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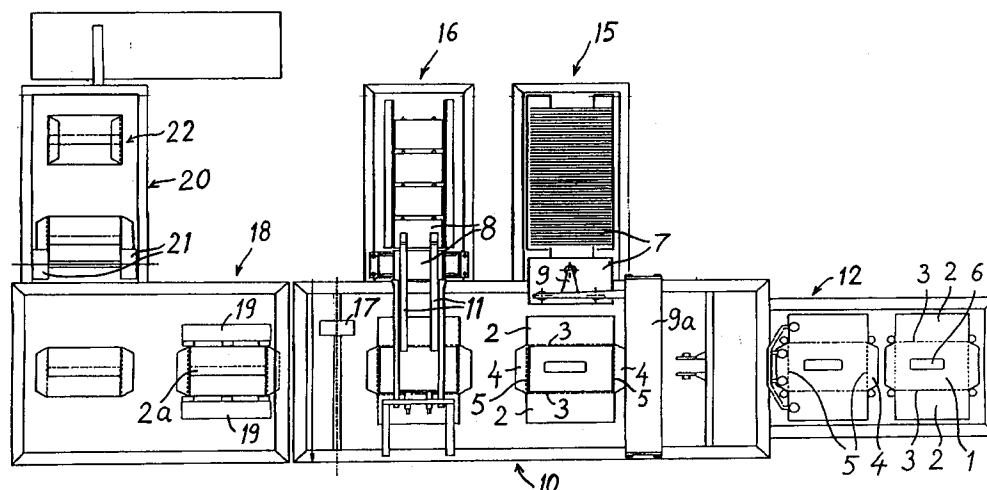
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D-80336 München (DE)(54) **Mailing package and packaging method.**

(57) A package blank and a packaging method for wrapping flat articles, such as diskettes, cassettes and books. A flat sheet of paperboard or cardboard is provided with a rectangular mid-section (1) defined by four bending lines (3, 5), one along each side of the rectangle. The sections beyond the sheet bending lines (3, 5) provide two side flaps (2) and two end flaps (4). The side flaps (2) defined by the longer bending lines (3) have a total width which exceeds the width of the rectangular mid-section (1). An article to be wrapped is placed on top of the

rectangular mid-section (1) of a flat sheet and the side flaps (2) are folded along the bending lines (3), on top of the article to be wrapped. The side flaps (2) include overlapping sub-areas (2a) which are sized into contact with each other, whereby the side flaps (2) are subjected to a flexural stress between the bending line (3) and the overlapping sub-areas (2a). Finally, the end flaps (4) are folded along the bending lines (5), and the folded end flaps (4) are sized against the outer surfaces of the side flaps (2).

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The present invention relates to a package for mailing flat articles, such as diskettes, cassettes and thin books, said package being made of a package blank comprising a flat sheet of cardboard or paperboard including a rectangular mid-section defined by four bending lines, one along each side of the rectangle, and the sections of said sheet beyond the bending lines providing two side flaps and two end flaps, the side flaps having overlapping sub-areas adjacent their longer edges and end sections adjacent their shorter edges, the finished package having a border edge defined by said bending lines.

The invention relates also to a packaging method employing a package blank as described above.

On the one hand, there are prior known package blanks forming a box-like package and made of paperboard or cardboard (including corrugated cardboard) and, on the other hand, blanks made of paper and capable of being sealed the same way as an envelope. Paperboard and cardboard have also been used for making bag-like prefabricated packages provided with a single mouth opening sealable with a flap. The automatic packaging or wrapping of diskettes, cassettes and thin books with an address label included is nevertheless problematic when using such prefabricated packages and, in addition, it requires relatively expensive automatic machines for fabricating the package itself. This is true with all prefabricated mailing envelopes, such as shown in patent publications US-4,555,026, US-3,522,907 and GB-2,208,075.

On the other hand, a problem with box-shaped packages is that the movement of an article to be wrapped in the package must be prevented by means of various fillings or paddings. Furthermore, and as a result of the large number of flanks between the folding lines, the fabrication, handling and automatic wrapping of a package blank will be inconvenient procedures.

An object of the invention is to provide a mailing package and a packing method which employ a package blank which is as simple and economical as possible and facilitates the automatic wrapping in a highly protective package, wherein the free movement of an article is prevented without internal paddings.

This object is achieved by means of a package blank and a packaging method as set forth in the appended claims.

The invention will now be described in more detail with reference made to the accompanying drawing which is a plan view and shows schematically a packaging line and a package blank during various operations included in the packaging method.

The package blank is intended for packaging or wrapping flat articles, such as diskettes, cas-

settes or thin books. The package blank is a flat sheet of paperboard or cardboard, including a rectangular mid-section 1 defined by four bending lines 3, 5, one along each side of the rectangle. The sheet sections beyond the bending lines 3 provide two side flaps 2 and the sections beyond the bending lines 5 provide two end flaps 4. The mid-section 1 is provided with an address window 6.

Each flap 2, 4 provides a continuous, rigid surface area without any bending or folding cuts. Thus, the result is not a box-shaped package but the edge portions of a finished package will have a V-shaped cross-section and, thus, the article is not able to move towards the narrowing edge. This result can be achieved also by double bending lines 3 and 5 with the provision that the distance between bending lines in each pair of parallel lines is smaller than the thickness of a flat article to be packed. The side flaps 2 defined by the longer bending lines 3 have a total width which exceeds the width of said rectangular mid-section 1. The end flaps 4 may be short as such flaps are only needed for closing the flattened ends of a package. The end flaps 4 have a parallelogram shape and the longer of the parallel sides of the parallelogram adjoins the bending line 5 which separates the end flap 4 from the rectangular mid-section 1. Thus, the corners of a package will be neat.

A station 12 contains two piles of stacked blanks. Vertical pins 13 hold the blanks in piles. A suction pad conveyor 14 carries one blank at a time to a loading station 10, including two loading sections 15 and 16. The first section 15 contains addressed invoice or other such forms 7 which are transferred by means of a suction pad advancer 9, 9a on top of the mid-section 1 of a blank. The blank is advanced further in the form of a flat sheet into alignment with the second loading section 16, containing a diskette, a cassette or a book 8 which is carried by means of a transfer gear 11 on top of the mid-section 1 to a position determined by a stop abutment 11a.

In the loading station 10 as well as in folding stations 18 and 20 for the side flaps 2, 4, the advancing of a blank can be effected on top of a conveyor belt or a roller table. When a blank is carried from the loading station 10 to a folding station for the side flaps 2, a sizing nozzle 17 is used for spraying adhesive adjacent to the free edge of one of the flaps 2. The station 18 includes folding elements 19 for folding the side flaps 2, each along said one bending line 3, on top of an article to be wrapped and overlapping sub-areas 2a included in the side flaps adjacent their edges are pressed into contact with each other, whereby the side flaps 2 are subjected to a flexural stress between the bending line 3 and the sized overlap-

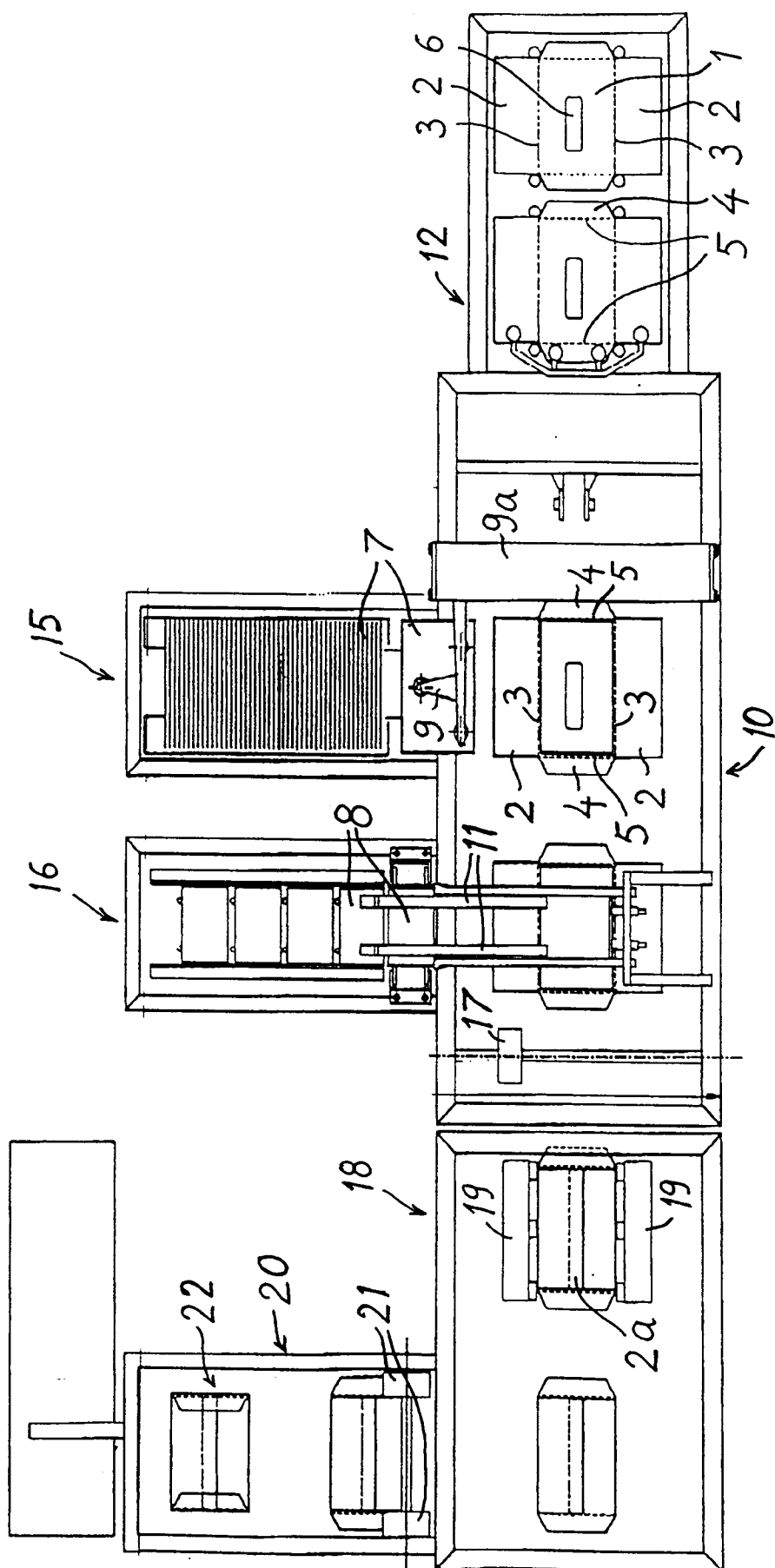
ping sub-areas 2a.

This is followed by deflecting the package advancing direction and the package is carried to the folding station 20 for the end flaps underneath sizing nozzles 21 spraying adhesive to the end flaps 2. Thereafter, the end flaps 4 are folded, each along said one bending line 5, and the folded end flaps 4 are glued against the outer surfaces of the side flaps 2.

In this method, the area defined by the outlines of an article 8 to be wrapped must be substantially smaller than the rectangular mid-section 1 defined by said bending lines 3, 5 in order to provide the edges of a package with triangular pockets which protect the edges and corners of a package. On the other hand, the triangular shape of the edges prevent the article from moving in the package. The package blank must be made of relatively stiff paperboard, cardboard or corrugated cardboard. It may be cut to a desired shape either by punching from a stack of rectangular sheets or by cutting from a continuous web. The latter approach facilitates the formation of bending lines on the same run but is nevertheless slower than punching in a stack.

Claims

1. A package for mailing flat articles, such as diskettes, cassettes and thin books, said package being made of package blank comprising a flat sheet of cardboard or paperboard including a rectangular mid-section (1) defined by four bending lines (3, 5), one along each side of the rectangle, and the sections of said sheet beyond the bending lines (3, 5) providing two side flaps (2) and two end flaps (4), the side flaps having overlapping sub-areas adjacent their longer edges and end sections adjacent their shorter edges, the finished package having a border edge defined by said bending lines (3, 5), **characterized** in that each end flap (4) is attached on outer surfaces of the end sections of each side flap (2) across the width of said rectangular mid-section, the overlapping sub-areas of the side flaps being attached on each other across the length of said rectangular mid-section (1), the thickness of the package increasing from the border edge towards an outline of the packed article.
2. A package blank as set forth in claim 1, **characterized** in that the end flaps (4) have a parallelogram shape and the longer of the parallel sides of the parallelogram adjoins the bending line (5) which separates the end flap (4) from the rectangular mid-section (1).
3. A package blank as set forth in claim 1 or 2, **characterized** in that the rectangular mid-section (1) is provided with an address window (6).
4. A package blank as set forth in claim 1, **characterized** in that the bending lines (3, 5) are each a double line with distance between the parallel lines of the double line being smaller than the thickness of the flat article to be packed.
5. A method for wrapping flat articles, such as diskettes, cassettes or thin books in a mailing package, said method employing a package blank which is a flat sheet of cardboard or paperboard including a rectangular mid-section (1) defined by at least four bending lines (3, 5), at least one along each side of the rectangle, and the sections of said sheet beyond the bending lines (3, 5) providing two side flaps (2) and two end flaps (4), **characterized** in that an article to be wrapped is placed on top of the rectangular mid-section (1) of the flat sheet, the side flaps (2) are folded, each along said at least one bending line (3), on top of an article to be wrapped and overlapping sub-areas (2a) included in the side flaps are attached with glue into contact with each other, whereby the side flaps (2) are subjected to a flexural stress between the bending line (3) and the overlapping sub-areas (2a), followed by folding the end flaps (4), each along said at least one bending line (5), and the folded end flaps (4) are glued against the outer surfaces of the side flaps (2).
6. A method as set forth in claim 5, employing a package blank which is provided with an address window (6), **characterized** in that on top of the rectangular mid-section (1) is first placed an addressed invoice or a like form (7) and on top of that is placed an article (8) to be wrapped, the area defined by the outlines of such article being substantially smaller than the rectangular mid-section defined by said bending lines (3, 5).
7. A method as set forth in claim 5, **characterized** in that the package advancing direction is deflected by 90° after the bending of the side flaps (2) but before the bending of the end flaps (4).





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EUROPEAN SEARCH REPORT

Application Number
EP 94 11 8474

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.6)
A	GB-A-2 239 446 (DEAN) * page 3, line 16 - line 26; figures 1,2 * ---	1,5	B65D75/14 B65B11/22
A	US-A-3 648 923 (YOUNG) * column 1, line 47 - column 2, line 51; figures 1-4 * ---	1,2,4,5	
A	FR-A-2 632 926 (CHANDELLIER) * page 2, line 29 - page 3, line 32; figures 1-3 * ---	1,4,5	
A	GB-A-2 229 710 (BLACKWOOD) * page 5, line 4 - page 12, line 32; figures 1-6 * ---	1,4,5	
A	US-A-1 865 037 (NOVICK) * page 1, line 44 - page 2, line 65; figures 1-11 * ---	1-3,5-7	
A	EP-A-0 367 674 (CHEVALIER) * claims 1-6; figures 1-16 * -----	1,2,4,5, 7	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65D B65B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 March 1995	Examiner Vantomme, M
CATEGORY OF CITED DOCUMENTS 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 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			