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

(11) Publication number: **0 248 499**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **87201053.3**

(51) Int. Cl.4: **B65D 5/72**

(22) Date of filing: **04.06.87**

(30) Priority: **05.06.86 NL 8601456**

(43) Date of publication of application:
09.12.87 Bulletin 87/50

(84) Designated Contracting States:
AT BE CH DE ES FR GB IT LI NL SE

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(54) Sheet for making a box, and a box made from a sheet of this kind.

(57) Sheet for making a closed rectangular box, of which one of the side walls comprises a lid (15) which is adapted to be folded in and opened out and which by means of side tongues (17, 18) fastened on each side of it is guided in two oppositely disposed double walled side walls of the box, which are thus composed of three layers. The sheet consists of three rectangular areas (9, 1, 7+15) lying in one line forming a strip and being separated by fold lines (3, 5). Each of said areas at two opposite edges being joined at at side area (26, 27; 6, 8; 10+17, 11+18) and three side areas lying next to one another forming the three-layered side wall of the box. Closure lips being provided at both outer ends of the strip and at the side areas (26, 27) which form the outside walls of the three-layered side wall.

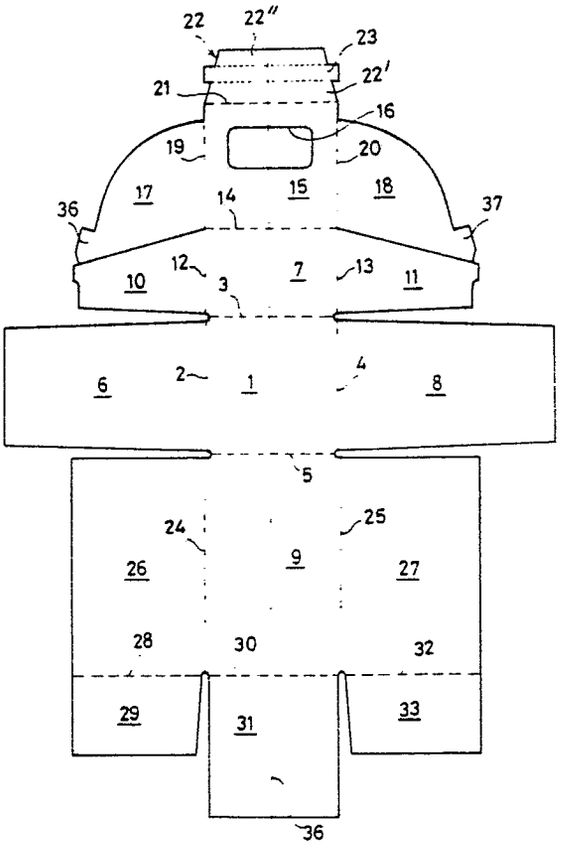

Fig. 1.

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Sheet for making a box, and a box made from a sheet of this kind

The present invention relates to a sheet according to the preamble of Claim 1.

A sheet of this kind is for example known from American Patent Specification 3,747,833. This known sheet has the disadvantage that a plurality of steps are required and that the filling of the resulting box gives rise to difficulties. This filling must take place between two successive steps for the formation of the box.

The present invention seeks to provide a sheet for forming a box of the abovementioned type, which can be constructed in a single step and can then be filled and closed.

This aim is achieved with a sheet according to the characterizing part of Claim 1.

The configuration of this sheet makes it possible for the box to be constructed by machine in a single operating step. This means that the resulting box consists of a base area with two oppositely situated single side walls and two oppositely disposed three-layer walls. In this single folding operation the three-layer side walls are stapled in position in suitable places. In this way, in a single step a box is formed of which only the wall opposite the base area is still open for the purpose of filling the box. All other walls are already in their final assembled positions. After the filling operation the top of the box can be closed in a simple manner with the aid of the closure lips.

If the box is intended for holding long objects which take up practically the whole length of the box, it is expedient for the base area to be formed by one of the large side walls of the box, in which case the base area also includes the lid. After erection of the box the large area opposite the base area is then open for insertion of the objects in the correct direction.

The invention will be explained more fully below with reference to the drawing, in which:

Figure 1 shows a sheet for the production of a box according to the invention;

Figure 2 is a view in perspective of the box according to the invention in the partly dismantled state;

Figure 3 is a view in perspective of the box according to the invention in the closed state.

Figure 4 shows another embodiment of the sheet according to the invention.

Figure 5 is a partial section along line V-V in figure 4.

The sheet shown in Figure 1 is composed of a number of areas which are separated by fold lines shown as broken lines. The sheet consists of a rectangular base area 1, which is bounded by the fold lines 2, 3, 4 and 5. Four areas 6, 7, 8 and 9, which will later form the side walls of the box, adjoin the base area 1. The area 7 has on both sides a side tongue 10, 11, these side tongues being joined by respective fold lines 12 and 13 to the area 7. The area 7 is then joined by a fold line 14 to the area 15, which will subsequently form the lid adapted to be folded in and out. The areas 7 and 15 form together that wall of the box which constitutes the lid, the area 15 being provided with a window-like opening 16 closed by transparent material. Side tongues 17, 18 are provided on each side of the area 15, being joined to the latter by respective fold lines 19 and 20. The area 15 is then joined by means of a fold line 21 to a closure lip 22, which in the embodiment illustrated has a tear-off strip 23, the action of which will be explained later on.

The area 9 has on both sides an area 26, 27, which are joined to it by respective fold lines 24 and 25 and whose size is approximately equal to that of the area 9. These areas 26 and 27 will later form, in conjunction with the respective areas 6 and 8, two oppositely situated double side walls of the box. The area 26 is joined via the fold line 28 to the area 29, the area 9 is joined via the fold line 30 to the area 31, and the area 27 is joined via the fold line 32 to the area 33. The areas 29, 31 and 33 together form the top closure of the box, as will be made clear further on.

The box according to the invention can be made in a particularly simple manner from the sheet shown in Figure 1. Starting from the base area 1, four parts of the sheet are folded up about the respective fold lines 2, 3, 4 and 5, the areas 6 and 8 being, as can be seen in Figure 2, first folded inwards, followed by the areas 7 an 9. The side lips 10, 11 and the side tongues 17, 18 are then folded inwards. The side areas 26 and 27 are then folded inwards and, in the embodiment illustrated, are then on the one hand fastened to the side lips 10, 1 by means of staples 34 and at the top to the areas 6, 8 by means of a staple 35. The various areas can of course also be fastened to each other in other ways, for example by means of adhesive. The side lips 10 and 11 may also first by glued to the respective areas 6 and 8, whereupon the respective areas 26 and 27 are glued to the side lips. The operations described so far can be carried out by machine at one operating station, so that a box open at the top is thus produced which can then be filled by machine with the objects which it is to hold, such as screws, nuts and the like. The lips 29, 31 and 33 are thereupon folded over and glued in place so as to close the box at the top. Finally, as can be seen in Figure 3, the

closure lip 22 fastened to the lid 15 is glued onto the lip 31. The box according to the invention can thus be made, filled and closed entirely by machine, starting with a single sheet. Since the sheet is symmetrical in relation to its centre line 36, it has a simple and easily handled shape.

The closure lip 22 is provided with a tear-off strip 23, which is represented by broken lines and which divides the lip 22 into two parts, namely the parts 22′ and 22″. The outer part 22″ is fastened by means of adhesive to the lip 31, so that after the tear-off strip 23 has been torn off the lid 15 can be turned outwards in the forward direction, the fold line 14 acting as a hinge for the lid. The side tongues 17, 18 of the lid are then guided respectively between the areas 26, 6 and 8, 27. The side tongues 17, 18 are each provided with a projection, which in the fully opened position of the lid comes to lie against the staple 35 joining together the areas 6, 26 and 8, 27 respectively. In this way the opening movement of the lid is limited in a simple, expedient manner.

The box according to the invention is extremely strong and the lid is easy to move without bringing the side tongues 17, 18 into contact with the objects contained in the box. Furthermore, the box is completely smooth on the inside, that is to say there are no projecting flaps or overlapping seams.

In the embodiment shown in Figure 4 the sheet also consists of three rectangular areas 41, 42 and 43, which are situated next to one another on one line and form an elongate strip, having a centre line 44. Said three areas are separated from each other by fold lines 45 and 46 and are forming a base area 42 and two oppositely situated side walls of the box. In this embodiment the base area 42 also comprises the lid 42′, which is separated from the remaining portion of the base area by the fold line 44″. The lid 42′ has been provided with a window-like opening 47 closed by transparent material.

Each of said three areas 41, 42 and 43 is joined via a fold line at its two oppositely situated side edges respectively 48, 49; 52, 53 and 58, 59 to a side area respectively 50, 51; 54, 55 and 60, 61. Three of said side areas lying next to one another 51, 55, 61 and 50, 54, 60 each form a three-layered side wall of the box.

The side areas 54 and 55 are each provided with a cut 56 and 57 respectively separating a portion 55′ and 56′. Said portions forming the side tongues of the lid 42′.

Both ends of the strip formed by the three areas 41, 42 and 43 are joined via a fold line respectively 62, 63 to a closure lip resp. 64, 65. The side areas 50 and 51 which each forms an outside wall of the three layered side walls of the box, are joined via a fold line resp. 66, 67 to a closure lip resp. 68, 69. The fold lines 66 and 67 are aligned with the fold line 62 and lie at right angles with the centre line 44.

As can be seen in Figure 5 the area 43 an elongated neck portion adjoining the fold line 46. Said neck portion has been folded back over itself and forms a tear-off strip 70.

The sheet described above can also be erected in a single operation step by first folding the sheet about the fold line 46 and next about the fold lines 58 and 59. Thereupon the side areas 54 and 55 are erected by folding the sheet about the respective fold lines 52 and 53. Then the sheet is folded about the fold line 45 and next about the fold lines 48 and 49. The three layers of the two opposite side walls of the box are connected by suitable means such as staples which can be done in the same operation step. In this way a box is produced open at the top which can be filled with elongate articles such as nails having a length of approximately the length of the box. After filling the box is closed by means of the closure lips 64, 64, 68, 69 which can be glued together in a conventional way.

It will be clear that the invention is not restricted to the embodiment described and illustrated herein, but that numerous modifications are possible within the scope of the invention.

Claims

1. Sheet for making a closed rectangular box, of which one of the side walls comprises a lid (15, 42′) which is adapted to be folded in and opened out and which by means of side tongues (17, 18; 54′, 55′) fastened on each side of it is guided in two oppositely disposed double-walled side walls of the box, which are thus composed of three layers, characterized in that the sheet consists of three rectangular areas (9, 1, 7+15; 41, 42, 43) which are separated from each other by fold lines (3, 5; 45, 46) and which are situated next to one another on one line and form an elongate strip, said three areas forming a base area (1; 42) and two oppositely situated side walls of the box, while one of these three areas comprises the lid (15; 42′) and each of these three areas is joined via a fold line, at its two oppositely situated side edges, to a side area (26, 27, 6, 8, 10+17, 11+18; 50, 51, 54, 55, 60, 61), and three side areas lying next to one another always form a three-layered side wall of the box, the side wall of the box lying opposite the base area being formed by a number of closure lips (22, 29, 31, 33; 64, 65, 68, 69), while the side areas (26, 27; 50, 51) forming the outside walls of the three-layered side wall are each joined via a

fold line (28, 32; 66, 67), which lies at right angles to the longitudinal direction of the strip, to a closure lip (29, 33; 68, 69), and that the oppositely situated outer ends of the strip formed by the three areas are joined via a fold line (21, 30; 62, 63) to a closure lip (22, 31; 64, 65).

2. Sheet according to Claim 1, characterized in that the side areas associated with the area (7+15; 42) which comprises the lid each are divided into a part forming a side tongue (17, 18; 54', 55') and a remaining part.

3. Sheet according to Claim 1 or 2, characterized in that the area (7+15) comprising the lid (15) is one of the outer areas of the three areas lying in one line, the lid adjoining the closure lip (22).

4. Sheet according to Claim 3, characterized in that the closure lip adjoining the lid is provided with a tear-off strip (23).

5. Sheet according to Claim 1 or 2, characterized in that the middle area, forming the base area (42), in the line of three areas comprises the lid (42').

6. Sheet according to Claim 5, characterized in that the area (43) adjoining the lid (42') comprises a portion folded back over itself, which forms a tear-off strip (70).

7. Box produced with the aid of a sheet according to one or more of the preceding Claims 1 to 6.

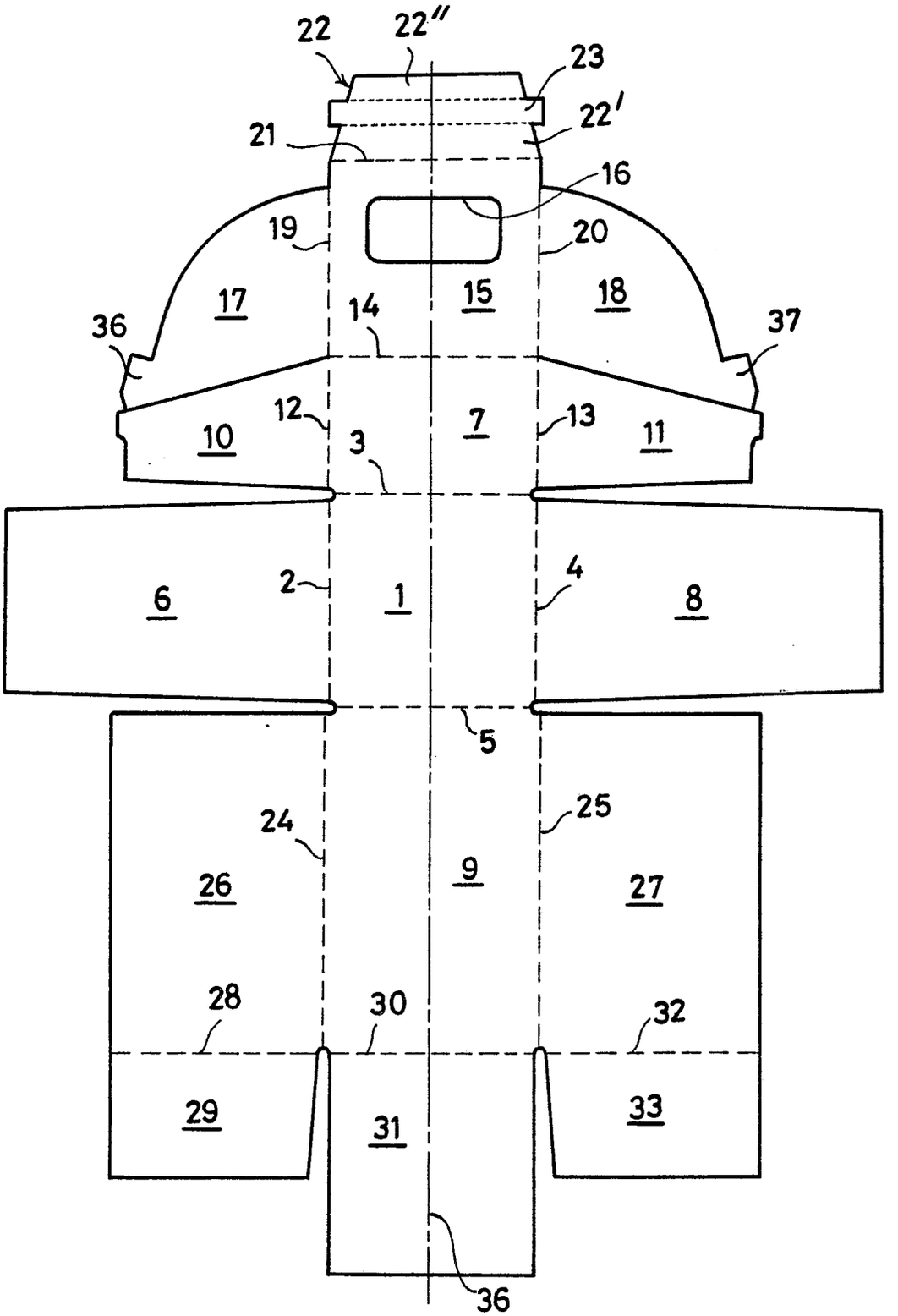
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Fig. 1.

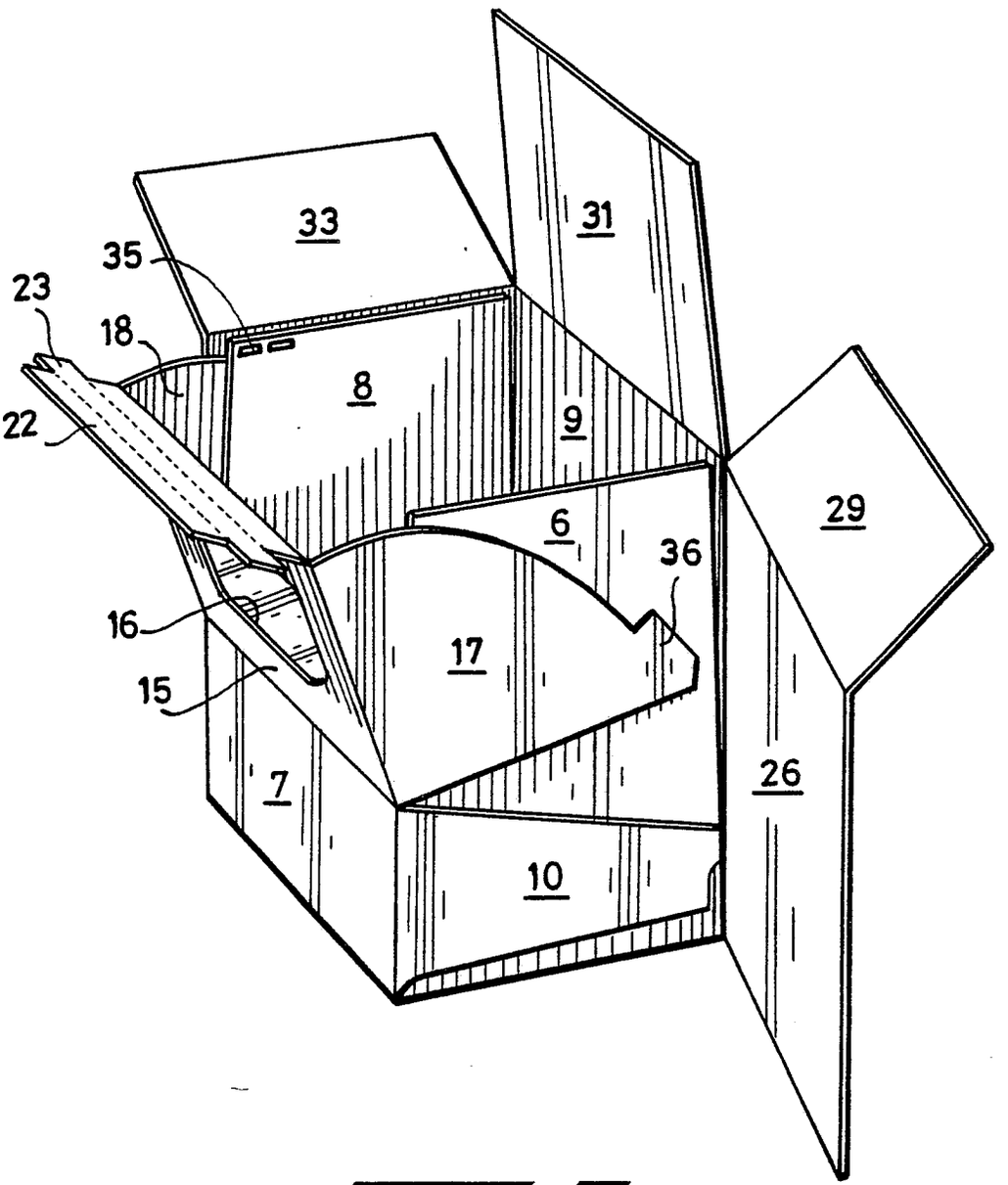

Fig:2.

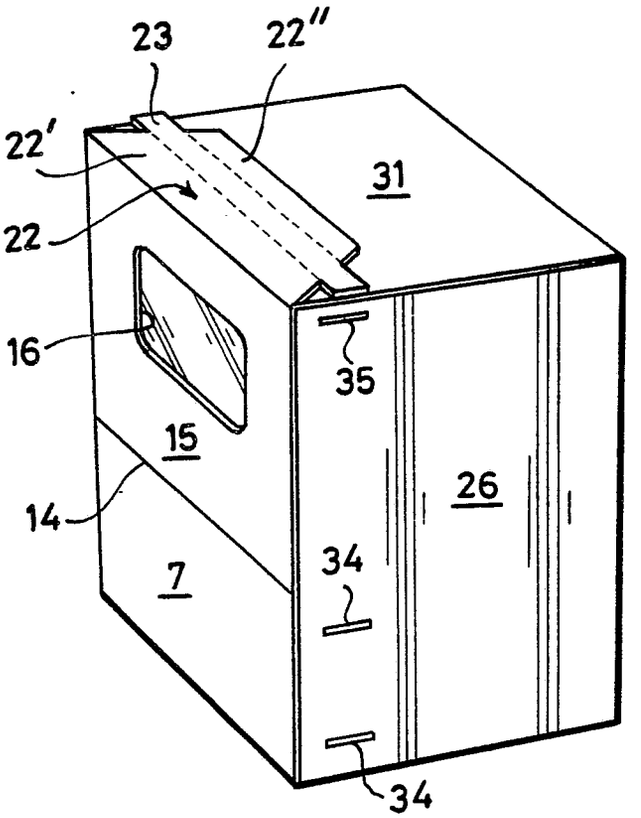

Fig:3.

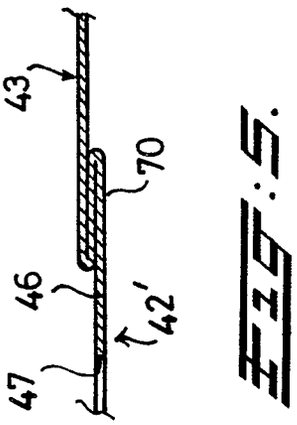
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Fig. 5.

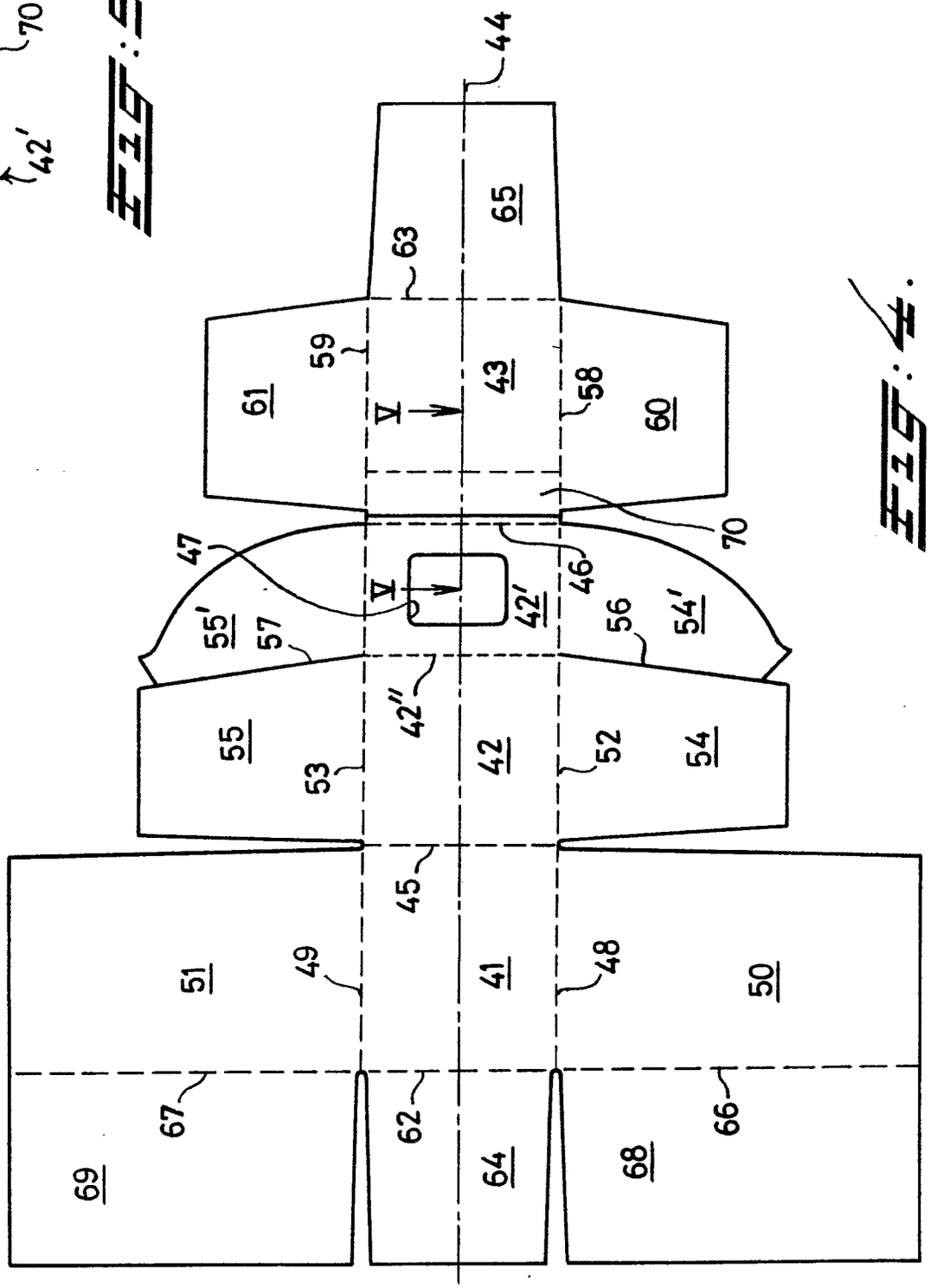
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Fig. 4.

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 87 20 1053

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.4)
A	US-A-3 478 948 (DORNBUSH) * Whole document *	1,7	B 65 D 5/72
D,A	US-A-3 747 833 (ROBINSON)		
A	US-A-2 684 792 (KRAUS)		
A	US-A-3 593 908 (DESMOND)		

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17-09-1987	MARTENS L.G.R.

CATEGORY OF CITED DOCUMENTS

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