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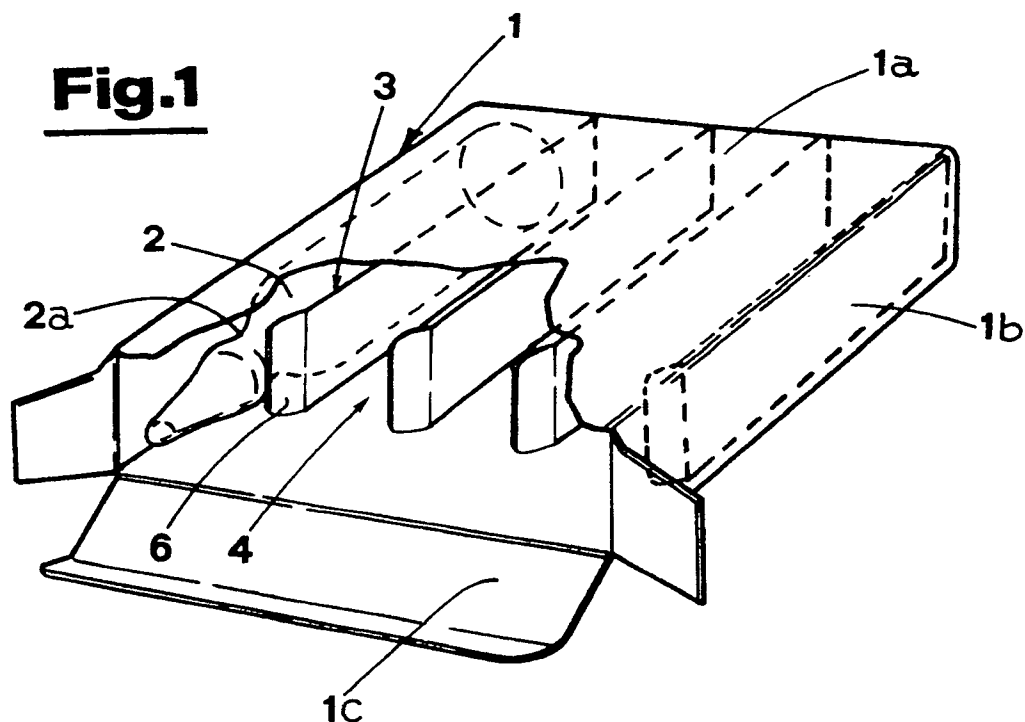
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(54) **Container for tubular products, such as glass phials, flacons and the like.**

(57) The container for glass phials, flacons and the like, comprises a box-type case (1) suited to contain a plurality of phials (2) orderly arranged side by side.

Inside the case (1) are devised to be inserted and restrained a plurality of separating elements (3) which define corresponding seatings (4) for housing the phials (2) and which are provided at one end with flaps (6) which are given a transverse folding and which are suited to engage with the neck (2a) of the phials (2), in order to hold the phials (2) axially.



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CONTAINER FOR TURBULAR PRODUCTS, SUCH AS GLASS PHIALS, FLACONS AND THE LIKE

This invention relates to the technical field concerning the packaging of glass phials, flacons and the like, particularly for pharmaceutical use.

In the above-mentioned field it is known the requirement of enclosing a plurality of phials into a container suited to keep them separate from each other and sufficiently stiff, in order to avoid any accidental breaking.

In particular, phial breakings are more likely to occur correspondingly with the shaped neck at the opening end ; said neck, in fact, is a weak point of the phial and it is devised for being broken to open the phial.

The packages presently distributed generally provide a box-type case, made from a cardboard blank, inside which is freely inserted an element for containing the phials.

Said containing element defines a plurality of seatings into which the phials are arranged individually, orderly set side by side, so being prevented from coming in touch with each other.

In a known embodiment, the containing element consists of a corrugated card, among whose folds the seatings for housing the phials are defined ; the corrugated card is glued onto an underlying plane card, provided with foldable side flaps so to close the ends of said seatings.

However, said embodiment, which is undoubtedly simple, brings about several drawbacks in the packaging phase.

As a matter of fact, the corrugated card, supplied by the paper and cardboard industry in rolls from which individual portions are cut away, is quite bulky. This has negative effects both on the overall dimensions of the packaging machines, and on the room required for storing the same rolls.

Furthermore, the containers made this way do not ensure an adequate strength, particularly in the case of stacking.

In another known embodiment, the containing element consists of a so-called "box" of plastic material, made by molding through suitable equipment, located upstream of the packaging machine.

This embodiment does not present the above-mentioned drawbacks of space, since rolls of flat material are used, but it turns out to be unquestionably more expensive, due both to the complexity of the equipment used, and to the cost of the raw material.

Furthermore, the "box" is relatively bulky in proportion to the dimensions of the phials contained therein, and it may involve problems of pollution, connected with the plastic material.

Besides that, both the packages mentioned above are of difficult use, since they require the extraction of the containing element of the case. Further-

more, this may also involve the risk that phials come out accidentally.

The objects of this invention is to provide a case which makes it possible to house stably and safely glass phials, flacons and the like, so to prevent them from coming out or breaking accidentally.

Another object of this invention is to provide a case made through a technical solution which turns out to be simple, functional and reliable, as well as versatile.

The above-mentioned objects are achieved through a case substantially as described hereinafter and as claimed in the appended claims.

In particular the case comprises a plurality of separating elements inserted restrained therein, so to define corresponding seatings to house phials.

In a preferred embodiment the separating elements have flaps, which are given a transverse folding to engage with the necks of the phials, so to hold them axially.

The case makes it possible to achieve the intended purposes since separating elements avoid mutual shocks among the phials and, through the flaps which engage with their neck, hold the phials axially.

The phials are thus prevented from coming out or breaking accidentally in any way.

In particular, the axial locking avoids shocks of the head of the phials, i.e. of the most fragile portion, against the closed flap of the case.

Furthermore, the separating elements efficiently perform the function of stiffening the case, preventing it from being squashed even in the case of stacking.

The diametral clearance among the phials and the seatings avoids the transmission of stresses to the same phials, to ensure further safety.

Furthermore, the case is of very simple and cheap construction. In particular, the separating elements may be obtained, through easy cutting and folding operations, from a roll of flat cardboard.

Therefore, there are neither problems of dimensions or of storing.

The invention will be described further, by way of example, with reference to the accompanying drawings, wherein :

– Fig. 1 is a perspective view, partially cutaway, of the container for glass phials conforming to the invention ;

– Fig. 2 is a perspective view of several embodiments of said separating elements ;

– Fig. 3 is a perspective view of a different embodiment of the container provided by the invention ;

– Fig. 4 shows a plurality of separating elements which may be used in the container of fig.3 ;

– Fig. 5 is a perspective view of a container suited

to contain two rows of phials set side by side ;

– Figs. 6 and 7 show separating elements which may be used in the container of fig. 5 ;

– Fig. 8 is a perspective view of a different embodiment of a container suited to contain two rows of phials set side by side ;

– Fig. 9 shows separating elements which may be used in the container of fig. 8 ;

– Fig. 10 is a perspective view of a further embodiment of the container provided by the invention ;

– Fig. 11 is a cross-sectional view of the container of fig. 10.

Referring to the figures mentioned above, the container conforming to the invention comprises a box-type case 1 suited to contain, e.g., a plurality of glass phials 2.

The case 1, made from a cardboard blank, defines a pair of base walls 1a connected by sides 1b and it is provided with an openable flap 1c.

Inside the case 1 are devised to be inserted and restrained a plurality of separating means, generally designated by the numeral 3. The separating elements 3 are suited to define seatings 4 to house the phials 2.

In the simplest embodiment, illustrated in fig. 2, the separating means 3 consist of single cardboard strips 5 which are inserted into the case 1 on edge, i.e. parallel to the sides 1b. The strips 5 are slightly shorter than the case 1, and their height is basically equal to its thickness.

The strips 5 bear, made at one end, a transverse folding line P which defines a flap 6 foldable with respect to the plane of the strip itself. The strips 5 are restrained inside the case 1 by glueing, through a series of glue spots distributed along the longitudinal edge of the strip and in particular correspondingly with the folding line P and the flap 6.

Obviously, the strips 5 are inserted into the case 1 spaced from one another, so to define seatings 4 of regular section. The flap 6 is suited, in configuration of use, to engage stably with the neck 2a of the phial 2 contained in a relative seating 4. Thus the phials 2 are held axially, so to prevent them from oscillating or coming out of the relative seatings 4 accidentally.

On the contrary, a suitable traction exerted on the phial makes it possible to easily overcome the strength of the glue which keeps the flap 6 fixed in folded position, for the extraction of the same phial at the moment of use.

Opportunely, the seatings 4 have dimensions slightly greater than those of the phials 2 contained therein.

This avoids the transmission of stress to the phials, particularly when the containers are stacked, so avoiding the risk of breakings of the same phials.

It should be appreciated that the separating elements 3, besides preventing phials from knocking against each other, contribute to stiffen the contain-

ers, particularly by withstanding the crushing of the case.

5 In a different embodiment, also illustrated in fig.2, two cardboard strips 5 are joined in a single piece by a transverse strip 7, so to provide a semi-tubular element, basically U-shaped, which is inserted into and restrained as described above inside the case 1 ; i.e. a plurality of said strips 5 are joined in a single piece, according to a bending pattern with right angles, by transverse strips 8,9 extending alternately from the upper and the lower edges of said strips 5. The transverse strips 7,8,9 turn out to be adjacent, in configuration of use, to the base walls 1a of the case.

10 The strips 5 are provided with flaps 6 to hold the phials, projecting at one corresponding end.

The number of said semi-tubular elements, i.e. the width of said accordion element, is obviously depending on the dimensions of the case 1, i.e. on the number of phials to be contained.

It should be appreciated that the transverse strips 7,8,9 contribute to increase the stiffness of the separating elements, i.e. the crushing strength of the container.

25 In a further embodiment, illustrated in figs. 3 and 4, the separating elements 3 are made up of a pair of cardboard strips 10, 11 joined together along a longitudinal side and disposed like an "L".

30 The strip 10 is suited to be inserted edgewise into the case 1, while the strip 11 is adjacent to a base wall 1a. The strips 10 and 11 are alternately provided with a holding flap 6 ; provision may be made for both strips 10,11 presenting a respective projecting flap, as may be seen in fig.4.

35 Obviously, said flaps 6 are folded and fastened inside the case in the sense suitable for engaging with the neck 2a of the phial.

40 For the packaging of a greater number of products, provision is made for the employment of a container suited to contain two rows of phials arranged side by side, as illustrated in figs. 5 and 8. In that case said separating elements provide a divisory septum 12, suited to subdivide the case 1 in two zones according to a plane parallel to the base walls 1a of the same case.

45 Said divisory septum 12 is provided, along its longitudinal edges, with two wings 13, whose height is basically half the case thickness, and which are devised to be respectively associated with the opposite sides 1b of the case, turned to opposite sides with respect to the same divisory septum 12.

50 The wings 13 bear protruding, at a corresponding end, respective flaps having the purpose described above.

55 The two inner zones of the case 1 are suited to receive cardboard strips 5, single or joined together in a single piece by a transverse strip 7, of the same type as those described above, so to form the seatings 4 (Fig.6).

Alternatively, it may be provided that the divisory septum 12 bears a series of longitudinal slits 14, covering half the length of the same septum.

With the slits 14 are able to be coupled, through corresponding slits 15, respective cardboard strips 16, so to form a sort of reticular structure (Fig.7).

The strips 16 have a length basically corresponding to the thickness of the case 1 and bear protruding, on the side of the slit 15, a pair of flaps, for the sake of clarity designated by the numerals 6a and 6b.

The flaps 6a, 6b are turned to opposite sides with respect to the plane of the strips 16, similarly to those of the wings 13 of the septum 12.

It is also possible to provide that the phial-holding flaps extend upwards and downwards from the plane defined by the septum 12, as illustrated in figs. 8 and 9.

In that case, the septum 12 forms, along the front edge, a first series of flaps 6c, e.g. turned towards the top of the case ; a second series of flaps 6d, turned towards the bottom of the case, is formed by a cardboard band 17, glued corresponding to the front edge of the septum 12 (Fig.9). However, said cardboard band may extend to cover the whole surface of the septum 12, as indicated by the numeral 17a in fig.9, so to act as a stiffening of the septum itself.

Also in this case, with the septum 12 may be associated, to make the seatings 4, either single strips 5, or slitted strips 16, which may be fitted onto corresponding slits 14 of the septum.

According to a further embodiment of the container hereto described, illustrated in figs. 10 and 11, the separating elements are made up of strips 18 joined in a single piece, along the longitudinal edges, and forming, between themselves, angles alternately projecting and re-entering.

The lateral strips 18 present, on the outer side, respective wings 18a devised to be glued inside the case 1.

In this case, the seatings to house the phials are defined among the inclined planes formed by the strips 18 and turn out to be offset on two planes parallel to the base walls 1a of the case.

The strips 18 bear projecting respective flaps 6 to hold the phials 2.

Similar flaps may be provided also at the opposite end of the strips 18 and glued to the bottom wall of the case 1.

According to an embodiment different from those described above, the separating elements may have no flap (or flaps) 6 ; this does not involve any problem in the case that the container presented is devised to contain glass flacons.

Finally, the divisory septa, particularly the solutions illustrated in figs. 2, 6, 7, 10, 11, may be provided associated with the case 1 without the need of making provision for a restraint (e.g. adhesives) among this

latter and the same divisory septa.

Claims

1. Container for tubular products, such as glass phials, flacons and the like, of the type comprising a box-type case (1) suited to contain a plurality of phials (2) orderly arranged side by side, **characterized in that** it comprises a plurality of separating elements (3) which are devised to be inserted and restrained inside said case (1) so to define corresponding seatings (4) for housing said phials (2) and they present at one end at least one flap (6) which is given a transverse folding which is suited to engage with the neck (2a) of a relative phial (2), in order to hold the same phial (2) axially.
2. Container for tubular products, such as glass phials, flacons and the like, of the type comprising a box-type case (1) suited to contain a plurality of phials (2) orderly arranged side by side, **characterized in that** it comprises a plurality of separating elements (3) which are devised to be inserted into said case (1) so to define corresponding seatings (4) for housing said phials (2) and they present, at one end, at least one flap (6) which is given a transverse folding which is suited to engage with the neck (2a) of a relative phial (2), in order to hold the same phial (2) axially.
3. Container for tubular products, such as glass phials, flacons and the like, of the type comprising a box-type case (1) suited to contain a plurality of phials (2) orderly arranged side by side, **characterized in that** it comprises a plurality of separating elements (3) which are devised to be inserted into said case (1) so to define corresponding seatings (4) to house said phials (2).
4. Container according to Claims 1 or 3, **characterized in that** said separating elements (3) are made up of single cardboard strips which are inserted into said case (1) edgewise, parallel to the sides (1b), and which are restrained inside the same case (1) by glueing along the longitudinal edges of the strips.
5. Container according to Claim 1, **characterized in that** said strips (5) bear, made at one end, a transverse folding line (P) which defines a respective flap (6) foldable with respect to the plane of the strip itself.
6. Container according to any of the Claims 1, 2 or 3, **characterized in that** said seatings (4) have dimensions greater than those of the phials (2)

contained therein, in order to prevent crushing stress from being transmitted to said phials (2).

7. Container according to the Claim 1 or 2, **characterized in that** said separating elements (3) are made up of two cardboard strips (5) which are joined together in a single piece by a transverse strip (7), thus providing a semi-tubular element suited to be inserted into said case (1) with said strips (5) arranged edgeways, and they bear projecting, at a corresponding end, respective flaps (6) for holding the phials.

8. Container according to the Claim 1 or 2, **characterized in that** said separating elements (3) are made up of a plurality of strips (5) joined together in a single piece, according to a bending pattern, by transverse strips (8,9) which extend alternatively from the upper and the lower edges of said strips (5), and are suited to be inserted into said case (1) with said strips (5) arranged edgeways, said strips (5) also bearing projecting, at a corresponding end, respective flaps (6) for holding the phials.

9. Container according to any of the Claims 1, 2 or 3, **characterized in that** said separating elements (3) are made up of a pair of cardboard strips (10,11) joined together along a longitudinal side and arranged like a "L", said strip (10) being suited to be inserted edgeways into said case (1), while said strip (11) is adjacent to a base wall (1a) of the same case.

10. Container according to any of the Claims 1, 2 or 3, **characterized in that** said separating elements (3) provide for a divisory septum (12), suited to subdivide said case (1) in two zones according to a plane parallel to base walls (1a) of the same case, said divisory septum (12) being provided, along the longitudinal edges, with two wings (13) with their height corresponding to half the thickness of the case (1) and devised to be respectively associated with opposite sides (1b) of the case, turned to opposite sides with respect to the same septum (12).

11. Container according to Claim 10, **characterized in that** said divisory septum (12) bears a series of longitudinal slits (14) covering half the length of the same septum, with which are suited to be coupled, through corresponding slits (15), respective cardboard strips (16) having a height corresponding to the thickness of said case (1).

12. Container according to Claim 10, **characterized in that** said cardboard strips (16) bear projecting, on the side of said slit (15), a pair of flaps (6a, 6b)

which are turned to opposite sides with respect to the plane of the strips (16).

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13. Container according to Claim 10, **characterized in that** said divisory septum (12) forms, along the front edge, a first series of flaps (6c), turned towards a zone of said case (1), and bears glued, corresponding to said front edge of the septum, a cardboard band (17) forming a second series of flaps (6d), turned towards the opposite zone of the case.

14. Container according to any of the Claims 1, 2 or 3, **characterized in that** said separating elements (3) are made up of strips (18) joined in a single piece, along the longitudinal edges, and forming, among themselves, angles respectively projecting and re-entering.

Fig.1

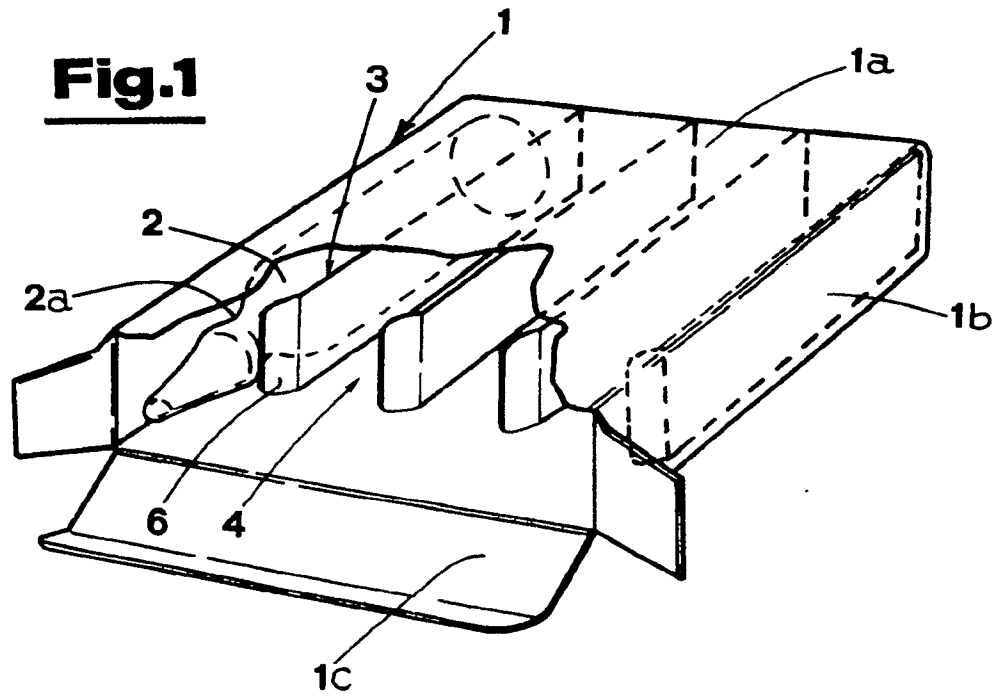
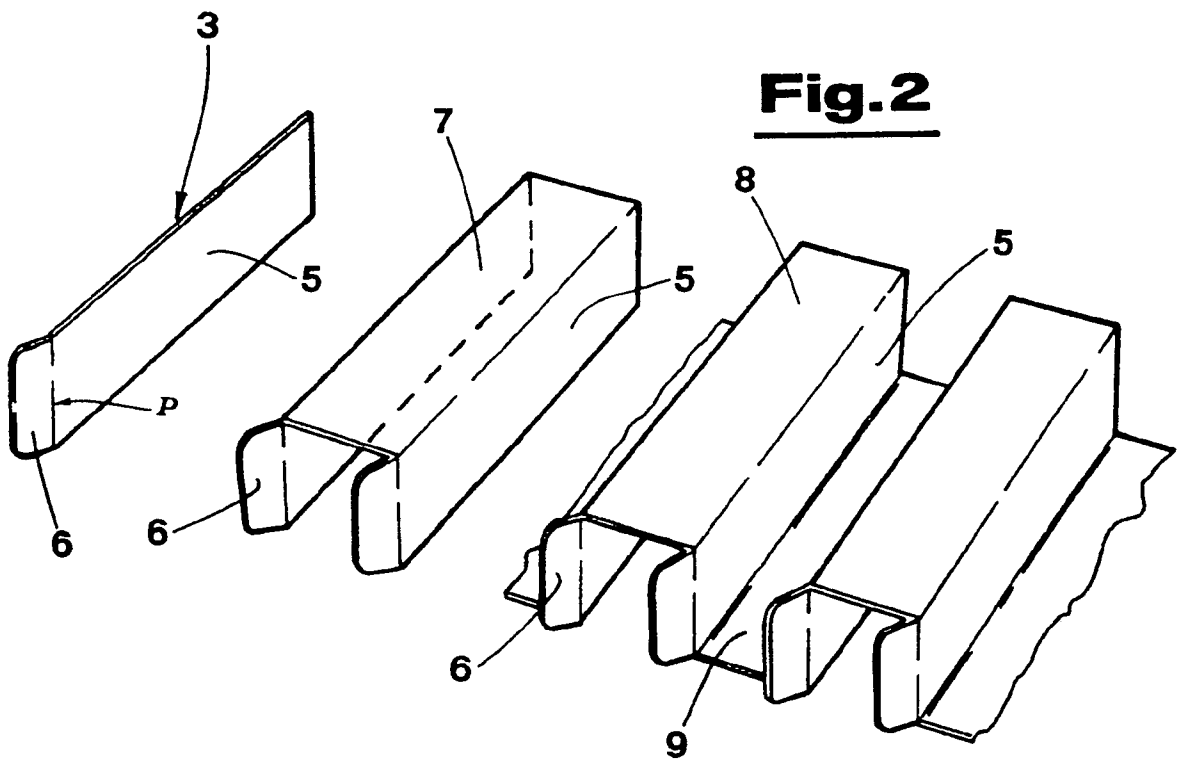


Fig.2



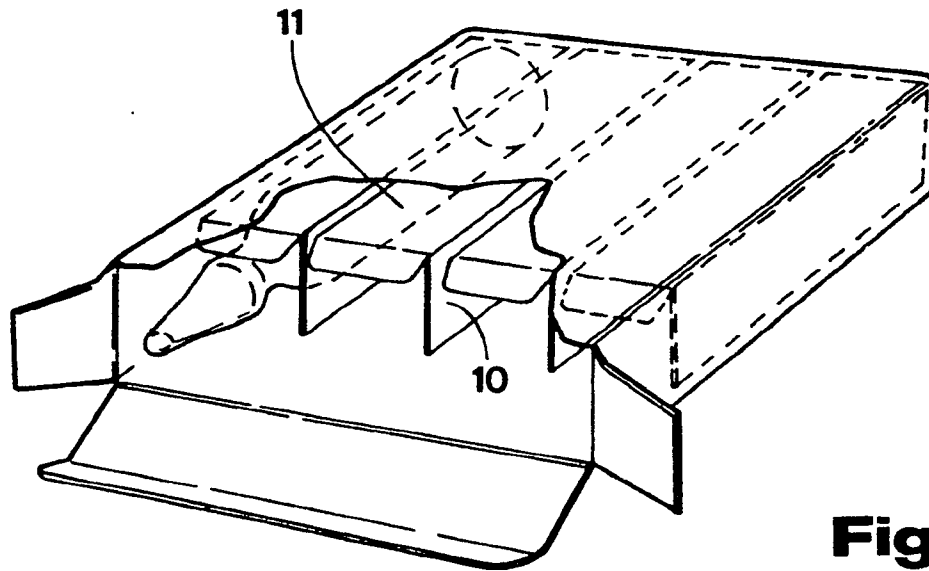


Fig.3

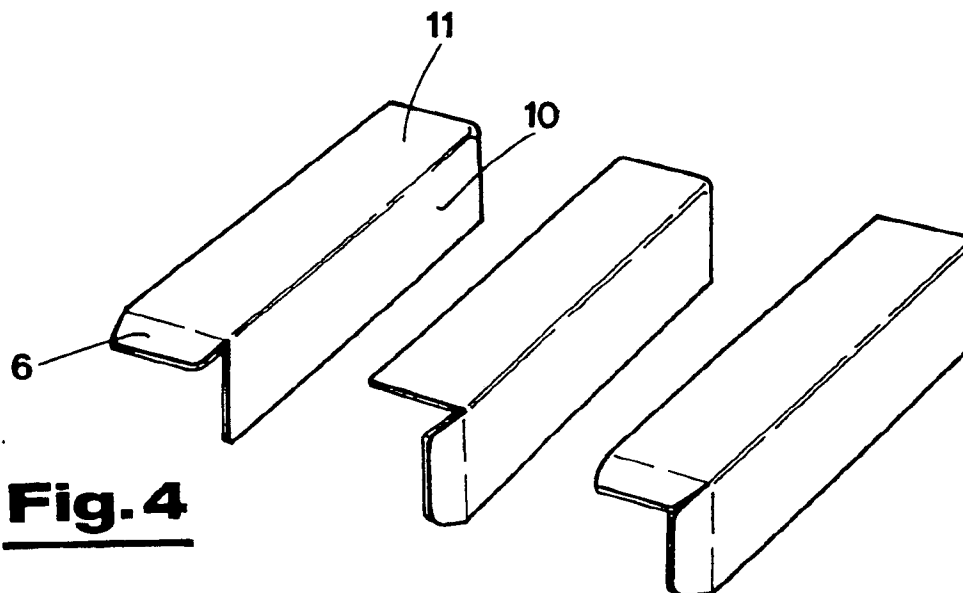
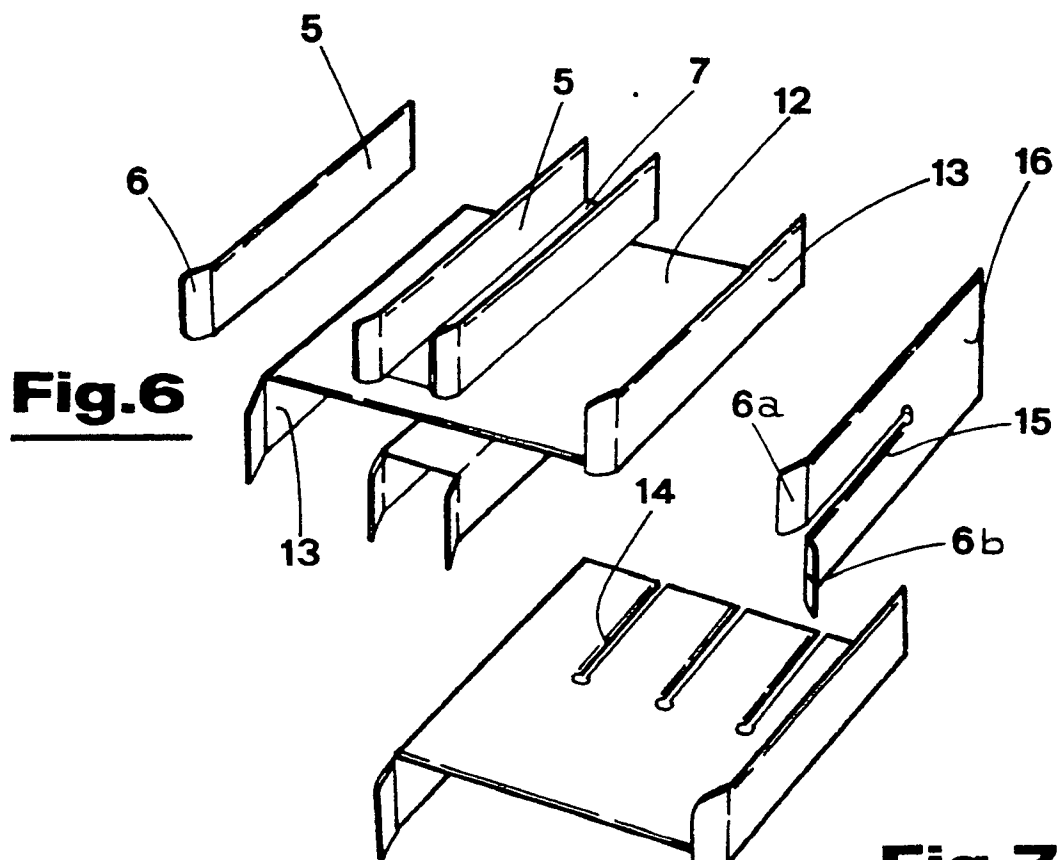
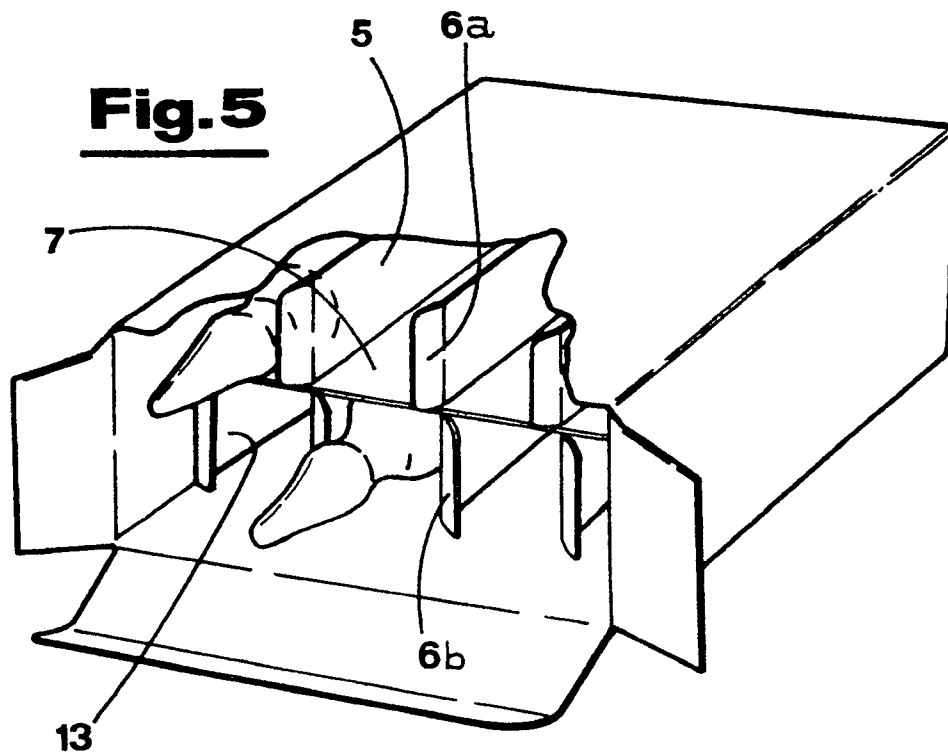


Fig.4



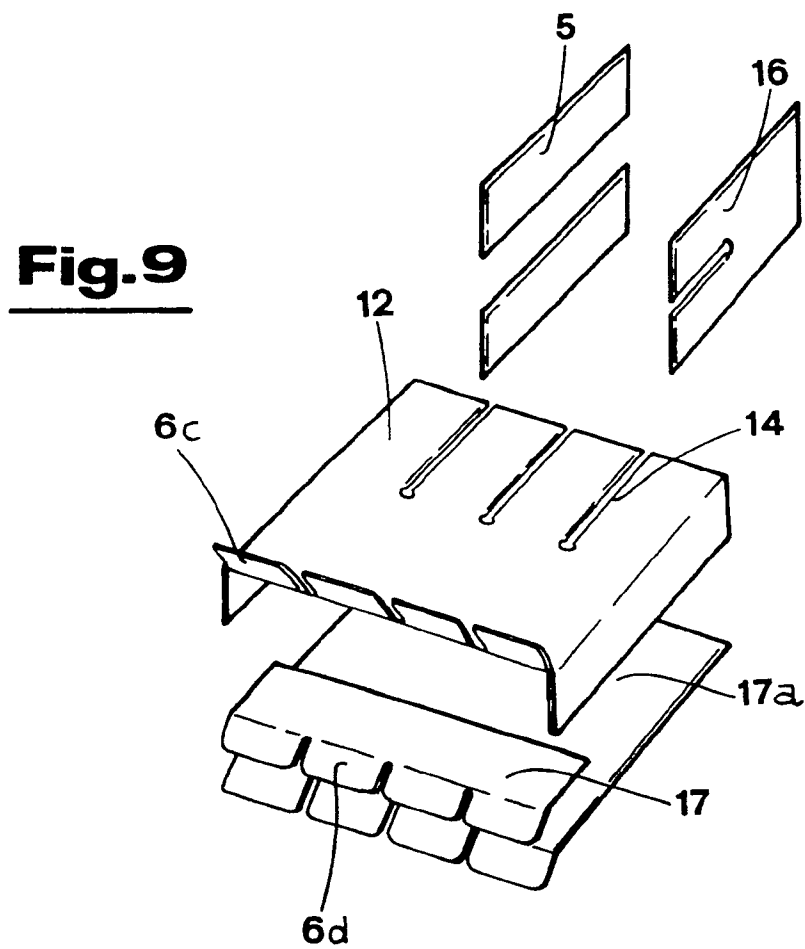
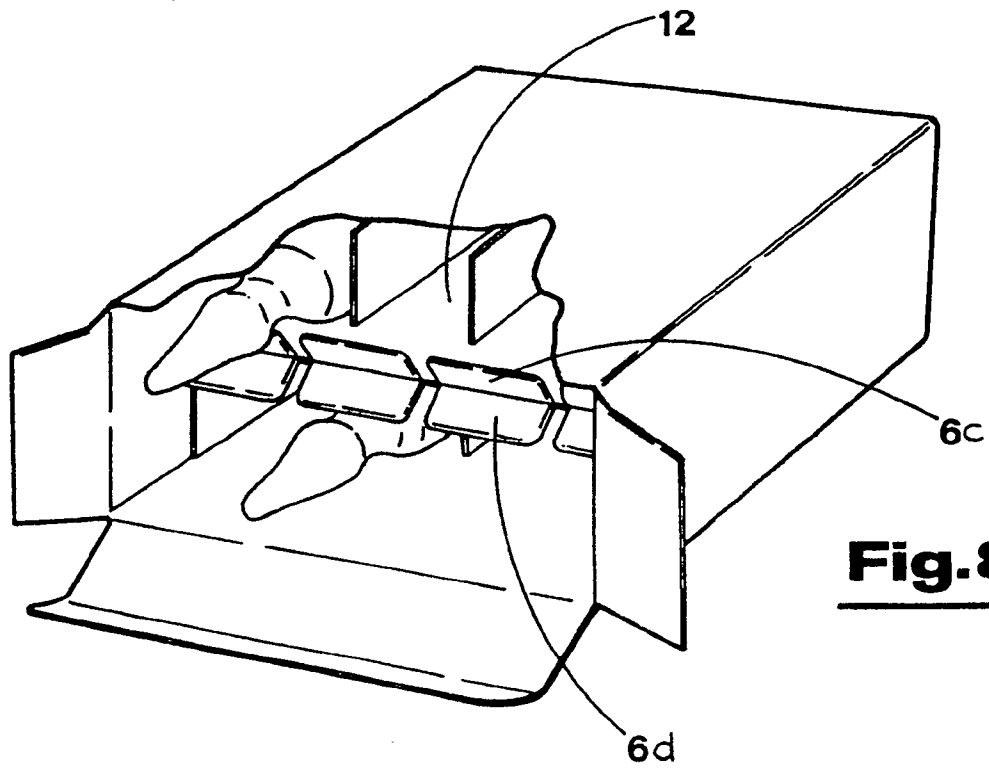


Fig.10

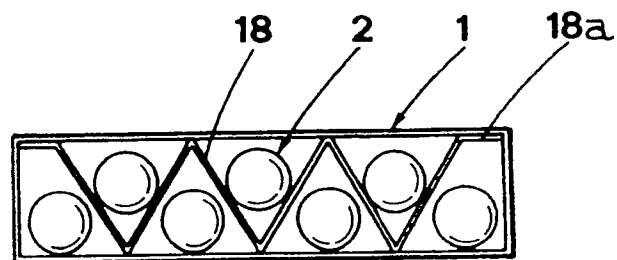
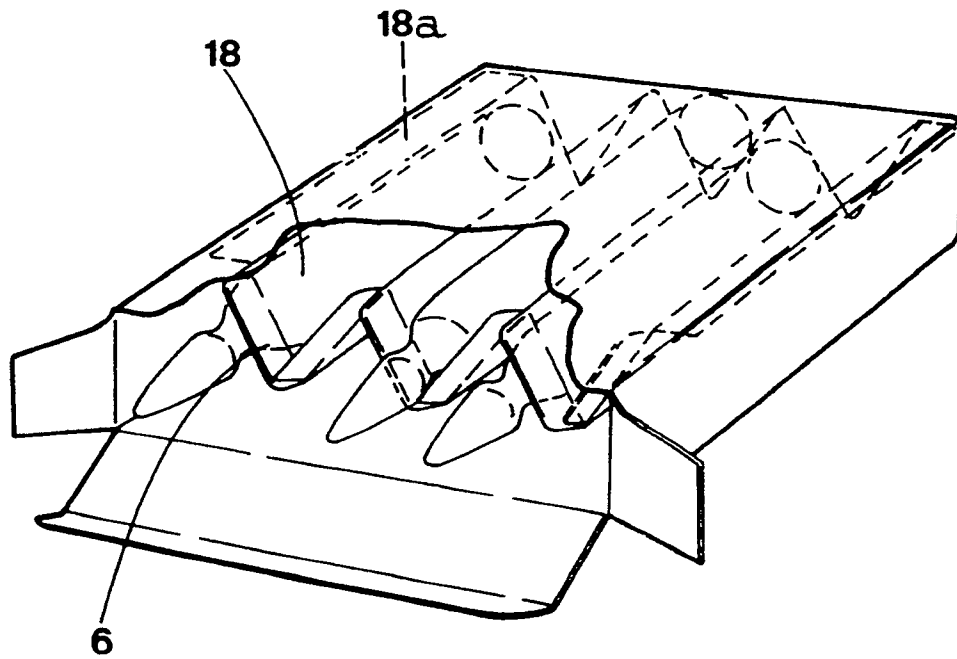


Fig.11



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EUROPEAN SEARCH REPORT

Application Number

EP 91 83 0035

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)
X	Soviet Inventions Illustrated, Derwent Publications Ltd., Section Mechanical week 8535, abstract no.216018, Q34, 10 Oct 1985 & SU-A-1138353 (LENGD ZHDANOVSK PRO) 7 Feb 1985	3	B65D85/42
A	---	1, 2, 4, 9, 10	
X	Soviet Inventions Illustrated Derwent Publications Ltd., Section Mechanical week K48, abstract no.831586, Q34, 18 Jan 1984 & SU-A-992334 (ZHDANOVSK MEDICAL) 15 Feb 1983	3	
A	---	1, 2, 4, 10, 14	
X	DE-U-8910314 (A. LANDERER GMBH & CO KG) * figures 1-6 *	3	
A	---	1, 2	
A	EP-A-0063290 (FUJISAWA PHARMACEUTICAL) * abstract; figures 1-6 *	1-3, 6	
A	DE-A-2453309 (CARL EDELMANN GMBH) * figures 1-7 *	1-3	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 24 MAY 1991	Examiner SMITH C.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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