March 30, 1965 W. McKOWEN 3,175,847

PLASTIC SPINE CONSTRUCTION FOR RING BINDERS

Filed March 6, 1963 2 Sheets-Sheet 1

Fig. 1

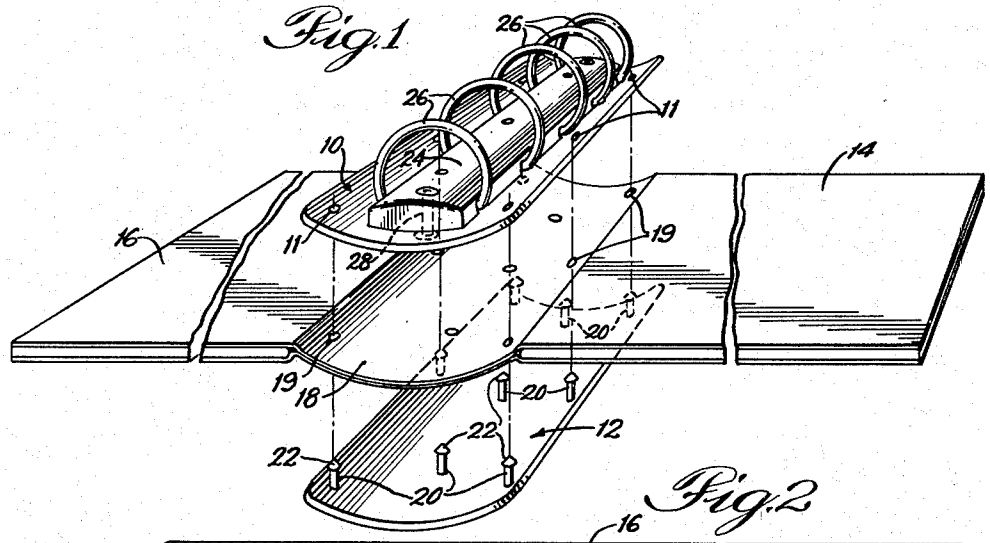



Fig. 2

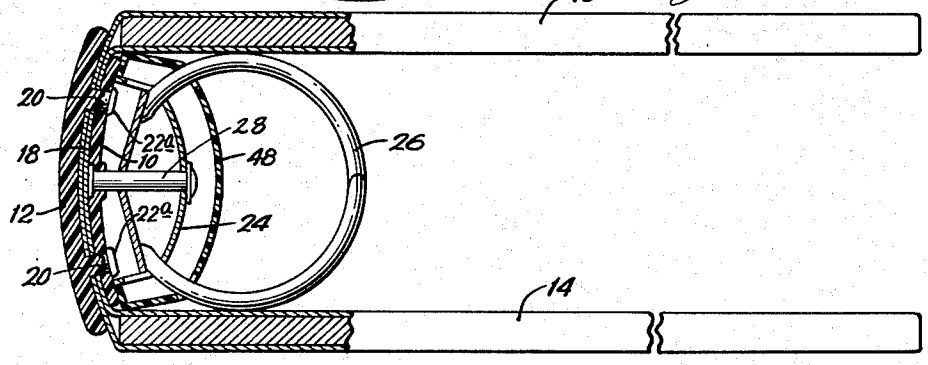
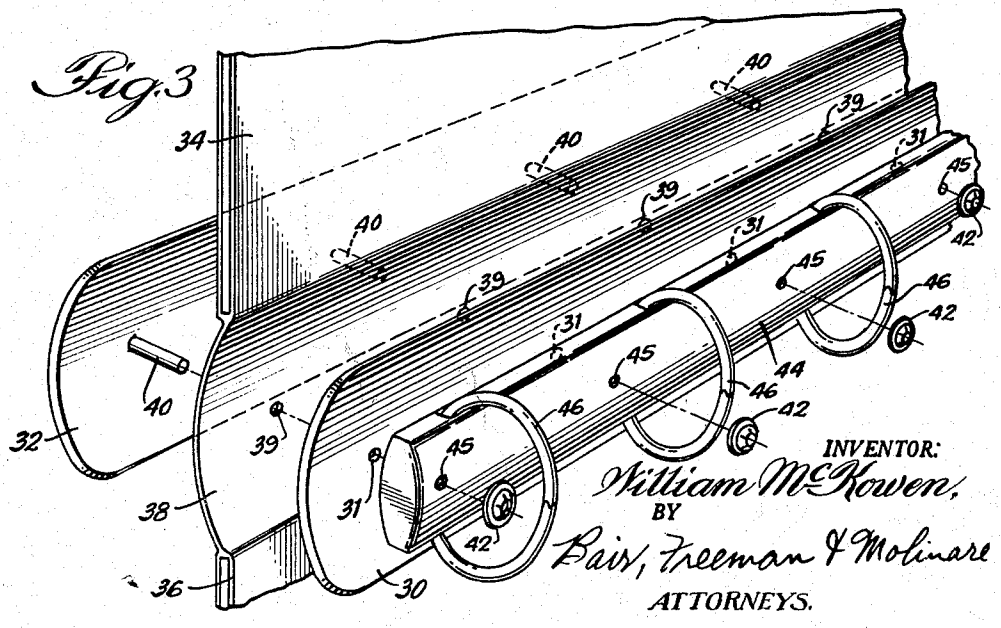



Fig. 3




INVENTOR:
William McKowen,
BY
Pair, Freeman & Molinare
ATTORNEYS.

March 30, 1965 W. McKOWEN 3,175,847

PLASTIC SPINE CONSTRUCTION FOR RING BINDERS

Filed March 6, 1963 2 Sheets-Sheet 2

Fig. 4

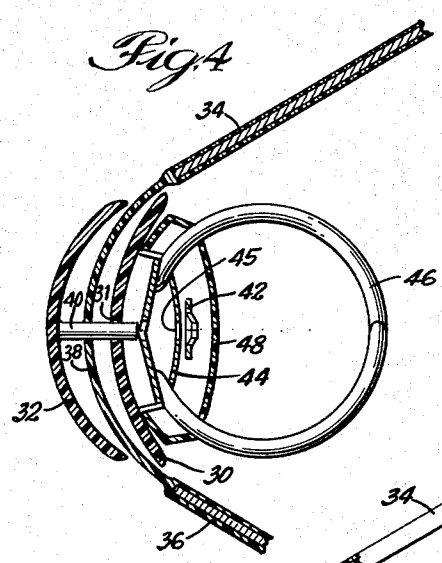



Fig. 5




INVENTOR:
William McKowen,
BY
Bair, Freeman & Molinare
ATTORNEYS.

United States Patent Office 3,175,847 Patented Mar. 30, 1965



3,175,847

# PLASTIC SPINE CONSTRUCTION FOR RING BINDERS

William McKowen, Des Moines, Iowa, assignor to Meredith Publishing Company, Des Moines, Iowa, a corporation of Iowa

Filed Mar. 6, 1963, Ser. No. 264,476
2 Claims. (Cl. 281—36)

This invention relates to a plastic spine construction particularly for ring binders of the loose leaf type, the present application being a continuation-in-part of my copending application Serial No. 182,506, filed March 26, 1962, which in turn is a continuation-in-part of my copending application, Serial No. 166,231, filed January 15, 1962.

One object of the present invention is to provide a spine construction having main or outer and secondary or inner spine members which are secured together by a post-and-perforation arrangement wherein connecting posts are headed, and the heads snapped through the perforations to provide a permanent connection between the spine members, the page, or leaf, covers being provided with a back member that is interposed between the spine members, the secondary or inner spine member providing a base for metal rings for binding loose pages between the page covers.

Another object is to provide a plastic primary spine member having post-like projections thereon adapted to pass through perforations of the back member and then through perforations of a secondary spine member which is provided with a metal ring binder assembly, the extending ends of the posts being enlarged by the application of heat and pressure thereto to hold the parts assembled.

Still another object is to provide a primary plastic spine member having integrally-molded posts, a secondary spine member of similar material and metal ring binder means, the secondary spine member and the ring binder means being perforated to receive the posts, the curvature of the primary spine member being greater than the curvature of the secondary spine member whereby the two may be drawn together to tightly clamp between them the back member of the page covers whereupon retainers may be applied to the inner ends of the posts to permanently retain the parts in rigidly-assembled position.

A further object is to provide a loose-leaf binder of this kind in which the leaf covers tightly abut the edges of the interconnected curved spine members so that the covers receive support along their entire length, thus providing a rigid unitary binder.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my plastic spine construction for ring binders, whereby the objects above contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in detail on the accompanying drawings, wherein,

FIGURE 1 is a perspective view of the spine members, ring binder, page covers and back member shown separated prior to assembly;

FIGURE 2 is an enlarged end view partly in section showing the parts assembled and ready for the reception of loose leaves therein;

FIGURE 3 is a perspective view somewhat similar to FIGURE 1 showing a modified construction;

FIGURE 4 is a sectional view somewhat similar to FIGURE 2 showing the parts of FIGURE 3 during one step in the assembly and before completion thereof; and

FIGURE 5 is a similar sectional view showing the parts in the completely assembled position.



On the accompanying drawings I have used the reference numeral 10 to indicate an inner spine member which may be formed either of plastic material or metal. An outer spine member 12 of plastic material is provided and it has posts 20 formed integrally therewith and projecting therefrom, which posts may terminate in enlarged heads 22 as shown in FIGURE 1.

The page covers 14 and 16 are made from rigid boards covered with suitable flexible material such as fabric, plastic or paper which also forms a back member 18 to be clamped between the spine members 10 and 12 as shown in FIGURE 2 by passing the posts 20 through perforations 19 of the back member and through perforations 11 of the inner spine member whereupon the heads, being slightly larger than the perforations 11, require forcing to snap therethrough and thereafter retain the parts permanently assembled. Alternatively, the posts 20 may be of the nonhead variety and project through the perforations 19 and 11 whereupon heat and pressure may be applied to the inner ends thereof and the same thereby enlarged as illustrated at 22*a* in FIGURE 2. In either case the spine members and the back member 18 cooperate with the page covers 14 and 16 to permit ready hinging thereof because of the flexibility of the back member.

The spine member 10 is provided with the usual metal ring binder assembly 24 including rings 26, and rivets 28 may be used for holding them assembled to the spine member 10. In FIGURE 2 the outer spine 12 lies adjacent the cover boards so that the covers cannot be pushed askew and loosened by stretching or tearing the back member 18. The wider spine member provides support for the edge of the cover member.

FIGURES 3, 4 and 5 illustrate a modification wherein posts 40 replace both posts 20 and the rivets 28 of FIGURES 1 and 2, the posts being integrally molded on a plastic outer spine member 32 and passing through perforations 39 of a flexible back member 38 of the page covers 34 and 36. The page covers are shown covered with plastic that may be in the form of sheets adhered thereto, or molded or extruded thereon with the back member 38 forming a web connecting the page covers together. An inner spine member 30 is provided having perforations 31 through which the posts 40 also extend, and a ring binder 44 is provided having rings 46. The ring binder 44 has perforations 45 through which the posts 40 also extend and the inner ends of the posts may be riveted by heat and pressure as indicated at 22*a* in FIGURE 2, or retainer washers 42 may be associated therewith as shown in FIGURE 5.

FIGURE 4 shows a desirable relationship between the curvature of the inner spine member 30 and the outer spine memer 32, which is an important feature of this invention. It will be noted that the outer spine member has a curvature of less radius than the inner spine member so that when the parts are drawn together and the retainer washers 42 applied, the back member 38 will be securely clamped between the spine members as the curvature of the outer one is decreased and the curvature of the inner one increased by the posts 40 being drawn up tight as shown in FIGURE 5. When the spines are drawn together, it will be noted from the same figure that their marginal edges are offset and that the cover 34 abuts the edge of the inner spine 30. Thus the cover is supported along its length to provide a rigid unitary binder. The offset precludes the cutting effect on the back member if the bearing edges were to fall precisely along the hinge line.

Preferably the upper and lower edges of the spine members are chamfered or rounded as shown in FIGURES 4 and 5 and the four corners of each are rounded as shown in FIGURE 3 to avoid any possibility of gouging the per-

son using the book. The dual curvature of the spines also contributes to the smooth exterior of the book and prevents dirt and foreign materials from lodging beneath the edges of the spine members. There is no possibility of a gap between the spine edges, as might result if the spines were molded to the same curvature but were slightly off tolerance.

The spine members may be formed by molding or extrusion of a tough horny thermoplastic material such as polypropylene, polystyrene, nylon, Delrin or the like. The tough thermoplastic material forms a base for the metal ring assembly so there is no opportunity for the metal to cut through the back member. The exposed or outside surfaces of the outer spine members **12** and **32** may have a design molded or extruded as part of the molding or extrusion step, and may be in relief or intaglio as desired.

From the foregoing specification it will be obvious that I have provided a ring binder construction including a plastic spine assembly that makes possible an inexpensive assembly. It is necessary only to push the posts through the opening in the inner spine and the ring assembly, compress the spine members, and apply the lock washers or snap rings to the ends of the posts.

A spacer **48** (omitted from FIGURES 1 and 3), which may be of plastic material serves as a guide and/or back rest for the usual loose-leaf pages mounted on the rings **26** to prevent excessive wear around the holes therein and to facilitate opening the book to any page.

Some changes may be made in the construction and arrangement of the parts of my plastic spine construction for ring binders without departing from the real spirit and purpose of my invention. I therefore intend to cover by my claims any modified forms of structure or use of mechanical equivalents which may reasonably be included within their scope.

I claim as my invention:

1. In a spine construction for loose-leaf ring binders, a curved outer spine member fromed of resilient plastic material and having integral connecting posts, a curved inner spine member formed of similar plastic material and having perforations therein adapted to receive said posts, the radius of curvature of said inner spine being greater than the radius of curvature of said outer spine, a pair of page covers, a flexible back member connecting said page covers together, said back member being interposed between said spine members and being in direct



contact with both of them, a ring binder assembly overlying said inner spine member, said posts also extending through said back member and said ring binder assembly, and means on the inner ends of said posts to lock said spine members, said back member and said ring binder assembly together, and to draw said spine members toward each other sufficiently to assume substantially the same curvature, and thereby provide squeezing pressure along their marginal edges against said back member.

2. A loose-leaf binder having a permanently affixed ring binder assembly comprising a curved outer spine member having integral connecting posts, a curved inner spine member having perforations therein for receiving said posts, said inner and outer spine members being formed of resilient plastic material, the radius of curvature of said inner spine being greater than the radius of curvature of said outer spine, a pair of page covers comprising boards connected together by means of flexible sheet material which forms a back member and covers the faces of said boards, said back member being formed of two thicknesses of said flexible sheet material in contact with each other and interposed between said spine members with said posts extending therethrough, a ring binder assembly overlying said inner spine member with said posts extending therethrough, and means on the inner ends of said posts to lock said spine members, said two thicknesses of said back member and said ring binder assembly together, and to draw said spine members toward each other sufficiently to assume substantially the same curvature and thereby provide squeezing pressure along their marginal edges against said back member, said boards abutting said marginal edges of said inner spine member.


**References Cited by the Examiner**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 1,074,510 | 9/13 | MacMaster | 129—1 |
| 1,615,493 | 1/27 | Trussell | 129—1 |
| 1,802,794 | 4/31 | Trussell | 281—35 |
| 2,017,220 | 10/35 | Schade | 281—25 |
| 2,269,495 | 1/42 | Trussell | 129—1 |
| 2,321,558 | 6/43 | Trussell | 129—1 |
| 2,607,350 | 8/52 | McKowen | 129—1 |
| 2,632,657 | 3/53 | Schade | 129—24 |



JEROME SCHNALL, *Primary Examiner.*

LAWRENCE CHARLES, *Examiner.*