

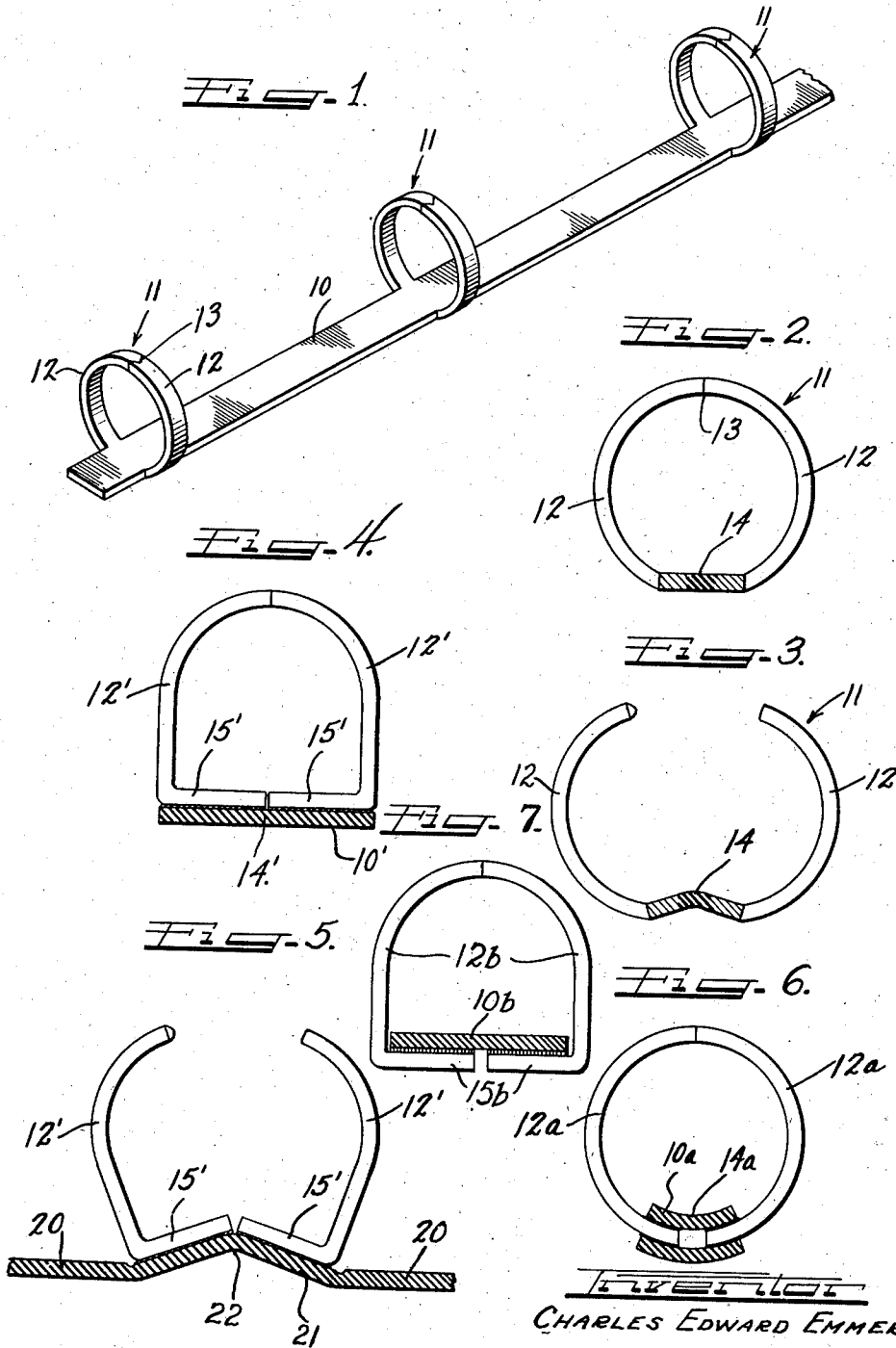
Nov. 28, 1944.

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2,363,848

PLASTIC LOOSE LEAF BINDER

Filed Jan. 2, 1943



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by Charlesworth & Co. Attys.

UNITED STATES PATENT OFFICE

2,363,848

PLASTIC LOOSE-LEAF BINDER

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Application January 2, 1943, Serial No. 471,175

7 Claims. (Cl. 129—1)

This invention relates to a binding structure particularly adapted for use in the binding of papers, magazines, books, and the like and more particularly to a novel synthetic plastic binding strip and ring structure.

An object of this invention is to provide an improved and simplified form of binder ring structure for use in connection with the binding of loose leaf papers, catalogs, magazines, books, and the like.

Another object of this invention is to provide in a plastic split binder ring structure an improved and simplified way of providing the opposite ring portions of the ring with the requisite flexibility for use in the separation of the ring portions.

Still another object of this invention is to provide a synthetic plastic binder ring wherein, without the use of any additional means other than the material of the ring itself, the performance of the ring can be greatly improved.

Another object is to provide a synthetic ring structure for a book in which the sides or cover of the book may be made of plastic and integral with the base of the ring structure.

In accordance with the general features of this invention, there is provided a split binder ring comprising a pair of cooperable fingers made of a thermoplastic material and connected together by an intermediate thermoplastic portion of less rigidity than that of the ring portions, said intermediate portion being rendered more flexible by the treatment of the same with a plasticizer.

In accordance with other features of this invention, there is provided a binder strip made of a thermoplastic material and having connected thereto a plurality of ring structures each comprising opposite ring portions with their free ends in substantial abutting cooperation to form with the strip a closed ring, the opposite ring portions being formed of a more rigid plastic material than that of the portions of the strip joining the ends of the ring portions connected thereto whereby said ring portions, upon being separated to open the ring, flex the connecting portion of the strip.

In accordance with further features of my invention, there is provided a number of different forms of binder rings, some of which are formed integral with a strip and others of which are made integral with a connecting element by reason of attachment thereto.

A still further form of the invention relates to the provision of a connecting portion for binder fingers, which portion is in the form of an intermediate tubular section joining the ends

of the ring portions together and being made of a synthetic plastic having greater flexibility than that of the ring portions proper.

Another feature of the invention relates to the provision of a form of ring structure for a book in which a plastic base strip may constitute an integral portion of the sides or cover of the book.

Other objects and features of this invention will more fully appear from the following detailed description taken in connection with the accompanying drawing, which illustrates several embodiments thereof, and in which:

Figure 1 is a perspective view of a binder strip embodying the features of this invention;

Figure 2 is a cross-sectional view through a portion of the strip of Figure 1 showing the manner in which it cooperates with ring portions to define a split binder ring;

Figure 3 is a view similar to Figure 2 but showing the manner in which the opposite ring portions may be spread apart by flexing the intermediate connecting portion of the base strip;

Figure 4 is a view similar to Figures 2 and 3 illustrating a modification of the invention wherein the ring portions, instead of being integral with the base strip, are attached to the base strip;

Figure 5 is a view similar to Figure 4 of a modification showing how the cooperable ring portions may be separated by the flexing of the portion of the base strip connecting such portions and also showing wherein the base strip may be formed integral with the sides or cover of a book or pamphlet;

Figure 6 is a view partly in section and similar to Figure 2 of a still further modification of the invention wherein the portion for connecting the opposite ring portions embraces both the upper and bottom sides of the adjoining connected ends of the ring; and

Figure 7 is a view similar to Figure 4 showing a further modification.

As shown on the drawing:

Reference character 10 designates generally a flat strip of synthetic plastic material from which are integrally formed a plurality of spaced split binder rings 11. It is to be understood that any number of rings may be formed from the strip as desired and that my invention is not only applicable to a strip having a plurality of rings but is also applicable to a single plastic ring such as is shown in the modification of Figure 6.

Each ring 11 has diametrically opposite ring portions 12—12 cooperable in abutting relation at their opposite ends and defining a split 13 between the opposite ends. The other ends of

the ring portions 12 are connected by an intermediate portion of the strip proper designated in Figure 2 by the reference character 14.

It should be noted at this time that I have not used the term "ring" in the sense that the ring must be a true circle since it is evident from Figures 4 and 5 that the ring may equally well have a non-circular shape. Accordingly, when I have used the term "ring portion," I refer to a binder ring having a split therein with opposite portions that are adapted to be separated to permit the application of the ring to sheets to be bound, such, for example, as loose leaf sheets or the like.

In the modification of Figure 4, the ring portions 12', instead of being formed out of the base strip 10', are in reality separate portions which are suitably fastened to the base strip 10' by a suitable plastic binding material or adhesive of which there are many different brands on the market, and such as a vinyl lacquer. In this form, it will be noted that each ring portion 12' has an inwardly bent leg portion 15' which is attached to the strip 10'. The two leg portions 15' are separated by an intermediate flexible base portion 14' in the strip 10'.

Attention is also directed to the fact that, in Figures 3 and 5, I have illustrated the manner in which the rings like those of Figures 2 and 4 are adapted to be opened by the flexing of the intermediate connecting base portions 14—14—22.

It should also be noted that, in the forms of invention shown in Figures 1 to 3, only a small portion of the base strip may be treated by a plasticizer to make that portion flexible. On the other hand, in the other forms of the invention illustrated herein, the entire base strip may be cut from a plasticized sheet of synthetic plastic material so that the entire base strip is more flexible than the relatively more rigid ring portions.

Also, in Figure 7 I have illustrated at 10b a base strip, which illustration makes it clear that the base strip may be applied to the top sides of the legs 15b—15b of ring portions 12b—12b instead of to the bottom sides thereof. In either event, whether the base strip is on the top or on the bottom of the adjoining legs of the ring portions, it serves to provide a flexible connection between the connected extremities of the ring portions.

Figure 5 illustrates a modification using the identical ring structure of Figure 4, and showing how the base strip 21 may constitute an integral portion of the sides 20—20 or cover of a book. The portions 20 represent fragmentarily the sides or cover of the book when the book is opened, and these sides or cover may constitute portions of the same sheet from which the base strip 21 is formed.

Excellent and economical results can be attained from such a structure, particularly where the base strip and the sides or cover of the book are made from sheet plastic material, such, for example, as a plasticized vinyl resin or a rubber-like material (natural or synthetic) or any other suitable material. In such a modification, the portion of the plastic sheet joining the two sides 20—20 serves as a flexible back for the book and also as a flexible connection at 22 between the juxtaposed extremities 15'—15' of the ring portions 12'—12'.

In Figure 6, I have illustrated a still further modification of the invention in which ring portions 12a, instead of being attached to or integral with a base strip, are connected by a connector

10a, which may be of arcuate configuration if desired. The connector 10a may be attached to the adjoining ends of the ring portions 12a—12a by any suitable plastic binding or cementitious material of which there are many brands on the market, as noted before.

The connector 10a has an intermediate flexible portion 14a which the opposite ring portions 12a—12a are adapted to flex when the split ring is opened to permit the introduction of sheets to be bound by the ring. It will be understood that, in the use of these rings of my invention, they are applied to sheets in the usual way through the conventional holes in the sheets spaced apart for the reception of binder rings.

The connector 10a may be in the form of an individual sleeve for each ring or may comprise a portion of an elongated strip for a multiple of the rings and which strip has a plurality of transverse openings for the reception of the ends of the ring portions 12a—12a to be connected together. If desired, the connector 10a may comprise two strips of plasticized synthetic plastic sheet, one on the top of the extremities of the ring portions and the other on the bottom, and which strips are suitably cemented together by means of a plastic binder.

In Figures 4, 5, 6 and 7, the sides or cover of the book may be formed integral with the base strip if it is so desired; this is exemplified by the structure shown at 20—20 in Figure 5.

An advantage of the ring structures shown in Figures 4, 5, and 6, wherein the ring portions each comprise substantially one half of the ring, resides in the fact that this structure lends itself to a press formation or injection or compression molding with thermo-setting material. In other words, each ring half may be economically fabricated from suitable plastic material in a press operation, thereby eliminating the need for a coiling operation such as used in the formation of continuous ring structures shown in Figure 1.

The rings could be made of other material such, for example, as metal, wood or fiber, if it was so desired, as long as such rings were fastened to a plastic or a synthetic resin backing strip adapted to flex in the opening and closing of the rings.

Now, in the use of these split binder rings it is desirable that they be made relatively rigid so as to withstand the wear and tear incident to their use and so that they will perform their intended binding functions. On the other hand, there must be sufficient flexibility at the connecting junction of the opposite ring portions so that they may be easily and resiliently flexed open and shut. In accordance with the features of this invention, I propose to provide the requisite resiliency at the connecting junction of the ring portions by so treating the plastic material at the junction portion that it will have greater resiliency and flexibility than the material of the ring portions proper.

It should be noted that the synthetic plastic used in the making of the rings disclosed hereinabove may be made of any of the now well known plastics on the market. For illustration, the ring portions may be made of a synthetic thermoplastic material such as the so-called vinyl ester resins. These resins are now available on the market in a number of different forms, such as polyvinyl acetate, polyvinyl chloride, and copolymerized vinyl chloride and vinyl acetate. The synthetic plastic used may also be of the so-called nylon type, which is the generic name for all materials defined sci-

tifically as synthetic fiber-forming polymeric amides.

I also contemplate the use of synthetic materials of the type referred to as acrylics or of the type referred to as cellulose acetates. The characteristics of such synthetic thermoplastics are now well known, as will be evident from the 1942 Plastics Catalog published by Plastics Catalogue Corporation. Therefore, in referring to these plastics, I refer to them in the same sense as they are referred to in the aforesaid publication.

It is also well known that certain plastics may be softened or rendered less brittle or more flexible by treating the same with a plasticizer. The plasticizers for the different synthetic plastics are also well known in the art, as is evident from the aforesaid publication.

In accordance with the features of my invention, I propose to apply a plasticizer solely to the connecting junction piece of my binder ring structure, such as the pieces 14, 14', 22, and 14a. By subjecting each of these pieces alone to the action of a plasticizer, which in some cases may be a solvent, only this connection is rendered more flexible and the remaining rigidity of the ring is not affected.

When a synthetic thermoplastic in the form of a vinyl resin is used, I have found that the desired plasticizing action may be effected by the use of esters, certain halogenated hydrocarbons, ethers, certain amines, and by lower aromatic hydrocarbons. Such a plasticizer is only applied to the restricted connecting piece between the joined ends of the split ring so that this piece will be rendered more resilient thereafter.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as follows:

1. As an article of manufacture, a binding structure comprising a strip of synthetic plastic material having projecting laterally therefrom fingers formed to cooperate in defining a split ring, said strip being treated between the fingers with a plasticizer for the purpose of rendering a portion of said strip more flexible whereby the split ring may be opened and closed by swinging said fingers about said flexible strip portion.

2. As an article of manufacture, a binder structure comprising a unitary strip of resinous plastic material having formed integral therewith and extending laterally therefrom two cooperable fingers shaped to define a split ring with the split at the free ends of the fingers, said strip between the attached ends of the fingers being of greater flexibility than the material in the fingers by reason of said strip having been treated with a plasticizer.

3. A binder comprising a strip made of a thermoplastic material and having connected

thereto opposite ring portions with their free ends in substantial abutting cooperation to form a closed ring on the strip, said opposite ring portions being formed of a more rigid plastic than that of a portion of the strip between the attached ends of the ring portions connected thereto whereby said ring portions, upon being separated to open the ring, flex said strip portion.

4. As an article of manufacture, a split binder ring for use in loose leaf binders, magazines, and the like comprising a pair of cooperable fingers made of a thermoplastic material connected together by an intermediate thermoplastic portion of less rigidity than that of the ring portions, said ring portions normally having their free ends juxtaposed to define substantially a closed ring and being separable upon a separating force being applied thereto and whereby the intermediate portion flexes to permit of the opening of the ring.

5. As an article of manufacture, a split binder ring for use in loose leaf binders, magazines, and the like comprising a pair of cooperable fingers made of a thermoplastic material connected together by an intermediate thermoplastic piece of less rigidity than that of the ring portions, said ring portions normally having their free ends juxtaposed to define substantially a closed ring and being separable upon a separating force being applied thereto and whereby the intermediate piece flexes to permit of the opening of the ring, the material of said intermediate piece being rendered more resilient than that of the fingers by reason of it being plasticized.

6. As an article of manufacture, a combination binder and ring structure comprising a backing or base piece of plastic material having connected thereto cooperating ring portions and also being formed integral with plastic sides of a book, said base strip and said sides of the book all being made of a synthetic thermoplastic material and the base piece being resilient at the junction of the adjoining extremities of the ring portions by reason of it being treated with a plasticizer whereby such resilient piece flexes in the opening of the ring portions.

7. As an article of manufacture, a split binder ring for use in loose leaf binders, magazines, and the like comprising a pair of cooperable fingers made of a thermoplastic material connected together by an intermediate thermoplastic piece of less rigidity than that of the ring portions, said ring portions normally having their free ends juxtaposed to define substantially a closed ring and being separable upon a separating force being applied thereto and whereby the intermediate piece flexes to permit of the opening of the ring, the material of said intermediate piece being rendered more resilient than that of the fingers by reason of it being plasticized, each of said ring portions comprising one half of the ring whereby said ring portions may be separately prefabricated and each being fastened by a binder to said connecting piece.

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