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CARDBOARD SHEET FORMING A PROTECTIVE COVER

The present invention relates to the field of packaging for voluminous manufactured products, frequently transported in the form of pallets or other transport units, of the type used in particular to protect stacks of panels or rolls of mineral wool (glass wool or rock wool) and packaged using well-known techniques that facilitate the transport and installation thereof.

Panels or rolls made of mineral wool are flexible and compressible and are frequently disposed in compacted stacks within suitable transport units. Reference may be made in particular to the publication WO2006/077347 for an example of such packaging.

As described in the application cited above, the materials made of mineral wool are kept in a compressed form while they are being transported so as to limit costs, in particular by using plastic films, having appropriate mechanical elasticity properties, accompanied by straps disposed securely around the compacted stacks.

In order to avoid a situation in which the strap or the film damages the mineral wool units or slips, a protective piece of cardboard in the form of a cover is frequently disposed on top of the pallet, the dimensions of said cardboard being suitable to enclose all of the top of the transport unit.

A transport unit protected by means of a cardboard sheet is known for example from document DE 20 2008 014502 U1. Documents GB 2 356 855, DE 83 28 912 U1 and DE 39 25 753 disclose plates for forming covers and containers of adjustable dimensions.

Even though it is made of a recyclable material, a piece of cardboard nevertheless has an environmental cost, as does the scrapping of the rest of the packaging products contained in the transport unit.

It is an aim of the invention to reduce the environmental cost of such a transport unit, in particular by giving a second use to the packaging of the product, in particular the above-described cardboard cover.

To this end, a first subject of the present invention is a cardboard sheet according to claim 1, of rectangular shape, configured to form a cover on a transport unit for transporting manufactured products, in particular disposed in said unit in the form of rolls or plates, said sheet having a rectangular bottom of length A and width B surrounded by four cover flaps, namely an upper longitudinal flap, a lower longitudinal flap and two transverse flaps, said cardboard sheet **being characterized in that** it is furthermore configured to form, after it has been used as a cover, a container for scraps with a polygonal section, preferably with a square or rectangular section, the cardboard sheet having to this end:

- a series of marks for transverse folding lines and a longitudinal folding line on the rectangular bottom, and
- marks for cutting lines extending transversely in line with the marks for the transverse folding lines and preferably in line with the longitudinal folding line.

5 According to the invention, said marks for cutting lines that are disposed transversely indicate the position on said cardboard of the cutting lines for four flaps that form the bottom of said container after said cardboard has been folded as per said folding lines. Further, the upper longitudinal flap and the rectangular bottom have marks for cutting openings that form handles, the marks being configured to be superposed after the upper
10 longitudinal flap has been folded into the inside of the container and thus to reinforce said handles.

Preferably, according to the invention, said panels or rolls comprise or consist of mineral wool, in particular glass wool or rock wool.

According to particular embodiments, the cardboard sheet and/or the transport unit
15 including said sheet comprise one or more of the following features, taken individually or in any technically possible combination:

- The cardboard sheet furthermore comprises a second series of marks for folding lines delimiting the rectangular bottom and the longitudinal flaps and transverse flaps.
- 20 - The longitudinal flaps have a width of $(C-B)/2$, where C is the total width of the cardboard sheet, and the transverse flaps have a width of $(L-A)/2$, where L is the total length of the cardboard sheet.
- The marks for the transverse folding lines are spaced apart by a distance $A/4$.
- The four bottom flaps have a width $A/8$ in a transverse direction with respect to the
25 cardboard.
- The upper longitudinal cover flap is configured to be folded towards the inside of the container and thus to double the upper edge of the container.
- The marks for cutting lines are extended along the lower longitudinal flap, in line with the marks for transverse folding lines.
- 30 - Following said cutting operation, each portion of said lower longitudinal flap forms part of the bottom flaps of the container.
- The marks for cutting lines furthermore extend in line with and on either side of the marks for the longitudinal folding line and transverse folding lines.

- One of the transverse cover flaps and the opposite portion of the rectangular bottom that is intended to face said transverse flap in said container have cutting marks for cutting complementary retaining reliefs.
- The complementary retaining reliefs are a slot and a tab, the slot preferably being
5 formed in said transverse cover flap.

A further subject of the invention is a method in which the above-described cardboard sheet is first of all used as a cover in a transport unit for transporting manufactured products and is then converted into a scrap container after said products have been unpacked.

10 According to preferred configurations of such a use method:

- The method comprises a first step of converting the cardboard sheet into a cover with four flaps and a subsequent step of converting the cover into a container for scraps with a polygonal section.
- The cover is used to cover a stack of objects to be protected before being strapped
15 in a transport unit, the cover being converted into a scrap container after said unit has been unpacked.
- The object to be protected is a stack of panels or rolls of flexible material, for example panels or rolls of mineral wool.

A final subject of the invention is a transport unit for transporting manufactured products,
20 grouped in the form of panels or rolls, in particular in the form of a package or pallet, comprising a cardboard sheet as described above, said cardboard sheet forming a cover for said pallet.

The invention will be understood better from reading the following description, given purely by way of example; the embodiment that will be described now should not be
25 considered as limiting the scope of the present invention.

The description is given with reference to the appended drawings, in which:

- Figure 1 is a view illustrating a cardboard sheet according to the invention, before being folded and cut;
- Figures 2 to 6 are perspective views illustrating the operations necessary for
30 converting the sheet in Figure 1 into a scrap container.

As can be seen in Figure 1, the cardboard sheet is firstly intended to be used as a protective cover.

For this purpose, the cardboard sheet 1 has a first series of marks that indicate folding lines 7 and marks that indicate cutting lines 12, allowing the cardboard to be configured

as a cover especially adapted to the dimensions of the transport unit of length A and width B.

More specifically, the cardboard sheet, which has a total length L and a total width C, has a first series of printed folding marks 7, said marks 7 delimiting a rectangular bottom 2 of length A and width B and four cover flaps, namely an upper longitudinal flap 3, a lower longitudinal flap 9 and two transverse flaps 4. The longitudinal flaps 3, 9 have a width of $(C-B)/2$ and the transverse flaps 4 have a width of $(L-A)/2$.

The cardboard sheet furthermore has a first series of marks for cutting lines 12. These lines 12, which start at the corners of the rectangular bottom 2, provide each corner with two possibilities for cutting flaps so as to form the lid, the cutting lines forming with the edges of the cardboard sheet a square extension 6, two diagonally opposite corners of which form a corner of the cardboard sheet 1 and the corner corresponding to the rectangular bottom 2.

The cardboard sheet furthermore has folding marks 7, in particular in the form of pre-printed marks on the cardboard, or pre-folds or pre-cuts (in the form of perforated dotted lines for example), that delimit an edge of the rectangular bottom 2. These folding marks 7 indicate the lines along which the cover flaps should be folded by the operator in order to obtain said cover. After folding, the square extension 6 of the flaps that is cut along a short side of the square is folded and stuck (using a glue or an adhesive) or alternatively stapled to the adjacent flap. As a variant, said squares can be cut out entirely and removed during the formation of the cover.

According to the invention, the same cardboard sheet that is usable first of all as a cover for the transport unit is also configured to be able to be converted into a scrap container after said first use.

To this end (that is to say for this second use), the cardboard sheet has specific series of folding marks 8 and cutting marks 13.

Within the meaning of the present invention, as already indicated above, any sign that is immediately visible to an operator as being a clear indication of the folding or cutting locations for converting the cardboard into a cover or container is denoted a "mark".

These are for example ink imprints made directly on the cardboard sheet, or any other solution that falls within the scope of the above definition, such as pre-folds, pre-perforations, in particular in the form of dotted lines (perforated dotted lines), pre-piercing (the cardboard is not cut all the way through along the cutting/folding line), etc. Of course, different types of marks can be combined on the cardboard.

According to an advantageous embodiment of the invention, said immediately visible elements make it possible to differentiate between the different series of marks by the use for example of pictograms, colour codes, or different thicknesses or styles of lines or kinds of marking (ink, pre-fold, perforated dotted lines or pre-piercing, see above). Such marks can also be used to indicate and cut the handle orifices 11.

More specifically, a second series of folding marks 8 is then visible within the above-described meaning (for example printed or alternatively incorporated where it is a question of pre-folding or pre-perforations/pre-piercing) according to the invention at the rectangular bottom 2.

These marks are disposed on the rectangular bottom in the following disposition:

- One longitudinal line 81 that is drawn at a distance equal to $A/8$ from the inner edge of the lower longitudinal flap 9, this line covering the entire length A of the rectangular bottom 2.
- Three transverse lines 82 that are spaced apart by a distance $A/4$ along the length A of the rectangular bottom 2 and extend from the inner edge 22 of the upper longitudinal flap 3 to the above-described longitudinal line 81.

The transverse lines 82 therefore divide said rectangular bottom 2 into four longitudinal portions 5 of equal area. These lines serve as a guide for folding the rectangular bottom 2 into four equal portions of width $A/4$, forming the faces of the scrap container as can be seen in Figure 3.

Without departing from the scope of the invention, it is also conceivable for the transverse lines 82 not to be spaced apart by an identical distance $A/4$ but at a succession of spacings that are different but equal in pairs (that is to say a spacing between the successive lines of A/x then A/y then A/x then A/y , where x is different from y) in order to finally obtain this time a container with a rectangular base. Generally, although the configurations according to which the container has a square or rectangular base are preferred according to the invention, other polygonal sections of the container finally obtained are conceivable, without departing from the scope of the invention, depending on the number and spacing of the transverse lines 82.

The cardboard 1 also has a second series of cutting marks 13, different from the cutting lines 12 described above in connection with the formation of the cover. These marks extend transversely and longitudinally, respectively in line with and on either side of the above-described folding marks 81 and 82. They delimit in particular the bottom flaps 10 of the container, namely four bottom flaps 10 of length $A/4$.

Once folded, the four bottom flaps 10 form the bottom 41 of the container (see Figure 5).

The four bottom flaps 10 are advantageously of width $A/8$, such that they all have the same dimensions and adjoin in pairs.

The cardboard sheet furthermore has marks for cutting handles 11, for example in the form of perforated dotted lines, as indicated above.

- 5 Figures 2 to 6 illustrate the method for converting the cardboard 1 that has previously served as a cover for the transport unit into a scrap container, in the form of a rectangular parallelepiped, the bottom of which is closed and square and the upper face of which is open.

- 10 After cutting along the lines 13, the upper longitudinal flap 3 of the cover is configured to be folded towards the inside of the container 40 and thus to double the upper edge 20 of the container (see Figures 2 to 6, in particular Figure 2). The upper edge of the final container will then be reinforced, as will the handles 11 which will be cut out at the corresponding cutting marks, such that they are superposed after the flap 3 has been folded. This will make it possible to increase the robustness of the scrap box while it is
15 being transported by hand.

Similarly, the lower longitudinal flap 9 can be folded over itself in order to reinforce the bottom 41 of the container 40.

- Alternatively, the latter can be cut along the lower edge 21 of the cover, following the folding line 7 of the inner edge of the lower longitudinal flap 9. This embodiment is the
20 one shown in the appended Figures 2 to 6.

- As a further alternative, according to another possible solution which may be preferred, the lower longitudinal flap 9 is laid out flat and after cutting, each portion of said flap forms part of the bottom flaps 10. In such an embodiment, as alternatively indicated in Figure 1, the marks 81 are configured such that the width $A/8$ of the four bottom flaps 10
25 incorporates the width of the lower longitudinal flap 9.

- Before the upper longitudinal flap 3 and optionally the lower longitudinal flap 9 are folded, a fold-forming tool can be applied to the marks for the folding lines 81 and 82 and a cutting tool can be applied to the lines of the cutting marks 13, in particular the climaver MM and MTR ® cutting tools sold by the company Climaver. One and the same tool especially
30 provided to this end can be used for the two functions, for example the blade of a cutter or knife, one edge of which is sharpened for cutting and the other is blunt in order to form folds.

The upper longitudinal fold 3 is folded as in Figure 2, after the folding tool has been applied along the folding marks 7 present on the inner edge 22.

After being cut along the cutting lines 13 (and after the four bottom flaps 10 have been obtained), the cardboard sheet is then folded along the transverse folding marks 82, as illustrated by the arrows in Figure 3.

As can be seen in Figure 3 and more particularly in Figure 4, the cardboard sheet preferably has means for retaining by way of a tab 31 and slot 32 that are provided in one of the transverse cover flaps 4 and on the opposite longitudinal portion 5 of the container. Cutting lines are thus advantageously provided in the cardboard sheet for cutting these retaining means 30 beforehand (or alternatively perforated dotted lines).

These retaining means are intended to facilitate the phase of placing an adhesive strip 42 for sealing the bottom 41 by bringing the bottom flaps 10 into abutment during the folding of the cardboard. It is thus possible to avoid having to apply adhesive to the upper part of the container in order to hold the joint.

Alternatively, of course, the retaining means 31, 32 can, however, and if necessary, be reinforced by additional means for maintaining the mechanical integrity of the container thus formed, such as an adhesive, a glue or staples.

Finally, an environmentally friendly container is obtained, as per Figures 5 and 6, by giving a second use to the packaging of the transport unit. The container can in particular be advantageously used, during the fitting of insulation materials present on the pallet, as a container for storing waste mineral wool and waste originating from the packaging itself (cardboard boxes, plastics materials, adhesives, etc.).

PAPPLADE, DER FUNGERER SOM BESKYTTELSÆDÆKSEL**PATENTKRAV**

1. Papplade (1) med rektangulær form, konfigureret til at danne et dæksel på en transportenhed for fremstillede produkter, "navnlig anbragt i omtalte enhed i form af ruller eller plader", hvor pladen har en rektangulær bund (2) med længden A og bredden B, omgivet af fire dækselklapper, heraf én øvre, langsgående klap (3), én nedre, langsgående klap (9) og to tværgående klapper (4), idet pappladen er **kendetegnet ved, at** den desuden er konfigureret til efter brug som dæksel at danne en affaldsbeholder (40) med polygonal sektion, fortrinsvis som en kvadratisk eller rektangulær sektion, hvor pappladen (1) har følgende formål:

- En række (8) tværgående (82) og langsgående (81) foldelinjemærker på den rektangulære bund (2), og
- skærelinjemærker (13), der strækker sig tværgående i forlængelse af de tværgående foldelinjemærker (82) og fortrinsvis i forlængelse af den langsgående foldelinje,

hvor skærelinjemærkerne (13), der er anbragt på tværs, indikerer placeringen af skærelinjerne for de fire klapper (10) på omtalte plade (41), der udgør bunden af omtalte beholder (40) efter foldning af pladen (1) i overensstemmelse med foldelinjerne (81, 82), og den øvre, langsgående klap (3) og den rektangulære bund (2) har skæremærker ved åbningerne (11), der danner håndtag, hvor mærkerne er konfigureret til at overlappe efter foldning af den øvre, langsgående klap (3) inde i beholderen (40) og derved forstærke håndtagene.

2. Papplade ifølge det foregående krav, der desuden omfatter en anden række foldelinjemærker (7), som afgrænser den rektangulære bund samt de langsgående (3, 9) og tværgående (4) klapper.

3. Papplade ifølge ét af de foregående krav, i hvilken de langsgående klapper har bredden $(C-B)/2$ med C som samlet bredde for pappladen", og i hvilken de tværgående klapper har bredden $(L-A)/2$ med L som samlet længde for pappladen.

4. Papplade ifølge ét af de foregående krav, i hvilken de tværgående foldelinjemærker 82 er anbragt med en afstand på $A/4$.

5. Papplade ifølge det foregående krav, i hvilken de fire bundklapper (10) har bredden $A/8$ i tværgående retning på pladen,

6. Papplade ifølge ét af de foregående krav, i hvilken den øvre, langsgående klap (3) på dækslet er konfigureret til at blive foldet indad i beholderen (40) og derved fordoble beholderens øvre kant (20).
7. Papplade ifølge ét vilkårligt af de foregående krav, i hvilken skærelinjemærkerne (13) strækker sig langs med den nedre, langsgående klap (9) i forlængelse af de tværgående foldelinjemærker (82).
8. Papplade ifølge det foregående krav, i hvilken hver del af den nedre, langsgående klap (9) efter skæring udgør en del af beholderens bundklapper (10).
9. Papplade ifølge ét af de foregående krav, i hvilken skærelinjemærkerne (13) desuden strækker sig i forlængelse af og på hver side af de langsgående (81) og tværgående (82) foldelinjemærker,
10. Papplade ifølge ét vilkårligt af de foregående krav, i hvilken én af de tværgående klapper (4) på dækslet og den modsatte del af den rektangulære bund (2), som er beregnet til at vende hen imod den i den omtalte beholder (40), har skæremærker til at skære supplerende fastgørelsesfremspring (31,32).
11. Papplade ifølge det foregående krav, i hvilken de supplerende fastgørelsesfremspring er en slids (32) og en kile (31), og hvor slidsen fortrinsvis er lukket på den omtalte tværgående klap (4) på dækslet.
12. Fremgangsmåde til anvendelse af en papplade ifølge ét vilkårligt af de foregående krav, der omfatter et første trin af omdannelse af pappladen til et dæksel med fire klapper og et efterfølgende trin af omdannelse af dækslet til en affaldsbeholder med en polygonal sektion.
13. Fremgangsmåde ifølge det foregående krav, hvor dækslet anvendes til at dække en stabel af genstande, der skal beskyttes, før den forsegles i en transportenhed, og hvor dækslet omdannes til en affaldsbeholder efter udpakning af omtalte enhed.
14. Fremgangsmåde ifølge det foregående krav, i hvilken den genstand, der skal beskyttes, er sammenfoldede paneler eller ruller af fleksibelt materiale, eksempelvis paneler eller ruller af mineraluld.
15. Transportenhed til fremstillede produkter, grupperet efter paneler eller ruller, navnlig efter palle, der omfatter en papplade som beskrevet i ét af kravene 1 til 11, idet pappladen danner dæksel på den omtalte transportenhed.

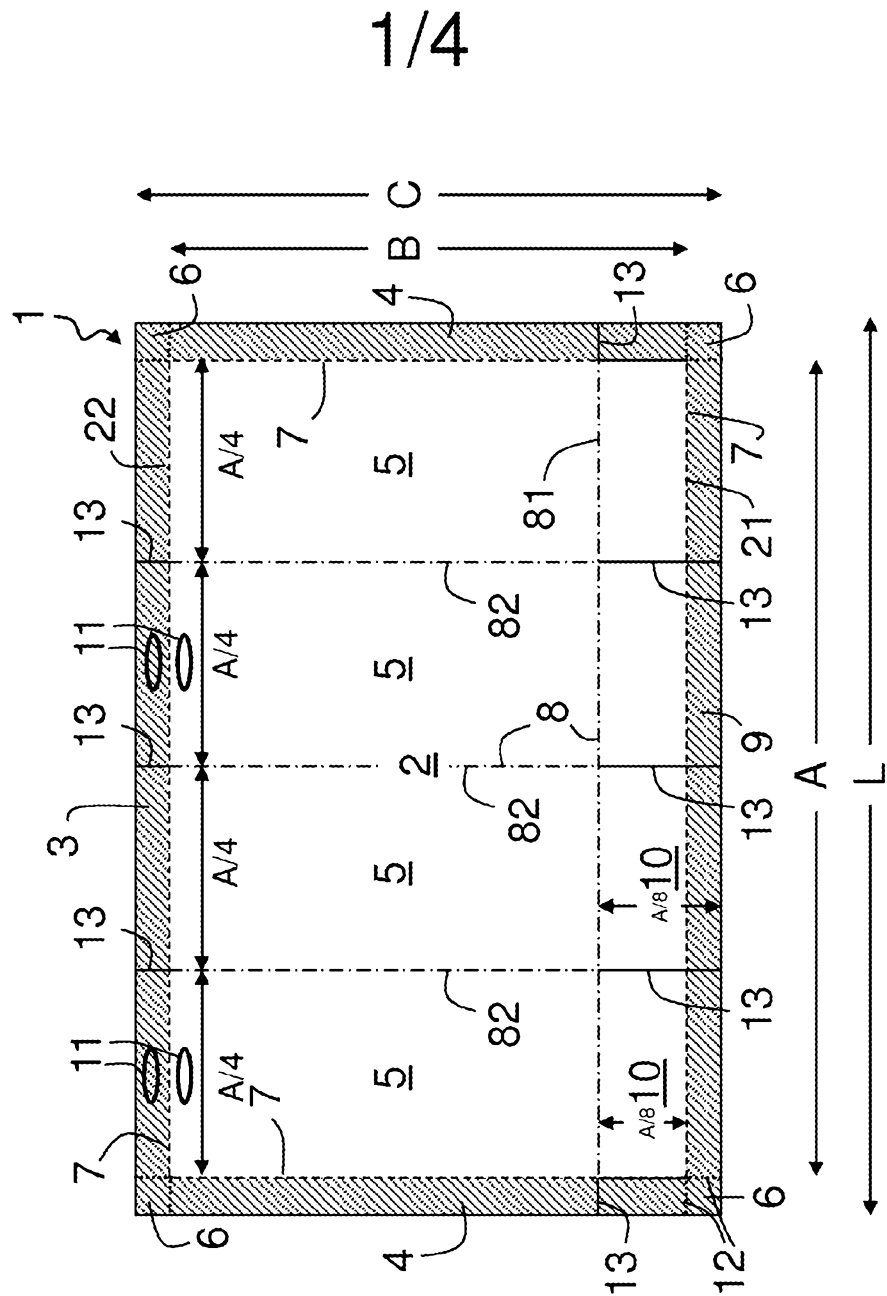


FIG. 1

2/4

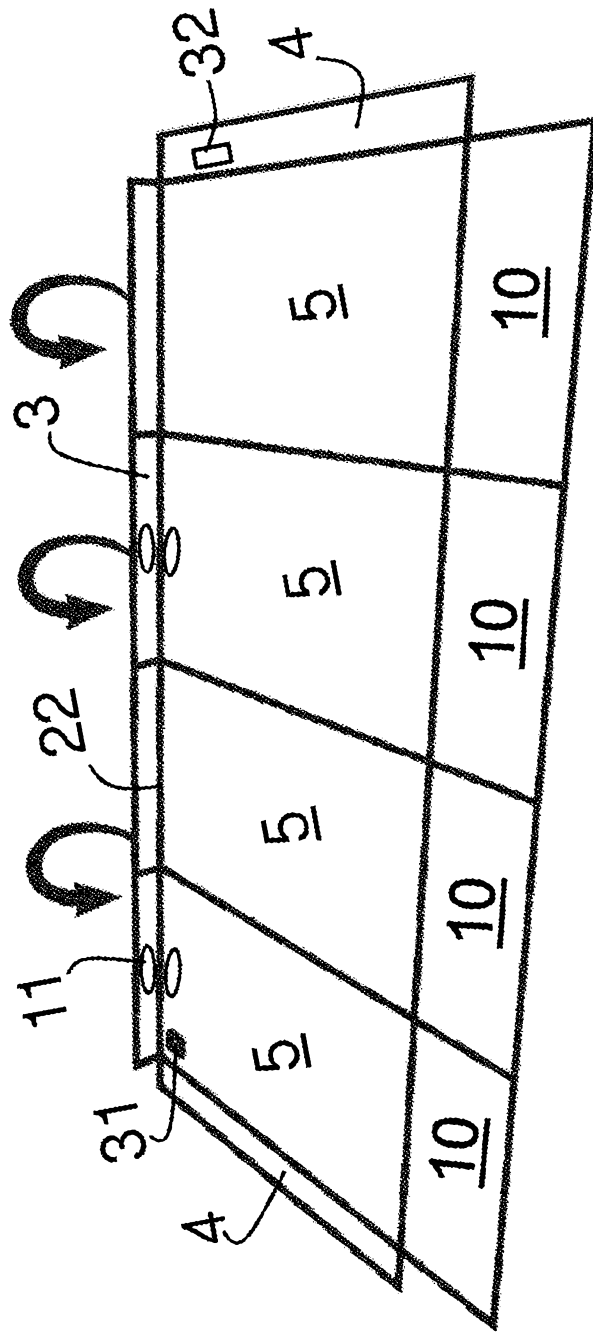


FIG. 2

3/4

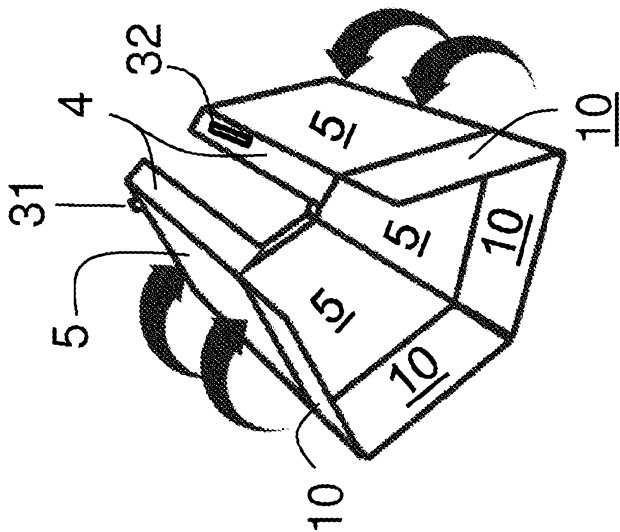


FIG. 3

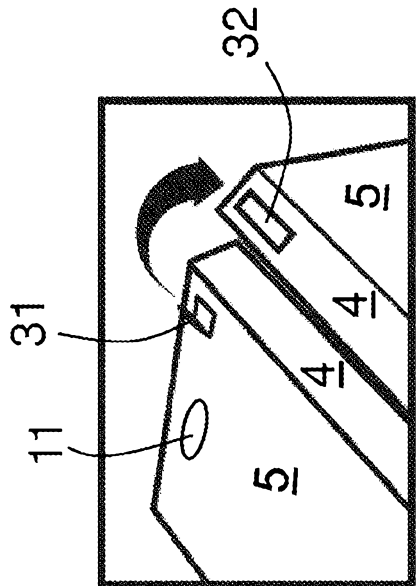


FIG. 4

4/4

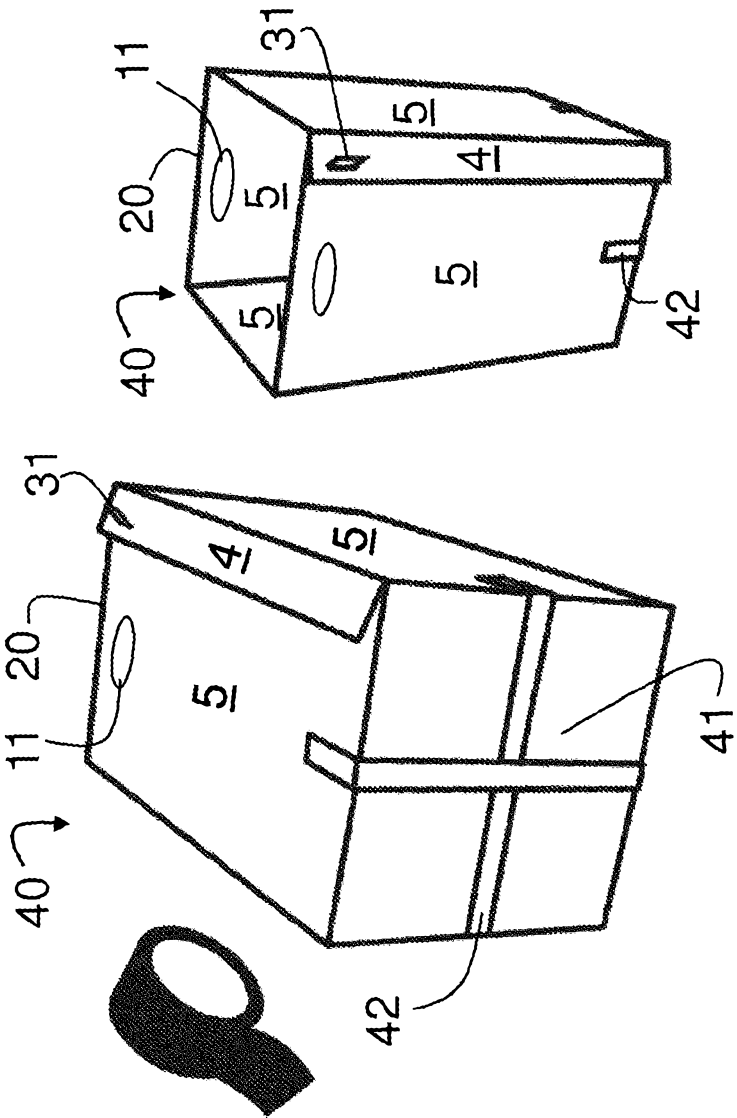


FIG. 6

FIG. 5