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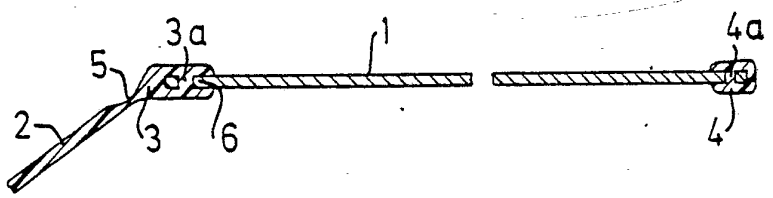
(54) Title: PLASTIC BINDER WITH BINDER BOARDS OF PAPERBOARD AND METHOD OF MANUFACTURING THE SAME



(57) Abstract

A binder of plastic with boards of paperboard, the fastening edges of which, to the back, are grasped essentially in a U-shape, in section, by the plastic fastening edges (3) of the back (2) and are securely anchored to the same by the binder board (1) fastening edges (6) having through-holes, in which the plastic forms pillar-shaped bridges (3a) joining the legs of the U. Preferably, the binder boards have along their free edges continuous edge protectors (4), essentially U-shaped in section and injection molded against said edges at the same time as the fastening edge, which are anchored to the binder boards by their free edges also having through-holes, in which the plastic forms pillar-shaped bridges (4a) joining the legs of the U. Likewise, a method of man-ufacturing such a binder, in which the two binder boards of paperboard are provided, at least along the edges which are to be fastened to the back, with a plurality of holes, and the binder boards are inserted into an injection molding machine against a molding tool, which, together with the fastening edges of the binder boards, forms the molding cavity for the binder back, fastening edges and possibly edge protectors as well. Thermoplastic material is then injected into the mold cavity, which is thereby filled up so that after hardening of the plastic it forms the binder's back, the fastening edges (3) grasping around the binder board fastening edges (6), and preferably also the edge protectors for the binder boards.

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Plastic binder with binder boards of paperboard and method of manufacturing the same

The invention relates to a binder comprising binder boards or sides of paperboard and a back made of thermoplastic material and having fastening edges, made in one piece with said back, for the binder boards. The invention also relates to a method of manufacturing such a binder.

In known binders of the above-mentioned type, which are mostly used for storing various types of information sheets, the binder boards are anchored to the fastening edges of the back by hot riveting in a separate operation, through a number of holes along the fastening edges of the binder boards. The binder boards may also have been provided, in a separate operation, with prefabricated edge protectors of metal or plastic, which have been pinched or glued onto the binder board edge. The anchoring rivets have often been a source of irritation due to the fact that the inserted sheets were often marked by the rivets. Furthermore, the anchoring procedure by means of hot riveting is rather time-consuming and involves the handling of a number of parts.

The purpose of the invention was therefore to achieve a binder with an anchoring means which removes the disadvantages in function and in production of known binders.

This is achieved according to the invention by a binder of the type mentioned by way of introduction, which is characterized in that the two binder board fastening edges are grasped essentially in a U-shape, in section, by the fastening edges of the back of thermoplastic material and are securely anchored to the same by the binder board fastening edges having through-holes in which the thermoplastic material forms pillar-shaped bridges joining the legs of the U.

According to a preferred embodiment, the binder boards have along their free edges continuous, thermoplastic edge protectors, essentially U-shaped in section and injection molded against said edges at the same time as the fastening

edge and which are anchored to the binder boards by their free edges also having through-holes in which the thermoplastic material forms pillar-shaped bridges joining the legs of the U.

The invention also relates to a method of manufacturing a binder of the type mentioned in the introduction, which is characterized in that the two binder boards 1 of paperboard are provided, at least along the edges which are to be fastened to the back 2, with a plurality of holes, that the binder boards are inserted into an injection molding machine against a molding tool which, together with the fastening edges of the binder boards, forms the molding cavity for the binder back 2 and fastening edges 3, that thermoplastic material is then injected into the molding cavity which is thereby filled up, including the holes made in the binder boards, so that after hardening of the thermoplastic material it forms the back 2 of the binder and fastening edges 3, which are essentially U-shaped in section, grasping around the binder board fastening edges 6 with pillar-shaped bridges 3a formed through said holes and joining the legs of the U.

According to a preferred embodiment, the binder boards are provided in the same step with an edge protector. This is achieved according to the invention by providing the two binder boards 1 with holes along their free edges as well, that the binder boards are inserted into an injection molding machine against a molding tool which forms, together with the binder board edges, the molding cavity for making the binder back 2, the fastening edges 3 and the binder board edge protectors 4, that thermoplastic material is then injected into the molding chamber which is thereby filled up including the holes made along the edges of the binder boards, so that after hardening of the thermoplastic material it forms the back 2 of the binder, fastening edges 3, essentially U-shaped in section, grasping around the binder board fastening edges 6, and edge protectors 4, essentially U-shaped in section, around the free edges of the binder

boards 1 with pillar-shaped bridges formed through said holes and joining the legs of the U.

A binder made in this manner has functional advantages in that it replaces the rivets used previously with a smooth, attractive fastening edge. As regards production, in a single operation a binder is produced with a back and sides anchored to the same. All that remains is essentially to mount a mechanism for holding sheets. Thus it is only necessary to handle a limited number of parts, thus reducing costs.

The back is made in a conventional manner with three flexible portions, one in the center of the back and the other two adjacent to the fastening edges as shown in the accompanying drawings. The back, as well as the fastening edges and the protectors, are made of thermoplastic material, preferably polypropylene.

The binder boards are preferably of stiff paperboard. At the fastening edge, the binder boards are provided with a number of through-holes through which, in the injection molding step, the thermoplastic material forms the pillar-shaped bridges which join together the two U-legs in the plastic fastening edge. The number of holes and their size can be easily determined by the person skilled in the art. The holes, which the outer edges of the binder boards are provided with for the application of the edge protector, can be of arbitrary shape and size, the only limitation being that the paperboard edge should not be significantly weakened. The distribution of the holes can be quite variable along the edges of the binder board, but there should preferably be holes on either side of the two outer corners of the binder board and at least one additional location along each of the three edges which the protector covers.

An edge protector made in the manner described above is quite securely anchored. The use of thermoplastic material provides increased coloring possibilities and a pleasantness to the touch which is attractive to the customer.

A special injection molding tool is required for

injection molding. This tool, which is preferably made of tempered steel, is to lie, during injection molding, in contact with the paperboard sides a bit in from their edges and form a closed mold cavity with inlets for the liquid thermoplastic material through ingates. When the plastic is injected it fills the entire mold cavity which is to form the back and fastening edges 3. If an edge protector is applied at the same time, the mold cavity for this is also filled at the same time. The bridges or pillars in the holes are injected at the same time in one piece with the U-shaped legs.

After the injection molding step, the thermoplastic material is allowed to harden, to form the back of the binder with the binder boards fastened thereto, possibly provided with an edge protector.

An example of a preferred embodiment of a binder according to the invention is shown in the accompanying drawings.

Fig. 1 shows the opened binder. The back 2 is of conventional type with a flexible joint in the middle and flexible joints 5 next to the smooth fastening edge 3 of the back. In the figure, the binder boards 1 are provided with edge protectors 4 of the same thermoplastic material as the back, in this case polypropylene.

Fig. 2 shows an enlarged view of the binder in Fig. 1, along the line II-II with corresponding numerals as in Fig. 1. 3a indicates one of the holes in the binder board fastening edge 6 which are filled out with plastic bridges. 4a indicates one of the holes along the outer edge of the paperboard which are filled with plastic to form bridges between the two legs of the protector 4.

CLAIMS

1. Binder comprising binder boards or sides of paperboard and a back made of thermoplastic material and having fastening edges, made in one piece with said back, for the binder boards, characterized in that the two binder board (1) fastening edges (6) are grasped essentially in a U-shape, in section, by the fastening edges (3) of the back (2) of thermoplastic material, and are securely anchored to the same by the binder board (1) fastening edges (6) having through-holes in which the thermoplastic material forms pillar-shaped bridges (3a) joining the legs of the U.

2. Binder according to Claim 1, characterized in that the binder boards (1) have along their free edges continuous, thermoplastic edge protectors (4) essentially U-shaped in section and injection molded against said free edges at the same time as the fastening edges (3) and which are anchored to the binder boards (1) by their free edges also having through-holes in which the thermoplastic material forms pillar-shaped bridges (4a) joining the legs of the U.

3. Method of manufacturing a binder according to Claim 1, comprising binder boards of paperboard and a back formed of thermoplastic material with fastening edges, made in one piece therewith, for the binder boards, characterized in that the two binder boards (1) of paperboard are provided, at least along the edges which are to be fastened to the back (2), with a plurality of holes, that the binder boards are inserted into an injection molding machine against a molding tool which, together with the fastening edges of the binder boards, forms the molding cavity for the binder back (2) and fastening edges (3), and that thermoplastic material is then injected into the molding cavity which is thereby filled up, including the holes made in the binder boards, so that after hardening of the thermoplastic material it forms the back (2) of the binder and fastening edges (3),

which are essentially U-shaped in section, grasping around the binder board fastening edges (6) with pillar-shaped bridges (3a) formed through said holes and joining the legs of the U.

4. Method according to Claim 3 for manufacturing a binder with binder boards having edge protectors, characterized in that the two binder boards (1) are provided with holes along their free edges as well, that the binder boards are inserted into an injection molding machine against a molding tool which forms, together with the binder board edges, the molding cavity for making the binder back (2), the fastening edges (3) and the binder board edge protectors (4), that thermoplastic material is then injected into the molding cavity which is thereby filled up including the holes made along the edges of the binder boards, so that after hardening of the thermoplastic material it forms the back (2) of the binder, fastening edges (3), essentially U-shaped in section, grasping around the binder board fastening edges (6), and edge protectors (4), essentially U-shaped in section, around the free edges of the binder boards (1) with pillar-shaped bridges (4a) formed through said holes and joining the legs of the U.

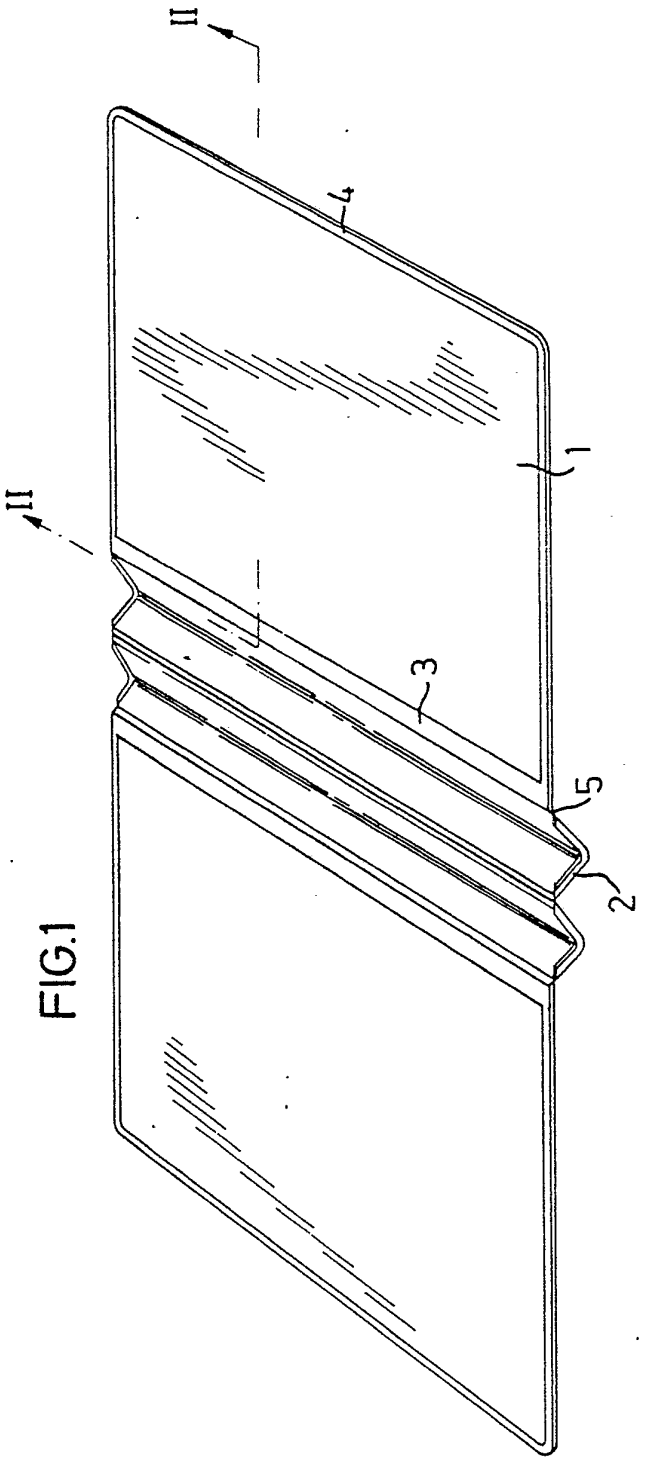

FIG.1

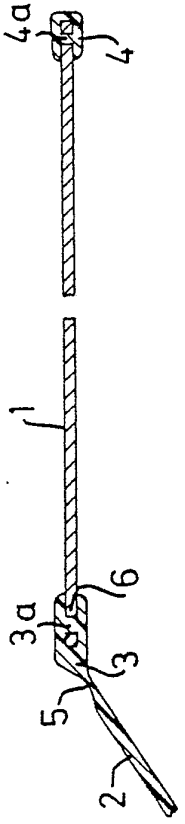

FIG. 2

INTERNATIONAL SEARCH REPORT

International Application No PCT/SE80/00115

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC 3

B 42 C 7/00; B 42 D 1/08; B 42 F 13/00

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC 3	B 42 C 7/00; B 42 D 1/00-1/10, 3/00-3/04; B 42 F 13/00, 13/12, 13/16-13/28, 15/00-15/06
National Cl	11c:3; 11d:3; 11e:1 .../...

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
A	SE, B, 338 974 published 1971, September 27, T Nyblom	1
A	DE, A, 2 644 824 published 1977, September 1, Biella-Neher AG	1
A	FR, A, 2 351 800 published 1977, December 16, Etablissements Chevalerias SA.	1
A	CH, A, 465 555 published 1969, January 15, Karl Bene u. Co	2

* Special categories of cited documents: [15]

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"L" document cited for special reason other than those referred to in the other categories

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"P" document published prior to the international filing date but on or after the priority date claimed

"T" later document published on or after the international filing date or priority date and not in conflict with the application, but cited to understand the principle or theory underlying the invention

"X" document of particular relevance

IV. CERTIFICATION

Date of the Actual Completion of the International Search [3]	Date of Mailing of this International Search Report [3]
1980-07-28	1980-08-12
International Searching Authority [1]	**Signature of Authorized Officer [20]**
Swedish Patent Office	Göthe Nylén

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields searched (cont,)

US Cl
129:17; 281:29, 36

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [10]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers_____, because they relate to subject matter [12] not required to be searched by this Authority, namely:

2. ☐ Claim numbers_____, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out [13], specifically:

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [11]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.