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(54) Package of photographic photosensitive material and packaging apparatus.

(57) A package of a photographic photosensitive material comprises articles to be packaged and a box to contain the articles. The box is assembled with a first paper board to cover at least three faces of the articles and a second paper board to cover at least the other three faces of the articles.

FIG. 1

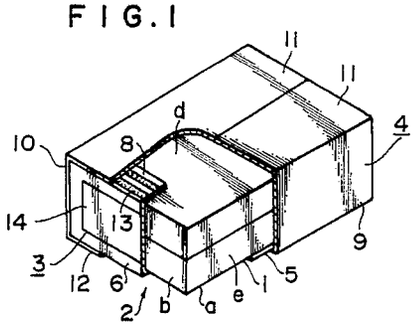
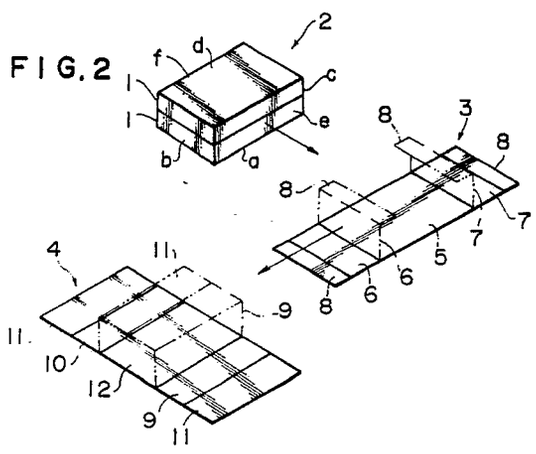


FIG. 2



EP 0 429 064 A1

PACKAGE OF PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL AND PACKAGING APPARATUS

BACKGROUND OF THE INVENTION

This invention relates to a package of a photographic photosensitive material, and a packaging apparatus and method therefore.

A photographic photosensitive material is packed into a light-shielding moistureproof bag to form an inner package of the photographic photosensitive material, and a stack of several inner packages are packed into a corrugated board box to complete a package of the photographic photosensitive material.

In the above package of the photographic photosensitive material, since a stack of the several inner packages was packed in the corrugated board box, it is necessary to produce corrugated board boxes having a variety of sizes according to the photographic photosensitive material to be packaged. Therefore, the packaging apparatus must be arranged so as to fit each corrugated board box having a different size, and the arrangement is very troublesome. In the past, several packaging techniques which can easily change the size of a box were proposed in Japanese Patent KOKAI No. 60-77809, Japanese Patent KOKAI No. 61-164903 and the like.

Besides, printing on a corrugated board box is usually printed on a corrugated board sheet prior to assembling the corrugated board box.

However, in the above-mentioned packaging art to be able to easily change size, a piece of board sheet is cut and bended to be formed in box-shape, so that works for changing size is troublesome and the packaging apparatus is complex, and it is difficult to provide a full automatic apparatus. Moreover, since the box is made of a piece of sheet, a space remains between an article to be packaged and the box opposed by the rectangular faces of the box. As a result the article can not packaged in a state fitted to the box.

Besides, since a printing is provided on the sheet, the sheet can not be used for the articles in various sizes and shapes in common. Therefore, there is no versatility in the sheet.

SUMMARY OF THE INVENTION

An object of the invention is to provide a package of a photographic photosensitive material which is easily changed in size and which can package an article in contact with a corrugated board box.

Another object of the invention is to provide a packaging apparatus which can easily change the size of a package and can package a particle being in contact with a corrugated board box.

Another object of the invention is to provide a packaging process where a corrugated board sheet has versatility.

The invention has been made in order to achieve the above objects the working efficiency in changing a size and the fitness of an article to be packaged with a box are improved by assembling two pieces of sheet into a box.

Thus, the package of a photographic photosensitive material of the present invention, comprises articles to be packaged, a first paper board to cover at least three faces of the articles and a second paper board to cover at least the other three faces of the articles, and the first paper board and the second paper board being joined together.

The packaging apparatus of the present invention comprises a first creasing cutting means to form a first paper board by creasing and cutting a paper board sheet, a first wrapping means to bend the first paper board along the sides of articles to be packaged, a second creasing cutting means to form a second paper board by creasing and cutting a paper board sheet, a second wrapping means to bend the second paper board along the sides of the articles wrapped with the first paper board by the first wrapping means and a joining means of the second paper board to the first paper board.

The packaging process of the present invention comprises a first wrapping process to wrap at least three faces of articles to be packaged with a first paper board, a second wrapping process to wrap at least the other three faces of the articles with a second paper board, a joining process to join the second paper board with the first paper board and a printing process to print at least one face of the first paper board or the second paper board of the package assembled in the above processes.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of an embodiment of the package of a photographic photosensitive material of the invention partially broken away. Figure 2 is a perspective view illustrating a procedure of packaging a photographic photosensitive material. Figure 3 is a skeleton view of an embodiment of the packaging apparatus. Figure 4 is a perspective view of another embodiment of the package of a photographic photosensitive material of the invention partially broken away. Figure 5 is a perspective view illustratig a procedure of pack-

aging a photographic photosensitive material. Figure 6 is a perspective view of another embodiment of the package of a photographic photosensitive material of the invention partially broken away. Figure 7 is a perspective view illustrating a procedure of packaging a photographic photosensitive material. Figure 8 is a perspective view of another embodiment of the package of a photographic photosensitive material of the invention partially broken away.

2 ... Stack
3 ... First paper board sheet
4,41,51 ... Second paper board sheet
15 ... First creasing cutting means
17 ... First wrapping menas
18 ... Adhesive coating means
19 ... Second creasing cutting means
21 ... Second wrapping means
22 ... Printing means
29 ... Hot melt gun
61 ... End

DETAILED DESCRIPTION OF THE INVENTION

The first paper board and the second paper board cover three faces of the articles to be packaged respectively, the articles are package in a box composed of the first paper board and the second paper board. The simplest package is composed of two paper board in "V"-shape. Both ends of the second paper board preferably projects from each end of the first paper board. Because, in the case that the both ends of the second paper board is in accord with the ends of the first paper board, when the second paper board curls to the outside, the article is exposed. However, in the case that both ends of the second paper board project from the ends of the first paper board, even if the second paper board curls to the outside, the article is not exposed.

When the second paper board overlaps with the first paper board, the overlapping part of the paper boards is joined by adhesive. While, when the second paper board does not overlap with the first paper board, the paper boards are joined by adhesive tape.

When the paper boards are simply joined at one or two points, the box composed of the paper boards is collapsed to be easily flat, therefore disposability is very excellent.

The paper board includes corrugated board, carton and the like.

The article to be packaged includes an inner package of a roll of a photographic photosensitive material, sheets of a photographic photosensitive material and the like, and a stack of two or more thereof.

The printing means is not restricted, but a rotary printing machine is prefered.

In the package of a photographic photosensitive material of the invention, the first paper board and the second paper board respectively cover at least three faces of the article to be packaged to protect the article from the outside pressure, and the form in box-shape is kept by joining of the first paper board and the paper board.

In the packaging apparatus of the invention the furst creasing cutting means makes the first paper board of a paper board sheet, and the wrapping means makes the furst paper board to wrap the article. The second creasing cutting means makes the second paper board of a paper board sheet, and the second wrapping means makes the second paper board to wrap the article wrapped with the first paper board. The joining means joins the first paper board to the second paper boards wrapping the article.

In the packaging process of the invention, the printing is conducted after wrapping the article to be packaged with two pieces of paper board and therefore, the paper board sheet is used freely.

In the present invention, an article to be packaged is packaged by two pieces of paper board and therefore, articles having arious sizes and shapes are easily packaged by changing the size and shape of the paper boards. Moreover, since the article is in contact with the paper boards, the protection of the article is increased. Besides, in the present invention, printing is conducted on the face of, at least, one paper board after joining both paper boards together. Therefore, it is not necessary that printing is conducted on the paper board prior to wrapping the article with the paper board, and the same paper board can be used for articles having various sizes and shapes. As a result, the paper board has generality.

EXAMPLES

An embodiment of the invention is shown in Fig. 1 to 3. In Fig. 1, the numeral 1 indicates an inner package, which is a roll of a photographic photosensitive material packed in a light-shielding moistureproof bag. Two of the inner package 1 are stacked to provide a stack 2 being the body to be packaged. The stack 2 is wrapped on approximately three faces with a first paper board 3, and is further wrapped on the remaining three faces over the first paper board by a second paper board 4. That is, the whole bottom face a, the whole left side face b, the whole right side face C and each end portion of the upper face d of the stack 2 are covered with the bottom part 5, the left side part 6, the right side part 7 and flaps 8 respectively. The

whole front side e, the whole back side f and the whole upper side d of the stack 2 and the whole bottom part 5 is covered with the front part 9, the back part 10, the upper part 11 and the bottom part 12 of the second paper board 4, respectively. The upper part 11 of the second paper board 4 is joined to the flaps 8 of the first paper board 3 with an adhesive 13. A print 14 is printed on the left side part 6 of the first paper board 3.

A process for packaging the package of a photographic photosensitive material is shown in Fig. 3. First, two of the inner package 1 are stacked to form the stack 2, and the stack 2 is placed on the bottom part 5 of the first paper board 3 being flat. The left part 6 and the right part 7 are bended toward the left side face b and the right side face c, and then the flaps 8 are bended toward the upper face d.

Subsequently, the stack 2 partly covered with the first paper board 3 is placed on the bottom part 12 of the second paper board 4. After bending the front part 9 and the back part 10 toward the front side e and the back side f, the upper part 11 is bended toward the upper face d and then joined to the flaps 8 with adhesive 13. In this condition, the print 14 is printed on the left side part 6 of the first paper board 3.

A packaging apparatus for the above-mentioned package is shown in Fig. 3. In Fig. 3, the numeral 15 indicates a first creasing cutting means to form the first paper board 3, the numeral 16 indicates a first transporting means to form the stack 2 by stacking the inner package 1 on the first paper board 3, the numeral 17 indicates a first wrapping means to wrap the stack 2 by bending the first paper board 3, the numeral 18 indicates an adhesive coating means to coat the flap 8 with the adhesive 13 prior to bending the flap 8 in the first wrapping means 17, the numeral 19 indicates a second creasing cutting means to form the second paper board 4, the numeral 20 indicates a second transporting means to transport the stack 2 partly covered with the first paper board 3 onto the second paper board 4 formed by the second creasing cutting means 19, the numeral 21 indicates a second wrapping means to wrap the stack 2 and the first paper board 3 by bending the second paper board and then to join the flap 8 to the upper part 11 with the adhesive 13, the numeral 22 indicates a printing means to print the print 14 at the left side part 6 of the first paper board 3 of the package assembled by wrapping with the first paper board 3 and the second paper board 4.

In the above first creasing cutting means, a transporting means (not illustrated) composed of rollers or the like is provided, and a creasing member 23 and a cutter 24 are provided above the transporting means. In the creasing member 23, a shaft 25 is provided at a right angle in the transporting direction and four creasing rollers 26 sre attached in a slidable state to the shaft 25. The cutter 24 can move along the right angle in the transporting direction. The first transporting means 16 is provided at the area where the first paper board 3 formed by the first creasing cutting means 15 is sent out.

The fitst transporting means 16 is composed of a variety of mechanium to individualy transport two of the inner packages 1 fed by a transporting member 27 such as a belt conveyer from an inner packaging machine (not illustrated) onto the bottom part 5 of the first paper board 3. The first wrapping means 17 is palced under the first paper board 3 on which the stack 2 is placed.

The first wrapping means 17 comprises a transporting member 28 such as a roller conveyer and a bending member (not illustrated), which is placed above the transporting member 28, such as a link motion to bend the first paper board 3. A hot melt gun 29 is placed between the bending member to bend the left and right parts 6,7 and the bending member to bend the flap 8.

The above second creasing cutting means 19 comprises transporting members (not illustrated) such as rollers, and a creasing member 30 and a cutter 31 are placed above the transporting members.

The creasing member 30 comprises a shaft 32 placed at a right angle in the transporting direction two cutters 33 slidably attached at both ends of the shaft 32 and four creasing rollers 34 slidably attached to the shaft 32 between the cutters 33. The cutter 31 can move along at a right angle in a transporting direction. The second paper board 4 formed by the second creasing cutting means 19 is fed to the transporting means 28.

The second transporting means 20 comprises a variety of mechanium to transport the stack 2 wrapped with the first paper board 3 onto the second paper board 4 formed by the creasing cutting means 19. The second wrapping means 21 is provided on a side of the transporting direction from the second transporting means 20 located on the transporting means 28, and comprises a bending members (not illustrated) suoh as a link notion to bend the second paper board 4. The printing means 22 comprises a roller printing machine, and is placed on a side of the left part 6 of the first paper board 1 and on a side of the transporting direction from the second wrapping means 21.

A process for packaging inner packages by the above-mentioned packaging apparatus is explained below.

First, a paper board sheet 36 of a difinite size is fed to the first creasing cutting means 15 by a stacker (not illustrated) and a paper board sheet 37

of a difinite size is fed to the second creasing cutting means 19 by a stacker (not illustrated).

Creases 38 are formed in a transporting direction on the paper board sheet 36 by the creasing rollers 26 of the creasing members 23 during the transport of the paper board sheet 36 and creases 39 are formed in a transporting direction on the paper board sheet 37 by the creasing rollers 34 of the creasing members 34 during transport of the paper board sheet 37. Then the paper board sheet 36 is cut by the cutter 24 to form the first paper board 1 having a difinite size and the paper board sheet 37 is cut by the cutter 31 to form the second paper board 4.

Subsequently, the inner packge 1 transported by the transporting means 27 is placed on the bottom part 5 of the first paper board 3 by the first transpoting means 16 one by one to form a stack 2 of two inner packages 1. The first paper board 3 on which the stack 2 is placed is fed to the first wrapping means 17, and the left side part 6 and the right side part 7 of the first paer board 3 are bent upward at 90 degrees. Two horizontal adhesive lines 13 are coated on the flaps 8 being in a vertical direction by the hot melt gun 29, and then, the flaps 8 are bent horizontally at 90 degrees by the first wrapping means 17 again.

The stack 2 wrapped with the first paper board 3 is transported onto the bottom part 12 of the second paer board 4 fed from the second creasing cutting means 19 by the second transporting means 20. The front part 9, the back part 10 and then the upper parts 11 of the second paper board 4 are bent in sequence, and the upper part 11 is joined to the flaps 8 by the adhesive lines 13, and then the necessary print 14 is printed on the left side part 6 of the first paper board 3 by the printing means to complete the packge of a photographic photosensitive material.

Another package of a photographic photosensitive material shown in Figure 4 is composed of a stack 2 and a first paper board 3 wrapping it similar to the package of a photographic photosensitive material shown in Figure 1. The stack 2 covered with the first paper board 3 is covered with a second paper board 41, and the upper part 42, the front part 43 and the back part 44 of the second paper board 41 are in contact with the upper face d, the front side e and the back side f of the stack 2, respectively. The front part 43 and the back part 44 are joined to the bottom part 5 by an adhesive tape 45, and the upper part 43 is joined to the flaps 8 by the adhesive lines 13. A print 46 is printed on the front part 43 of the second paper board 41.

The above packge of a photographic photosensitive material is produced in a packaging process shown in Figure 5. First, the stack 2 is wrapped with the first paper board 3 similar to the package of a photographic photosensitive material shown in Fig. 1. Subsequently, the second paper board 41 is placed on the stack 2 wrapped with the first paper board 3 and the upper part 42 is joined to the flaps 8 by the adhesive lines 13. The front part 43 and the back part 44 are bent downward to be in contact withe the front side e and the bottom part 5 of the stack 2, and then the front part 43 and the back part 44 are joined to the bottom part 5 of the first paper board 3 by the adhesive tape 45. Finally, the print 46 is printed on the front part 43 of the second paper board.

Another package of a photographic photosensitive to material shown in Figure 6 is composed of a stack 2 and a first paper board 3 wrapping it similar to the package of a photographic photosensitive material shown in Figure 1. The stack 2 covered with the first paper board 3 is covered with a second paper board 51, and the upper part 52, the front part 53, the back part 54 and the bottom part 55 of the second paper board 51 are in contact with the upper face d, the front side e and the back side f of the stack 2, and the bottom part 5 of the first paper board 3 respectively. The front parts 53 are joined together by an adhesive tape 56 and the upper part 52 is joined to the flaps 8 by the adhesive lines 13. A print 57 is printed on the left side part 6 of the first paper board 3.

The above package of a photographic photosensitive material is produced in a packaging proces shown in Figure 7. First, the stack 2 is wrapped with the first paper board 3 similar to the package of a photographic photosensitive maaterial shown in Fig. 1. Subsequently, the stack 2 wrapped with the first paper board 3 is placed on the bottom part 55 of the second paper board 51, and the front part 53 and the back part 54 are bent, and then the upper part 52 is bent to be joined to the flaps 8 by the adhesive lines 13. The other front part 53 is bent and then both front parts 53 is joined together by the adhesive tape 56. Finally, the print 57 is printed on the left side part 6 of the first paper board 3.

Another package of a photographic photosensitive material shown in Figure 8 is composed of a stack 2, a first paper board 3 and a second paper board 4 wrapping the stack 2 similar to the package of a photographic photosensitive material. However, both side ends 61 of the first paper board 3 hang over the left side part 6 and the right side part 7.

Claims

1. A package of a photographic photosensitive material which comprises articles to be packaged, a first paper board to cover at least three faces of the

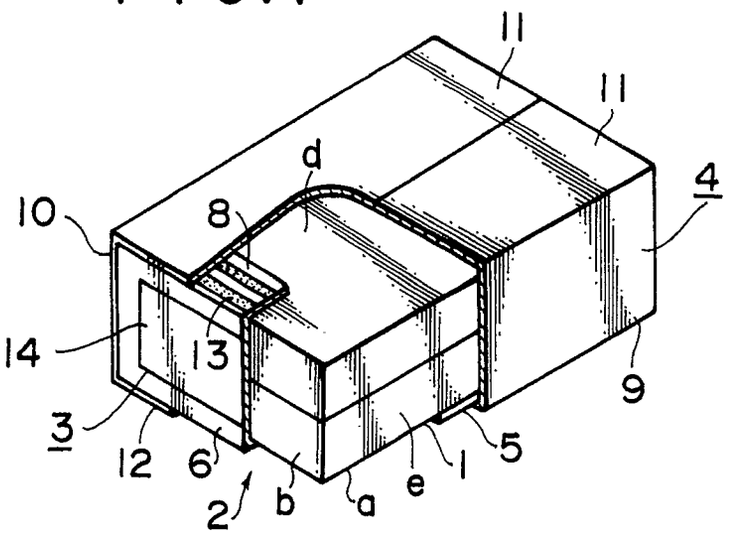
articles and a second paper board to cover at least the other three faces of the articles, and the first paper board and the second paper board being joined together.

2. The package of a photographic photosensitive material of claim 1 wherein both ends of the second paper board hangs over each end of the first paper board.

3. A packaging apparatus which comprises a first creasing cutting means to form a first paper board by creasing and cutting a paper board sheet, a first wrapping means to bend the first paper board along the sides of articles to be packaged, a second creasing cutting means to form a second paper board by creasing and cutting a paper board sheet, a second wrapping means to bend the second paper board along the sides of the articles wrapped with the first paper board by the first wrapping means and a joining means of the second paper board to the first paper board.

4. A packaging method which comprises a first wrapping process to wrap at least three faces of articles to be packaged with a first paper board, a second wrapping process to wrap at least the other three faces of the articles with a second paper board, a joining process to join the second paper board to the first paper board and a printing process to print at least one face of the first paper board or the second paper board of the package assembled in the above processes.

FIG. 1


11
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14
13
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12
6
5
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e
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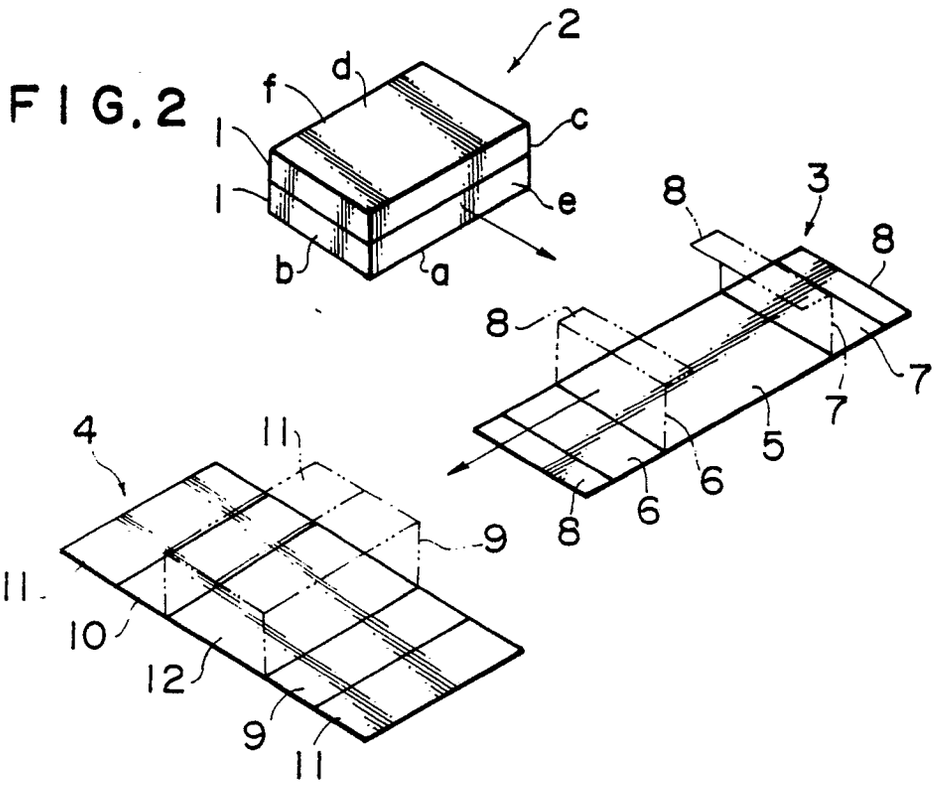
b
a

FIG. 2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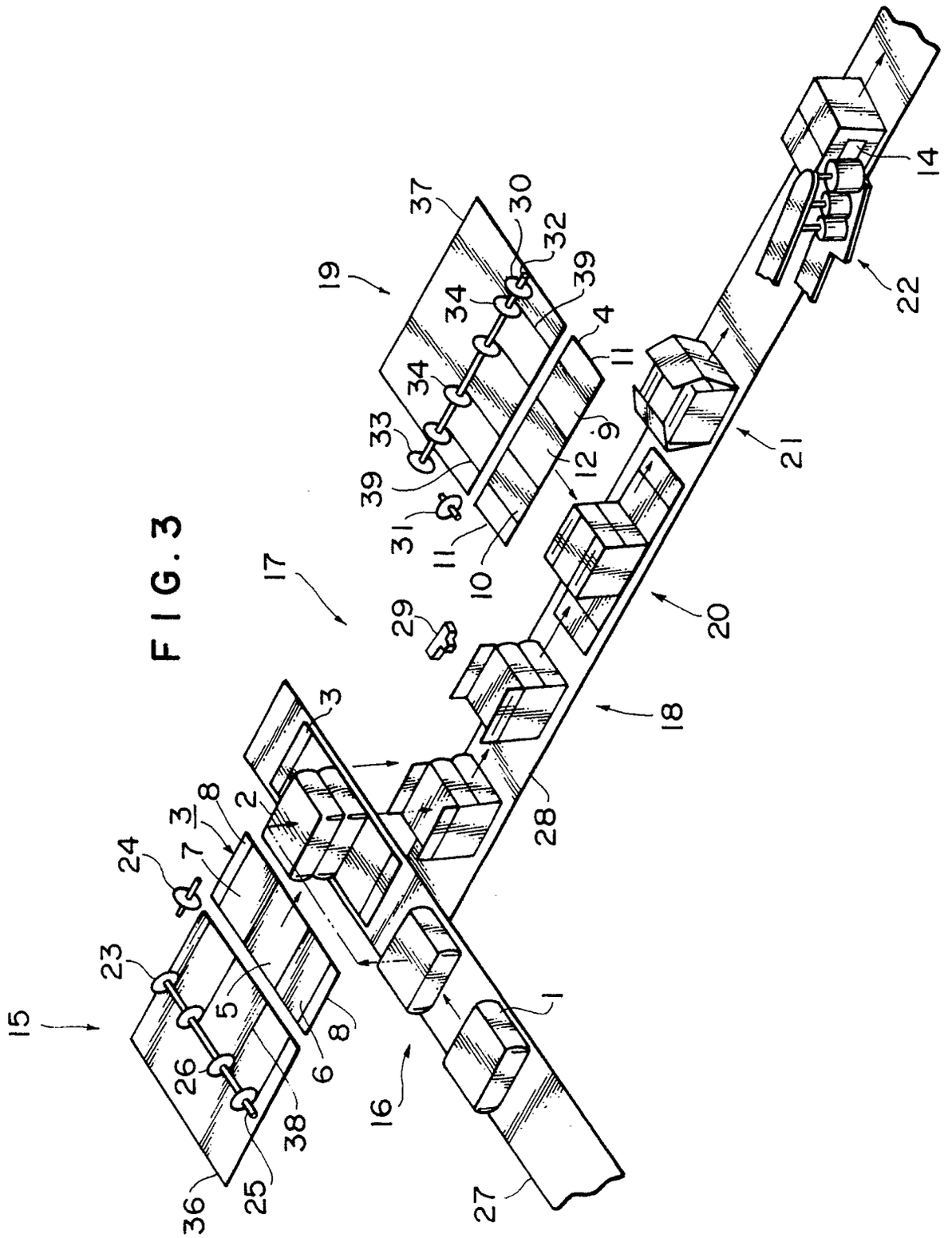
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FIG. 3

FIG.4

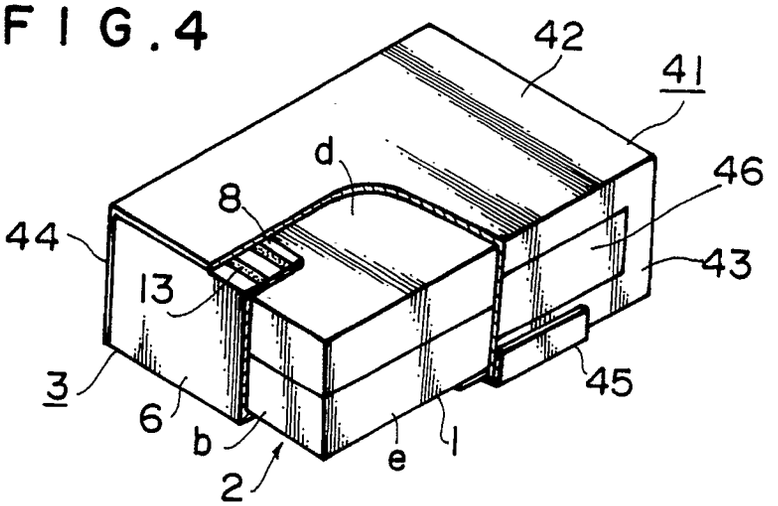

FIG.5

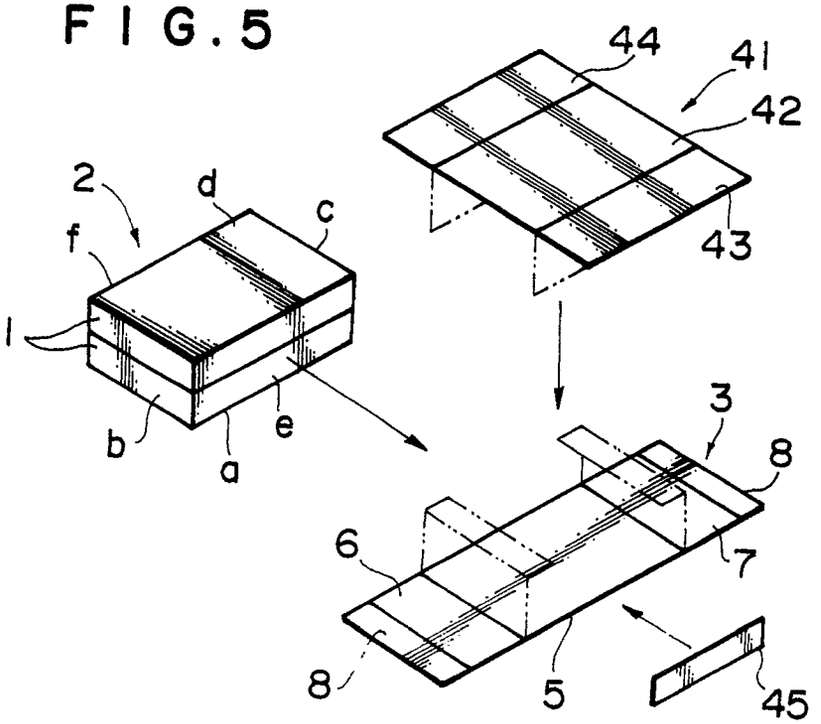

FIG.6

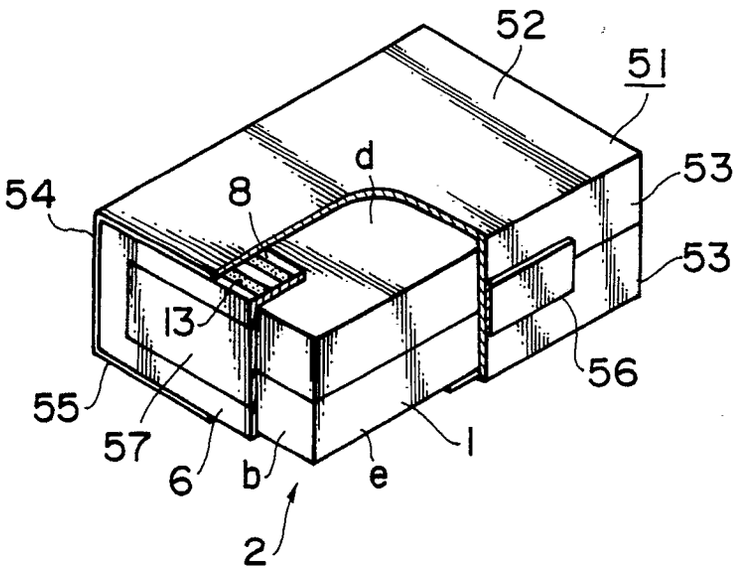
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FIG.7

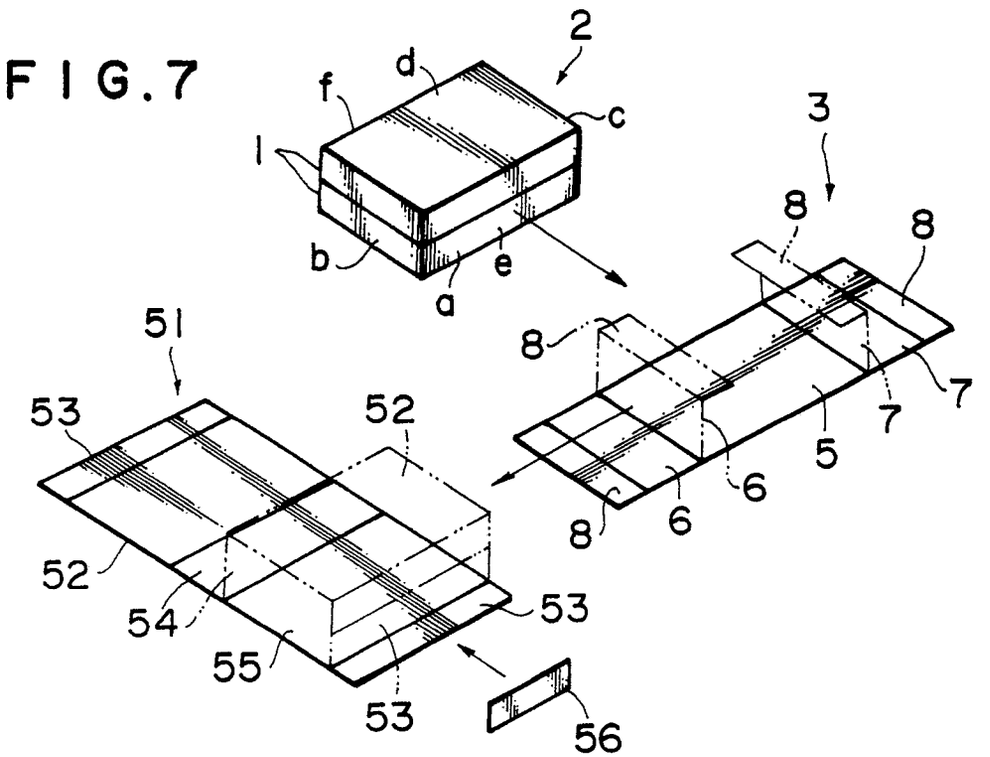
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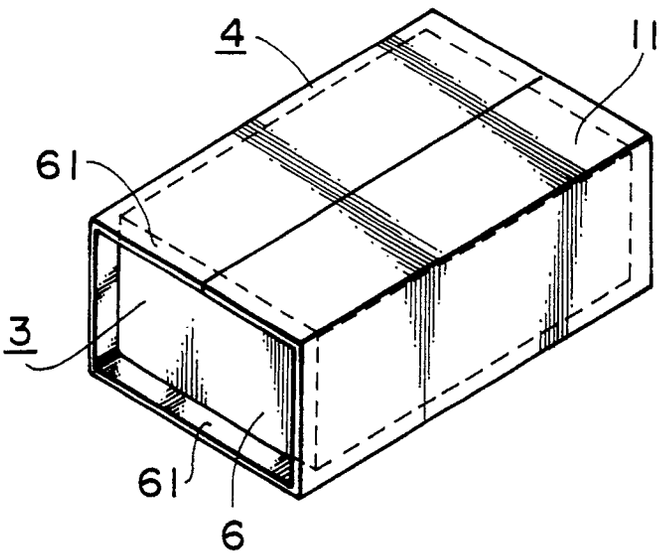
FIG. 8



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EUROPEAN SEARCH REPORT

Application Number

EP 90 12 2187

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,Y	FR-A-2 150 350 (TETRA PAK DEVELOPPEMENT) * claims 1-12; figures 1, 2 *	1-4	G 03 C 3/00 B 65 B 5/02
X,Y	US-A-3 817 018 (VICKERS) * claims 1-34; figures 1-11 *	1-4	B 65 D 5/32
X,Y	US-A-3 654 745 (SMITH ET AL.) * abstract; claims 1-21; figure 1 *	3,4	
Y	GB-A-4 922 10 (EBURITE CORRUGATED CONTAINERS) * claims 1-3; figures 1-5 *	1,2	
Y	GB-A-3 796 65 (I.G.FARBENINDUSTRIE) * the whole document *	1,2	
Y	US-A-4 809 482 (HORTON ET AL.) * claim 14 *	3,4	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

G 03 C
B 65 B
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	21 December 90	MAGRIZOS S.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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