(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 435 327 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.07.2004 Bulletin 2004/28

(51) Int Cl.[7]: **B65D 6/24**, B65D 21/08, A47B 87/00

(21) Application number: **03011181.9**

(22) Date of filing: **27.05.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(30) Priority: **30.12.2002 IT PD20020089 U**

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(54) Modular storage box

(57) A modular storage box (10), comprising a base (11), a first (15) and a second walls (16), and a lid (18), capable of increasing its capacity longitudinally by way of the connection, by means of bridge elements (23), of additional first walls (15) and second walls (16) and bases (11), the bridge elements (23) being mutually connected by a cross-member (34), all of the components being connected by means of reversible interlocking elements.

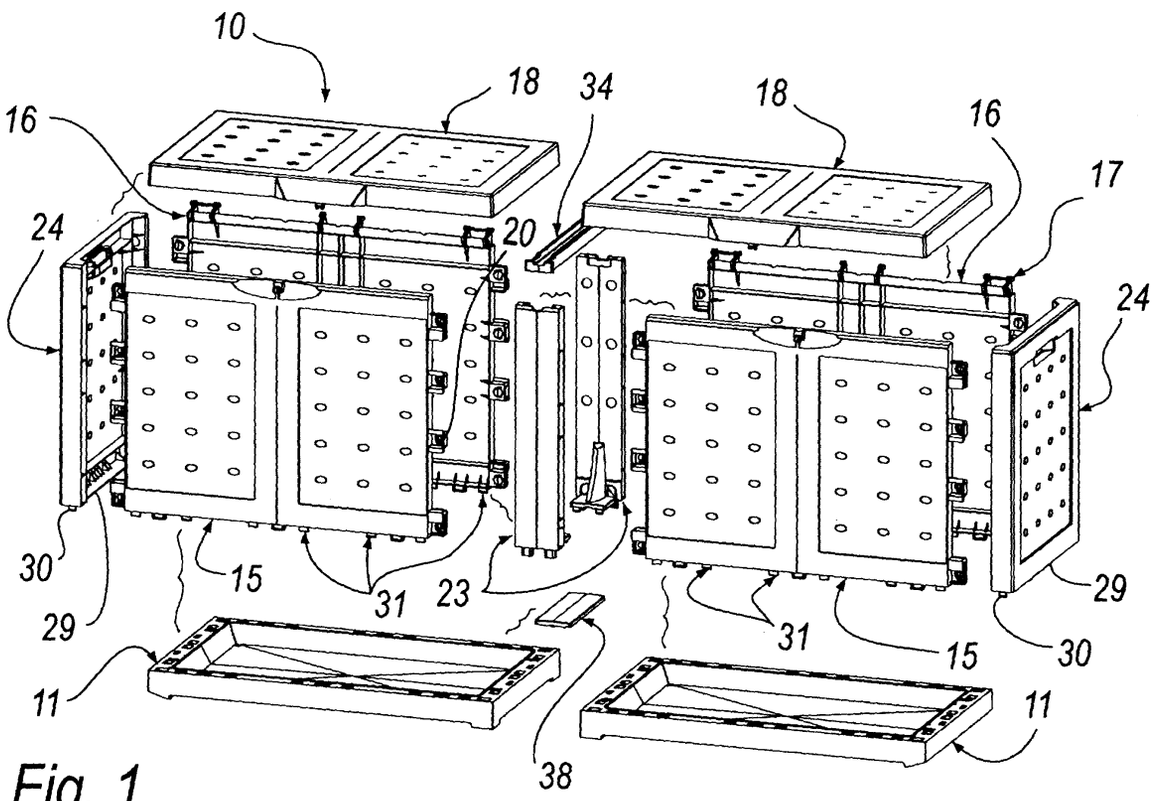

Fig. 1

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Description

[0001] The present invention relates to a modular storage box.

[0002] Modular storage boxes are currently known which are composed of a base with which two longitudinal walls and two side walls are associated, each longitudinal wall being fixed to the two side walls and each side wall being fixed to both longitudinal walls.

[0003] The modular storage box is completed by a lid that is hinged to one of said walls.

[0004] The base, the walls and the lid are mutually connected by way of detachable connection means.

[0005] Such detachable connection means are of the type with reversible interlocking; the walls, the base and the lid are therefore particularly easy to assemble/disassemble even for a user lacking particular technical skills.

[0006] Under the base there are castors that allow to move the storage box easily even in the assembled configuration.

[0007] Such storage boxes are very useful because of their capacity in every room of a house, from bedrooms to bathrooms to the garden.

[0008] Such storage boxes have a wide market owing to their great versatility, light weight, easy handling and therefore easy transport, and to their low cost.

[0009] The modularity of the storage boxes is a great advantage for manufacturers and retailers, who can package and store the modular storage boxes and to optimize the space available.

[0010] The modular storage boxes as described above, although being commercially known for several years, have perfectible aspects.

[0011] One drawback is that they can be assembled according to a single assembly method.

[0012] An equally important drawback is that such storage boxes are limited longitudinally due to the inherent limits of the molds and machines employed for molding.

[0013] Molds of exceptional size in fact entail an exponential cost increase, arising both from the size increase and from the increase in the problems linked to the molding techniques and methods employed.

[0014] This drawback generally conditions the capacity of the storage box, in particular by not allowing to store therein all garden maintenance or house cleaning tools that are particularly long, such as vacuum cleaners, string trimmers, rakes and many others.

[0015] The aim of the present invention is to provide a modular storage box that allows a wider public offer range.

[0016] Within this aim, an object of the present invention is to provide a modular storage box comprising components that allow to increase the capacity of the storage box.

[0017] Another object of the present invention is to provide a modular storage box that can be manufactured with known technologies and systems without resorting to molding machines that have special dimensions and are therefore particularly expensive.

[0018] An important object of the present invention is to provide a modular storage box whose components can be packaged and stored easily, optimizing the space available.

[0019] Another object of the present invention is to provide a modular storage box that can be placed in an enclosed environment as well as outdoors.

[0020] Another object of the present invention is to provide a modular storage box that is provided with castors that can be moved easily in the assembled configurations.

[0021] Another object of the present invention is to provide a modular storage box that can be assembled even by users lacking particular technical skills.

[0022] Another object of the present invention is to provide a modular storage box whose manufacturing costs are competitive with respect to those of known models.

[0023] This aim and these and other objects that will become better apparent hereinafter are achieved by a modular storage box, characterized in that it comprises a base, on the longitudinal edges of which a first wall and a second wall are associated by way of detachable connection means, a lid being connected to the second wall by way of detachable articulation and connection means, the first and second walls and the base having, in perimetric regions, fixing elements for components selected at will between side walls and bridge elements for connection to additional such first and second walls and such bases, the bridge elements being mutually connected by a cross-member.

[0024] Further characteristics and advantages of the invention will become better apparent from the following detailed description of an embodiment thereof, illustrated by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a perspective, exploded view of the modular storage box according to the invention in the combined configuration;

Figure 2 is a perspective top view of the base;

Figure 3 is a sectional view of a portion of the base in which a castor is accommodated;

Figure 4 is a perspective view from the inside of the second wall;

Figure 5 is a perspective view of a portion of the lower face of the lid;

Figure 6 is a perspective view of the internal face of a portion of the first wall;

Figure 7 is a perspective view of the lower face of a component of the modular storage box according to the invention;

Figure 8 is a perspective view of the bridge element;

Figure 9 is a perspective view of the lower face of the bridge element;

Figure 10 is a perspective view of the cross-member;

Figure 11 is a perspective view of the modular storage box according to the invention, assembled in its basic configuration;

Figure 12 is a perspective view of the modular storage box according to the invention, assembled in its combined configuration.

[0025] With reference to the figures, a modular storage box according to the invention is designated by the reference numeral 10 in this case.

[0026] The modular storage box 10 comprises two bases 11, one of which is provided with two castors 12 below one of its lateral edges 13.

[0027] A first wall 15 and a second wall 16 are associated on the longitudinal edges 14 of each base 11 by way of detachable connection means 31.

[0028] A lid 18 is connected to each one of the second walls 16 by way of detachable connection and articulation means 17.

[0029] The first and second walls 15 and 16 have, on their vertical edges 19, first engagement means 20 for connection to additional components described in greater detail hereinafter.

[0030] The first engagement means 20 are constituted by lugs 20a that are monolithically associated with the vertical edges 19.

[0031] Each lug 20a comprises a flexible chamfered stud 20b.

[0032] The lugs 20a with studs 20b interlock reversibly in corresponding and suitable contoured centering and connection portions 21, which are provided in the facing components that are described in greater detail hereinafter.

[0033] The bases 11 have, on their lateral edges 13, complementarily shaped seats 22 that are suitable to accommodate second engagement means 28 and third engagement means 30 that protrude downward from said components and are described in greater detail hereinafter.

[0034] The first engagement means 20 and the complementarily shaped seats 22 allow the first walls 15 and the second walls 16 and the base 11 to connect components selected at will between bridge elements 23 and side walls 24.

[0035] The bridge element 23 is monolithically constituted by a vertical portion 25, by a footing 26 and by a substantially triangular element 27 for reinforcement and connection between the vertical portion 25 and the footing 26.

[0036] The bridge element 23 comprises laterally the contoured centering and connection portions 21, and the second engagement means 28 protrude below the footing 26.

[0037] The second engagement means 28 are constituted by first tabs 28a with an engagement tooth 28b.

[0038] The first tabs 28a, and therefore the teeth 28b, are monolithic with the footing 26.

[0039] The third engagement means 30 protrude from the lower sides 29 of each one of the side walls 24.

[0040] The third engagement means 30 are constituted by second tabs 30a, with engagement teeth, which are monolithic with the lower sides 29 and therefore with the side walls 24.

[0041] The first tabs 28a and the second tabs 30a are flexible and engage by reversible interlocking in the complementarily shaped seats 22 on the lateral edges 13 of the bases 11.

[0042] Contoured centering and connection portions 21 are also provided on the side walls 24.

[0043] The two bridge elements 23 allow, by means of the first tabs 28a, the connection between the two mutually adjacent bases 11 by means of one of their lateral edges 13, and allow, by means of the contoured portions 21, the engagement of two of the first and second walls 15 and 16.

[0044] The two side walls 24 complete the configuration of the storage box 10, being arranged on the sides of the structure that are not occupied by the bridge elements 23.

[0045] The detachable connection means 31 are constituted by third flexible tabs 31a provided with an anchoring tooth 31b.

[0046] The third tabs 31a protrude monolithically from the lower edges 32 of the first and second walls 15 and 16 and engage by reversible interlocking in slots 33 that are shaped complementarily on the longitudinal edges 14 of the bases 11.

[0047] The bridge elements 23 are mutually connected by a cross-member 34.

[0048] The cross-member 34 has T-shaped ends 34a, each of which is suitable to be accommodated in a corresponding complementarily shaped cavity 35 that is provided above the vertical portion 25 of the bridge element 23.

[0049] The cross-member 34 comprises a drainage channel 36 that runs longitudinally with respect to said cross-member 34.

[0050] The cavities 35 are shaped so as to form a raised edge 35a for preventing overflow.

[0051] The vertical portion 25 of the bridge element 23 has a drainage opening 37 at the upper end of the outside wall.

[0052] The drainage channel 36 and the opening 37 allow, if the box is placed outdoors and exposed for example to rain, the water to be captured directly below the slot provided between the two adjacent lids 18 and to be expelled rapidly, therefore avoiding the penetration of the water in the box, wetting its contents.

[0053] The raised edge 35a acts as a barrier to any seepage of drained liquid that penetrates between the T-shaped end 34a and the respective cavity 35.

[0054] The cross-member 34, arranged in a beam-like fashion, prevents the bridge elements 23 from flexing outward (due to any pressures applied by the con-

tent of the storage box to first and second walls 15 and 16), further improving the interlocking of the lugs 20a with the contoured portions 21 and the strength of the structure in general.

[0055] The modular storage box 10 comprises a complementary element 38, which is provided with detachable, complementary connection means 39 for connection to the adjacent lateral edges 13 of bases 11 that are connected by means of the bridge elements 23.

[0056] The detachable connection means 39 are constituted by fourth tabs 39a, which protrude monolithically downward from the lower face of the complementary element 38.

[0057] The fourth tabs 39a are flexible and have an anchoring tooth 39b at their end.

[0058] The fourth tabs 39a interlock reversibly in the seats 22 that are shaped complementarily on the lateral edges 13 of the bases 11.

[0059] The complementary element 38 strengthens the coupling between the bases 11 already provided by the bridge elements 23 and improves the design of the interior of the storage box.

[0060] Proximate to the first tabs 28a, the second tabs 30a, the third tabs 31a and the fourth tabs 39a centering and reinforcement elements 40 are provided, which enter complementarily shaped holes 41 provided in the lateral edges 13 and longitudinal edges 14 of the bases 11.

[0061] The centering and reinforcement elements 40 facilitate assembly and make the assembled structure less likely to splay (due for example to any pressure generated by the contents of the storage box) in the connection regions.

[0062] The two lids 18, which complete the storage box 10 in an upper region, are connected by way of detachable articulation and connection means 17 to the respective second walls 16.

[0063] The detachable articulation and connection means are constituted by plate-like elements 17a, which rise vertically and monolithically from the second walls 16 and have pivot elements 17b at their ends.

[0064] The plate-like elements 17a and the pivot elements 17b are flexible and interlock reversibly in the complementarily shaped seats 17c formed below each one of the lids 18 at one of the longitudinal sides.

[0065] The modular storage box 10 assumes a basic configuration 42, which comprises one of the bases 11, two of the castors 12, one of the first walls 15 and the second walls 16, one of the lids 18, and two of the side walls 24.

[0066] The modular storage box 10 assumes a combined configuration 43 if it is composed of two of the bases 11, two first walls 15 and second walls 16, two lids 18, two side walls 24, two bridge elements 23, a cross-member 34 and a complementary element 38.

[0067] In practice it has been found that the intended aim and objects of the present invention have been achieved.

[0068] In particular, it should be noted that the modular storage box 10 according to the invention, in its combined configuration 43, has twice the capacity of the basic configuration 42, while maintaining the same characteristics of light weight, strength, easy handling and adaptability to any kind of environment.

[0069] In practice, the materials employed may be any according to requirements, so long as they are compatible with the contingent use.

[0070] The disclosures in Italian Utility Model Application No. PD2002U000089 from which this application claims priority are incorporated herein by reference.

[0071] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. A modular storage box (10), **characterized in that** it comprises a base (11), on the longitudinal edges (14) of which a first wall (15) and a second wall (16) are associated by way of detachable connection means (31), a lid (18) being connected to said second wall (16) by way of detachable articulation and connection means (17), said first wall (15) and said second wall (16) and said base (11) having, in perimetric regions, fixing elements (20) for components selected at will between side walls (24) and bridge elements (23) for connection to additional said first walls (15) and said second walls (16) and said bases (11), said bridge elements (23) being mutually connected by a cross-member (34).

2. The modular storage box according to claim 1, **characterized in that** said fixing elements comprise first means (20) for engagement on said first walls (15) and said second walls (16), and complementarily shaped seats (22) on the lateral edges (13) of said base (11).

3. The modular storage box (10) according to claim 1, **characterized in that** it comprises complementary elements (38) for adjacent lateral edges (13) of bases (11) that are connected by means of said bridge elements (23).

4. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said complementary elements (38) are rigidly coupled to the adjacent lateral edges (13) of said bases (11) by way of detachable connection means (39).

5. The modular storage box (10) according to one or

more of the preceding claims, **characterized in that** said bridge element (23) is constituted monolithically by a vertical portion (25), by a footing (26), and by a substantially triangular element (27) for reinforcement and connection between said vertical portion (25) and said footing (26).

6. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said first engagement means (20) comprise lugs (20a) provided monolithically with the vertical edges (19) of said first wall (15) and said second wall (16).

7. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** each one of said lugs (20a) has a flexible chamfered stud (20b).

8. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said lugs (20a) with studs (20b) interlock reversibly in corresponding and preset contoured centering and connection portions (21) provided in the mutually opposite bridge elements (23).

9. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said bridge elements (23) also comprise second engagement means (28) and third engagement means (30).

10. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said second engagement means (28) comprise first flexible tabs (28a) with an anchoring tooth (28b), which protrude downward and monolithically with respect to said footing (26) of said bridge elements (23).

11. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said third engagement means (30) comprise second flexible tabs (30a) with an anchoring tooth that protrude monolithically from the lower sides (29) of said side walls (24).

12. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said first tabs (28a) and said second tabs (30a) engage by reversible interlocking in said seats (22) shaped complementarily in the lateral edges (13) of said bases (11).

13. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said detachable connection means (31) are constituted by third flexible tabs (31a) with an anchoring tooth (31b), said third tabs (31a) protruding monolithically from the lower edges (32) of said first walls (15) and said second walls (16) so as to engage by reversible interlocking in slots (33) that are shaped complementarily on the longitudinal edges (14) of said bases (11).

14. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said detachable connection means (39) are constituted by fourth flexible tabs (39a) with an anchoring tooth (39b), said fourth tabs (39a) protruding downward, being monolithic with said complementary elements (38), and interlocking reversibly in said seats (22) shaped complementarily on the lateral edges (13) of said bases (11).

15. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** proximate to said first tabs (28a), said second tabs (30a), said third tabs (31a) and said fourth tabs (39a) there are centering and reinforcement elements (40), which enter complementarily shaped holes (41) on the lateral sides (13) and longitudinal sides (14) of said bases (11).

16. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said cross-member (34) has T-shaped ends (34) that are suitable to be accommodated in complementarily shaped cavities (35) provided above the vertical portions (25) of said bridge elements (23).

17. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said cross-member (34) comprises a drainage channel (36) that runs longitudinally with respect to said cross-member (34).

18. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said cavities (35) are shaped so as to form a raised edge (35a) to prevent overflow.

19. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** said vertical portion (25) has a drainage opening (37) at the upper end of the outer wall.

20. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** it comprises, in its basic configuration (42), one of said bases (11), one of said first walls (15) and said second walls (16), one of said lids (18), and two of said side walls (24).

21. The modular storage box (10) according to one or

more of the preceding claims, **characterized in that** it comprises, in its combined configuration (43), two of said bases (11) and of said first walls (15) and said second walls (16), two of said lids (18), two of said side walls (24), two of said bridge elements (23), a cross-member (34) and a complementary element (38).

22. The modular storage box (10) according to one or more of the preceding claims, **characterized in that** it comprises, in its basic configuration (42), below one of the lateral edges (13) of said base (11), two wheels (12) for moving said structure (10) in the assembled condition.

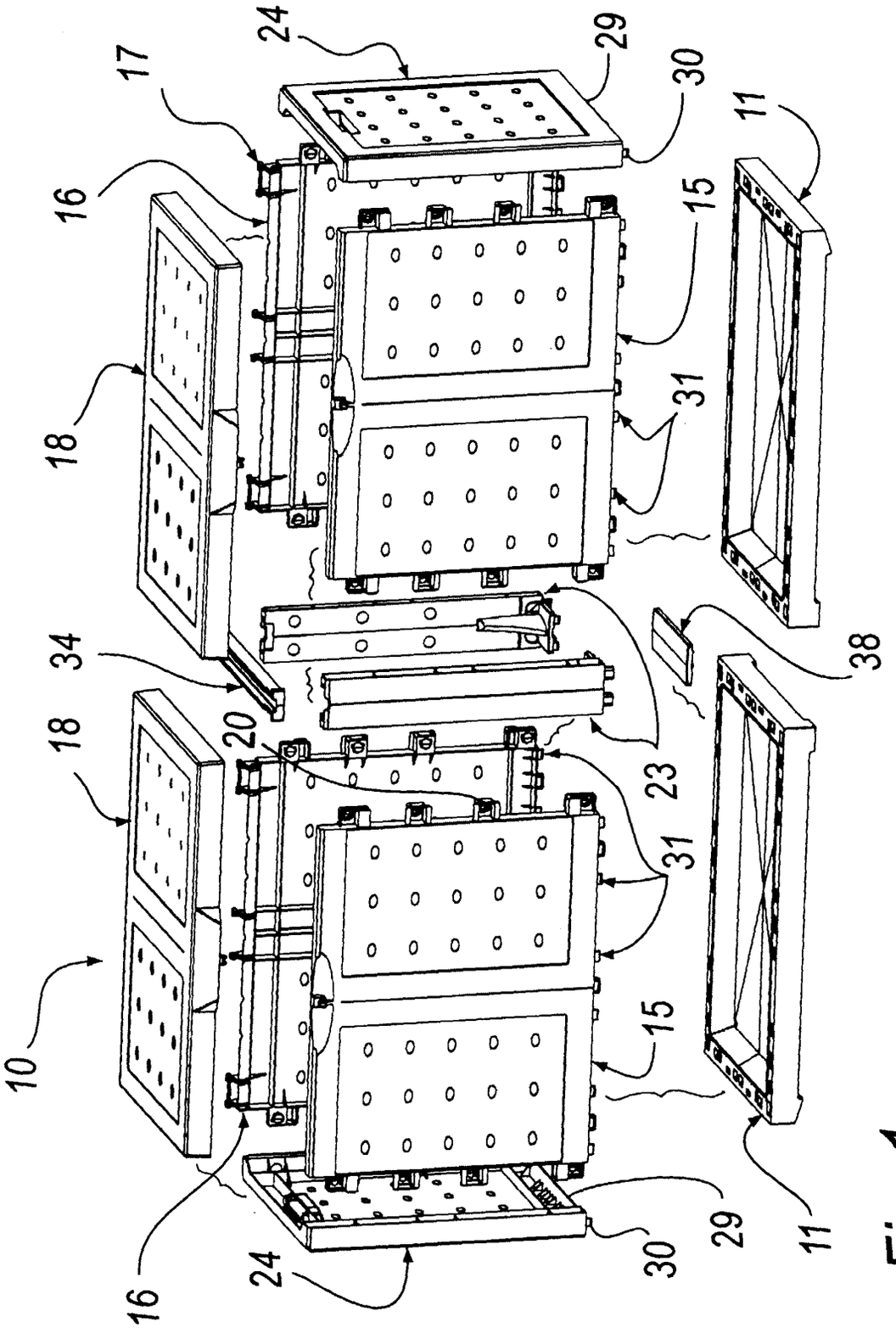


Fig. 1

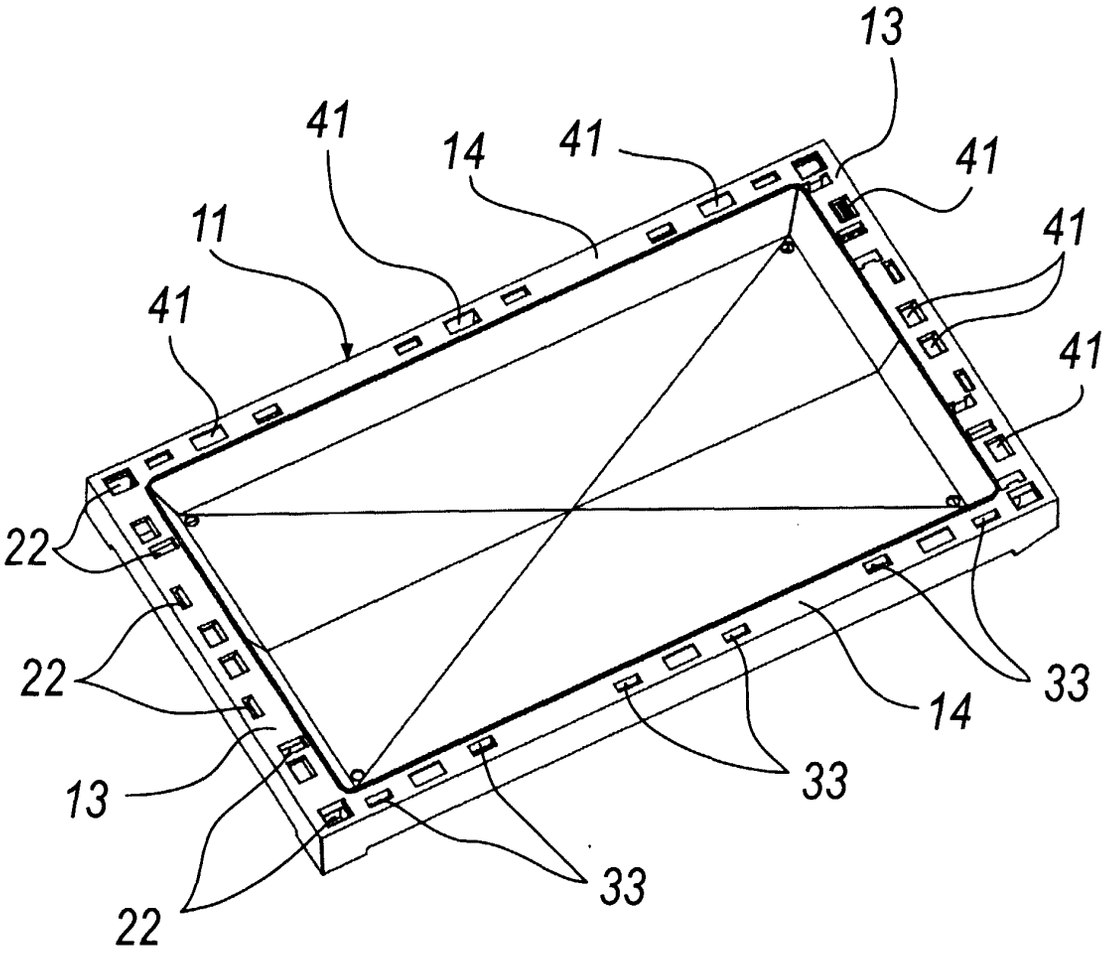


Fig. 2

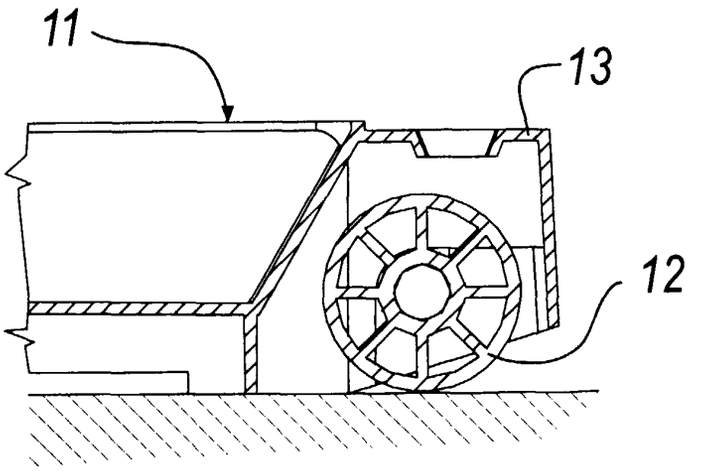
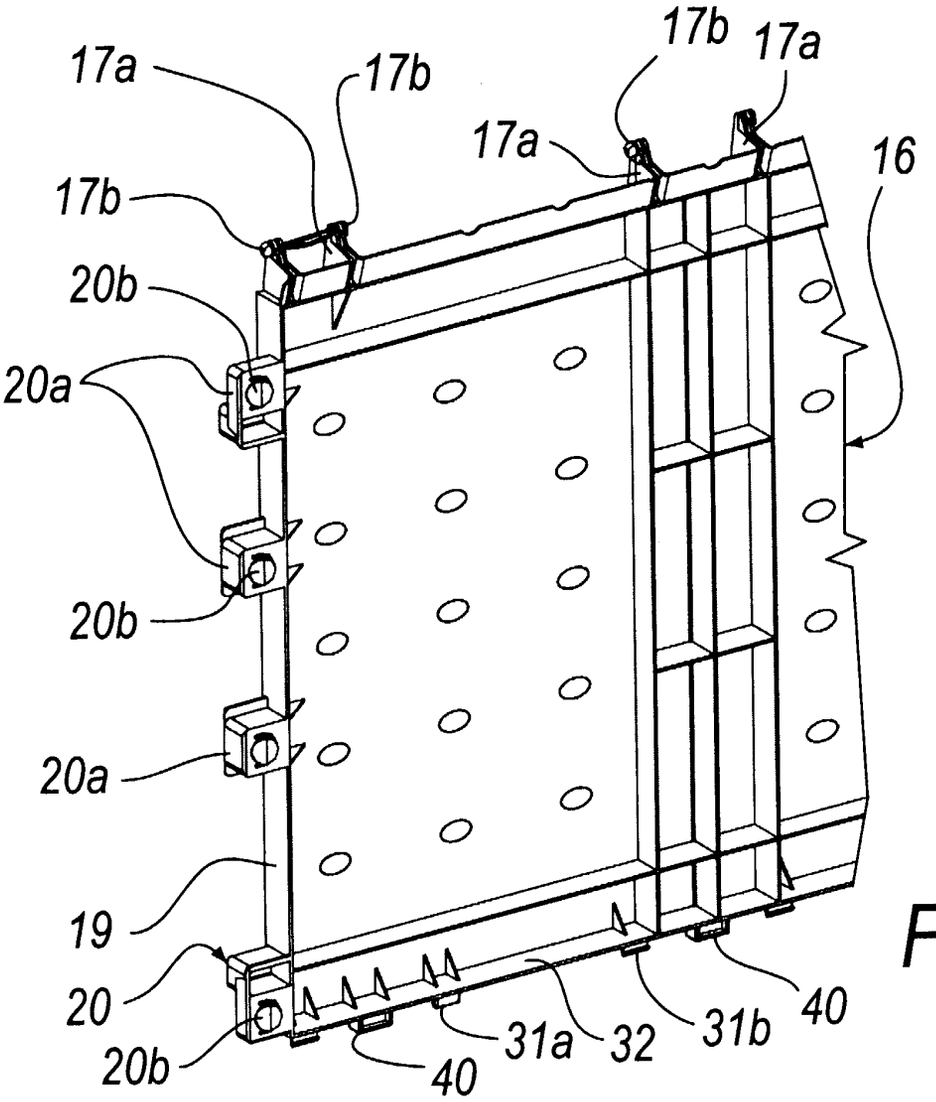


Fig. 3


17a
17b
17b
17a
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16
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20b
40
31a
32
31b
40

Fig. 4

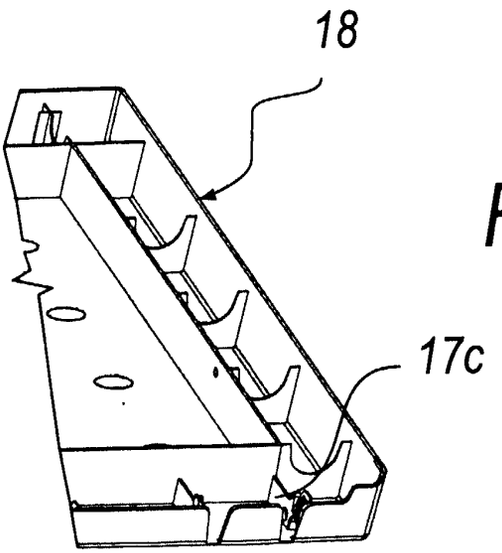
18
17c

Fig. 5

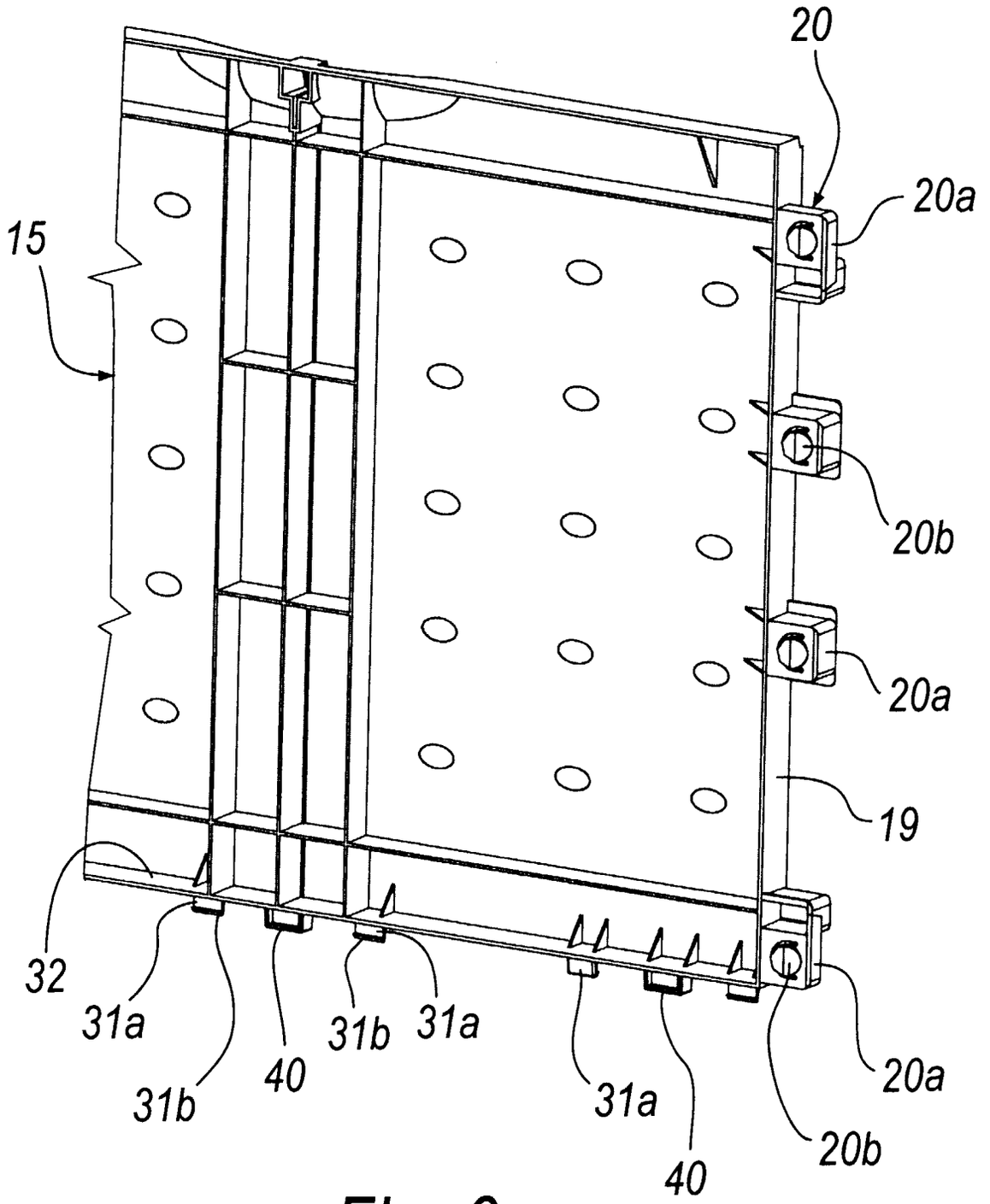

Fig. 6

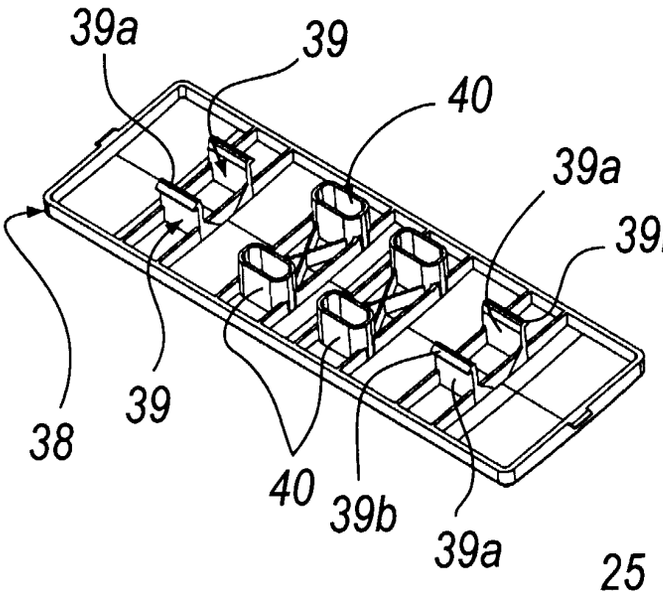

Fig. 7

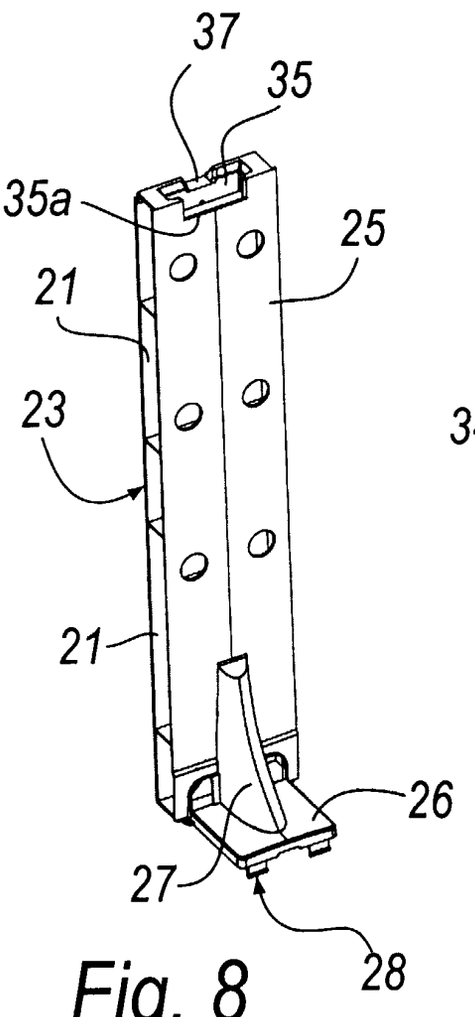

Fig. 8

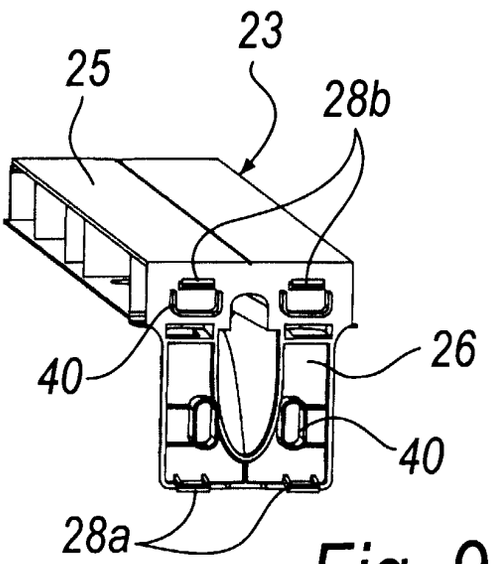

Fig. 9

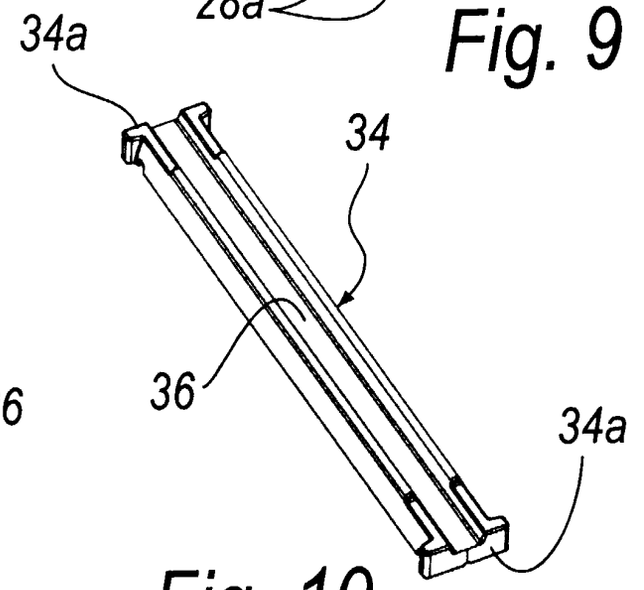

Fig. 10

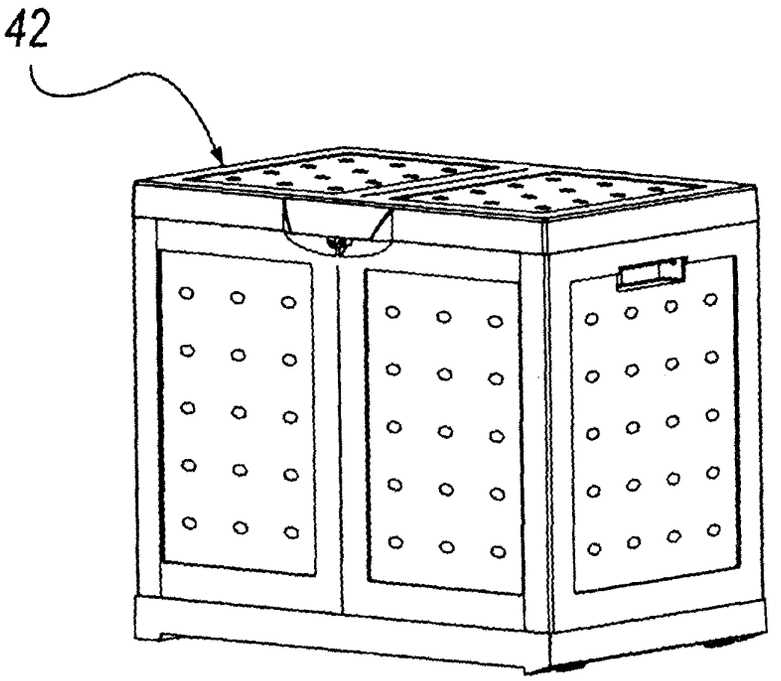

Fig. 11

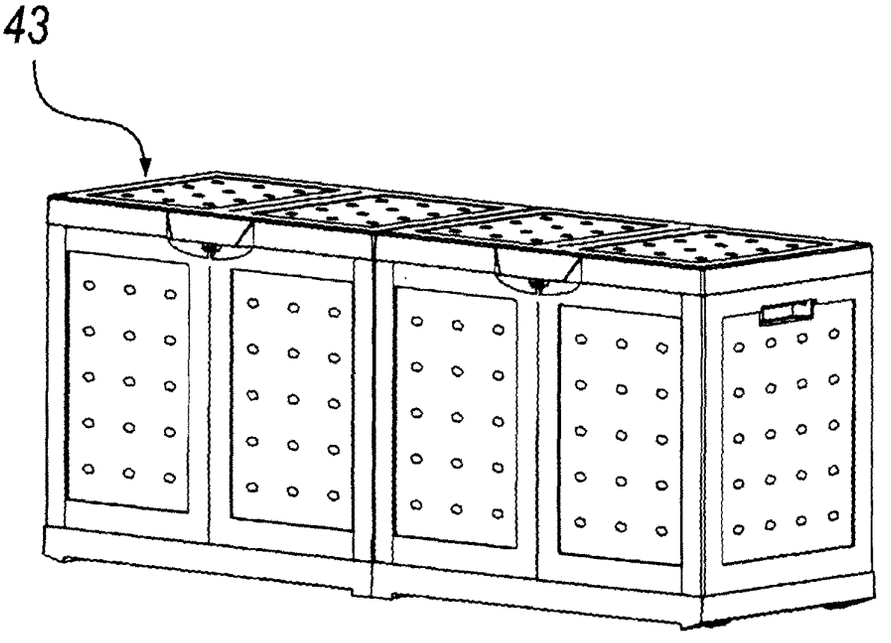

Fig. 12

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 01 1181

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X Y	FR 2 060 233 A (YAZBEK MARGUERITE;NEMAH FOUAD; CABANEL MARCEL; YAZBEK SOLIMAN) 18 June 1971 (1971-06-18) * page 1, line 24-34 * * page 2, line 47-58 * * page 3, line 92-98 * * figure 1 * ---	1,2,6,7, 11-13, 20,22 3-5, 8-10,14, 15,21	B65D6/24 B65D21/08 A47B87/00
Y	US 3 261 493 A (SMITH DONALD G) 19 July 1966 (1966-07-19) * column 3, line 43-58 * * figures 7,8 * ---	3-5, 8-10,14, 15,21	
A	US 3 584 757 A (BLAISDELL JOHN DARRELL) 15 June 1971 (1971-06-15) * column 3, line 53 - column 4, line 28 * * figures 1-7 * ---	1	
A	DE 295 10 332 U (TSAI SHAO NONG) 14 September 1995 (1995-09-14) * page 4, line 4-9 * * figure 1 * -----	7,14,15	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D A47B F16B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	16 July 2003	Piolat, O

CATEGORY OF CITED DOCUMENTS

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16-07-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2060233 A	18-06-1971	FR 2060233 A5 FR 2073264 A6	18-06-1971 01-10-1971
US 3261493 A	19-07-1966	NONE	
US 3584757 A	15-06-1971	NONE	
DE 29510332 U	14-09-1995	DE 29510332 U1	14-09-1995

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82