



Europäisches Patentamt
European Patent Office
Office européen des brevets



Publication number:

0 457 118 A1

12

EUROPEAN PATENT APPLICATION

21 Application number: **91107144.7**

51 Int. Cl.⁵: **B65D 19/14, B65D 19/40**

22 Date of filing: **03.05.91**

30 Priority: **08.05.90 SE 9001637**

43 Date of publication of application:
21.11.91 Bulletin 91/47

64 Designated Contracting States:
CH DE DK ES FR GB IT LI

71 Applicant: **V-LINK SYSTEMS HANDELSBOLAG**
Namnlösa Geddeholm
S-725 97 Västeras(SE)

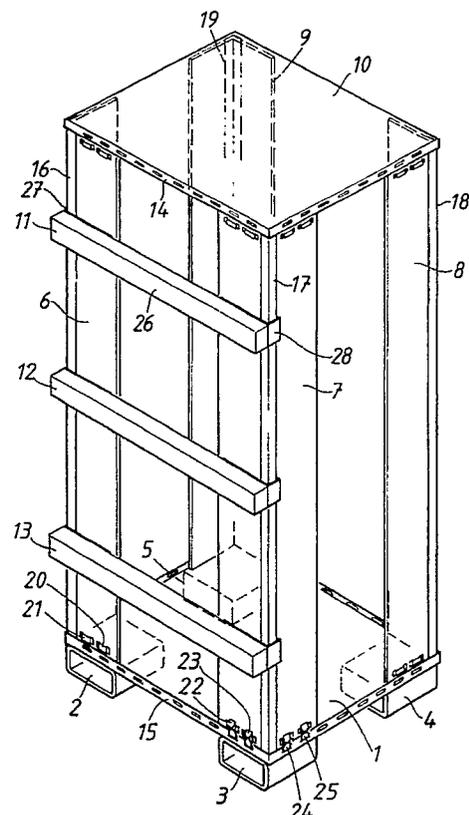
72 Inventor: **Isokytö, Raimo Antero**
Namnlösa Geddeholm
S-725 97 Västeras(SE)

74 Representative: **Warstrand, Hans Jerker**
Grytahögsgatan 11
S-723 51 Västeras(SE)

54 **Transport package.**

57 A transport package in the form of a cage-like box comprises a pallet (1), four protective corners (6,7,8,9) and a top plate (10), which are held together by folded edge plates (15,16,17,18,19), loops (20,21) and angled plates (22,23,24,25). The under side of the pallet is provided with feet (2,3,4,5) fixed thereto, which are formed as straight tubes of rectangular cross section. Two of the protective corners are held together by crossbars (11,12,13) provided with fastenings (27,28) which snap into recesses in the protective corners.

FIG. 1



EP 0 457 118 A1

TECHNICAL FIELD

The present invention relates to a method of packaging goods to ensure that transport can be effected without damage to the goods arising. The invention comprises the packaging of goods which normally need a fork-lift truck or the like for transfer from the assembly and packaging stations to the means of transport in question, which may be by lorry, by rail, by air, etc.

BACKGROUND ART

There are a very large number of methods of packaging goods for transport, ranging from securing the goods by straps to a more or less standardized pallet to a package which is specially made for the goods in question. In order to simplify the packaging method and to make the package as such as inexpensive and light as possible, a plurality of system solutions have been proposed over the years.

Characteristic of most of these solutions is that boxes of various sizes can be assembled with the aid of sheets of plywood. The reason that conventional wooden boxes is practically not used at all anymore is that the same strength can be obtained in a plywood box with a wall thickness about one-third of that in ordinary wood, which, of course, is very favourable from the point of view of weight.

Different methods and devices for assembling the boxes are also available on the market. Often, the assembly is performed with the aid of studded sections and steel cramp strips which are pressed under high pressure to the sheets.

An example of the prior art is given, inter alia, in the Swedish published patent application with publication number 442 823. To sum up, the joining of two side parts which are to form a right angle to each other takes place as follows:

The edge portion of one of the side parts is provided with an edge strip, fixed by means of fastening members, which edge strip is folded at right angles. Along its length on the side which is to be connected to the other side part, the edge strip is provided with a number of projections or slots arranged in spaced relationship to each other. Along the edge portion which faces the edge strip, the other side part is provided with a number of spaced-apart projections or slots. A connecting member in the form of an angled plate connects the corresponding projections to each other.

In the Swedish published patent application with publication number 457 509, another - but similar - solution to the attachment of two side parts is shown. Also in this case, a folded edge strip, provided with projections or loops, is fixed to the edge portion of one of the side parts. The other

side part is provided with pressed-in angled plates which are intended to be inserted into the loops on the edge strip and then to be folded around the loops. This publication mainly deals with a tool for the actual bending operation.

In the packaging industry it is also known to provide protective corners consisting of two lengths of plywood joined together by means of a right-angled, bent edge strip. The edge strip is fixed to the two plywood lengths by studs or fixing members, as described above. The short ends of the plywood lengths may very well be provided with loops for angled plates.

With the aid of four protective corners, a rectangular or square pallet and a similarly shaped top plate, a cage-like box can be manufactured in a relatively simple manner. It is then assumed that the side edges of the pallet and the top plate are provided with the above-mentioned folded edge strips with loops. By locating the protective corners in the corners of the pallet and the top plate and applying angled plates in corresponding loops in the edge strips and on the short sides of the protective corners, a form of protective casing is obtained. Such a cage-like box will not, however, in itself possess any major stiffness.

In many cases the goods to be transported have a shape which corresponds to a parallelepiped. By adapting the internal dimensions of a cage-like box to the dimensions of the goods in question in such a way that, between the corners of the goods and the inner corners of the protective corners, space is provided for a relatively elastic filling compound, it will be possible to improve the stiffness of the cage-like box, particularly if the cage-like box is also provided with outer straps.

A transport package in the form of a cage-like box entails a reduction in weight in relation to a whole box, which may be of great value, particularly in connection with air transportation. The reduced mechanical strength and stiffness possessed by a cage-like box in relation to a whole box may, however, be fatal.

When goods are stored in a central packing room, goods packaged for transport are normally placed on some type of pallet. A number of different designs of such pallets exist. Swedish published patent application with publication number 378 228 describes such a pallet which consists of a plate and one or more projections or spacers fixed thereto. These spacers consist of a ring formed with a flange. The flange has punched-out flaps which are pressed into the plate. In the patent specification with publication number 376 214, a pallet is disclosed consisting of a loading plane and feet fixed thereto for supporting the loading plane, each foot consisting of a cardboard sleeve, of square or rectangular cross section, lying on one

side.

Transport boxes are available on the market in which the bottom of the box consists of a pallet with feet. In these designs, the pallet has been provided with edge strips with loops as described above.

When goods packaged for transport are placed on a separate pallet, normally the transport package has to be secured to the pallet with straps before it can be moved. The reason for this is that during a movement by means of a fork-lift truck, the risk of the packaged goods tilting and slipping off the pallet and the truck is very great. During careless driving with the fork-lift truck there is, of course, also a considerable risk that the transport package with the pallet strapped thereto may tilt over or slip off the truck. Movement by means of a hand-operated truck also involves a certain risk.

When the pallet is integrated with the transport package, there is, in the same way as the above case with a separate pallet strapped to the package, a risk of tilting or slipping off the truck.

The risk of a transport package tipping off a fork-lift truck or a hand-operated truck during movement depends, in addition to the manner of driving, also on the ratio between width, depth and height of the goods and on where in the goods the centre of gravity is to be found. In case of a great risk of tilting, the goods are often placed down on one side where the risk is smaller. Certain cargo spaces with a low ceiling height, especially in airplanes, may sometimes demand that the goods be placed horizontally. To be able to reach the goods with a fork of some kind also in this case, it is then assumed that the side facing the floor, or the downwardly-facing side, is provided with spacers of some kind.

As has been described above, a plurality of more or less good transport packaging systems are available on the market. It is desirable to have access to standardized parts with which goods of different dimensions can be packaged in a rapid and safe manner, while at the same time the package should protect the goods against damage, have as low weight as possible, and the risk of tilting over or slipping off a fork-lift or hand-operated truck in motion should be non-existent.

SUMMARY OF THE INVENTION

Within certain industrial production, there are often very large series of products having a superficially similar or almost similar size. For transport of these products to different parts of the world, it may often be profitable to produce some kind of specially-made parts, both as regards appearance and dimensions. Now, if these specially made parts prove to yield considerable advantages

from several points of view, these partial solutions may also advantageously be transferred to transport packages for products and sizes other than those for which they were originally intended, which has proved to be possible with the present invention.

The present invention is to some extent based on the prior art as described above. Further, it largely assumes that the package has a parallelepipedic or cubic shape. The special features of the invention comprises: (i) a faster assembly of the package, (ii) a mechanically stable and rigid package, and (iii) that the packaged goods are prevented from tilting over or slipping off a truck in motion.

A transport package which comprises the features of the present invention is substantially constructed as the above-mentioned cage-like box. As mentioned, it consists of a rectangular or square pallet and a similarly shaped top plate, both being provided with folded edge strips with loops. The pallet and the top plate are interconnected by four protective corners placed in the corners of the pallet and the top plate. The protective corners are provided on their short sides with loops, and by means of angled plates in corresponding loops in the edge strips, the cage-like box can be held together.

A further condition for the invention is the provision of a compressible filling compound between goods and the inner corners of the protective corners. Further, the goods, the filling compound and the inner protective corners of the cage-like box should be so dimensioned and adapted to each other that the filling compound, after assembly, is prestressed to a certain extent.

The invention comprises special feet or spacers which are fixed below the pallet of the transport package. The feet are formed in such a way that the risk of tilting during movement by a fork-lift truck has been eliminated.

A foot according to the invention is, in principle, formed as a straight tube of rectangular cross section. One of the two largest opposite rectangular sides faces the lower side of the pallet, and the other faces the floor-surface. The foot is fixed to the pallet in some suitable way, for example with countersunk screws extending from the upper side of the pallet. To prevent the foot from rotating, it must be fixed with at least two screws.

Further, the invention comprises a special crossbar, the task of which is threefold; first, the crossbar functions as a conventional crossbar, that is, as a piece of wood or support element between the protective corners of the transport package to impart to the package greater mechanical strength and rigidity; secondly, the crossbar functions as a foot on which the transport-packaged goods may

rest when being positioned horizontally against the floor; and thirdly, the crossbar functions as a spacer between the floor and the transport-packaged goods. In the following, therefore, the crossbar according to the invention will be referred to as a crossbar foot.

Each pallet is provided with at least four feet. In the case of specially heavy goods, the number of feet may be extended, in which case also the thickness of the pallet will have to be adjusted to the load in question. As an example it may be mentioned that in case of loads of up to 1500 kilos, it is sufficient with an 8 mm thick pallet and that a 16 mm thick plate may carry 8000 kilos.

The intention with the rectangular cross section of the tube of the foot is to make it possible for one of the legs of the fork-lift truck to be moved into and through the foot. The invention thus comprises the following three features: (i) the inner rectangular opening of the foot is dimensioned so as to provide a certain amount of clearance in relation to the leg of the fork-lift truck; (ii) the feet are placed in rows on the bottom plate so that one of the two legs of the fork-lift truck can be simultaneously moved into and through two feet in a row; and (iii) two rows are placed so that the mutual distance between the rows corresponds to the distance between the two legs of the fork-lift truck.

The location of the feet according to the above permits a fork-lift truck to lift and move a transport package from two diametrically opposite sides. Since it may sometimes be necessary to be able to move the goods with the aid of a hand-operated truck, a sufficiently large distance between the feet must also be provided to enable the insertion of such a truck under the pallet. The invention thus also assumes that the distance between the feet in each row should be sufficiently large for this purpose. Thus, this means that lifting and movement with a hand-operated truck can also be made from two diametrically opposite sides, however rotated through an angle of 90° in relation to the sides for handling with a fork-lift truck.

To further increase the rigidity of the transport package, the goods may also be screwed to the feet via through-holes in the pallet.

The crossbar feet according to the invention comprise a wooden crossbar with a length equal to the distance between the outer corners of two adjacent protective corners. Otherwise, the wooden crossbars are dimensioned so as to be able jointly to support a horizontally positioned transport package. At the ends of the wooden crossbars and on that side of these which faces the plywood lengths of the protective corners - hereinafter referred to as first plywood lengths - specially designed fastening devices bent as snap-on fastenings are attached. These consist of sheet lengths of steel material

bent through an angle of 90 degrees relative to the longitudinal direction of the wooden crossbars, that is, the bent part connects to the plywood lengths of the protective corners - hereinafter referred to as second plywood lengths - which are bent at an angle of 90 degrees relative to the first plywood lengths. The bent part is then bent once more, at an angle exceeding 90 degrees, turning inwardly towards the second plywood lengths. In the second plywood lengths recesses are made, into which the inwardly turned bent part of the fastening may snap. By first snapping in one side of a crossbar at one corner and then snapping in the other side of the crossbar at an adjacent corner, the crossbar will, in addition to serving as a foot for a horizontally positioned transport package, also serve as a stabilizing support for the whole package. Since these fastenings are attached to the crossbar feet and are intended for attachment of the crossbar feet to the protective corners, the fastenings will be referred to below as crossbar fastenings.

To obtain sufficient carrying capacity for the weight of the goods and obtain sufficient stiffness in the package, an optional number of crossbar feet may be applied.

When a fork-lift truck is to be used for lifting and moving a horizontally positioned transport package, that is, when it rests on the crossbar feet, there may be a risk that a leg of the fork-lift truck may enter between the protective corners, thus damaging the goods. To prevent this, two crossbar feet may be attached by means of edge strips to a rectangular plate and form a so-called double crossbar. As far as dimensions are concerned, the plate is adapted such that it has the same width as the distance between the above-mentioned first plywood lengths as well as a height which enables the crossbar fastenings on the two crossbar feet to fit into adjacent recesses. To ensure that the goods are not damaged, two or more double crossbars may be used.

Goods such as refrigerators, washing machines, dishwashers, electrical cubicles, etc., which are to be transported in the manner described above, generally consist of an external apparatus case, often of sheet steel, which surrounds an interior. Generally, the apparatus case is manufactured at one location, the installation of the interior takes place at another location, and the packaging for transport takes place at yet another location.

The transport packaging system to which the invention relates permits, if properly used, great rationalization profits and advantages, both as regards cost, manufacturing, and installation of the goods, storage of the packaging material, speed of packaging, etc.

It is suitable to secure the pallet with legs to the apparatus case even during the manufacturing

of the case. This facilitates the transport of the case, without the risk of tilting and slipping, to the location where the interior of the case is to be installed. At the same time, the case is secured to the pallet and is able to stand "on its own legs" on a floor. As will be clear, it is suitable for the pallet to be stored at the manufacturer of the apparatus case.

The packing station now only needs to stock the protective corners, the top plate, the angled plates and the crossbar feet with the crossbar fastenings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a transport package in the form of a cage-like box according to the invention.

Figures 2 and 3 show two of a plurality of alternative embodiments of a foot according to the invention.

Figure 4 shows a crossbar foot with a crossbar fastening according to the invention.

Figure 5 shows an embodiment of a double crossbar according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figure 1 shows an assembled cage-like box with a pallet 1 with feet 2, 3, 4 and 5. 6, 7, 8 and 9 designate the four protective corners and 10 the top plate of the cage-like box. In the alternative shown, the cage-like box is provided with three crossbar feet 11, 12 and 13.

As will have been clear from the foregoing description, both the pallet and the top plate are provided with folded edge strips 14 and 15 with loops. The plywood lengths of the protective corners are fixed at an angle of 90 degrees relative to each other with the aid of folded edge strips 16, 17, 18 and 19. These edge strips are provided with studs which are pressed into the plywood lengths. On the short sides these studs are provided with loops, shown at 20 and 21 at protective corner 6, which correspond to loops in the folded edge strips of the pallet and the top plate. The cage-like box is then held together by means of angled plates, as exemplified at 22, 23, 24 and 25 at protective corner 7.

Each one of the crossbar feet 11, 12 and 13 consists of a wooden crossbar 26 with two crossbar fastenings 27 and 28, bent as previously described and as shown in more detail in Figure 4. The crossbar fastenings are formed so as to snap into recesses in the protective corners.

Figure 2 shows a simple embodiment of one of the feet of the pallet. In this embodiment, as will be clear, the foot consist of a straight tube with a

rectangular cross section. The ratio between the height and the width of the rectangular cross section and its other dimensions are adapted so as to obtain a suitable clearance in relation to a leg of a fork-lift truck. On that side which faces the pallet, the foot is provided with two threaded holes 29 and 30 for fixing screws extending from the upper side of the pallet. Half-way between these screws there is a hole 31 intended to correspond to a hole in the pallet for a through-screw which secures the apparatus case to the pallet and the foot.

Figure 3 shows an example of an embodiment of a foot with a mechanically inner reinforced form. The threaded holes 29 and 30 in Figure 2 are here replaced by clearance holes 32 and 33. The fixing of the foot to the pallet is here performed with the aid of screws and nuts extending from the upper side of the pallet and inserted into slots 34 and 35 provided in the foot and formed so as to prevent the nut from rotating. Otherwise, the foot is provided with a through hole 31 for securing the case to the pallet and the foot.

Figure 4 shows a crossbar foot consisting of the wooden crossbar 26 and the two crossbar fastenings 27 and 28.

Figure 5 shows a double crossbar which comprises two crossbar feet according to Figure 4 and a rectangular plate 36. The wooden crossbar and the plate are suitably fixed to each other with the same kind of folded edge strips 16 as are the plywood lengths of the protective corners. By adapting the width of the plate to the distance between the plywood lengths of the protective corners, the stiffness of the transport package is also enhanced. The height of the plate is adapted such that the distance between the crossbar feet corresponds to the distance between two recesses in the protective corners for the crossbar fastenings.

In an alternative embodiment of a transport package, the top plate may be omitted. However, since the crossbar feet only fix two protective corners to each other, the package must be supplemented with straps in order to hold all protective corners together.

Claims

1. A transport package in the form of a cage-like box consisting of a pallet (1), four protective corners (6,7,8,9) and a top plate (10) which are held together by folded edge plates (15,16,17,18,19), loops (20,21) and angled plates (22,23,24,25), the lower side of the pallet being provided with feet (2,3,4,5) formed as straight tubes of rectangular cross section, **characterized in that** two protective corners are held together by means of crossbars (11,12,13) formed so as to enable them to

serve at the same time as feet for a horizontally positioned transport package.

2. A transport package according to claim 1,
characterized in that the feet (2,3,4,5) are 5
 arranged in rows on the pallet (1) and that the
 distance between the feet in a row is larger
 than the width of a hand-operated truck.

3. A transport package according to claim 1, 10
characterized in that each one of the cross-
 bars (11,12,13) comprises a wooden bar (26)
 which at both ends is provided with fastening
 devices (27,28) bent as snap-on fastenings for
 snapping into recesses in the protective cor- 15
 ners.

4. A transport package according to claim 1,
characterized in that two crossbars form a
 double crossbar in which the crossbars are 20
 arranged in parallel and fixed to a plate (36),
 the width of which corresponds to the open
 distance between two adjacent protective cor-
 ners.

25

30

35

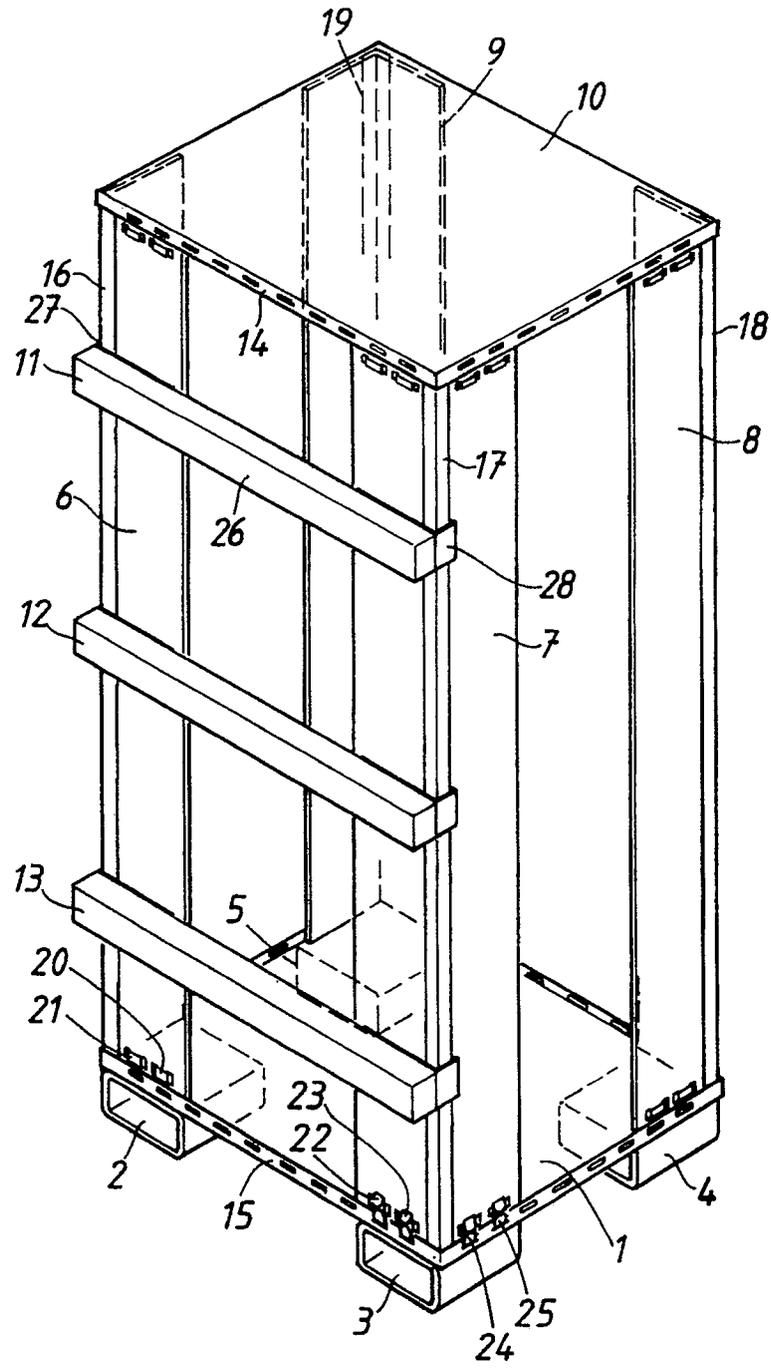
40

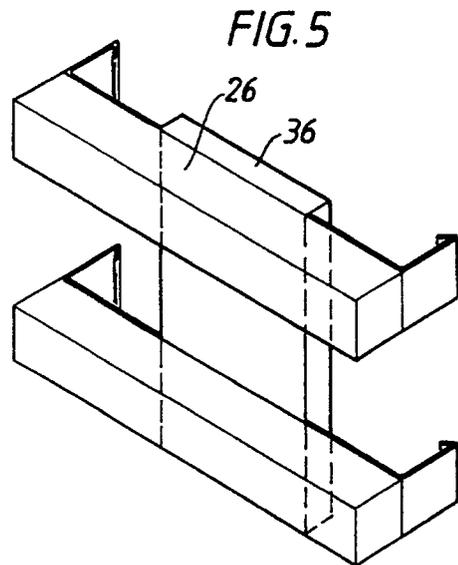
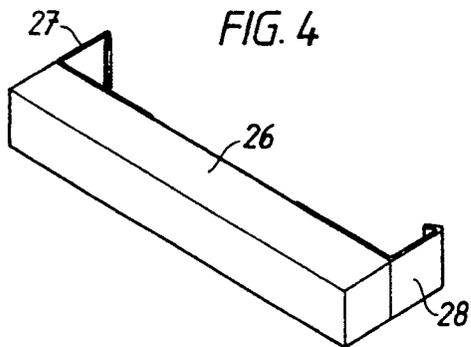
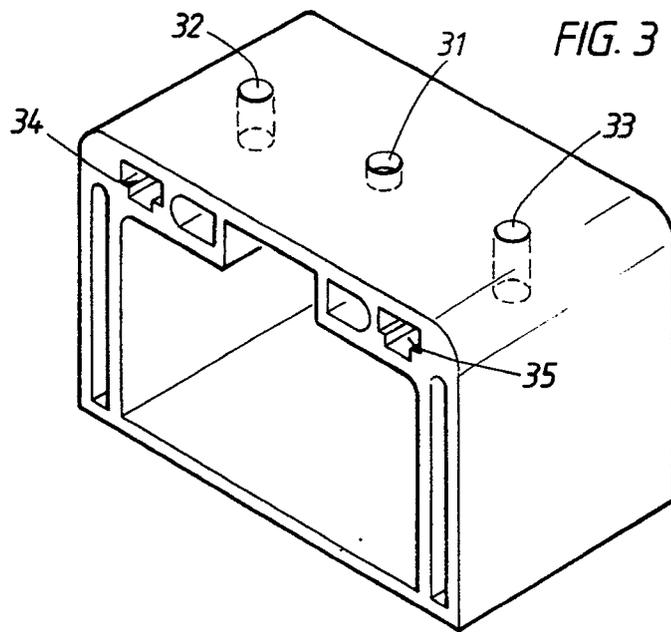
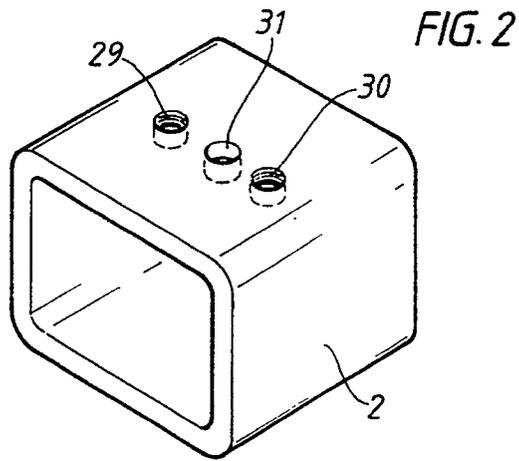
45

50

55

FIG. 1







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.5)
D,A	EP-A-0 143 098 (BJÖRKLUND) * page 9, line 6 - page 10, line 28; figures 1,2 * - - - -	1	B 65 D 19/14 B 65 D 19/40
A	US-A-3 091 195 (KENYON) * column 1, line 60 - column 2, line 45; figures 1-7 * - - - - -	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 D
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		03 September 91	VANTOMME M.A.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X: particularly relevant if taken alone</p> <p>Y: particularly relevant if combined with another document of the same category</p> <p>A: technological background</p> <p>O: non-written disclosure</p> <p>P: intermediate document</p> <p>T: theory or principle underlying the invention</p> <p>E: earlier patent document, but published on, or after the filing date</p> <p>D: document cited in the application</p> <p>L: document cited for other reasons</p> <p>&: member of the same patent family, corresponding document</p>			