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The following information is taken from the documents submitted by the applicant

(54) Title: **Stackable container**

(57) Main claim: The stackable container (100) having a base part (1) and a cover (2) pivotable about an axis A on the base part (1), wherein the base part (1) has at least one standing foot for placing the container on a surface or on a cover (2') of another, similar container (100'), and wherein the container (100) has at least one separate support element (11) that, upon placing the first container (100) on the other container (100'), engages in an engagement structure of the other container (100') and thereby inhibits a displacement of the first container (100) relative to the second container (100') in at least one direction vertical to the stacking direction, characterized in that the support element is designed in such a way that, upon placing the container (100) on a flat surface, no mechanical contact results between the support element and the surface.

Description

[0001] The invention relates to a stackable container according to the preamble of claim 1. Such containers can be used, for example, to accommodate electric hand tools or also consumable materials in the trade environment. In particular on construction sites, a large number of different tools such as jigsaws, cordless screwdrivers, hammer drills or circular saws are often used which generally always must first be loaded into a vehicle, then transported to the particular construction site, and subsequently brought to their particular place of use on the construction site - or to a temporary storage space provided there, for example a lockable container or the like. In the past, it has proven advantageous in this regard to design the containers in such a way that they can be stacked on top of each other and, if necessary, also locked. In this way, assemblies of similar containers can be formed which can be easily transported together and stored stacked.

[0002] A corresponding container is described in European Patent EP 2 313 321 B1. The arrangement disclosed in the aforementioned document is characterized in particular by the fact that at least two containers are stacked in such a way that two front and two rear standing feet of a top container engage in corresponding recesses of a bottom container, and the two rear standing feet interact with the rear recesses in the cover of the bottom container in such a way that a hinge effect results, and the top container can be placed on the bottom container by first inserting the top container - slightly raised at the front - by its rear standing feet into the corresponding recesses in the cover of the bottom container and then lowering the front part of the top container onto the front part of the bottom container by pivoting about the pivot axis formed in this way. In the process, the front standing feet of the top container, designed as centering elements, come into engagement with the corresponding recesses in the cover of the bottom container and thereby secure the top container against slipping. However, one of the disadvantages of the dual functionality of the front standing/centering feet is that the standing feet usually under considerable mechanical stress are subject to a certain wear or damage over time. In this case, situations can arise in which the desired centering functionality is no longer guaranteed.

[0003] In addition, the aforementioned document discloses a twist lock on the front face of the

container which can optionally be used to lock two containers against each other or merely to close one container. Due to the structural design of the twist lock, however, only a limited pre-tension can be applied thereby so that reliable closing of a container or secure locking of two containers against each other is not always feasible.

[0004] Based on the above-described prior art, the object of the present invention is to present a container which has mechanically robust devices for centering with respect to similar containers, and which can be reliably closed or locked with other containers.

[0005] This object is achieved by the devices with the features listed in the independent claims. The dependent claims concern advantageous embodiments and variants of the invention.

[0006] The stackable container according to the invention shows a base part and a cover pivotable on the base part about an axis A, wherein the base part has at least one standing foot for placing the container on a surface or on a cover of another, similar container. Furthermore, the container has at least one separate support element which, upon placing the first container on the other container, engages in an engagement structure of the other container and thereby inhibits displacement of the first container relative to the second container in at least one direction vertical to the stacking direction. The support element is designed in such a way that no mechanical contact results between the support element and the surface when the container is placed on a flat surface.

[0007] In other words, the support element serves exclusively to support the top container relative to the bottom container in such a way that a slippage or displacement of the two containers relative to one another in a spatial direction vertical to the stacking direction of the containers, i.e. the vertical direction, is inhibited or prevented at a fixed point at the latest. The support element functioning as a standing foot is not provided. By this measure according to the invention, it is prevented that the support element is exposed to increased mechanical stress and therefore the risk of damage. In addition, new design possibilities arise for the design of the underside of the support element, i.e. the side that faces the lower of the two containers when stacking two containers on top of each other. In

particular, the underside of the support element can be designed open since there is no need for a standing surface on the underside of the support element.

[0008] If the support element is arranged in a bottom part of the container, a particularly efficient protection of the support element against mechanical stress while simultaneously maintaining the desired support functionality can be achieved in that the underside of the support element is recessed by 3 to 5 mm, in particular by 4 mm, in relation to the plane in which the undersides of at least three standing feet are located.

[0009] In a variant of the invention, the at least one support element can be designed such that, upon placing the container on another container of the same type, it inhibits the displacement of the top container relative the bottom container only in a first direction.

[0010] In another embodiment of the invention, a certain centering function beyond mere support can be achieved in that the at least one support element is designed such that it inhibits the displacement of the top container relative to the bottom container in a first and a second direction upon placing the container on another, similar container.

[0011] In this regard, the referenced centering can be further improved in particular by the first and second directions being perpendicular to one another; for this purpose, the support element can in particular have an L-shaped geometry.

[0012] The support element can be designed as a stub-shaped centering element; alternatively, the support element can also be designed as a circumferential rib.

[0013] In an advantageous further development of the invention, the circumferential rib can be designed in the form of a hollow profile with a rectangular cross-section, wherein a web runs along a diagonal in the interior of the rib. In this way, a material-saving and yet robust design of the support element is created.

[0014] In another variant of the invention, the support element is arranged projecting upwards on the cover of the container and forms a stop against which the lower part of a second container arranged on the first container abuts in a direction vertical to the stacking direction of the containers.

[0015] A plurality of, in particular three, upwardly projecting support elements can be arranged in the cover of the first container, which elements can be brought into engagement with a complementary structure arranged in the base part of the second container.

[0016] In particular, the upwardly projecting support elements can be arranged as rib-shaped elements next to one another on a straight line, wherein the complementary structure has a plurality of projections, and wherein the support elements can be brought into intermeshing engagement with the projections. In this way, effective support of the top container can be achieved with regard to forces acting vertically to the stacking direction of the containers.

[0017] In another variant of the invention, a stackable container, in particular a stackable container as described above, is provided with a closure apparatus for locking a cover on a base part of the container, wherein the closure apparatus has a buckle and a clip, and wherein the container has a closure tab for closing the first container and a coupling tab for coupling the container to another, similar container. The closure apparatus is designed in such a way that the clip can optionally grip around the closure tab of the first container or the coupling tab of the second container.

[0018] In other words, the described closure apparatus creates the possibility of optionally closing a container or coupling two stacked, similar containers to one another and in this way producing a stable container assembly. The use of a clip closure as described above has the advantage over, for example, the twist closure known from the prior art that a higher pre-tension can be applied by the clip closure and for this reason, among others, the closure is much more robust against loss of functionality or wear and tear with frequent actuation.

[0019] The coupling tab can be arranged in the bottom part of the container; the geometric parameters

of the clip closure can be selected in particular such that the clip is pivotable about an axis C and, in the closed or coupled state, the distance of that flank of the coupling tab and of the closure tab which is in engagement with the clip from the axis C is around 20 mm to 45 mm, in particular around 33 mm.

[0020] Advantageous embodiments of the invention are explained below with reference to the drawing.

[0021] In the drawings:

[0022] **Fig. 1** shows a perspective view of a container according to the invention,

[0023] **Fig. 2** show two sectional lines A-A and B-B for further explanation of the shown embodiments,

[0024] **Fig. 3** shows a perspective view of two coupled containers according to the invention,

[0025] **Fig. 4** shows a sectional view of the conditions both in the region of the rear and the front standing foot,

[0026] **Fig. 5** shows a sectional view of the lateral extent of the front support elements in particular,

[0027] **Fig. 6** shows a second embodiment of the invention,

[0028] **Fig. 7** shows a sectional view of the embodiment shown in **Fig. 6**,

[0029] **Fig. 8** shows another sectional view of the embodiment shown in **Fig. 6**,

[0030] **Fig. 9** shows a third embodiment of the invention,

[0031] **Fig. 10** shows a sectional view of the embodiment shown in **Fig. 9**,

[0032] **Fig. 11** shows another sectional view of the embodiment shown in **Fig. 9**,

[0033] **Fig. 12** shows a fourth embodiment of the invention,

[0034] **Fig. 13** shows a sectional view of the embodiment shown in **Fig. 12**,

[0035] **Fig. 14** shows another sectional view of the embodiment shown in **Fig. 12**,

[0036] **Fig. 15** shows a perspective view of another variant of the invention,

[0037] **Fig. 16** shows a perspective view of the container shown in **Fig. 15** from below,

[0038] **Fig. 17** shows an enlargement of a detail of the embodiment shown in **Fig. 15** and **Fig. 16**,
 [0039] **Fig. 18** shows another detail enlargement of the embodiment shown in **Fig. 15** and **Fig. 16**; and
 [0040] **Fig. 19** shows a sectional view of the embodiments shown in **Fig. 15** and **Fig. 16**.

[0041] **Fig. 1** shows a perspective view of a container **100** according to the invention. The container shows a trough-shaped base part **1** as well as a cover **2** arranged pivotably about the axis A in the region of the rear side thereof. The base part **1** shows on its front side a lateral carrying handle **3** and a buckle **4** with a clip **41** pivotable about an axis C for closing the container **100** or for coupling the container **100** to other containers, as will be explained in more detail below. On its upper side, the container **100** has a cover carrying handle **5** which is pivotably arranged in the cover **2** and can optionally be used to transport the container **100**. The cover **2** also has two front recesses **5** and two rear recesses **7**, which serve to accommodate the standing feet or support elements of another similar container **100** standing on the container **100**. The rear recesses **7** reveal a rearward-facing undercut **8**, into which a corresponding projection of a rear standing foot of another container can engage, so that a hinge-like effect of the two rear recesses **7** results in conjunction with the associated standing feet and a similar second container **100'** arranged on the shown container **100** can be pivoted about the axis A' relative thereto. In practical use, this is in particular important if a second container **100'** is to be arranged on the first container **100**. For this purpose, the second container **100'** is first lifted slightly upwards in its front region, i.e. in the region in which the lateral carrying handle and the buckle with the clip are arranged, and placed on the first container **100** and then pushed backwards until the rear standing feet of the top container **100'** engage with the rear recesses **7** of the bottom container **100**, in particular with the undercuts **8**. The the top container **100'** is then lowered onto the bottom container **100** by its front region by rotating about the axis A' and a stack of two containers **100, 100'** is formed.

[0042] In the front region of the container **100**, it is shown how the buckle **4** with its associated clip **41** engage in a closure tab **9** in the cover **2** of the container **100** and in this way tightens the cover **2** against the base part **1**, whereby the container **100** is reliably closed, in particular due to the pretension thereby achieved. Also shown in **Fig. 1** is the coupling tab **10** in the lower region of the base part **1**.

It serves to lock two stacked containers **100**, **100'** against each other, as shown in **Fig. 2**. In **Fig. 2**, it can be seen how the clip **41** grips around the coupling tab **10** of a second container **100'** arranged on a first container **100** according to the invention and in this way secures the second container **100'** against the first container **100** or couples the two containers **100**, **100'** together. The coupling tab **10** and the closure tab **9** are arranged in relation to the clip **41** or to the buckle **4** such that, in the closed or coupled state, the distance of that flank of the coupling tab **10** and of the closure tab **9** which is in engagement with the clip **41** is around 20 mm to 45 mm, in particular around 33 mm from the axis C.

[0043] This advantageous design of the closure **9** and coupling nub **10** in interaction with the buckle **4** and the associated clip **41** provides a simple and robust way of coupling two containers according to the invention (or possibly also containers of other systems) to each other under a certain pretension or reliably closing a container in uncoupled use.

[0044] **Fig. 2** also shows the two sectional lines V-V and IV-IV with which the geometric relationships, in particular in the region of the standing feet and the support elements will be explained below.

[0045] In a first embodiment of the invention, **Fig. 3** shows a perspective view of two coupled containers **100**, **100'** according to the invention from the underside. The enlarged section clearly shows the design of the support element **11**, which is formed at a distance from a front standing foot **12**. As indicated in **Fig. 3** and can be seen in somewhat more detail in the section IV-IV shown in **Fig. 4**, the support element **11** or **11'** is designed in such a way that it is considerably flatter than the front standing foot **12** or **12'** and therefore does not come into contact with the ground when a single container or the lowermost container of a stack is set down so that the risk of mechanical damage to the support element **11** or **11'** is reduced. In this way, it is ensured that the support element **11** or **11'** can fulfill its function perfectly even after prolonged use of the container **100** or **100'**.

[0046] **Fig. 4** shows in another sectional view (section IV-IV) the conditions both in the region of the rear and the front surface **13'**, **12'** and the support element **11'**. The engagement of the projection **14'**

of the rear standing foot **13** in the undercut in a recess **7** of the cover **2** of the bottom container **100** is clearly visible. It is also clearly visible that the support element **11'** rests against the front side wall of the front recess **6** in the cover **2** of the bottom container **100**, so that pulling off or slipping off of the top container **100'** towards the front is effectively prevented. However, if the top container is not locked to the bottom container **100** by the buckle **4** and the associated clip **41**, swinging upwards is quite possible and desirable. Furthermore, it can be seen that the interaction of the projection **14'** in the rear standing foot **13'** with the undercut in the rear recess **7** effectively prevents the top container **100'** from being pulled away from the bottom one in the rear region of the arrangement.

[0047] **Fig. 5** shows another sectional view (section V-V) of the lateral extent of the front support elements **11'** in particular. In the shown example, the front support elements **11'** are designed in such a way that they only rest against the front wall of the recess **6** in the cover **2** of the bottom container at the front, i.e. in the grip direction, in order to prevent the top container **100'** from slipping forwards relative to the bottom container **100** already described above. The support elements **11'** do not rest laterally against the wall of the front recess **6**, so that in the embodiment shown, the support elements **11'** merely ensure support in the form of a stop, but not centering. However, the centering of the two containers **100, 100'** is achieved by the fact that the rear standing feet **13'** in conjunction with the rear recesses **7** are designed in such a way that lateral sliding of the containers against each other is also prevented. For this purpose, as shown, the dimensions of the rear standing feet **13'** and the rear recesses **7'** are such that the sides of the rear standing feet facing each other rest against the wall of the rear recess **7'** or only a small distance around a few tenths of a millimeter remains between the wall of the recess **7'** and the lateral flank of the rear standing foot **13'**. In contrast to the variant known from the prior art, in which the rear standing feet **7'** engage in a groove extending over practically the entire width of the container, the variant shown in **Fig. 5** can achieve an increased interior volume of the container according to the invention due to the smaller space required by the recesses **7'**.

[0048] In addition, the design of the support elements **11'** in the shown form offers the advantage that when the front part of the top container **100'** is lowered onto the cover **2** of the bottom container **100**,

it is easier sliding of the support elements **11'** into the recess **6** is enabled since no fine adjustment is required laterally.

[0049] **Fig. 6** shows a second embodiment of the invention in which the support element is designed as a pipe stub-like centering pin **11a**. In this case too - as can be seen from the sectional view in **Fig. 7** - the support element **11a'** is recessed in relation to the standing foot **12a**, which ensures the advantages already described above with regard to mechanical protection and also robustness against soiling. However, in contrast to the embodiment shown in the above figures - as can be seen from the sectional view in **Fig. 8** - the support pin **11a'** is in contact with the sides of the walls of the recesses **6** facing each other both in the front and in the lateral region of the recess **6** in the cover **2** of the bottom container **100**, so that the interaction of the two centering pins **11a'** not only provides a supporting effect but also an additional centering effect.

[0050] **Fig. 9** shows a third embodiment of the invention, in which the support element is realized as a support rib **11b**; **Fig. 10** and **Fig. 11** illustrate the geometric relationships as sectional views analogous to the sections already used above. Here too, the support element or the support rib **11b** or **11b'** is set back in relation to the standing foot **12b** or **12b'** and ensures centering due to the contact both laterally and to the front in the recesses **6** of the cover of the bottom container **100**. The support rib **11b** or **11b'** is designed as a circumferential rib in the form of a hollow profile with a rectangular cross-section. For further mechanical stabilization of the support rib **11b** or **11b'**, a web runs along a diagonal in the interior of the rib, the height of which substantially corresponds to the height of the circumferential rib.

[0051] **Fig. 12** shows another variant of the invention, which is derived from the embodiment shown in **Fig. 3-Fig. 5**. In contrast to the variant shown in the aforementioned figures, the support element **11c** shown in **Fig. 11** not only shows a support to the front, but also a lateral support, which is achieved by the essentially L-shaped geometry of the support element **11c**. A first leg of the support element **11c**, conceived as an "L", lies against the front of the recess **6**, while a second leg of the "L" runs

essentially vertically to the first leg and lies against the inward-facing side surface of the recess **6**. The geometry of the support element **11c** is further illustrated by the sections shown in **Fig. 13** and **Fig. 14**. **Fig. 13** in particular clearly shows the flatter geometry of the support element **11c** compared to the standing foot **12'**.

[0052] **Fig. 15** shows another variant of the invention, in which a plurality of support elements **11d** are arranged projecting upwards on the cover **2** of a container **100**. In contrast to the embodiments described above, the support elements **11d** are therefore located on the opposite side of a container **100** according to the invention. In the shown example, the support elements **11d** are designed as three upwardly projecting rib-shaped elements, which are arranged next to each other on a straight line. This structure on the upper side of the cover **2** of the container **100** corresponds to a complementary additional structure attached to the bottom part of the container **100** which in the shown example has two forward-projecting projections **15**.

[0053] **Fig. 16** shows a perspective view of a container of the mentioned embodiment according to the invention as seen from the underside. The comparatively small design of the standing feet **12** is also clearly recognizable in the figure.

[0054] **Fig. 17**, in a detailed enlargement, shows the structure of the support elements **11d** and their arrangement on the cover **2** of the container **100** in the region between the recess **6** and the front edge of the cover **2**. The rib-shaped structure of the support elements **11d** is clearly recognizable.

[0055] With the detailed enlargement shown in **Fig. 18** and the section shown in **Fig. 19**, the mode of operation of the embodiment shown in **Fig. 15** to **19** will be further clarified. The intermeshing engagement of the projections **15'** in the base part **1'** of the top container **100'** with the rib-shaped support elements **11d**, which are arranged in the cover of the bottom container **100**, is clearly visible in **Fig. 18**. On the one hand, the shown geometry of the projections **15'** and support elements **11d** ensures reliably securing of the top container **100'** against being pulled off the bottom container **100**. In addition, the lateral contact of the projections **15'** and the support elements **11d** against each other

also ensures that the containers **100** and **100'** are laterally secured against each other.

[0056] **Fig. 19** illustrates the geometric relationships in the region of the support elements **11d** as well as the projections **15'** and the standing foot **12'** in the recess **6** by means of a section through one of the support elements **11d** running parallel to a short side wall of the container **100** or **100'**. The effect of the intermeshing structure of support elements **11d** and projections **15'** is clearly recognizable in **Fig. 19**. The front flank of the standing foot **12'** maintains the distance *a* from the front wall of the recess **6**, which can be around 1 to 3 mm, in particular around 2 mm. The maintenance of the distance *a* has the effect that the standing foot **12'** does not strike against the front wall of the recess **6** even under the effect of a tensile force at the front of the top container **100'**, i.e. it does not absorb any forces vertically to the stacking direction of the containers. In the shown embodiment, these forces are absorbed by the structure consisting of support elements **11d** and projections **15'**, so that the standing foot **12'** in the shown example makes no contribution to supporting the cases against each other in a direction vertical to the stacking direction. In other embodiments not shown here, however, this case is however quite conceivable - depending in particular on the dimensions of the standing foot **12'**.

CITATIONS IN THE DESCRIPTION

This list of documents provided by the applicant was generated automatically and is exclusively included to better inform the reader. This list is not part of the German patent and utility model application. The DPMA assumes no liability for any errors or omissions.

Cited Patent Literature

- EP 2313321 B1 [0002]

Claims

1. A stackable container (100) having a base part (1) and a cover (2) pivotable about an axis A on the base part (1), wherein the base part (1) has at least one standing foot for placing the container on a surface or on a cover (2') of another, similar container (100'), and wherein the container (100) has at least one separate support element (11) that, upon placing the first container (100) on the other container (100'), engages in an engagement structure of the other container (100') and thereby inhibits a displacement of the first container (100) relative to the second container (100') in at least one direction vertical to the stacking direction, **characterized in that** the support element is designed in such a way that, upon placing the container (100) on a flat surface, no mechanical contact results between the support element and the surface.

2. The stackable container (100) according to claim 1, **characterized in that** the support element (11, 11a, 11b, 11c) is arranged on a base part of the container (100), and the underside of the support element (11, 11a, 11b, 11c) is recessed by 3-5 mm, in particular by 4 mm, with respect to the plane in which the undersides of at least three standing feet (12) lie.

3. The stackable container (100) according to claim 1 or 2, **characterized in that** the at least one support element (11) is designed such that, upon placing the container (100) on another container of the same type, it inhibits the displacement of the top (100) container relative the bottom (100') container only in a first direction.

4. The stackable container (100) according to claim 1 or 2, **characterized in that** the at least one support element (11a, 11b, 11c) is designed such that, upon placing the container (100) on another container (100') of the same type, it inhibits the displacement of the top (100) container relative the bottom (100') container in a first and a second direction.

5. The stackable container (100) according to claim 4, **characterized in that** the first and second directions are perpendicular to each other.

6. The stackable container (100) according to one of claims 4 or 5, **characterized in that** the support element (11c) has an L-shaped geometry.

7. The stackable container (100) according to one of the preceding claims 4 or 5, **characterized in that** the support element (11a) is designed as a stub-shaped centering element.

8. The stackable container (100) according to one of the preceding claims 4 or 5, **characterized in that** the support element (11b) is designed as a circumferential rib.

9. The stackable container (100) according to claim 8, **characterized in that** the circumferential rib is designed in the manner of a hollow profile with a rectangular cross-section, and a web runs along a diagonal in the interior of the rib.

10. The stackable container (100) according to one of the preceding claims 1 or 3-5, **characterized in that** the support element (11d) is arranged projecting upwards on the cover (2) of the container (100) and forms a stop against which the lower part (1') of a second container (100') arranged on the first container (100) abuts in a direction vertical to the stacking direction of the containers (100, 100').

11. The stackable container (100) according to claim 10, **characterized in that** a plurality of, in particular three, upwardly projecting support elements (11d) are arranged in the cover (2) of the first container (100), which elements can be brought into engagement with a complementary structure arranged in the base part of the second container (100').

12. The stackable container (100) according to claim 11, **characterized in that** the

upwardly projecting support elements (11d) are arranged as rib-shaped elements next to one another on a straight line, wherein the complementary structure has a plurality of projections (15), and wherein the support elements (11d) can be brought into intermeshing engagement with the projections (15).

13. The stackable container (100), in particular according to one of the preceding claims, having a closure apparatus for locking a cover (2) on a base part (1) of the container (100), **characterized in that** the closure apparatus has a buckle (4) and a clip (41), and wherein the container (100') has a closure tab for closing the first container (100) as well as a coupling tab (10) for coupling the container (100) to another, similar container (100'), and wherein the closure apparatus is designed in such a way that the clip (41) can optionally grip around the closure tab of the first container (100) or the coupling tab (10) of the second container (100').

14. The stackable container (100) according to claim 13, **characterized in that** the coupling tab (10) is arranged in the bottom part (1) of the container (100).

15. The stackable container (100) according to one of claims 13 or 14, **characterized in that** the clip (41) is pivotable about an axis C and, in the closed or coupled state, the distance of that flank of the coupling tab (10) and of the closure tab (9) which is in engagement with the clip (41) is around 20 mm to 45 mm, in particular around 33 mm from the axis C.

To follow: 11 pages of drawings

Appended drawings

August 12, 2024

CERTIFICATE OF ACCURACY OF TRANSLATION

I, Jonathan Lack, hereby certify and declare as follows:

1. I am a resident of the State of California, United States and am over the age of 18. My business address is P.O. Box 423, Sutter Creek, CA 95685. I have personal knowledge of all of the following facts and if called to testify could testify as follows based upon my personal knowledge.

2. I am fluent in the German and English languages. MA in German translation from MIIS. 37 years freelance. Extensive experience with multinational clients. Accredited by American Translators Association in German into English. Accredited by Fédération Internationale des Traducteurs.

3. The documents attached hereto are an English translation of the annexed documents in the German language, described as follows:

Patent: DE202014103695U1

I hereby certify that the same, to the best of my ability and belief, is a complete and accurate translation of the accompanying original German documents.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 12, 2024.

SUTTER CREEK, CALIFORNIA
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