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(54) **STORAGE ARRANGEMENT CONSISTING OF TWO PARTS SUCH AS TOW CASES OR ONE CASE AND ONE LID**

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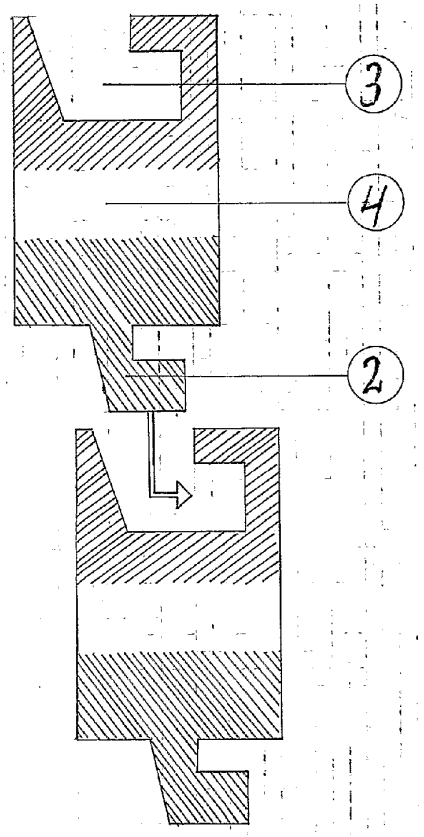
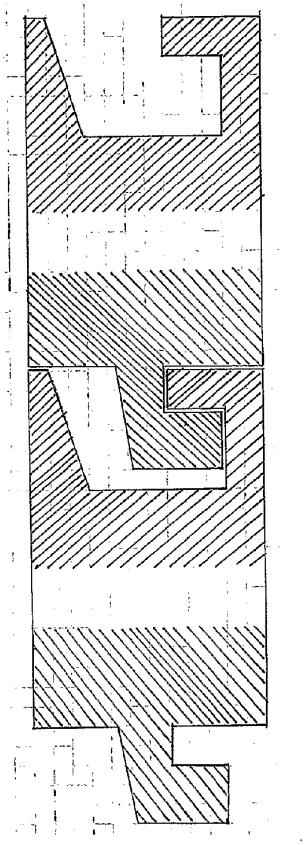
(57) **ABSTRACT**

The storage facility for coupling of at least one box and at least one lid is comprised of coupling units as shown in FIG. **2**, bottom bridge **2** on the top box and top bridge **3** on the lower box. These must be tightly engaged via the conic flanges **14** **+38** and subsequently locked in the gear via transport lock **7**. The primary objective of the invention is to provide a new and functional storage system for tools, equipment and minor parts, which makes it easy to locate what you are looking for and where the objects are easy and fast accessible. Furthermore, it is possible to produce the invention in an inexpensive way and still make it robust and easy to assemble as well as disassemble in only a few seconds.





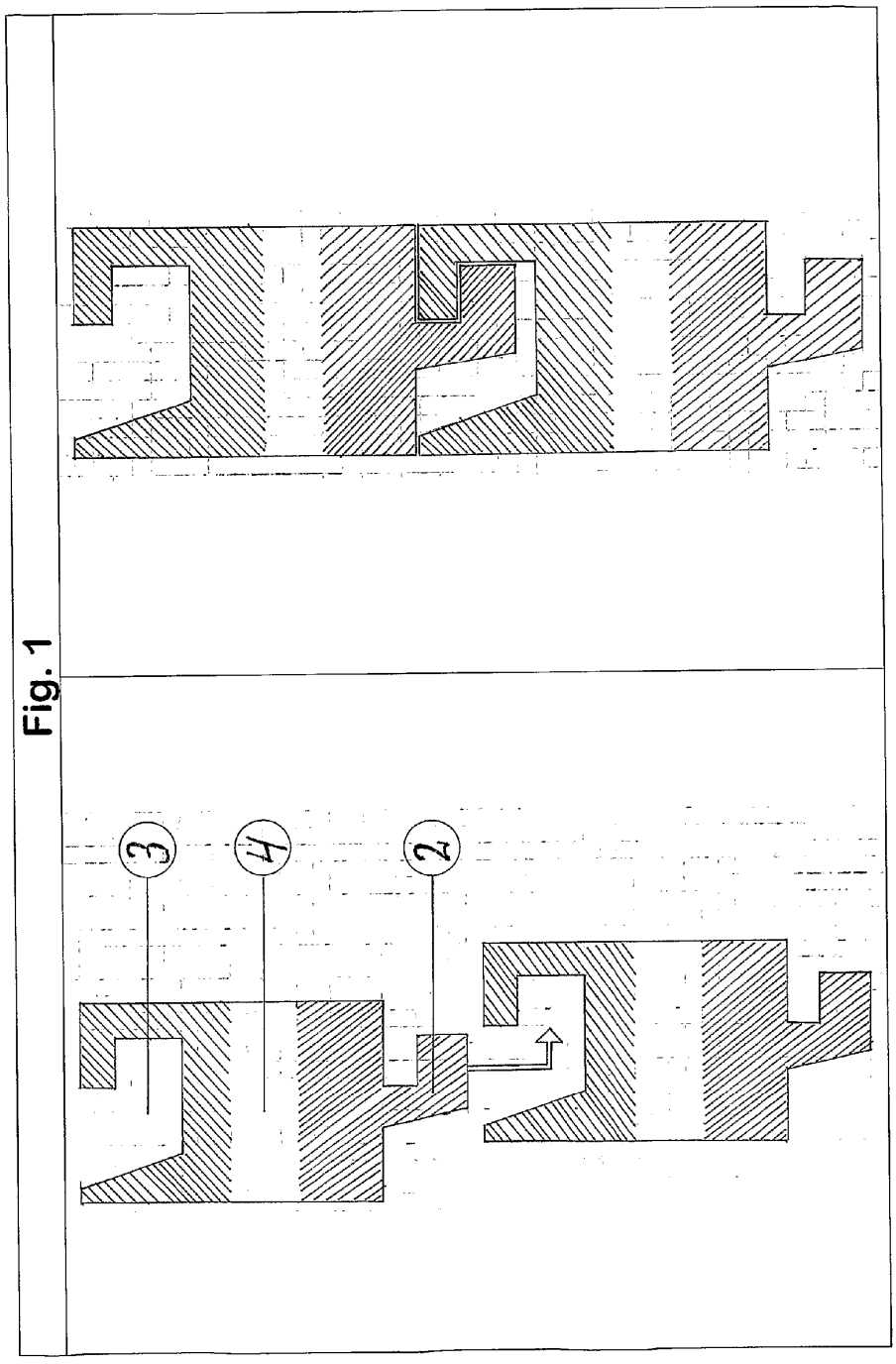


Fig. 1

Fig. 4

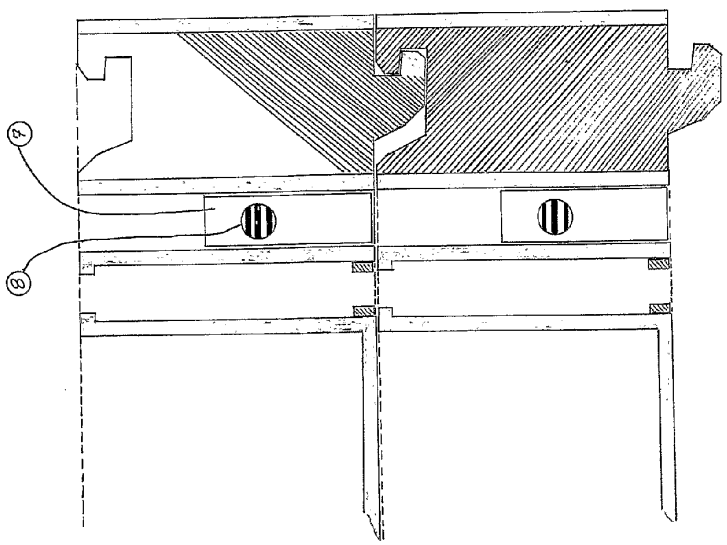


Fig. 3

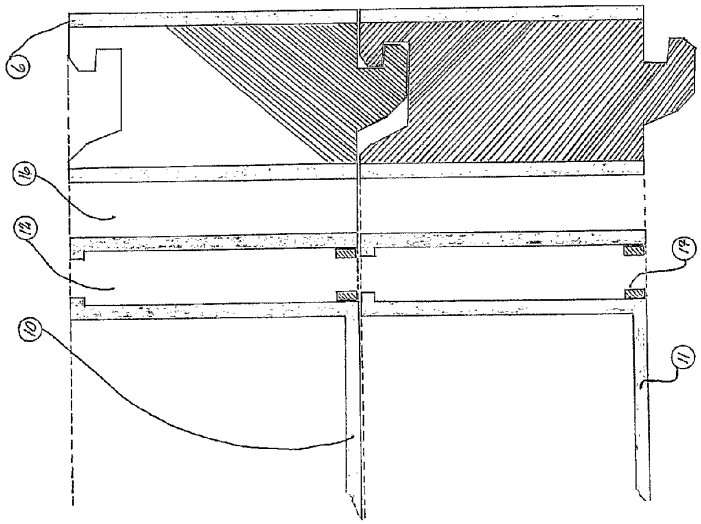


Fig. 2

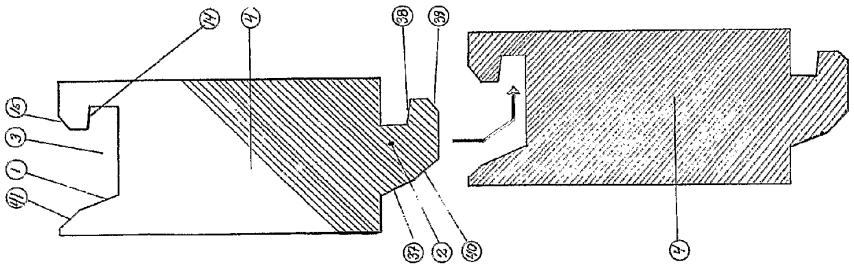


Fig. 7

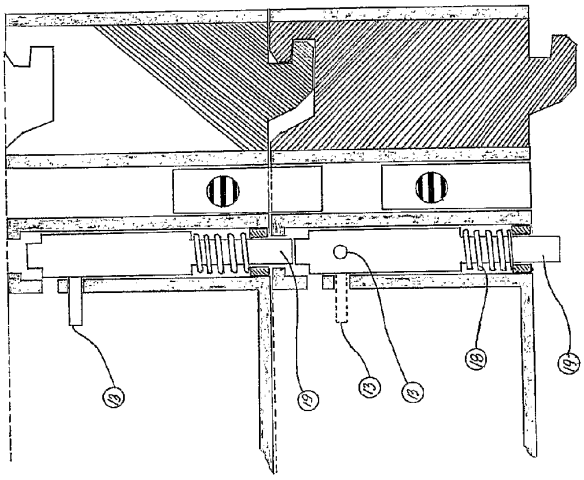


Fig. 6

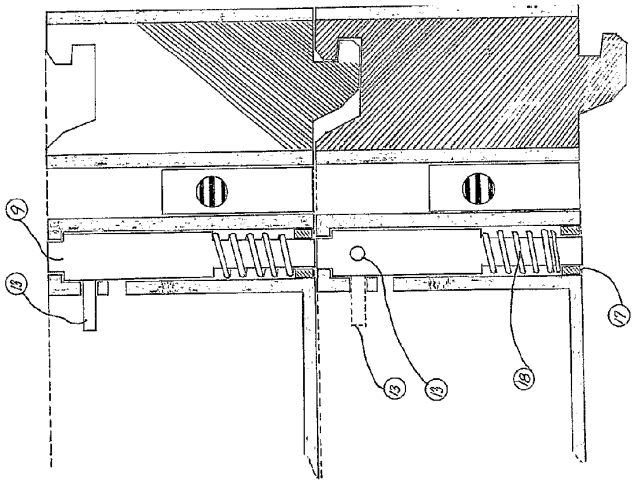
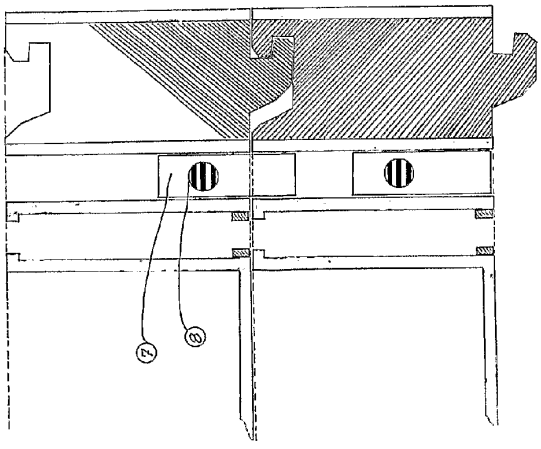


Fig. 5



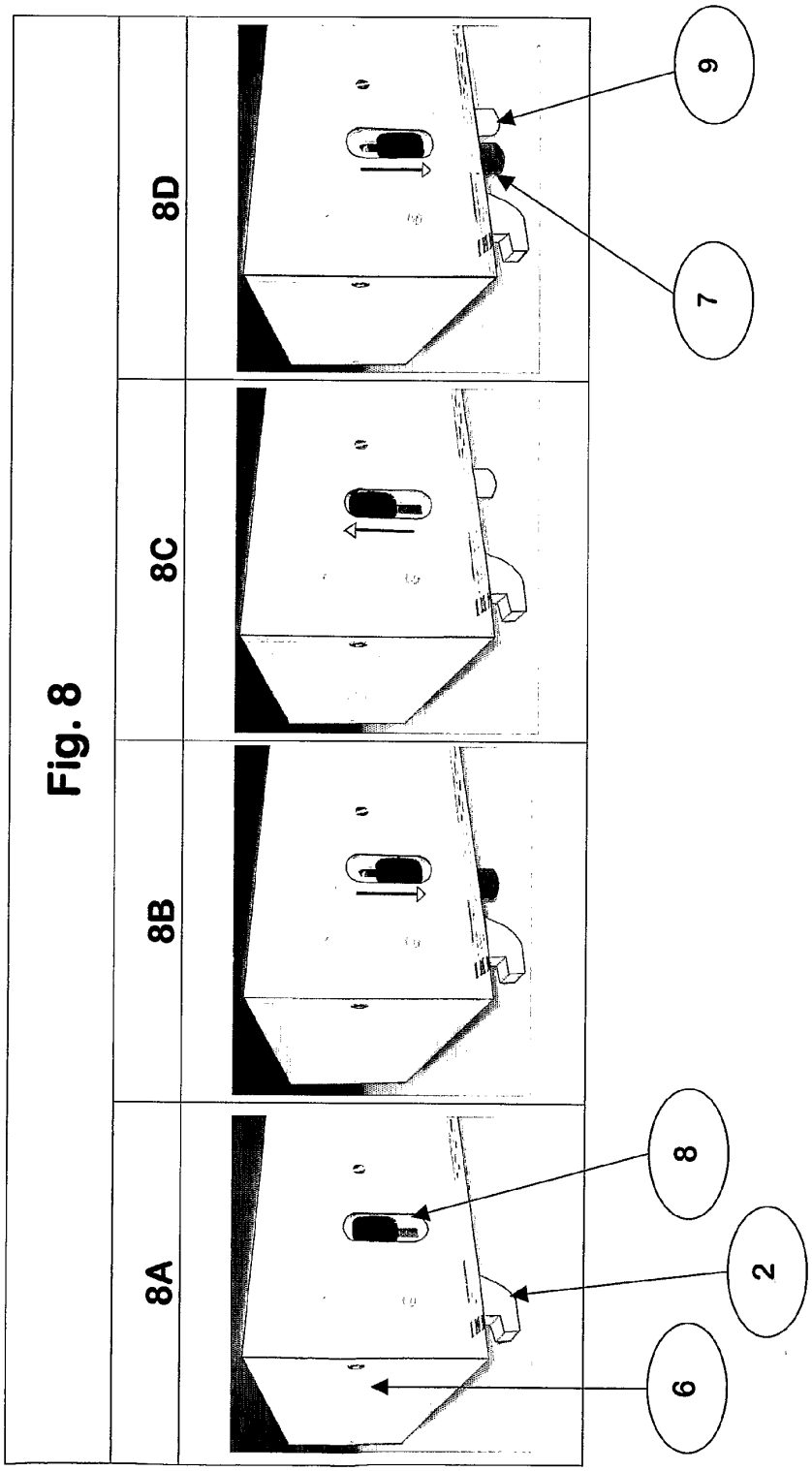


Fig. 8
8D
8C
8B
8A
9
7
8
2
6

Fig. 9

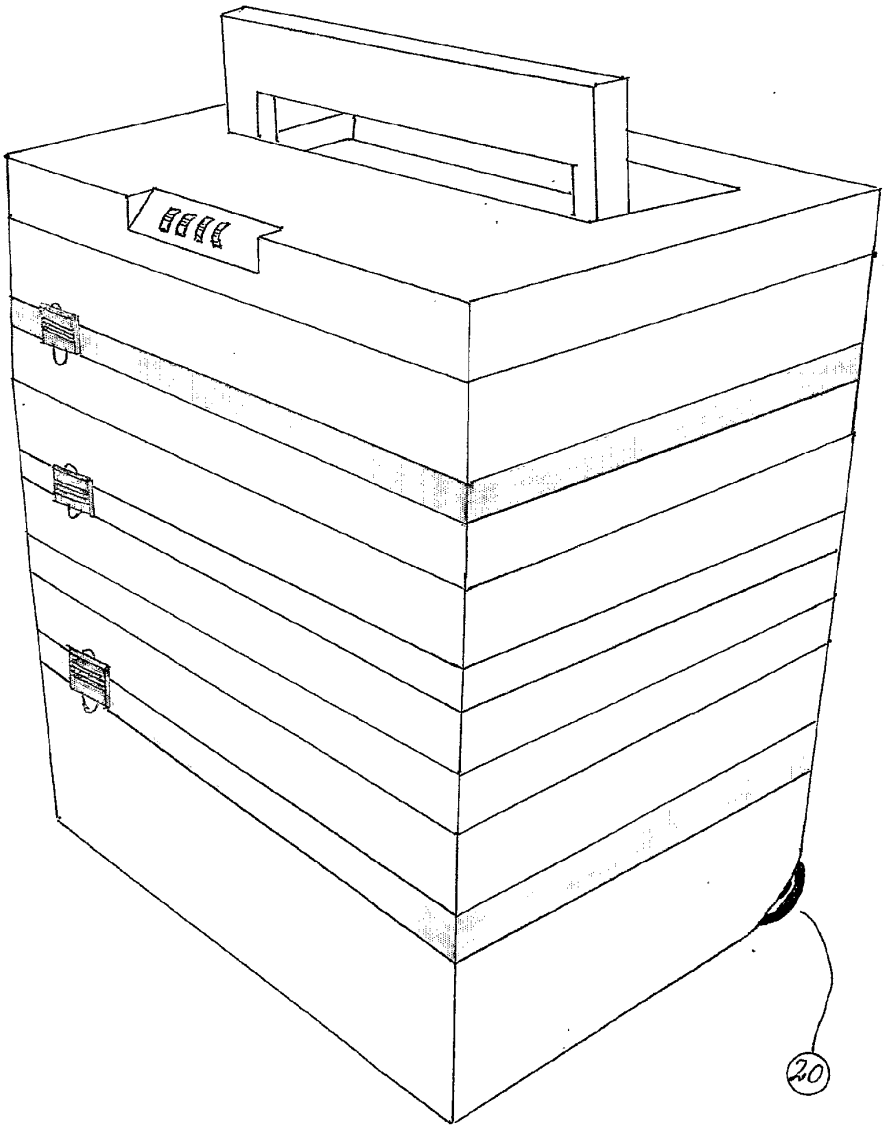


Fig. 10

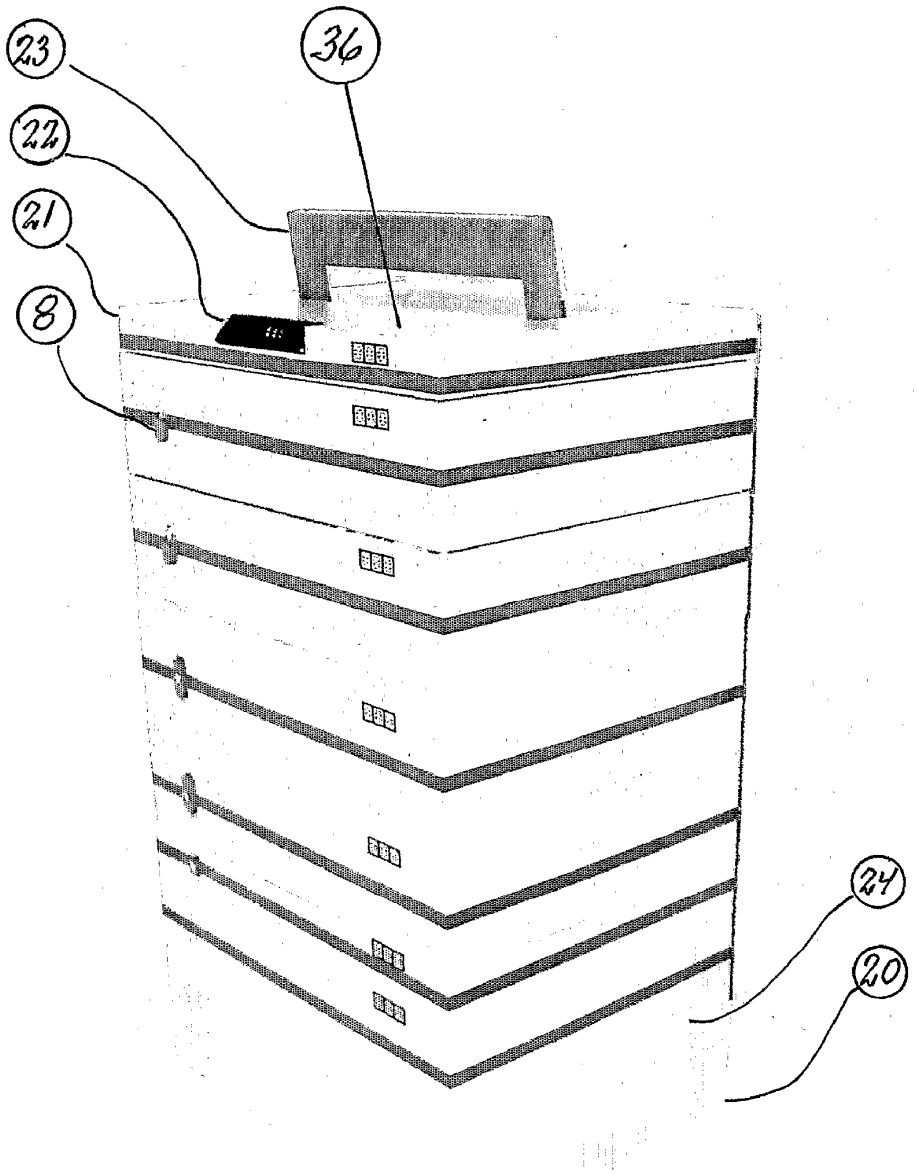


Fig. 11

Fig. 12

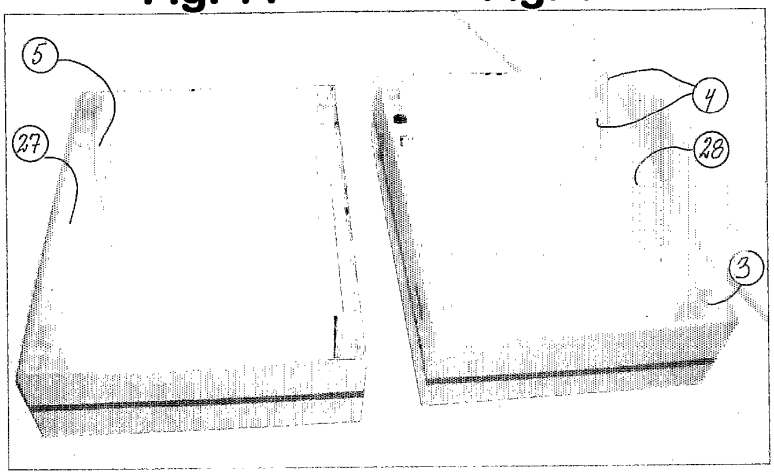


Fig. 13

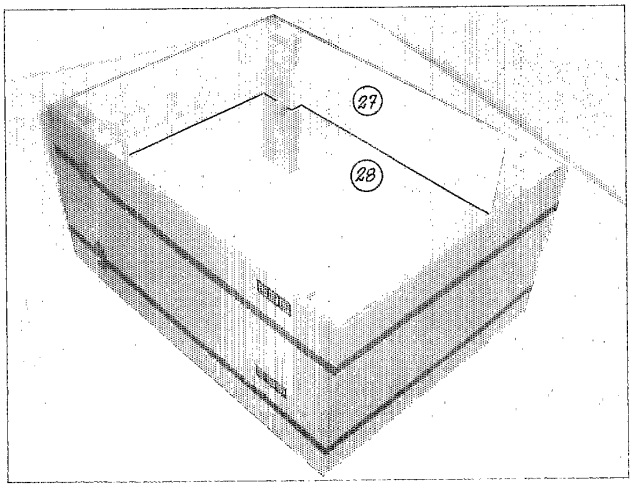
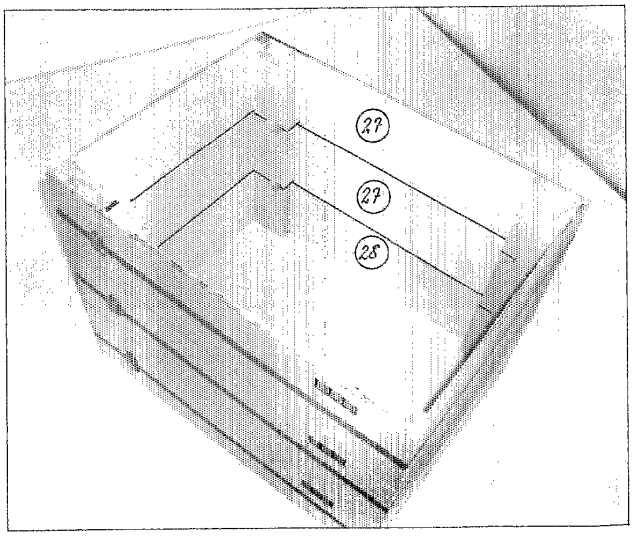


Fig. 14



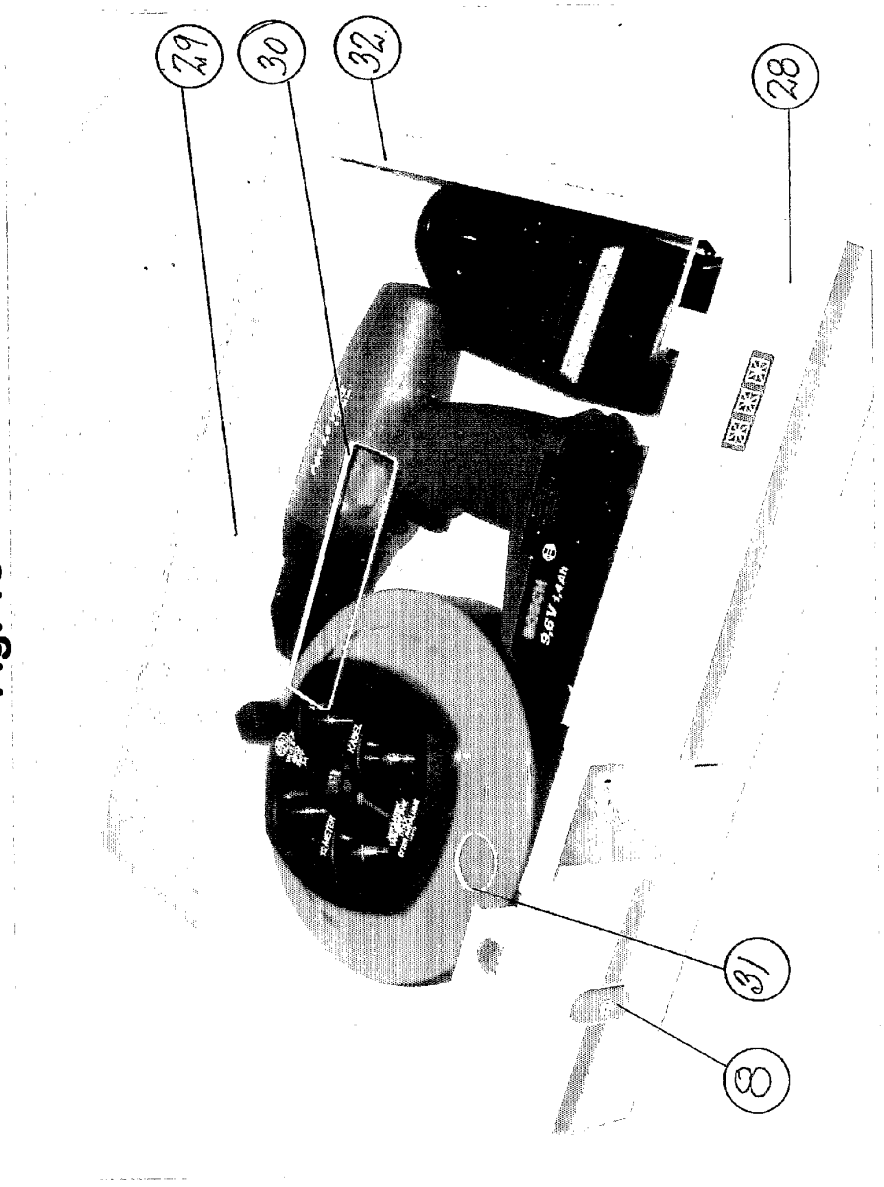


Fig. 15

Fig. 16

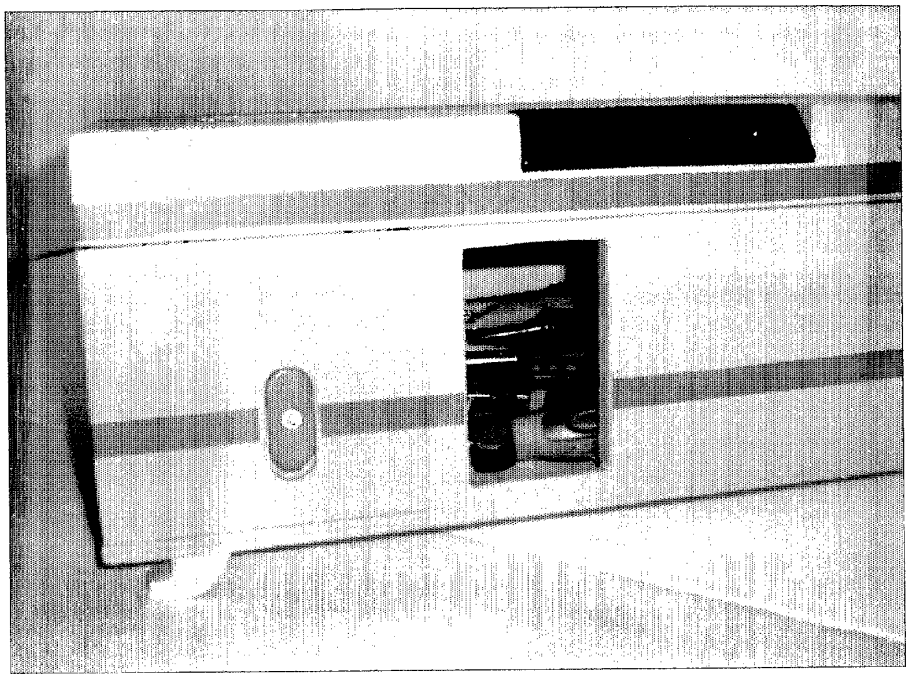
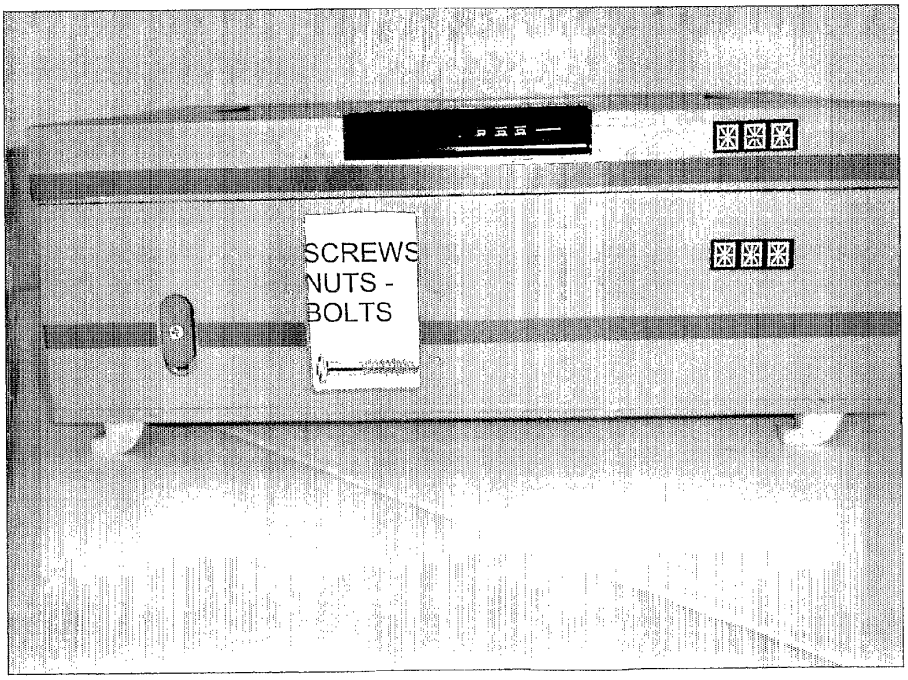


Fig. 17



STORAGE ARRANGEMENT CONSISTING OF TWO PARTS SUCH AS TOW CASES OR ONE CASE AND ONE LID

[0001] The invention concerns a storage arrangement that includes two parts such as two cases or one case and one lid, which parts can be stacked and connected to each other and where each part has two opposite gables and by a coupling unit in each of the two gable corners for separable connection of the two parts in stacked condition, caused by the four coupling units having one in each corner, is arranged to cooperate with the coupling units of an underlying case or lid, which also are placed in the four corners.

[0002] The bottom part of each case is in each of the four corners provided with a bottom bridge and in the four corners of the top part with a top bridge. When the bottom bridges of the top case are placed above the opposite top bridges of the lower case they will easily get in gear and with a slight sidewards push be brought into a tight and compact condition. A transport lock placed in tight connection to one of the connecting bridges (bottom- and top bridges), can be activated outside the case with a little downwards push and provide a blocking for separation of the four sets of connecting bridges and as such also for separation of the two cases or case and lid. As such cases can be connected unlimited. A craftsman f. inst. can have a set of cases (tower) existing of six-eight cases on top of each other. The value of tools and technical equipment in f. inst. six-eight cases can be extremely high and it can be desirable to lock the whole system (tower). A lock against theft can be integrated in the system with a blocking lock only operational inside the cases. A spring loaded security lock in full height of all cases can be activated with a downwards push and then be locked with a little twist. If f. inst. six cases are stacked on top of each other it will be possible with a push on the security lock on the top case to activate all the security locks of all underlying cases. On the top case a lid with a handgrip can be placed and on the lid can be placed a lock, f. inst. a digital code lock. During this, the whole case system (tower) is locked.

[0003] Cases with lids that can be connected are available in various designs and sizes and are being used in many connections. Many tool cases are available with various features.

[0004] Normally tool cases and stackable cases are designed with a hinged lid. There are stackable cases with hinged lid that in principle can be stacked and connected unlimited.

[0005] The coupling for these case systems normally takes place with snaplocks and/or locking clips. Snaplocks can be springloaded and provide automatic locking. Locking clips normally have to be operated by hand for both locking and unlocking. The disadvantages by these locking clips are that they by low temperature can be tight and difficult to operate (broken nails). They can also be worn, break into pieces and because it is a separate component it can fall off and disappear, where after the system does not work anymore. With a well known case system the coupling is made via four locking clips per case. By coupling of f. inst. six cases it means five cases with each four locking clips=in total twenty locking clips to be pressed in locking position. By separating the case system the process has to be repeated with twenty times finger releases. Furthermore it is a well known disadvantage by existing coupling systems that the coupling is not tight and compact and leaves a space in between the cases from 1.5 to 3,0 mm when lifting in the top case or top lid (accordion effect).

[0006] Coupling with snaplocks can be automatic in the locking process and as such very quick. Very often these snaplocks are separate components that can be worn, come to pieces or fall off. In addition these locks will not establish a tight and compact coupling and therefore not provide the desired breaking strength and wearing quality.

[0007] The purpose with the invention is to provide a connecting bridge for stackable cases and lids that can raise the desired and needed demand for strength and to avoid breakage in connection with daily use, wear and tear and in addition a simple and quick operational system. Other points and functions are also a part of the invention and are described following.

[0008] The purpose with the invention is considered by a storage arrangement as described in the introduction to claim **1** that is characteristic by that in each of the four corners of the storage arrangement (case) a connecting bridge is moulded together from top to bottom of the case. The connecting bridge is constructed with a top bridge on top and in bottom a bottom bridge.

[0009] By coupling of two cases the bottom bridges of the top case will meet the top bridges of the lower case and they will easily fall in gear because of the conical catch flanges on both top- and bottom bridges. The final coupling is made by a slight sideward push on the top case. To secure this coupling, are by at least one of the four connecting bridges moulded together two vertical houses for locking (columns). In one of these is placed a vertical lock (transport lock) that can be operated from outside the case and with a slight downwards push bring the transport lock in a blocking position and secure that all four top bridges and bottom bridges are in gear.

[0010] The other vertical column for locking can be used as a security lock as described following.

[0011] Because of the special design of the conical top- and bottom bridges the coupling can happen very quick and a push on the locking knob placed outside the case will bring the transport lock in blocking position tight to the connecting bridge.

[0012] The four connecting bridges are placed in the outer corners of the cases and as such providing optimal strength and stability in the coupling. The connecting bridges including top- and bottom bridges are moulded together with the gable, sidewall and bottom of the cases and as such providing optimal strength and stability.

[0013] The connecting bridges are moulded together with the case and as such there are no loose components that can be worn, go apart, fall off and disappear.

[0014] Because of the construction where all the basic elements of the case are moulded together a very advantageous and inexpensive cost price can be obtained.

[0015] Alternatively to four connecting bridges per case it could be considered for lighter and private use only to use two connecting bridges, f. inst. one in each gable of the case. Because of the construction with the conical locking frames on top- and bottom bridges and combined with the accuracy available by plastic moulded subjects it will be possible to avoid accordion effect because the coupling will be tight and without wobble.

[0016] This also provides a robust impression in connection with the security lock and use of the system (tower) as a sack trolley.

[0017] The transport lock keeping the top- and bottom bridges in tight gear can be activated by a locking knob placed outside the cases. The process of locking and unlocking will only take one second.

[0018] The locking column for the security lock is moulded together with the case and the connecting bridge for optimal strength and stiffness. The security lock is in same height as the outer dimension of the case and is equipped with a push spring that at all time will try to position the security lock within the height of the case.

[0019] The security lock is being activated by a downward push from above and will after four to six mm's movement provide a total blocking and as such secure the coupling. The security lock has a locking arm that can be twisted, get in gear and fix the locking.

[0020] If f. inst. six cases are stacked on top of each other the six security locks will in principle be in contact with each other meaning that when the security lock of the top case is activated downwards the security locks of all underlying cases will be brought in blocking position and the final locking with the small locking arm is only needed inside the top case. The security lock can only be operated inside the cases. When the small locking arm in the vertical house for locking is turned back again the push spring will bring all six locks back to the starting point. Upon the top case will be placed a lid with an integrated lock f. inst. a digital padlock and the whole system is locked up.

[0021] As such the security lock is extremely quick to operate for unlocking the system (tower) f. inst. consisting of six cases. Some users could choose to use the security lock as transport lock because only one action (one second) is needed for locking or unlocking the whole tower.

[0022] Both transport- and security locks are very robust and strong caused by the construction in which they are placed in the vertical houses moulded together with the gables, sidewalls and bottom of the cases.

[0023] The four bottom bridges can be provided with small rubber shoes and then be used as feet, which will protect against dust and scratches on the cases as well and on tables, shelves and floors on which the cases might be placed.

[0024] By a selection of extension walls (cases without bottom) existing height of the cases can be enlarged and the volume of the cases will also be enlarged. The extension walls also have a connecting bridge in each of the four corners and can as such be coupled and locked random with the other cases. If f. inst a case is 100 mm high and two extension frames of each 100 mm are placed on top the height of the case will be 300 mm.

[0025] With a case system, as here mentioned, with extreme tight and compact connection it is obvious to provide a rolling transport of the set (tower). A bottom box has two wheels that only will obtain contact to the foundation by a 15° backwards inclination. Because the whole set (tower) is very compact and stiff it will in principle be possible to transport it as an ordinary sack trolley.

[0026] A transparent lid (possibly disposable) means that a supplier of machines, hand tools, accessories, screws, bolts, etc. can prepare and pack "a set", place the transparent lid on top of the case and seal it. With this the end user (final customer) is secured, that "the set" is complete in the buying situation and when sealing is broken.

[0027] A small opening locked with a transparent plate in the walls of the cases provides a visual view to the contents of the cases. The transparent plate is placed in an insert frame and can easily be replaced by a not transparent plate on which can be indicated contents etc. Without any indications this plate will simply just block for view into the case.

[0028] The invention also concerns the practical use.

[0029] With the previous mentioned basic ideas and features the modern craftsmen can look forward to a more organised and structured separation, handling and transport of tools, equipment, etc.

[0030] With the quick disassembly and assembly of the cases, combined with the visual overview of the contents the craftsmen can choose and couple together exact the cases needed for today's work. The transport of the set is wheeled (sack trolley concept).

[0031] Following the invention will be described with reference to the enclosed drawings and photos.

[0032] FIG. **1** showing two connecting bridges assembled and disassembled.

[0033] FIG. **2** showing two connecting bridges disassembled and with more details inclusive conical locks and catch flanges.

[0034] FIG. **3** showing two cases in which the connecting bridges in the corner unit are moulded together with the houses for transport- and security lock.

[0035] FIG. **4** showing the same as FIG. **3** but now with the transport lock in both cases.

[0036] FIG. **5** showing the same as FIG. **4** but with the transport lock of the top case in blocking position.

[0037] FIG. **6** showing the two cases with both transport- an security, lock in neutral position.

[0038] FIG. **7** showing the same as FIG. **6** but with the security lock in blocking position on both top- and bottom case.

[0039] FIG. **8** showing transport- and security lock in the four possible positions in respectively **8**A-**8**B-**8**C-**8**D. The gable of the case is marked on **8**A.

[0040] FIG. **9** showing a set of stacked cases (tower) where one of the two integrated transport wheels can be seen lowest at right.

[0041] FIG. **10** showing a set of cases (tower) with lid, code lock and carrying-grip.

[0042] FIG. **11** showing an extension frame without bottom but with the four connecting bridges.

[0043] FIG. **12** showing a 100 mm high standard case.

[0044] FIG. **13** showing a 100 mm high standard case with a 100 mm high extension frame placed and the transport lock is locked.

[0045] FIG. **14** showing a standard case with two extension frames on top.

[0046] FIG. **15** showing a case with a drill and a cable reel as a packed set. Closing of the case can be done with a transparent lid that can be sealed. It means that both the retailer and the end user can be sure that the set is complete.

[0047] FIG. **16** showing a case with an inside insert frame with a transparent window for view into the contents of the case.

[0048] FIG. **17** showing a case like in FIG. **16** on which the transparent window is replaced be a plate for indication of the contents.

[0049] Following the invention will be described with reference to the enclosed drawings/photos and the reference numbers used.

[0050] On FIG. **1** is shown the basic drawing of the connecting bridge (**4**) on which the bottom bridge (**2**) is framed like a downwards positive L-profile (male) which falls in gear with the top bridge (**3**) of the underlying case which is framed like a negative L-profile (female).

[0051] On FIG. **2** is shown the top bridge (**3**) with a direct frame (**1**) which will meet the catch flange (**40**) on the bottom bridge (**2**). To simplify and make an easy and safe placing of the top case on the lower case are both top bridge (**3**) and bottom bridge (**2**) provided with conical catch flanges (**15**+

41) and (39+40). To secure a right and compact coupling both top bridge (3) and bottom bridge (2) are constructed with conical locking frames (14+38). When top case (10) is placed on top of the lower case (11) the direct frame (1) and the conical catch flange (40) will automatically bring the coupling parts in gear. A slight sideward push will bring the connecting bridges (4) in tight gear and as shown on FIG. 5 the transport lock (7) will block for disassembly and keep the connecting bridges in tight and compact coupling. The transport lock (7) can be activated outside the case by locking knob (8). As it appears on FIG. 5 the transport lock (7) is placed very close to the connecting bridges (4) and thus the coupling is free from wobbles and slack and at the same time robust and almost impossible to break open.

[0052] On FIG. 6 is shown the security lock (9) placed in mutual connection with connecting bridge (4) and transport lock (7). Security lock (9) is assembled with a push spring (18) and the set is placed in house for security lock (12) and fixed with a press bushing (17) which at the same time controls and supports the locking tap (19).

[0053] As it appears on FIG. 6 and FIG. 7 the two security locks (9) are in contact with each other. When the security lock (9) of the top case is pushed downwards it will automatically move the security lock (9) in the lower case downwards. At the same time the locking tap (19) of the top case is positioned in blocking position with the house for security lock (12) on the lower case.

[0054] It means that the security lock (9) of all upon each other placed cases can be activated by just activating the security lock (9) of the top case. Following the final locking can be made by a little twist with locking arm (13). A fine point could be to use the security lock as transport lock. All stacked cases locked via one activation of the security lock (9) of the top case. Spend of time: 1 second.

[0055] All shown examples only show open cases stacked and with a lid on top. If one want a case cases with lids stacked, meaning a case+a lid+a case+a lid etc., it is possible because both the transport lock (7) and security lock (9) can be integrated in the separate lid which then can be stacked and locked with the same system as in the cases, although with a hole in the lid for activating the security lock (9).

[0056] On FIG. 9 and FIG. 10 is shown a stacked set (tower 36) with the special bottom case (24) in which the two transport wheels (20) are integrated. The tower (36) is finally on top closed with a lid (21) with carrying grip (23) and a code lock (22).

[0057] FIG. 11 shows an extension frame (27) without bottom. The corner unit (5) can also be seen here.

[0058] FIG. 12 shows a standard case (28) with bottom and connecting bridge (4) and top bridge (3).

[0059] FIG. 13 shows a standard case (28) and an extension frame (27) coupled together.

[0060] FIG. 14 shows the same example but with two extension walls (27). As it can be seen it gives a great flexibility to adjust cases in different heights.

[0061] FIG. 15 shows a standard case (28) in which a drill and a cable reel is placed. This kind of "combination-pack" is often used by manufacturers as promotional idea for machines, accessories, screws, bolts, nails, plugs etc. It is highly essential for as well manufacturer, retailer and the final end user to be sure that "the set" is complete.

[0062] The innovation is here that a transparent lid (29) is placed in a countersinked frame (32). A sealing can be made by a warm-up/melting into the frame or alternatively via one or two hot melted straps. A carrying grip (30) as well as a hole (31) for the security lock (9) is a possibility, when the transparent lid is wanted for future and continuous use. The transport lock (7) can be operated from outside with the locking knob (8).

[0063] FIG. 16 shows the case with a transparent window (33) that inside the case is pushed down in an insert frame (34). The same insert frame (34) is used on FIG. 17 but with the transparent window replaced by a plate (35) for indication of contents.

1. Storage facility comprising two or more boxes or a box and a lid, all parts that can be stacked and interconnected and where the boxes or lids have opposite facing gables and where the connecting bridge (4) is placed in the four corners or with one connecting bridge (4) on each of the opposite facing gables, whereby the bottom bridge (2) of the upper box or lid interconnects with the top bridge (3) of the below box or lid characterized by the bottom bridge (2) of the top box or lid being shaped as a downward pointing L profile (male part), which interconnects with the top bridge (3) of the below box, which is shaped as an L profile (female part).

2. Storage facility according to requirement 1 characterized by having the four connecting parts in the four outer corners of the boxes or lids.

3. Storage facility according to requirements 1-2 characterized by the connecting parts being cast together with the bottom and side walls of the boxes and the top and side walls of the lids.

4. Storage facility according to requirements 1-3 characterized by the connecting parts being cast together with boxes or lids and connecting via the four cast-in connecting parts.

5. Storage facility according to requirements 1-4 characterized by a construction that allows injection moulding of box and connecting parts or lid and connecting parts in one process.

6. Storage facility according to requirements 1-5 characterized by one or more of the connecting parts being cast together with a locking column.

7. Storage facility according to requirements 1-6 characterized by a construction that creates very close contact between connected boxes and lids.

8. Storage facility according to requirements 1-7 characterized by one or more of the connecting bridge being cast together with a cavity in which a security lock is placed.

9. Storage facility according to requirements 1-8 characterized by having a plexiglass in front of the catch on the locking device.

10. Storage facility according to requirements 1-9 characterized by the security locks' proximity to the connecting bridges and the fact that the security locks will interact with the below security locks, when the boxes or lids are placed on top of each other.

11. Storage facility according to requirements 1-10 characterized by having small soft rubber buttons underneath the four bottom bridges.

12. Storage facility according to requirements 1-11 characterized by wall systems, which are boxes without bottoms and with the same connecting system as boxes and lids.

13. Storage facility according to requirements 1-12 characterized by having transparent glass or plexiglass in the box gables or sides.

14. Storage facility according to requirements 1-13 characterized by having one bottom box with two transport wheels.

* * * * *