwed to a bowl-shaped middle leg (30) opposite thereto formed by
the base (26).
- 20 16. The base frame according to any one of claims 10 to 15,
characterized in that
the outer runners (32) are welded to the corner legs (27) and/or the
middle legs (28).
- 25 17. The base frame according to any one of the preceding claims,
characterized in that

the connections between the base (26) and the corner legs (273) and the middle legs (28, 29, 30) are severable connections.

18. The base frame according to any one of claims 1 to 6,
characterized in that
5 the runners form the corner legs and/or the middle legs of the base.
19. The base frame according to any one of the preceding claims,
characterized in that
outer edges (67) of the ground contact surface (40) of the run-
ners (32, 33) are configured in such a manner that the corner
10 legs (27) at least partially protrude laterally over the outer edges and
the base frame (11) can be inserted with the outer edges inside an in-
ner edge (68) of an upper frame profile (24) of the outer jacket (23)
of the transport and storage container (10).
20. A transport and storage container (10) for liquids, the transport and
15 storage container (10) comprising a plastic inner container (12) hav-
ing four side walls (13, 14, 15, 16), a lower and an upper bottom (17,
18), a closable filling neck (19) formed on the upper bottom, and a
discharge port (20) formed on a lower portion of a side wall (13) and
having a tap fitting (21), and a metal outer jacket, which is prefera-
20 bly a cage (22), for accommodating the inner container, and a plate-
like base frame (11) according to any one of the preceding claims.