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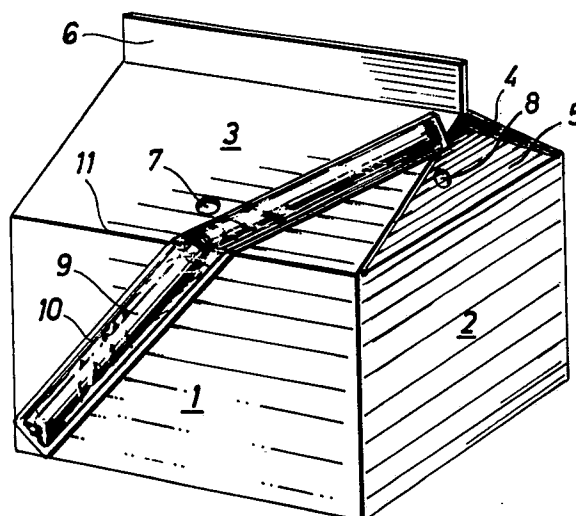
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54 **A packing container with suction tube and a method for the manufacture of the same.**

57 A packing container of the non-returnable type of beverages ready for consumption is provided sometimes with an externally applied suction tube. To make possible the application of the suction tube (9) of the greatest possible length without the tube with any part extending outside the contour of the packing container, the suction tube is placed so that it extends over two wall panels (1, 3) adjoining each other, which are situated at an angle to one another. The tube is bent at an appropriate angle and is placed along the joint diagonal line of the wall panels. The invention also relates to a method for the manufacture of packing container provided with suction tube.



A PACKING CONTAINER <sup>(WITH)</sup> SUCTION TUBE AND A METHOD FOR THE MANUFACTURE  
OF THE SAME

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The present invention relates to a packing container comprising two adjoining wall panels, situated at an angle to one another, and a suction tube applied to the outside.

The present invention also relates to a method for the application of a suction tube to a packing container comprising two adjoining wall panels, situated at an angle to one another.

Beverages ready for consumption such as juices and the like are often packed in non-returnable packages, from which the beverages are intended to be consumed directly with the help of a suction tube. For this purpose the packing container is provided with a specially marked area in which the packing material is weakened so as to facilitate penetration of the material, when the suction tube is to be introduced in connection with the consumption of the contents. The suction tube is furnished either separately at the point of sale, or else it is applied in certain types of packages to the outside of each individual packing container. The suction tube is wrapped in an envelope of paper or plastic, which envelope is attached by means of an adhesive to a side wall of the packing container. To make it possible to apply a suction tube which is as long as possible to a packing container of e.g. parallelepipedic form, the suction tube is placed diagonally over the largest rectangular side wall. In this way it is made possible to utilize a suction tube of a length convenient to the user without the suction tube, when it is applied to the packing container, extending outside the boundary line of the side wall, which would act as an obstacle in the handling of the packing container and would mean, moreover, very probably that damage to the suction tube by buckling would be a very common occurrence.

The abovementioned technique of application of the suction tube has been used successfully on parallelepipedic packages, since in such packages relatively large plane side walls are available for the attachment of the

suction tube. In the type of packing containers which are generally described as "gable top" or "ridge-type/packages", however, it has not been possible up to now to apply suction tubes of sufficient length, since this type of packing container has relatively small, connected, wall surfaces. A suction tube of the length required for the purpose will, therefore, unavoidably extend outside the contours of the packing container with the aforementioned disadvantages as a consequence.

It is an object of the present invention to overcome the abovementioned disadvantages in the application of suction tubes to packing containers and to provide a packing container of the ridge type with a suction tube which, in spite of the required length, does not extend outside the contours of the packing container in applied condition.

It is a further object of the present invention to provide a packing container of the ridge type with an externally applied suction tube, which packing container has a conventional, well-known basic design which is not rendered more complicated or expensive by the application of the suction tube.

These and other objects have been achieved in accordance with the invention in that a packing container comprising two wall panels adjoining one another, situated at an angle to one another and an externally applied suction tube has been given the characteristic that the suction tube is bent and is applied so that it extends over the said wall panels, the place of bending coinciding with a folding line located between the panels.

Preferred embodiments of the packing container in accordance with the invention have been given the further characteristics which are evident from the subsidiary claims 2 to 8 inclusive.

Ridge packages of the type used for the packing of beverages ready for consumption are usually of 1/4 litre size, and for this size of package the invention makes possible the use of a suction tube of a length which is almost double the size of the greatest possible length of a suction tube which is attached in a conventional manner, that is to say diagonally over a single wall panel. In that the suction tube is bent in accordance with the invention and is placed over a side wall panel as well as over a top wall panel of the packing container extending at an angle to the same, any bending which is so strong that there is a risk of damage to the suction tube is avoided, since the angle between the said panels on a packing container accommodating 1/4 litre is relatively obtuse and reaches approx. 120°. If the suction tube is made of relatively flexible plastic material, e.g. polypropylene or HDPE, the risk of buckling of the suction tube at this bending angle is small.

In accordance with the invention the suction tube is placed appropriately so that it extends along the common diagonal line of the two panels, which not only allows a maximum length of suction tube, but also reduces the necessary bending of the suction tube, since the suction tube, as a result of extending obliquely over the folding line between the two panels, is given a bending angle  $V$  which is greater (more obtuse) than the angle  $\alpha$  between the panels. The risk of the suction tube being buckled or damaged in connection with the bending or handling is reduced further, if the suction tube is made of a flexible plastic material and is provided with a bending indication e.g. in the form of a bellow-type fold.

It is a further object of the present invention to provide a rapid and safe method for the mechanical and automatic application of the suction tube to a packing container without either the suction tube or the packing container being damaged.

It is a further object of the present invention to provide a method for the application of the suction tube to two wall panels of a packing container which are situated at an angle to one another.

These and other objects have been achieved in accordance with the invention in that a method for applying a suction tube to a packing container comprising two adjoining wall panels, situated at an angle to one another, has been given the characteristic that the suction tube is made to rest against and to be joined to both wall panels with the help of adhesive.

Preferred embodiments of the method in accordance with the invention have been given the characteristics which are evident from the subsidiary claims 10 to 21 inclusive.

The method in accordance with the invention makes possible the mechanical application and attachment of a suction tube to two adjoining wall panels on a packing container situated at an angle to one another. Through the various embodiments of the method in accordance with the invention is made possible the application of a straight suction tube with subsequent bending, as well as the bending of the suction tube to the required angle and subsequent application. In accordance with one embodiment, a certain pre-bending of the tube is also made use of which makes it possible to utilize a suction tube of relatively rigid and unyielding material.

Preferred embodiments of the packing container as well as of the method in accordance with the invention will now be described in greater detail with special reference to the enclosed schematic drawing, which merely show the details necessary for the understanding of the invention.



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Fig.1 shows in perspective a preferred embodiment of the packing container in accordance with the invention including the applied suction tube.

Fig.2 is a side view of a suction tube bent at an angle V.

Fig.3 shows schematically the packing container in accordance with the invention from the side, and illustrates the location of an angle between one top wall panel and the adjoining side wall panel of the packing container.

A preferred embodiment of the packing container in accordance with the invention comprises a conventionally designed so-called ridge-type package with a volume of 1/4 litre. This type of package is used e.g. for juices and the like ready for drinking and is manufactured from a flexible laminated material which comprises a central carrier layer of fibrous material, e.g. paper, which is covered on both sides by thermoplastic material (polyethylene) which on the one hand serves to make the laminate liquid-tight, on the other hand makes possible heat-sealing. The laminate is fed to a machine for forming, filling and closing of the packing containers in the form of flattened, tubular blanks of square cross-section. In the machine the blank is converted to a packing container which is filled and closed so as to obtain the main shape as shown in fig.1. More precisely, each packing container comprises a base, not visible in fig.1 and side wall panels 1,2 parallel in pairs and joined to the same (in the figure only two side wall panels are visible). The side wall panel 1, like the opposite side wall panel (not visible) is connected at its upper end to a top wall panel 3 which, together with a number of partly visible backfolding panels 4,5, forms a ridgelike packing top part, crowned by a sealing fin 6 in which the individual wall folds are sealed in a liquid-tight manner to one another.

The packing container in accordance with the invention also comprises one or more weakened areas 7,8 to make possible the introduction of a suction tube into the packing container, when the contents are to be consumed. The weakened areas or suction tube holes 7,8 preferably consist of holes punched out of the material which are of a diameter substantially corresponding to the diameter of the suction tube used, and are covered by one or more layers of plastic or aluminum foil, which layer, however, is of relatively small thickness, so that it can be penetrated in a simple manner by means of the suction tube end.

Finally the packing container in accordance with the invention also comprises an externally placed suction tube 9, which preferably is placed into an envelope 10 adapted to the shape and length of the suction tube. The suction tube as well as the envelope are preferably made of a flexible plastic material and the suction tube 9 is applied so that it extends over the side wall panel 1 as well as over the top wall panel 3. More precisely, the suction tube 9 is bent at a centrally located place which coincides with a folding line 11 between

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the wall panels 1 and 3. In accordance with a preferred embodiment of the packing container, the suction tube is placed so, moreover, that it extends substantially along the joint diagonal of the two wall panels 1 and 3.

The design of the packing containers in accordance with the invention, with the suction tube bent and placed along the joint diagonal of the adjoining wall panels, makes it possible to join the suction tube to the container wall in such a manner that the suction tube does not with any part of it extend outside the contour of the packing container. This is necessary so as to prevent the suction tube from becoming damaged or unstuck on handling of the packing container. The placing of the suction tube makes it also possible to utilize a suction tube of such a length, that on being used it cannot "disappear" down into the packing container, that is to say, the length of the suction tube is greater than the maximum distance between the suction tube hole 7 or 8 and the most distant inner corner of the packing container seen from the suction tube hole. This has not been possible earlier, with a conventional placing of the suction tube diagonally over one of the side wall panels, since the space available then did not make possible an application of a suction tube of a length greater than the said inner distance in the packing container.

Earlier attempts to apply a suction tube over more than one wall surface on the packing container have often failed on account of the suction tube being exposed to damage by buckling. By applying the suction tube diagonally over a top wall panel and a side wall panel, the suction tube will be bent at an angle  $V$  (fig. 2) which is greater than the angle  $\alpha$  (fig. 3) between the two wall panels and smaller than  $180^\circ$ . The diagonal placing of the suction tube means that the suction tube extends obliquely over the folding line 11, so that the angle  $V$  of the suction tube will become greater than the angle between the two adjoining wall panels. In the conventionally shaped packing container mentioned earlier with a volume of  $1/4$  litre, the angle is typically between  $110^\circ - 120^\circ$ , which gives an angle  $V$  for the suction tube of between  $130^\circ$  and  $140^\circ$  when the suction tube is applied diagonally in accordance with the invention.

Suction tubes manufactured of flexible plastic material, the preferred materials being polypropylene or HDPE (high density polyethylene), may be bent readily at this angle in cold condition, that is to say, bent elastically without being damaged and without any difficulties arising when the suction tube is returned to its normal, straight form. In order to facilitate further the bending, especially when the suction tube is made of other, less flexible plastic material, the suction tube may be provided with a bending indication

e.g. a centrally located part with a slightly oval or flat cross-section or one or more bellows folds. The placing of the part provided with bending indication centrally on the suction tube allows the retaining of the relatively rigid end parts of the suction tube, which facilitates usage, and in particular the penetration of the suction tube hole or the packing container wall on consumption.

The attachment of the suction tube on the wall panels of the packing container is done preferably by means of thermoplastic adhesive which is applied between the wall panels and the two ends of the suction tube. However, the attachment may also be done by a different technique, e.g. self-adhesive strips or the like. As mentioned earlier, the suction tube is generally wrapped in a suction tube envelope which may be manufactured of a thin, flexible plastic material or paper. In the description and in the claims the term suction tube is used to describe the suction tube proper as well as the suction tube wrapped in a suitable envelope, since both variants occur in practice without having any effect on either the location of the suction tube, the bending of the suction tube or any other parameter significant for the invention.

The application of a suction tube to a packing container and the bending of the same in accordance with the invention may be carried out in a number of different ways. It is a common feature of the different methods in accordance with the invention, all of which will be described in the following, however, that the suction tube is applied to two adjoining wall panels of the packing container situated at an angle to one another, by virtue of the suction tube being made to rest against and be joined to both wall panels with the help of adhesive. In accordance with the different embodiments of the method in accordance with the invention, the bending of the suction tube may take place either at the same time as the application of the same to the packing container, before the application of the suction tube to the packing container or through a combination of both these procedures. All these methods will be described in the following.

In accordance with a first embodiment of the method in accordance with the invention, the suction tube is bent at the same time as it is applied to the packing container. More precisely, the procedure is so that the ready-filled and closed packing container is provided with a coating of thermoplastic material, so-called hot-melt, on the side wall panel 1 which adjoins directly the top wall panel 3 situated above. The adhesive is applied to one bottom corner of the side wall panel 1, whereupon a suction tube 9, possibly wrapped in an envelope, is brought into contact with the hot-melt before the same has had time to cool off. The suction tube is given here a direction

which coincides with the ultimate diagonal placing. Then further hot-melt is applied to the corresponding top wall panel 3 and, more precisely, to the opposite top corner of the same. Subsequently the suction tube is bent in cold condition, so that its free end will rest against the top wall panel 3 and the still warm and soft adhesive, which has been applied to the same. By this method the bending of the suction tube will take place automatically in the right position, since the edge 11 between the top wall panel and the side wall panel acts as a holding-up surface during the bending operation. Furthermore, the suction tube will automatically be given the right bending angle if it is ensured that it rests against the side wall panel as well as against the top wall panel. After the adhesive applied to the upper part of the top wall panel has set, the suction tube will be fixed in the desired position on the packing container, ready to be detached and used when the contents of the packing container are to be consumed. After detachment, the suction tube 9 on account of its inherent flexibility automatically resumes its original straight form.

The method described has been found to function with great safety also at high manufacturing speed and the method is, moreover, simple and applicable in most cases when a filled and closed packing container of the ridge type is to be provided with an attached suction tube, possibly provided with a protective envelope.

As an alternative to the method described above, it is also possible to bend the suction tube before the application of the same to the packing container, which is particularly appropriate, if the suction tube is intended to be bent permanently, that is to say, if it is to be heated before the bending so that the bending will be plastic. Such a suction tube will thus be angled, even after detachment from the packing container, which of course shortens a little the effective length of the suction tube, but makes it possible to use a particularly rigid and strong suction tube material, e.g. HIPS (High Impact Polystyrene) which sometimes may be desirable. The method presumes that the angle  $V$  over which the suction tube is to be bent, will be calculated in advance, which can be done in a fairly simple manner, since the angle  $\alpha$  between the top wall panel and the side wall panel is known and it is only necessary to compensate for the reduction of the bending angle which stems from the diagonal placing of the suction tube obliquely over the folding line 11. In a ridge package of conventional shape which holds 2.5 dl, the angle  $\alpha$  is thus generally  $110^\circ - 120^\circ$ , which gives an angle  $V$  of  $130^\circ - 140^\circ$ . Instead of calculating the angle  $V$  with the guidance of the angle  $\alpha$  it is of course possible in a simple manner, to determine a suitable

angle V empirically. By bending the suction tube prior to application, a heating of the suction tube to the softening temperature of the suction tube material is thus made possible, so that the bending can be made permanent. This is more difficult to carry out in the firstmentioned method in accordance with the invention, since heating of the suction tube, after the same has been placed directly adjoining the packing container, would be difficult to realize, owing to the risk of damage to the packing container wall which, as mentioned previously, is coated with an external thermoplastic layer.

In accordance with a third embodiment of the method in accordance with the invention, use is made of plastic as well as elastic bending of the suction tube, and this embodiment can be said to constitute a combination of the two firstmentioned embodiments. This third method of applying a suction tube to a packing container of the ridge type is used when a suction tube material is employed which has a certain, albeit limited, inherent flexibility. This may be the case e.g. when the suction tube material in itself is relatively flexible (polypropylene), but where the suction tube on account of its wall thickness is liable to the risk of buckling on being bent to the desired angle V in cold condition. Here it is possible, prior to its application to the packing container, to heat the suction tube and bend it to an angle  $V_1$  which is substantially equal to  $\frac{\text{angle } \alpha + \frac{(180 - \alpha)}{2}}{2}$ , so that subsequently on application it can be bent elastically to an angle  $V_2$ , which is smaller (more acute) than the angle  $V_1$  and normally coincides with angle V. In other words, the suction tube is heated before the application and bent over approximately half the angle from straight condition to the desired final angle, so that the suction tube will permanently be at this angle, whereupon, after application and in accordance with the embodiment 1 described above, an elastic bending and attachment of the suction tube to the wall panel of the packing container are performed. After detachment of a suction tube thus prepared, the suction tube will return to the angle  $V_1$ , which to some extent shortens the usable, active length of the suction tube, but not to such a high degree as in accordance with the embodiment two, where the suction tube remains completely in the bent position, that is to say, at an angle V between the two halves of the suction tube.

Whilst in all three embodiments of the method in accordance with the invention described above it is assumed that the suction tube is applied to a filled and ready-formed packing container, the suction tube is being applied to the packing container, in accordance with a fourth embodiment of the method according to the invention, already before the same has been fully formed and obtains its ridge-shaped top part. In contrast to the earlier methods, the attachment of the suction tube is taking place here whilst the packing

container is still in the filling machine, which is an advantage inasmuch as the packing container, when it leaves the machine, is completely finished and provided with suction tube, so that it can be packed directly in the collective package, e.g. be enwrapped in shrink-film and be conveyed to the retailer and consumer.

In the manufacture of the individual packing containers these are formed, as mentioned previously, from a tubular blank of square cross-section, which blank is provided in the filling machine with a base and is filled with the desired contents, whereupon the ridge-type top part is formed and the material layers included are joined together in a liquid-tight manner so that the sealing fin 6 is formed. The application of the suction tube to the wall panels of the packing container is taking place here prior to the formation of the ridge-like top part on the packing container, that is to say, whilst the top wall panel 3 is still in vertical position in the same plane as the side wall panel 1. The suction tube can be applied to the packing container, therefore, and joined to the two adjoining wall panels 1, 3 in straight condition, so as to be bent subsequently to the desired angle at the same time as the formation of the top part of the packing container, that is to say, at the same time as the folding down of the top wall panel 3 to the position shown in fig. 1. The application of the suction tube takes place preferably, as mentioned previously, with the help of a heat-sealable adhesive, which is applied to diagonally opposite corners of the rectangular surface which is formed by the side wall panel 1 and the top wall panel 3. The suction tube is then applied diagonally over the said panels and the adhesive is allowed to dry before the top wall panel is folded down so that the desired angle of  $110^{\circ}$ - $120^{\circ}$  is formed. On folding down, the suction tube will be bent into the correct position over the folding line 11 without any further measures having to be taken. This method ensures a rapid and continuous manufacture when all the packing containers coming off the packing and filling machine are to be provided with suction tubes, but in return requires a certain amount of redesign of the packing machines which are used at present.

In the cases where the bending of the suction tube is to be permanent, the suction tube, or rather that part of the suction tube on which the bending is to take place, is heated to the softening temperature of the suction tube material prior to bending, whereupon the suction tube becomes plastic and the bending can take place without any risk of buckling of the suction tube. In order to prevent the suction tube from being flattened or in some other manner being deformed in an undesirable manner in connection with the bending, it is appropriate to support the suction tube during the actual bending internally by means of a spiral spring or the like. It is also possible merely

to heat the suction tube to softening temperature on the side on which the suction tube material during the bending operation will be stretched, that is to say the side remote from the packing container. Through this technique, the deformation of the suction tube is limited to a certain flattening on the heated side, which flattening, though, has no negative effect on the function of the tube. The temperature used for heating the suction tube is adapted to the suction tube material used, and a suitable softening temperature for polypropylene is thus 155° - 170°C whilst a suitable corresponding temperature for HDPE is 110° - 125°C.

Although the suction tube in the package as well as in the method in accordance with the invention has been described as non-wrapped, it will be understood in the description as well as in the patent claim, that the suction tube can be provided with a protective envelope which, for reasons of hygiene, is very often the case. The protective envelope is mainly flattened tubular and may consist of paper or plastic material. When the protective envelope is made of plastic material it is appropriate to ensure that the softening temperature of this plastic material is higher than that of the plastic material of which the suction tube is made, since this makes it possible to heat and bend the suction tube whilst it is located inside the suction tube envelope. For the rest, the suction tube can be treated substantially in similar manner in accordance with all the embodiments of the method according to the invention, irrespectively of whether it is enwrapped in an envelope or not.

CLAIMS

1. A packing container comprising two adjoining wall panels (1,3) situated at an angle to one another and a suction tube (9) applied to the outside, characterized in that the suction tube (9) is bent and is applied so that it extends over the said wall panels (1,3), the place of bending coinciding with a folding line (11) located between the panels.
2. A packing container in accordance with claim 1, wherein the said wall panels are substantially rectangular, characterized in that, the suction tube (9) extends substantially along the joint diagonal of the two panels (1,3).
3. A packing container in accordance with claim 1 or 2, wherein the wall panels (1,3) form a mutual angle  $\alpha$ , characterized in that, the suction tube (9) is bent at an angle  $\gamma$  which is greater than the angle  $\alpha$  but smaller than  $180^\circ$ .
4. A packing container in accordance with anyone of the preceding claims, characterized in that the suction tube (9) is provided with a bending indication.
5. A packing container in accordance with anyone of the preceding claims, characterized in that the suction tube (9) is provided with a bellows fold.
6. A packing container in accordance with anyone of the preceding claims, characterized in that it comprises a base and side wall panels (1,2) parallel in pairs joined to the same, two of which at their upper end are joined to a number of intermediate backfolding panels (4,5) forming a ridge-like package top part, the suction tube (9) extending over and being joined to a side wall panel (1) as well as to the adjoining top wall panel (3).
7. A packing container in accordance with anyone of the preceding claims, characterized in that the suction tube consists of polypropylene.
8. A packing container in accordance with anyone of claims 1 to 6 inclusive, characterized in that the suction tube consists of HDPE.
9. A method for applying a suction tube to a packing container comprising two adjoining wall panels situated at an angle to one another, characterized in that the suction tube (9) is made to rest against and be joined to both wall panels (1,3) with the help of adhesive.
10. A method in accordance with claim 9, characterized in that the suction tube (9) is bent at the same time as it is applied to

the packing container.

11. A method in accordance with claim 9, characterized in that one end of the suction tube is joined to a wall panel (1), whereupon the suction tube (9) is bent and its other end is joined to the adjoining wall panel (3).

12. A method in accordance with claim 9, characterized in that the suction tube (9) is bent prior to the application to the packing container.

13. A method in accordance with anyone of claims 9 to 12 inclusive, characterized in that the suction tube (9) is bent to an angle which is greater than the angle  $\alpha$  between the two wall panels 1,3.

14. A method in accordance with claim 12, characterized in that the suction tube (9), prior to application, is bent plastically to an angle  $V_1$  which is substantially equal to  $\angle + \frac{180 - \alpha}{2}$ , so that subsequently on application it can be bent elastically to an angle  $V_2$  which is smaller than the angle  $V_1$ .

15. A method in accordance with claim 14, characterized in that the angle  $V_2$  is equal to the angle  $V$ .

16. A method in accordance with anyone of the preceding claims, characterized in that the suction tube (9) on the packing container is joined to two adjoining wall panels (1,3) in straight condition, to be bent subsequently to the desired angle simultaneously with the forming of the top part of the packing container.

17. A method in accordance with anyone of claims 8 to 16 inclusive, characterized in that the suction tube (9), prior to bending, is heated to the softening temperature of the suction tube material.

18. A method in accordance with anyone of claims 8 to 17 inclusive, characterized in that the suction tube (9) is heated on the side at which during the bending operation the suction tube material will be stretched.

19. A method in accordance with anyone of claims 8 to 18 inclusive, characterized in that the suction tube (9) is located in a suction tube envelope (10).

20. A method in accordance with claim 19, characterized in that during the bending operation the suction tube (9) is located in the suction tube envelope (10).

21. A method in accordance with claim 20, characterized in

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t h a t the suction tube envelope (10) is made of a material of a higher softening temperature than the suction tube material.

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Fig.1

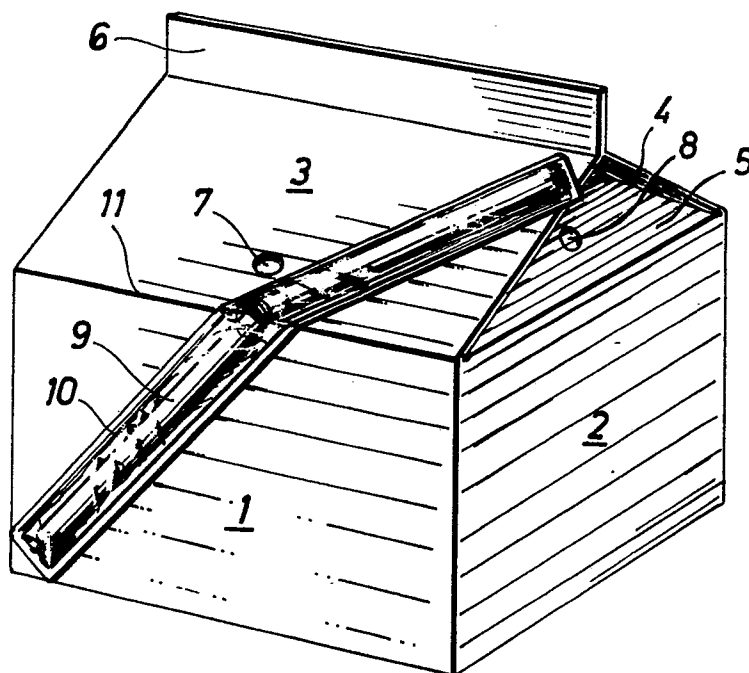


Fig.2

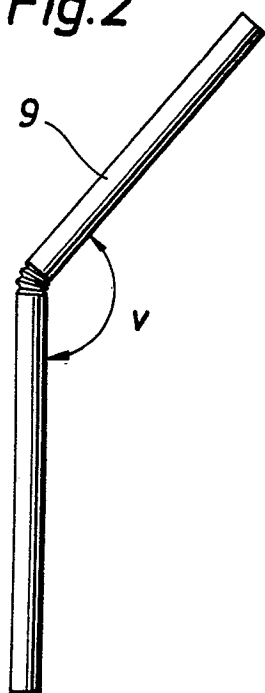
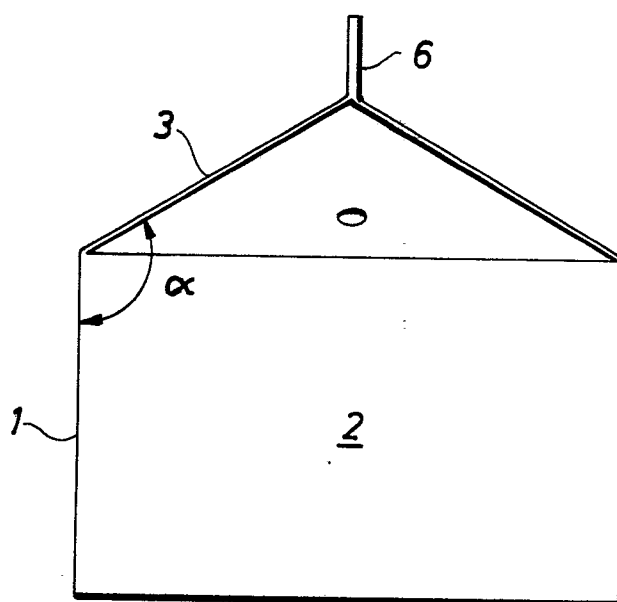


Fig.3



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European Patent  
Office

# EUROPEAN SEARCH REPORT

Application number

EP 81109595.9

| DOCUMENTS CONSIDERED TO BE RELEVANT                                 |                                                                                                                |                                  | CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category                                                            | Citation of document with indication, where appropriate, of relevant passages                                  | Relevant to claim                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| A                                                                   | <p>US - A - 3 346 187 (MUELLER)</p> <p>* Column 1, lines 44-47;<br/>column 2, lines 51-56 *</p> <p>--</p>      | 5,7,8                            | <p>B 65 D 85/72</p> <p>B 65 D 77/28</p>                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| A                                                                   | <p>GB - A - 2 013 606 (TETRA PAK)</p> <p>* Page 1, lines 34-51 *</p> <p>--</p>                                 | 9,19                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| A                                                                   | <p>AU - B3 - 56 812/80 (TETRA PAK)</p> <p>* Fig. 1 *</p> <p>--</p>                                             | 19                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| A                                                                   | <p>DE - A1 - 2 828 881 (PAPIER- UND KUNSTOFFWERKE LINNICH GMBH)</p> <p>* Page 4, lines 19-28 *</p> <p>----</p> | 9,19                             | <p>TECHNICAL FIELDS SEARCHED (Int.Cl. 3)</p> <p>A 47 G 21/00</p> <p>B 65 B 15/00</p> <p>B 65 B 61/00</p> <p>B 65 D 77/00</p> <p>B 65 D 85/00</p>                                                                                                                                                                                                                                                                                                                                 |
|                                                                     |                                                                                                                |                                  | <p>CATEGORY OF CITED DOCUMENTS</p> <p>X: particularly relevant if taken alone<br/>Y: particularly relevant if combined with another document of the same category<br/>A: technological background<br/>O: non-written disclosure<br/>P: intermediate document<br/>T: theory or principle underlying the invention<br/>E: earlier patent document, but published on, or after the filing date<br/>D: document cited in the application<br/>L: document cited for other reasons</p> |
| <p>X The present search report has been drawn up for all claims</p> |                                                                                                                |                                  | <p>&amp;: member of the same patent family, corresponding document</p>                                                                                                                                                                                                                                                                                                                                                                                                           |
| Place of search                                                     |                                                                                                                | Date of completion of the search | Examiner                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| VIENNA                                                              |                                                                                                                | 26-02-1982                       | MELZER                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |