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E. N. FARKAS

2,265,276

BINDER

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Fig. 1.

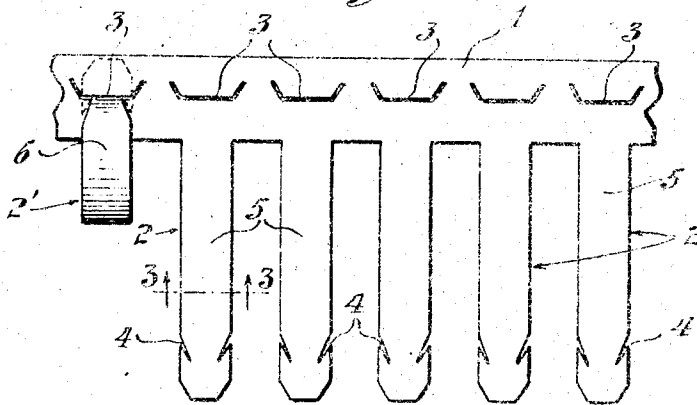


Fig. 2.

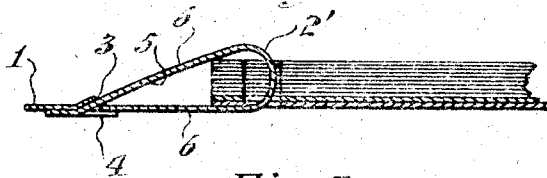


Fig. 3.

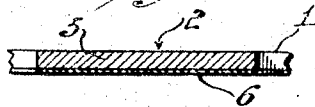
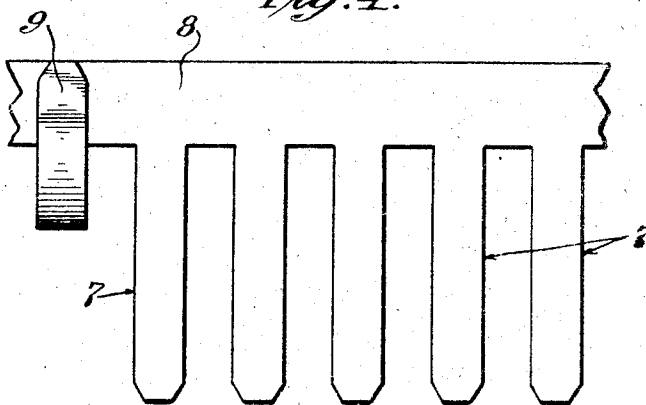


Fig. 4.



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BINDER

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6 Claims. (Cl. 129—1)

This invention relates to new and useful improvements in binders for marginally perforated leaves.

Binders of that type are usually made of metal, plastic, or thermoplastic composition such as Celluloid, cellulose acetate, etc., or paper.

While each of these materials has its advantages, certain drawbacks attendant their use have generally become recognized in the art. Costly machinery is required for forming and inserting metal binders into the leaves. The material is heavy, rigid, has the tendency to tear the apertures in the leaves, and to mar table tops.

Binders formed of plastic materials are somewhat easier on the leaves and on table tops, but they are rather heavy, rigid, and require special expensive machinery for their manufacture and insertion. When, as is usual, the plastic material or the metal is blanked out of a flat sheet, this operation also requires rather elaborate equipment.

Perforated book leaves held together with metal or plastic binders, although eminently satisfactory in many respects, form rather large and relatively bulky packages since metal or plastic rings cannot be compressed or collapsed without destroying their utility. To remedy this it has been suggested in United States Patent No. 2,188,680, Frank F. Farkas, to form a spiral binder of plastic material of such light stock that even when the spiral is folded, compressed, or tightened, it will regain its normal shape in use. However satisfactory such spiral binders may be for many purposes they must be preformed, they do not lend themselves to insertion by means of automatic machinery, they are not as convenient as closed ring type binders, their appearance is not always as attractive as closed ring binders, and it is difficult to anchor them in place.

Binders formed of paper have none of the above enumerated disadvantages. Paper binders are suitable to be shaped into closed rings, can be stamped out of sheets, are inexpensive, light in weight, can be inserted in leaves by means of simple machinery, will conform to the shape of the books, are less likely to tear perforations than plastic binders, and can be readily compressed in shipping. However, paper binders have not the tensile strength of metal or plastic binders and they are not quite resilient enough to spring back into shape after the book has been used for some time. These drawbacks of paper binders can be counteracted by using stiff, strong paper, but these characteristics mitigate in other respects against the use of paper.

In accordance with the present invention, these disadvantages of paper binders are eliminated by producing a binder which is a combination of paper and a plastic substance. The relative proportions in which these two materials are combined are of great importance in making effective in the combination only the desirable features of each material and eliminating their undesired qualities. The plastic material should lend resilience capacity to spring back into form, but without the rigidity of a binding element made entirely from plastic material. Hence, according to the present invention, plastic is used in fractional proportion to the whole. The paper should give soft, pliable and conforming bulk but with greater tensile strength and resistance to moisture and inflammability than such paper alone would have. The paper used constitutes the main portion of the whole.

The combination may be effected by establishing the desired quantitative proportion of the two materials by laminating, i. e., fastening a coating or sheathing of cellulose acetate or other suitable plastic to a sheet of paper, or the plastic material may be applied to the paper by a spraying or dipping process. One or both surfaces of the paper may be coated with the plastic.

The plastic coating or sheathing lends strength to and protects the paper against moisture, whereby almost any kind of paper may be employed in my binders. However, I have found that particularly good results are obtained if the paper is supple and has no assertive grain trend, and I find it advisable with some papers to pass them through crushing rolls to break up any grain trend that may exist.

Plastic material should make up only a fraction of the bulk of the total, and I find the most effective ratio to be about one part by bulk of plastic to ten parts by bulk of paper. However, this ratio may have to be varied depending on the compactness, density, and other characteristics of the paper, and the size and weight of the book to be bound.

A sheet of paper thus combined with a plastic substance can be as readily cut and shaped as paper alone. Forms stamped out of such sheets can be handled and made into closed-ring binders in substantially the same manner as paper. The plastic constituent, and particularly cellulose acetate, will render the paper non-inflammable and moisture resistant. The material will be sufficiently resilient to insure that closed rings formed out of it will retain their shapes even after long usage much better than paper rings.

Closed rings formed of this material may be radially collapsed, and the books folded transversely to the cylindrical axis of the binder rings without permanent injury to the latter. Books bound with such material can, therefore, be mailed as simply and easily as a letter. The exposed surface of the binder will have a glossy, highly polished appearance, which is so greatly appreciated in plastic binders. It will protect even soft and porous paper from drying out or becoming wrinkled or brittle. The plastic constituent will add only very slightly to the weight of the paper, insuring thus low transportation cost, and the plastic constituent will add very little to the cost of paper binders, and will be no more likely to scratch or mar polished surfaces than paper. The saving in material cost is drastic. Considering that in my combination only $\frac{1}{10}$ of the bulk of the binder is made of plastic, and also that paper at about 10 cents per pound costs only $\frac{1}{10}$ of the cost of heavy sheet plastic at about \$1.00 per pound, the saving is as 1 to 100 by the use of my material as contrasted with all plastic binders.

I find that paper thus sheathed is less likely to mutilate leaves at the perforations than rings formed out of either stiff paper alone or sheets of plastic material alone. The reason for this is that my invention permits the use of relatively thick and supple paper and an extremely thin and, therefore, very pliable sheet of plastic material. Thus I avoid the disadvantages resulting from the use of stiff paper or heavy sheets of plastic material.

Two embodiments of the invention are illustrated in the drawing in which Fig. 1 is a plan view of one embodiment, Fig. 2 is a transverse cross section of Fig. 1, and Fig. 3 is a cross section taken along the line 3-3 on Fig. 1. Fig. 4 is a plan view of another embodiment of the invention.

The binder is blanked out of a sheet in the form of a comb, having a back 1, and teeth 2, which may be inserted through marginal perforations of book leaves, and then bent into closed rings 2' with the ends of the teeth projecting through perforations 3 in the back and held against withdrawal by the slotted portions 4.

The comb is formed of a sheet of paper 5, one of the surfaces of which is covered by a sheath 6 of plastic material, such as cellulose acetate, Celluloid, etc. I have found that best results are obtained when thin sheets of cellulose acetate are used. The sheet 6 is extremely thin, constituting only about $\frac{1}{10}$ of the bulk of the combined material. It can be laminated to the paper in liquid form, or the paper dipped therein. I find that good results are obtained if a sheath of plastic substance is applied to one surface of the paper. When the spraying or dipping process is

used then both surfaces of the paper may be coated.

In Fig. 4 I have illustrated a second of many possible modifications of my invention in which the laminated paper comb has teeth or strips 7 which may be formed into substantially complete rings by passing them through the marginal perforations in the book leaves, then bending back the protruding ends, lying them flat against the back 8 and fastening them in place by glue or otherwise as indicated at 9. The structure shown in this figure has the great merit of simplicity and is recommended even for binders made of paper alone.

Obviously, the finished material may be shaped into other than comb type binders which can be formed into closed rings, loops, or the like, through the perforations in the leaves. Similarly, the composition of the paper and of the plastic substance may be varied within wide limits without departing from the spirit of the present invention. The materials must have, of course, the required physical qualities. Without wishing to repeat all these, I mention the use of supple paper and of a plastic substance that can be formed into thin, flexible, and yet, strong sheets adapted for the laminating or other process employed.

What I claim is:

1. A binder for marginally perforated leaves comprising strips adapted to be formed into rings through the perforations and formed of paper at least one of the surfaces of which has coating of plastic material.

2. A binder for marginally perforated leaves comprising strips adapted to be formed into rings through the perforations and formed of paper laminated with a sheet of plastic material.

3. A binder for marginally perforated leaves comprising a comb formed of a sheet of paper having on at least one of its surfaces a coating of plastic material.

4. A binder for marginally perforated leaves comprising strips adapted to be formed into closed rings through the perforations and formed of a sheet of supple paper laminated with a sheet of cellulose acetate of much smaller bulk than the paper.

5. A binder for marginally perforated leaves comprising a comb formed out of a sheet of supple paper laminated with a relatively thin sheet of cellulose acetate.

6. A binder for marginally perforated leaves comprising a comb composed of paper sheathed with a thin plastic film and having teeth projecting through the marginal perforations in the leaves with the protruding ends fastened to the back of the comb.

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