United States Patent

[11] **3,572,957**

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[21] Appl. No. **749,795**
[22] Filed **Aug. 2, 1968**
[45] Patented **Mar. 30, 1971**

[54] **RIBBED-BACKBONE BINDER CONSTRUCTION**
1 Claim, 4 Drawing Figs.

[52] **U.S. Cl.** **402/75,** 281/29
[51] **Int. Cl.** **B42f 3/04,** B42d 3/06
[50] **Field of Search** 281/29, 33, 36, 35, 37; 402/75, 76, 77

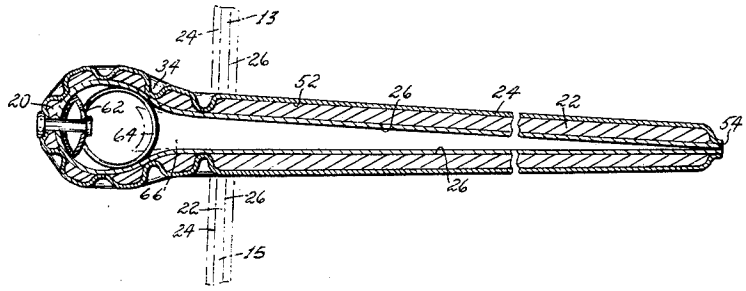
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ABSTRACT: A ribbed-backbone binder construction for use in a looseleaf binder having a typical snap ring mechanism. The board stiffener has a plurality of elongated openings extending substantially the entire width of the stiffener and on either or both sides of the ring mechanism support section. The outer and inner covers are joined through the openings to form a plurality of alternating ribs and hinges, allowing the backbone portion to expand for accommodation of increased capacities within the binder.



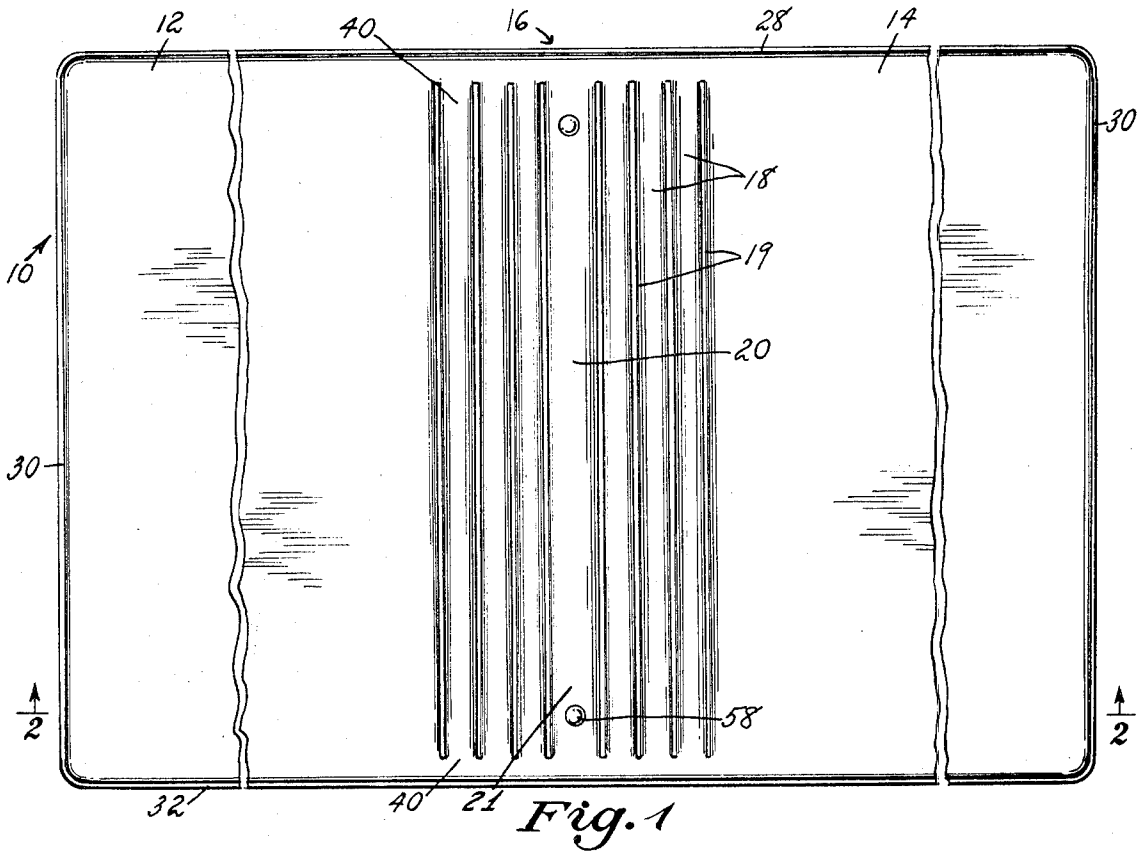


Fig. 1

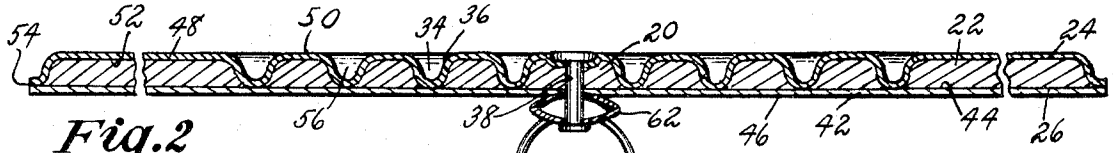


Fig. 2

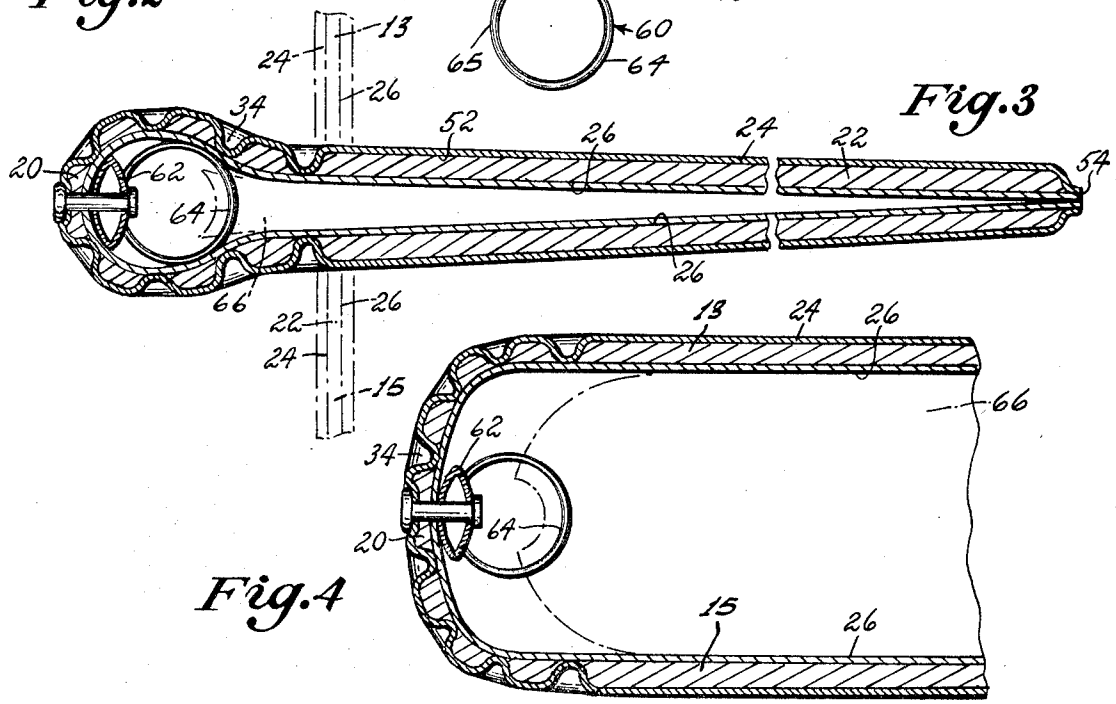


Fig. 3

Fig. 4

RIBBED-BACKBONE BINDER CONSTRUCTION

PRIOR ART

This invention relates to the construction of the backbone and covers of binders, and more particularly, to a binder in which the backbone portion has a plurality of hinged ribs extending from either or both sides of the ring mechanism support section.

In prior art constructions, a typical binder consisted of a front cover, a rear cover, and a backbone of rigid or semirigid stiffening material, one or all of these elements being interposed between two outer layers of flexible material. Hinging action for the covers was formed by the space between the sections of stiffening material where the inner and outer layers of covering material were joined. The backbone was generally flat or if the effect of a rounded backbone exterior was desired, it was accomplished with padding or curved metal or other shaped firm filler material.

If adjustability of the backbone was desired for incremental capacity changes, this was accomplished with separable covers, split twin backbones sliding relative to each other, and other such modifications to the backbone structures. In addition, auxiliary shaped devices commonly known as "sheet lifters" have been provided with binder construction to prevent pages from slipping around the rings and from distorting or damaging the pages when the binder was in a closed or semiclosed position.

These prior art binders had the limitation of a triangular or rectangular cross section when the unit was in a closed position, with the fixed backbone at the maximum dimension required for the snap ring mechanism. If the capacity required of the binder extended beyond this, the covers would bow outwardly making the binder difficult to handle.

Furthermore, the binder of the prior art construction could not be held by the backbone in one hand and still be opened with pages and covers in a flat open position.

The binders having the conventional rounded backbone when in a full opened position, do not have their covers lying flat, but are held away from the flat surface by the curvature of the backbone, and will not allow the presentation of a flat writing surface of front and rear covers simultaneously.

Accordingly, it is among the principal objects of the present invention to provide a new and improved binder construction which will allow the backbone portion to expand to accommodate increased capacities of sheets without bowing of the covers.

Another object of the present invention is to provide a binder which will present a pleasing rounded back which is comfortable to hold and compact at all times.

Still a further object of the present invention is to provide a binder which will automatically conform to the shape of the ring metal of the snap ring mechanism, performing the function of "sheet lifters" and therefore making them unnecessary to this improved construction.

Still a further object of the present invention is to provide a binder which will allow the backbone portion to assume a three-dimensional form allowing it to be firmly gripped by the hand without interfering with the action of the sheets or their ability to lay flat.

Yet a further object of the present invention is to provide a binder which, although having a rounded back when closed, will lay completely flat when in the full opened position and present a flat writing surface on both covers.

It is still a further object of the present invention to provide the novel structure which may be manufactured efficiently and economically in a manner so that the desired embodiment will lend itself to the welding of thermoplastic material and the minimization of labor involved in the positioning of the covers and backbone portion.

The present invention contemplates, in its preferred embodiment, the use of a single unit board stiffener which includes front and rear cover sections and a backbone section having elongated openings, running almost the entire width of the stiffener and positioned on both sides of a center strip, forming an element of the support strip for the ring mechanism. The stiffener is completely covered by sheets of thermoplastic material which are welded around the edges and through the elongated openings of the stiffener. A typical snap ring mechanism may then be riveted into position against the support strip formed by the cover sheets and the stiffener, and the elongated openings and the material therebetween form a plurality of ribs and hinges which may be folded around the ring mechanism. The ribs and hinges may then be expanded beyond the widths of the support strip as there is increased capacity within the binder. The ribbed and hinged portion may also be gripped by the hand, the hinges allowing the covers to lie completely flat.

The above description and objects of the present invention will become apparent from a reading of the following description, taken with reference to the accompanying drawings, wherein:

FIG. 1 is a planned view of the outer cover of the binder, showing the binder in its flat, fully extended configuration;

FIG. 2 is an enlarged, cross-sectional view taken along the line 2–2 in FIG. 1 with portions of the cover broken away;

FIG. 3 is an enlarged, cross-sectional view similar to FIG. 2, showing the binder with the covers in a closed, abutting position; and the covers in phantom, in fully extended position with the ribbed portion of the binder still surrounding the ring mechanism; and

FIG. 4 is an enlarged, fragmented view similar to FIG. 3 showing a large number of sheets secured within the ring mechanism and the ribbed section of the backbone binder portion being expanded to compensate for the increased width of the sheets.

Referring now to the drawings, and in particular, to FIG. 1, there is shown a preferred embodiment of the binder 10 which comprises cover portions 12, 14 and a ribbed backbone portion 16. The portion 16 includes a plurality of ribs 18 and hinges 19, extending from a centrally located ring mechanism support strip 20.

The binder 10 includes (FIG. 2) a piece of stiffening material, such as a board stiffener 22 which may be made of several pieces, such as members 13, 15 corresponding to the covers 12, 14, respectively and the sections of the ribbed portion 16, or may be made out of a single unit of the stiffening material, which increases production efficiency. More particularly, the board stiffener is defined by an outer surface 24, an inner surface 26, an upper edge 28, side edges 30, and a lower edge 32. Elongated openings 34 defined by surfaces 36 and rivet holes 38 are punched out of the stiffener 22 during the original die cutting operation extending along slightly less than the width thereof.

The openings represent rectangles with rounded or rectangular edges in cross sections and extend nearly the entire width of the binder 10, the remaining material defining joinder sections 40 connecting the members 13, 15 and a centrally located support section 20 through which the rivet holes 38 have been punched.

Surrounding the stiffener 22 are an inner cover 42, defined by an inner surface 44 and an exposed surface 46, and an outer cover 48 defined by an outer surface 50 and an inner surface 52. The covers are cut to approximately the shape of the board stiffener with slightly larger dimensions and may be joined around the edges by any convenient means, such as gluing. In the preferred embodiment thermoplastic material is used and a thermoweld 54 joins the covers proximate to the edges 28, 30, 32; and the thermoweld 56 is formed through the openings 34 to form the hinges 19. A thermoweld is formed through the rivet holes 38 so that the cover material is very thin at the weld. The completed structure forms the central portion 21 and the covers 12, 14. Rivet 58 may then be easily extended through the rivet holes 38 joining a typical snap ring mechanism 60 having a base 62 to which the rivets are secured in a standard ring 64 having an outer circumference 65 defining its outer diameter receiving standard ring sheets of paper 66 in the well-known manner.

The assembly, which has been discussed to some extent previously, consists of preparing the stiffener in a single die cutting operation which forms the edges 28, 30, 32; the elongated openings 34, and the rivet holes 38. Thermoplastic covers 42, 48 are also cut to the approximate dimensions of the stiffener and thermowelded around the edges into the openings. The snap ring mechanism 60 is then secured against the inner cover 42 by means of rivets 58.

The binder is now ready to receive sheets of material, such as paper, having ring holes corresponding to the ring mechanism 60. When there are a few sheets secured within the ring mechanism the backbone portion will surround the ring 64 as shown in FIG. 3, and the covers may actually move into a budding relation as at 54. As can be seen in the phantom view of the covers 12, 14 in FIG. 3, the ribs and hinges are in direct contact with and may surround the ring for more than 180° of it's circumference 65, forming a partial cylindrical portion and be held in that manner by the hand, while the outermost hinges permit the covers to lay flat open. Thus, a user may hold the binder in one hand while keeping the covers in a flat open position.

As the number of sheets of material increase, the hinges allow the ribs to move away from the ring 64 to accommodate for the increased volume (FIG. 4). Thus the backbone portion is not limited to the width dimension of the central portion 21, and is, in fact, only limited by the number of ribs 6 extending outwardly in either direction. No matter what the volume of material held in position within the binder by the ring mechanism, the covers will lay flat until this volume increases to a width beyond that of the ribs and hinges for the particular construction.

It should be noted that the number of ribs is not in any way limited, either at a lower or upper limit. In fact, the entire binder may be composed of ribs, without any covers at all present. The ribs and hinges do not have to be symmetrical around the support strip, and may extend all on one side or the other.

Furthermore, any type of mechanism may be used to retain sheets, other than a snap ring mechanism.

The invention is not limited to thermoplastic materials and the end result could be accomplished with other materials and by a gluing or sewing process.

During the assembly operation, it has been noted that the stiffener is die cut with the rivet holes 58, the covers being then joined within the holes to form a thin weld. It is important that this is done prior to the thermowelding operation, or otherwise, air would enter between the covers of the binder and result in a loose "billowing" effect around the central portion 21, which would be undesirable. Rivets can be easily pushed through the weld, passing through the already punched holes 38 without disturbing the airtight nature of the product and the covers will retain a "tight" and smooth desirable surface.

While there has been described and illustrated a preferred embodiment of the present invention, it is apparent that numerous alterations, omissions, and additions may be made without departing from the spirit thereof.

I claim:

1. A ribbed-backbone binder construction to accommodate varying numbers of looseleaf sheets as desired comprising:

a. retaining means having snap rings allowing addition and removal of sheets to vary the volume of sheets, the snap rings defining a circumference at the outer diameter thereof;

b. a binder with a ribbed-backbone portion, the binder including a single piece board stiffener having a ribbed portion with a centrally positioned support section and a plurality of elongated openings, therein, substantially centrally positioned on both sides of the support section and extending along slightly less than the width thereof, and said stiffener further including members extending outwardly of the ribbed portion inner and outer covers covering the board stiffener and enjoined along the outer edges and through the elongated openings, the joinder of the covers in the openings forming hinges, the covers and stiffener portions between adjacent openings forming ribs, the support section and adjacent portions of said covers forming a central portion and said members and portions of said covers adjacent thereto forming cover panels, said support portion having a width substantially less than the diameter of said rings and said retaining means being secured to said support portion, and

c. the ribs abutting the snap rings along the circumference thereof when a small amount of sheets are secured therein, the ribs extending around substantially the entire circumference of said rings, forming a cylindrical portion, allowing the cover panels to lie in substantial flat abutment against the outside sheets, and also allowing gripping of the binder around the rings at the cylindrically formed portion with said cover panels lying open in alignment and the sheets and material thereon being visible, while the binder is held by a single hand of the user, and the ribs being extendable away from the retaining means when a large number of sheets is secured therein, yet still allowing the cover portions to lie flatly against the outside sheets.