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

(54) Title: **Stackable case with coupling connection and securing**

(57) Main claim: A stackable case (1) with coupling connection (10-12; 24-26) to a further case (1a) or the like placeable thereon, and with securing of the coupling connection (10-12; 24-26) by at least one spring-loaded displaceable locking slide (18) which is displaceably mounted on one case (1) and, in the closed or securing position, bears against the other case (1a) or the like and secures the coupling connection (10-12; 24-26) against arbitrary opening, characterized in that the locking slide (18) can be actuated by placing the upper case (1a) for stacking on the lower case (1).

Description

[0001] The innovation relates to a stackable case with a coupling connection and securing of the coupling connection according to the preamble of claim 1.

[0002] A stackable tool case has become known from the subject matter of EP 1 516 703 A1. For stacking a plurality of tool cases on top of each other, it is provided that the two identically designed cases are stacked with their flat sides flush on top of each other. So-called snap latches are on the given side surfaces of the given case so that a snap latch, which is fastened to the lower case, is provided for force-fit and form-fit connection to the side wall of the case above. However, the disadvantage of this known stacking arrangement is that the individual snap latches have to be operated individually by hand, which involves a great deal of effort in the mutual connection of the tool cases stacked on top of each other.

[0003] Similar subject matter is disclosed in DE 42 01 264 A1 in which pivoting locking latches are also arranged on a part of the case, which must be brought into engagement with associated projections on the case lying above. Here too, all connecting elements must be operated individually by hand.

[0004] With the subject matter of EP 2 346 741 B1, cases stackable on top of one another have become known, in which spring-loaded transport locks displaceably arranged in a direction perpendicular to the bottom surface of the given case are provided on the side wall as locking slides which are actuatable together with the aid of a continuous push bar extending on the side wall. The disadvantage of this arrangement is that the actuations of the push bar must be performed manually, which is associated with increased handling effort.

[0005] The innovation is therefore based on the object of further developing an arrangement according to EP 2 346 741 B1 with at least two cases that can be stacked flat on top of one another in such a way that manual actuation of the locking slides serving to lock the cases is unnecessary.

[0006] The innovation is characterized by the technical teaching of claim 1 to achieve the addressed object.

[0007] A feature of the innovation is that at least one locking slide arranged on the front side of one case can be actuated spring loaded in its open position by placing an upper case for stacking on the lower case.

[0008] During the subsequent coupling of the two cases, the locking slide moved from the upper case to its open position is again released and moves into its closed position. It then rests against a wall of

the case above and secures the coupling connection between both cases against unintentional actuation.

[0009] The object of the present innovation is accordingly a coupling or hook-in connection between two suitcases which can be stacked on one another, wherein the bottom surface of an upper case is placed on the top surface of a lower case and the hook-in connection (coupling) between the suitcases associated with one another is produced upon shoving the two suitcases in the transverse direction (hereinafter also termed the Y direction).

[0010] The coupling or hook-in connection is secured by at least one spring-loaded locking slide which is arranged on the lower case and which can be actuated by the bottom surface of the upper case. Once actuated, it rests against a stop surface of the upper case and thereby secures the hook-in connection between the two cases against unintentional unhooking.

[0011] Such a technical teaching was not previously known in the prior art. According to the aforementioned publications, securing the hook-in connection was only manually possible in that a locking slide or a locking member, which was possibly also rotatable, had to be manually actuated.

[0012] The innovation avoids this. Instead, the innovation provides for at least one spring-loaded locking slide which is preferably arranged in the front area of the lower case and which is designed with its spring-loaded slide bolt displaceable in the Z direction in such a way that, in the secured state, it rests against an associated stop surface on the case above and secures against a decoupling of the two cases.

[0013] To release this secured hook-in connection, it is provided that the spring-loaded locking slide is manually actuated to bring it into its open position and thus out of engagement with the associated stop surface on the opposite case part.

[0014] The innovation provides for a plurality of embodiments for the formation of such locking slides.

[0015] In a first embodiment, it is provided that a locking slide consists of an approximately upwardly open, approximately bottom part with a U-shaped profile, on which one end of a compression spring is supported, the other end of which is supported in a slide bolt which is also approximately U-shaped in profile and which is mounted so as to be longitudinally displaceable in the lower, U-shaped bottom part limited by a stop and spring-loaded.

[0016] Instead of a compression spring arrangement for displacing the slide bolt, other force accumulators can also be used such as elastomer springs, leaf springs, spiral springs or springs of a general type. Torsion springs or disk springs can also be used.

[0017] Instead of a linearly moving locking slide, other locking and securing elements can also be used such as, for example, sliding levers pivotably mounted on one side which can also be brought into a pivoted position or securing position under a spring load, or also rotary locks which, in one position, reach the opening position under a spring load by placing the upper case on top and can be brought into their securing position by applying the spring force in order to rest against an associated stop surface on the opposite and upper case.

[0018] It is unnecessary for the solution for the stop surface to be formed on the face of the case above, in particular on the front side. Other stop surfaces can also be used, in particular stop surfaces that are recessed or also provided with insertion chamfers, in order to achieve additional pretensioning of the locking latch on the hook-in connection between the cases.

[0019] In a preferred embodiment, it is provided that the locking slide has an essentially rectangular profile in order to secure the hook-in connection with some play so that the hook-in connection in its hooked-in state still has play in the Y-direction of 1 to 2 mm, for example, without it being able to be unhooked (manually decoupled).

[0020] In another embodiment, it can be provided that the locking slide itself or the surface against which the locking slide rests in the secured state is slightly wedge-shaped so that the spring-loaded locking slide additionally pretensions the hook-in connection in the Y-direction and secures it against displacement.

[0021] In a preferred embodiment of the innovation, it is provided that the hook-in connection between the mutually associated cases consists of hook-in projections which are designed approximately lobular and which can be brought into engagement in associated hook-in openings in the opposite part.

[0022] It is preferred if the lobular hook-in projections are beveled and the hook-in openings also have insertion bevels in order to enable a hook-in connection with reliable displacement and relatively play-free between the associated case surfaces.

[0023] Accordingly, the present invention differs from the prior art according to EP 2 346 741 B1 in that the locking elements in said publication are activated by a locking knob, whereas in the present innovation, the locking elements are actuated by the upper stacked case.

[0024] A preferred embodiment of the hook-in connection between the two associated surfaces of the stacked cases can be formed in various ways. At least one hook-in projection on one part must engage in a hook-in opening on the opposite part.

[0025] For reasons of stability, however, it is preferred if there are hook-in openings arranged at a

distance from one another in one case surface and offset from one another in the X-direction which interact with associated hook-in tabs on the opposite part of the case.

[0026] Likewise, it is preferred if the coupled case surfaces are interlocked at the front and rear, i.e. the hook-in connection is arranged both near the front wall of the given case and near the rear wall.

[0027] Of course, the invention is not limited to this. The hook-in connection on the rear wall can also be relocated towards the center of the case, and/or the hook-in connection on the front side of the case can be relocated towards the center.

[0028] Instead of the arrangement of a single locking slide, which is preferably arranged on the front side of the case, a plurality of locking slides offset at a distance from one another in the X-direction can also be provided.

[0029] Furthermore, in a first embodiment, it is provided that the one or more locking slides are integrated in the case itself and do not protrude beyond the outer surfaces of the case.

[0030] In another embodiment, however, it can also be provided that the one or more locking slides are connected outside the case surfaces as a separate part, but of one or more materials with the given case surfaces.

[0031] Moreover, such locking slides can also be arranged as separate parts on the outer wall of a case in order to ensure subsequent retrofitting of stackable cases with the new locking slides.

[0032] The subject matter of the present innovation not only results from the subject matter of the individual claims, but also from the combination of the individual claims with each other.

[0033] All of the information and features disclosed in the documents including the abstract, in particular the spatial layout depicted in the drawings, are claimed as essential to the invention to the extent that they are novel over the prior art individually or in combination.

[0034] Insofar as individual subjects are designated as "essential to the invention" or "important", this does not mean that these subjects must necessarily form the subject matter of an independent claim. This is determined solely by the applicable wording of the independent claim.

[0035] The innovation is explained below in greater detail with reference to drawings that merely depict one embodiment. Additional features essential to the invention and advantages of the invention are offered in the drawings and their description.

[0036] In the drawings:

[0037] **Fig. 1:** schematizes a perspective view of a stackable case according to the innovation

[0038] **Fig. 2:** schematizes in a side view the lock between two stackable cases in a first position

[0039] **Fig. 3:** shows the locking mechanism according to **Fig. 2** in a second position

[0040] **Fig. 4:** shows the locking mechanism between the two stackable cases in the final state

[0041] **Fig. 5:** shows a perspective rear view of the rear wall of a stackable case

[0042] **Fig. 6:** schematizes the principle of the locking mechanism according to **Fig. 2** to **Fig. 4** in the working state

[0043] **Fig. 7:** shows the principle according to **Fig. 6** in the locked state with further details shown

[0044] **Fig. 8:** shows a modified embodiment of a locking slide compared to **Fig. 6** and **Fig. 7**

[0045] In the following drawings, two stackable cases **1** are shown, the shape of which can be changed within wide limits. The lower stackable case is provided with the reference sign **1**, while the upper case above, which can be locked to the lower case **1**, is provided with the reference sign **1a**.

[0046] The term "case" is also to be understood within broad limits. It does not necessarily have to be a container that is closed on all sides and provided with a pivotable lid. Instead of the arrangement of a pivotable lid, the pivotable connection between the lid and the case can be omitted. The upper case, which can be placed on the lower case, can also be designed as a half-open shell or as a plate (adapter plate).

[0047] In the shown exemplary embodiment, each case has a lid **2** which is pivotably arranged on the lower part **4** along a horizontal hinge axis **3**.

[0048] In order to distinguish the two stackable cases from one another, the stackable case is always designated with the lower-case letters a, although the same reference signs are used for the same parts.

[0049] Instead of a lid **2**, which is pivotably mounted on the lower part **4** in a horizontal hinge axis **3**, other pivoting connections can also be used such as a hinge axis, a piano hinge or even a loose lid, which can be locked to the lower part **4** in another way.

[0050] The lid of the case **1** basically consists of a flat part which, in its central area, has a transverse groove **5** running longitudinally in the transverse direction (X-direction) which is designed as a recessed area and which is bounded at the sides by two raised transverse ribs **6**, **7**, likewise running in the X-direction.

[0051] The reason for the arrangement of a recessed transverse groove **5** in the lid **2** is that shorter variants of stackable cases **1a** can also be stacked on a larger stackable case **1**, wherein the foot strips **22** of a case **1a** shorter in the Y-direction then engage in this transverse groove **5**.

[0052] In the front region of the stackable case **1** beyond the front side **15**, a first front receiving region **8** is arranged in the lid region **8**, which is offset downwards with respect to a higher transverse rib **6**. The same symmetrical arrangement results for the rear receiving area **9**, which is offset downwards with respect to the transverse rib **7** arranged higher.

[0053] Both in the front receiving area **8** and in the rear, recessed receiving area **9**, hook-in inserts **10**, **11** of the same direction are integrally connected in one piece to the surface of the lid **2** as approximately U-shaped profiled parts, wherein each hook-in insert **10**, **11** has a forward-facing hook-in opening **12**.

[0054] The profile of the hook-in opening **12** and the shape of the hook-in projections **10**, **11** is adapted to the engagement of a hook-in tab **24**, **25** and **28**, **29** arranged on the lower area of a lower case.

[0055] The hook-in tabs **24**, **25** and **28**, **29** each consist of projections facing forwards on one side, which can be brought into engagement in the associated hook-in openings **12** of the hook-in projections **10**, **11**.

[0056] It is preferred if the hook-in tabs **24**, **25** and **28**, **29** are somewhat wedge-shaped and accordingly the hook-in opening **12** is also wedge-shaped in order to form an insertion chamfer and to secure the front and rear hook-in connection on the cover against displacement in the Y and X-directions according to **Fig. 1**.

[0057] Of course, the profiled hook-in opening **12** is also secured in the Z-direction when the hook-in connection is made, because the two stacked cases **1**, **1a** are secured against lifting in the Z-direction when the hook-in connection is made (see **Fig. 4** below).

[0058] Locking latches **16** of any type are also arranged on the front side **15** of the case **1**, which serve to connect the lid to the lower part **4** and to secure it against opening.

[0059] A locking slide **18** is arranged in a recess **17** in the front side **15** of the case **1** displaceable in the Z-direction under a spring load, wherein the position of the locking slide **18** in **Fig. 1** corresponds to its rest position.

[0060] A pivotably mounted carrying handle **19** is arranged on the front side **15** in a manner known per se, which is guided over a stop surface **20** offset to the rear in the Y-direction, which forms the

stop surface for the locking slide **18** of the lower case. The locking slide **18**, which will be described later, rests against this stop surface **20**.

[0061] The bottom side of the lower part **4** has a recess **21** running in the X-direction, which is formed as a transversely running groove. This recess **21** is provided to accommodate the transverse ribs **6, 7** of the case underneath.

[0062] Foot strips **22** are provided on the other side of the recess **21**, which terminate approximately with the rear wall **23** and the front side **15** of the given case. In the shown exemplary embodiment, the foot strips **22** are continuous. The innovation is not limited to this. The foot strips can also be present only sectionally, or they can also be omitted.

[0063] **Fig. 2** shows a first position of the hook-in or coupling process, where it can be seen that the upper case **1a** is placed on the lower case **1** for the purpose of coupling, in such a way that the upper case **1a** is first placed on the lower case **1** offset in the Y-direction, in order to ensure that the upper hook-in connection with the hook-in projections **26a, 28a** pointing rearwards in the Y-direction comes into juxtaposition with the hooking openings **12** arranged on the lower case **1**.

[0064] This offset of the cases stackable with each other according to **Fig. 2** now makes it possible to move the upper case **1a** according to **Fig. 3** against the lower case **1** in the direction of arrow **Z**, namely in the direction of arrow **33**, in order to thereby allow the foot strip **22a** of the upper case **1a** to come to rest on the locking slide **18** and pivot its spring-loaded sliding bolt **30** into its actuating position, as shown in **Fig. 3**.

[0065] According to the position in **Fig. 3**, it is now possible to move the two cases relative to each other in the direction of arrow **34** in order to engage the hook-in connection between the upper case **1a** and the lower case **1**. In doing so, the spring-loaded locking slide **30** slides upwards into its locking position according to **Fig. 4** and rests against the front side **15a** of the case **1a**.

[0066] This secures the hook-in connection between both cases against mutual displacement and against unhooking.

[0067] In the shown exemplary embodiment, the locking slide **18** basically consists of a U-shaped profiled or cup-shaped profiled bottom part **32**, in the upwardly open recess of which a compression spring **31** is arranged which is supported on the inside of the slide latch **30** which is displaceably guided in the bottom part **32**. There are stops to prevent the spring-loaded sliding bolt **30** from being pushed completely out of the U-shaped profiled bottom part **32** by the force of the spring.

[0068] In the locking position according to **Fig. 4**, the sliding bolt **30** rests against the front side **15a**

of the case 1a and secures the coupling connection between the cases against unintentional unhooking.

[0069] In order to disengage this connection, it is necessary to press the sliding bolt **30** downwards manually in order to bring it into the position according to **Fig. 3** and then the two cases **1, 1a** can be moved against each other in the direction opposite the drawn arrow direction **34** in order to reopen the hook-in connection.

[0070] The innovation is not limited to the hook-in connection shown here with interlocking recesses and associated hook-in tabs. Any hook-in connection can be selected which can be moved in the Y-direction into an open position and into a closed position.

[0071] What is decisive about the innovation is the spring-loaded locking slide which ultimately secures the hook-in connection against re-unhooking and can only be actuated manually to ensure manual opening of the hook-in connection.

[0072] **Fig. 6** and **Fig. 7** show the principle of the novel locking slide **18** in schematic form, and it is shown in **Fig. 7** that the hook-in connection can also be pretensioned by the fact that either the slide bolt **30** and/or the front side **15** have associated wedge surfaces **36** in the area where the slide bolt **30** contacts, in order to additionally pretension the hook-in connection in the direction of arrow **34**. The pretensioning is spring-loaded by the compression spring **31**.

[0073] This shows that the actuating surface for the locking slide **18** is always a bottom-side stop surface or actuating surface **35** of the case **1a** above, wherein it does not necessarily have to be a bottom surface itself. The actuating surface **35** can also be designed as an offset stop surface or the like or as a foot strip or the like.

[0074] As a kinematic equivalent, **Fig. 8** shows that a spring-loaded sliding bolt **30** that can be moved linearly in the Z-direction can also be replaced by a pivoting locking slide **38**.

[0075] The locking slide **38** is pivotable in a pivot axis **39** in the directions of arrow **40**, and for reasons of simplification, the compression spring required for spring preloading is not drawn. In this exemplary embodiment, as well, a pivoting movement for the locking slide to secure the hook-in connection is possible instead of a linear spring-loaded displacement movement.

[0076] Finally, the pivotable locking slide can also be replaced by a spring-loaded, rotatable locking slide. In this case, the actuating surface of the upper case rotates the locking slide, which is spring-loaded and can be rotated about an axis of rotation, into its open position and, once the coupling connection between the two cases has been made, the locking slide rotates spring-loaded and automatically into its closed position and secures the coupling connection.

List of reference signs

1	Stackable case
1a	Stackable case
2	Cover
3	Hinge axis
4	Lower part
5	Transverse groove
6	Transverse rib
7	Transverse rib
8	Receiving area (front)
9	Receiving area (rear)
10	Hook-in insert (front)
11	Hook-in insert (front)
12	Hook-in opening
13	
14	
15	Front side
16	Locking latch
17	Recess
18	Locking slide
19	Carrying handle
20	Stop surface
21	Recess
22	Foot strip
23	Rear wall
24	Hook-in tab (rear)
25	Hook-in tab (rear)
26	Hook-in projection
27	Insertion chamfer
28	Hook-in tabs (front bottom)
29	Hook-in tabs (front bottom)
30	Sliding bolt (of 18)
31	Compression spring
32	Bottom part

- 33** Arrow direction
- 34** Arrow direction
- 35** Actuating surface
- 36** Wedge surface
- 37**
- 38** Locking slide
- 39** Pivot axis
- 40** Arrow direction

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 1516703 A1 [0002]
- DE 4201264 A1 [0003]
- EP 2346741 B1 [0004, 0005, 0023]

Claims

1. A stackable case **(1)** with coupling connection **(10-12; 24-26)** to a further case **(1a)** or the like placeable thereon, and with securing of the coupling connection **(10-12; 24-26)** by at least one spring-loaded displaceable locking slide **(18)** which is displaceably mounted on one case **(1)** and, in the closed or securing position, bears against the other case **(1a)** or the like and secures the coupling connection **(10-12; 24-26)** against arbitrary opening, characterized in that the locking slide **(18)** can be actuated by placing the upper case **(1a)** for stacking on the lower case **(1)**.

2. The stackable case according to claim 1, **characterized in that**, after the coupling of the two cases **(1, 1a)**, the locking slide **(18)**, which is displaced from the upper case **(1a)** into its open position, is released from this case **(1a)** and passes into its spring-loaded closed position and rests against a stop surface on the upper case **(1a)**.

3. The stackable case according to claim 1 or 2, **characterized in that** the spring-loaded locking slide **(18)** is arranged in the front area of the lower case **(1)** and, in the secured state, bears with its spring-loaded slide bolt **(30)**, which is displaceable in the Z-direction, against an associated front stop surface on the case **(1a)** above it and secures the coupling connection **(10-12; 24-26)** between the two cases **(1, 1a)** against decoupling.

4. The stackable case according to one of claims 1 to 3, **characterized in that** the spring-loaded locking slide **(18)** can be actuated manually to release the secured coupling connection **(10-12; 24-26)**.

5. The stackable case according to one of claims 1 to 4, **characterized in that** a locking slide **(18)** consists of an approximately upwardly open, approximately bottom part **(32)** with a U-shaped profile, on which one end of a compression spring **(31)** is supported, the other end of which is supported in a slide bolt **(30)** which is also approximately U-shaped in profile and which is mounted so as to be longitudinally displaceable in the lower, U-shaped bottom part **(32)** limited by a stop and spring-loaded.

6. The stackable case according to one of claims 1 to 4, **characterized in that** the locking slide **(18)** is designed as a pivoting lever.

7. The stackable case according to one of claims 1 to 4, **characterized in that** the locking slide **(18)** is designed as a rotary lever.

8. The stackable case according to one of claims 1 to 7, **characterized in that** the locking slide **(18)** pretensions the coupling connection **(10-12; 24-26)** between the cases **(1, 1a)** in the coupling

position.

9. The stackable case according to one of claims 1 to 7, **characterized in that** the locking slide (18) forms play in the Y-direction in the coupling connection (10-12; 24-26) between the cases (1, 1a).

10. The stackable case according to one of claims 1 to 9, **characterized in that** the hook-in connection between the cases (1, 1a) associated with one another consists of hook-in projections (10) which are designed approximately lobular and which can be brought into engagement in associated hook-in openings (12) in the opposite part.

To follow: 6 pages of drawings

Appended drawings

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. 35 years freelance. Extensive experience with multinational clients. Accredited by American Translators Association – German into English. Accredited by Federation International des Traducteurs.

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

- File name: DE202015005752UI.docx

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 document.

I declare under penalty of perjury that the foregoing is true and correct. Executed on:

SUTTER CREEK, CALIFORNIA

September 5, 2024



[translator]



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