June 8, 1943. C. D. TRUSSELL 2,321,558

RING BINDER

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FIG. 1.

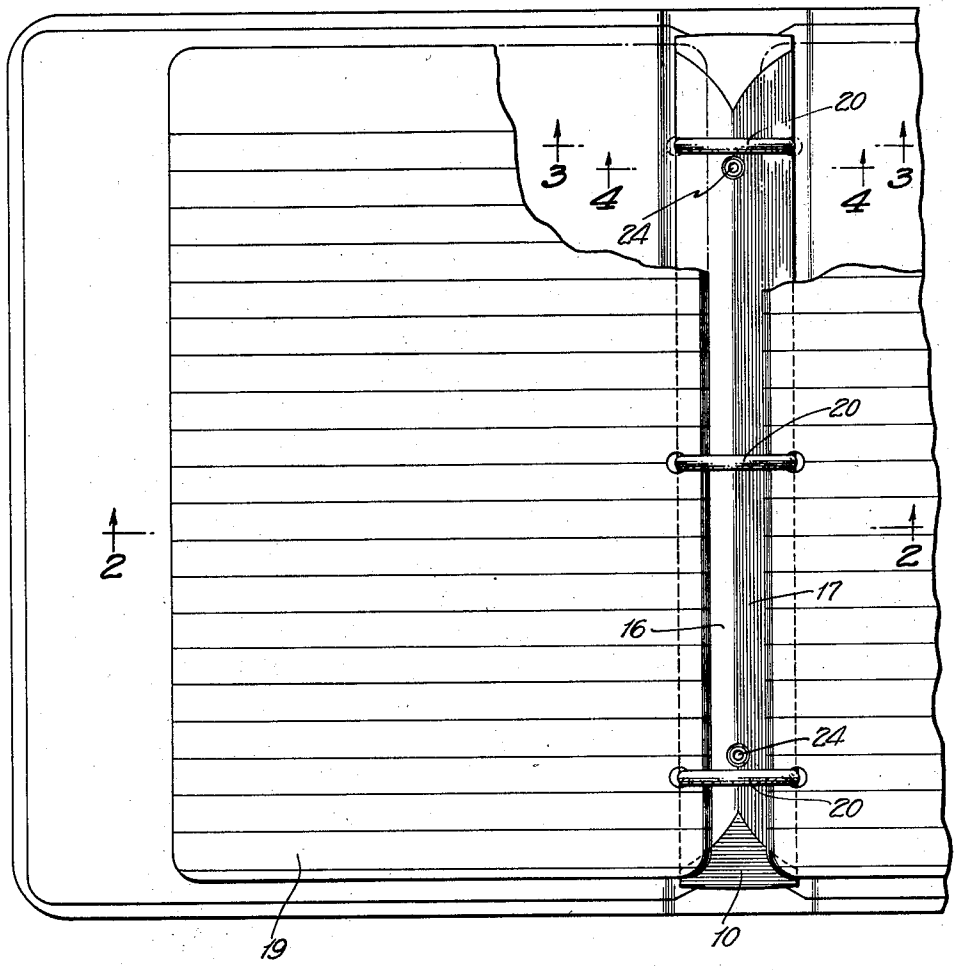
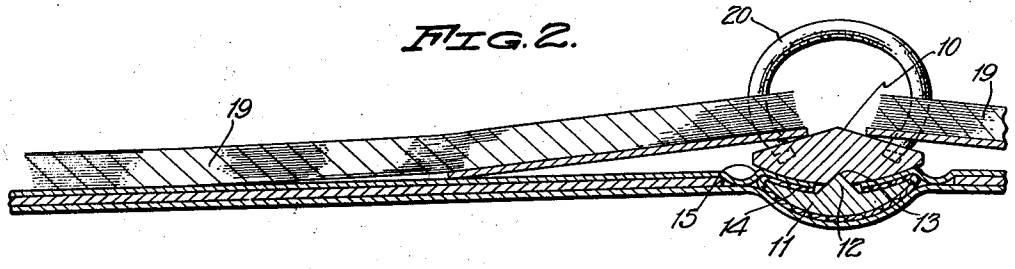


FIG. 2.



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FIG. 3.

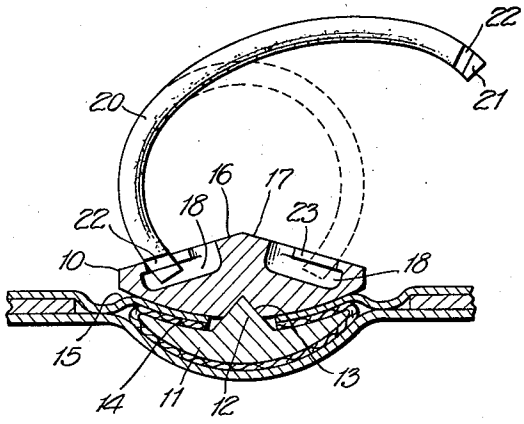


FIG. 4.

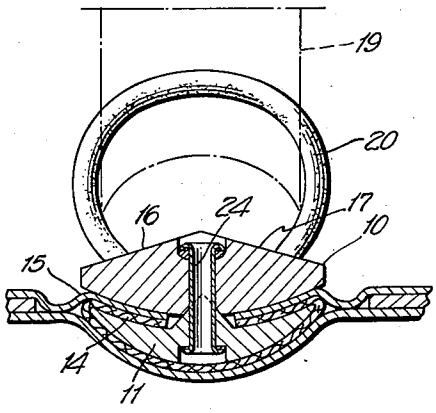


FIG. 5.

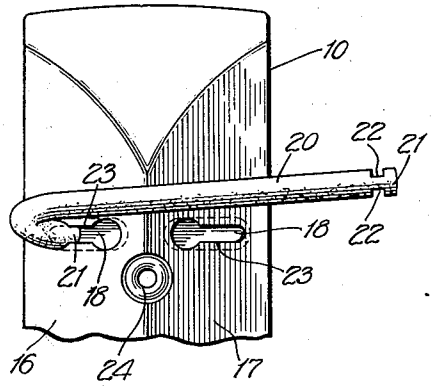
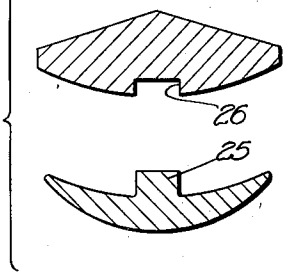


FIG. 6.



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RING BINDER

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Application July 23, 1942, Serial No. 452,111

3 Claims. (Cl. 129—1)

The invention here disclosed relates to ring binders.

Special objects of the invention are to provide a binder of light-weight, inexpensive construction, easily manufactured from readily available materials; which will hold the leaves securely but in a readily releasable fashion and which further will be somewhat flexible in character, thus to avoid injury and wear on the leaves, such as occasioned by the rigid metallic form of rings heretofore employed.

The foregoing and other desirable objects are attained by novel features of construction, combinations and relations of parts, all as hereinafter described, illustrated in the accompanying drawings and covered in the claims.

The drawings accompanying and forming part of the following specification illustrate typical and at present preferred embodiments of the invention. Structure however, may be modified and changed as regards the present illustration without departure from the true spirit and scope of the invention as hereinafter defined and claimed.

Fig. 1 is a broken plan view showing an embodiment of the invention opened out flat.

Fig. 2 is an enlarged cross-sectional view as on substantially the plane of line 2—2 of Fig. 1.

Figs. 3 and 4 are further enlarged cross-sectional details as on the lines 3—3 and 4—4 respectively of Fig. 1.

Fig. 5 is a broken plan of the wooden back member showing the undercut keyhole grooves providing the holding seats for the ends of the flexible ring element.

Fig. 6 is a sectional detail illustrating a modified form of the wooden back construction.

In the form of the binder first illustrated, the back is made up of inner and outer members 10 and 11, of wood or similar material, fitted together in tongue and groove fashion with a longitudinal rib or ridge 12, on one member, the outer member in this instance, seating in a groove 13, in the other member.

The outer part 11, is shown covered with a layer of fabric or other material 14, adhesively or otherwise secured and with opposite edges turned in between the two members at opposite sides of the mating tongue and groove and the inner layer of the cover material 15, is shown similarly caught and held between the two back members.

The inner back member is shown as having oppositely bevelled or inclined faces 16, 17, Figs. 3 and 5, in which are provided oppositely disposed, undercut keyhole slots 18, arranged with their larger ends inward, toward the center ridge of the back piece and their narrower ends outward toward the edges of said back piece.

These undercut keyhole slots in the inclined sides of the back piece form keepers or seats for the rings which hold the sheets or leaves 19.

The rings 20, are unique in that they are formed of leather or some such like firm but flexible, tough and strong non-metallic material.

At present, the so-called "round" leather belting, such as used for sewing machines, has been found a practical and desirable ring material. Such belting is substantially circular in cross-section and finished smooth and hard enough for the leaves to slide readily thereover and for the short lengths of material required, to hold the desired ring-like formation.

The ends of the flexible rings are embedded and anchored in the back piece, in the present disclosure by providing heads 21, on the ends of such rings, which will pass through the circular enlargements at the ends of the keyhole slots and back behind the material forming the narrower undercut portions of the slots.

In practice, these securing heads on the ends of the ring elements can be produced by simply impressing, cutting or otherwise forming narrow grooves 22, across opposite sides of the ring elements, which reduce the cross-section at such points to substantially the width of the narrow portions of the slots.

As shown particularly in Fig. 3, the cross-section reducing grooves 22, may be formed just about the width of the wall thickness at 23, constituting the overhang of the undercut slots and disposed on an incline to the longitudinal axis of the ring element, thus to make the ring ends fit snugly and cause the rings to stand up firmly and with a desired degree of rigidity from the back piece and in the proper ring shape.

As a practical matter, it is desirable to have the rings in the shape of a flattened oval rather than truly circular, such shape providing greater leaf capacity.

These flexible rings of leather-like material have a tendency to flatten down themselves under the weight of leaves, substantially as indicated in Fig. 4, and as shown in Fig. 3, the inclination of the holding grooves 22, may be such as to give them an initial "set" in the oval outline.

The spring of the leather-like material provides a force tending to hold the rings firmly anchored in place and the weight of the leaves

tends to hold the ends of the rings outward, securely locked in the narrower holding ends of the undercut keyhole slots. At the same time, any one or any number of rings may be readily unhooked and released at one or both ends by simply forcing such ends inwardly to the larger circular terminals of the keyhole slots.

While various means may be employed for fastening the ring carrying back member in place, tubular rivets are well adapted to this purpose and such are shown so employed at **24**, Figs. 1 and 4.

Instead of a V-shaped interlocking engagement between the outer and inner back members such as shown in Figs. 2 and 3, a plain flat sided tongue and groove engagement may be provided between these members, such as illustrated at **25**, **26**, Fig. 6. Other forms or shapes of interlockingly engaging elements may be provided between the back members **10** and **11**.

The wooden back form of construction provides a desirably firm and sufficiently light-weight structure. The short lengths of flexible leather-like material forming the individual rings may be impregnated, compacted, coated or otherwise treated to give them any desired degree of firmness, hardness or smoothness, or to provide additional tensile strength, wearing qualities or the like.

What is claimed is:

1. A binder of the character disclosed, comprising a non-metallic back piece of wood-like material, longitudinally ridged at the inside of the binder and having oppositely disposed and reversely inclined transversely extending undercut slots, said slots being enlarged at the inner ends of the same and flexible non-metallic rings of springy material having end portions of a size to enter the enlarged ends of said slots and being grooved in opposite sides of the same to transverse dimensions which will enter the narrower portions of said undercut slots and on lines inwardly inclined to the axes of said rings, whereby to cause the end portions of said rings to be held in upstanding outwardly flared relation when so engaged on the back piece.

2. A binder, comprising inner and outer back members of wood, one having a centrally disposed longitudinally extending rib projecting from the face of the same and the other having a correspondingly placed longitudinally extending groove to receive said rib, a cover having flange portions caught and held between said back members at opposite sides of the centrally disposed mating rib and groove, said inner back member having transversely extending undercut grooves at the inner face of the same and said grooves being enlarged toward the longitudinal center of said back member and flexible ring members of non-metallic material having end portions to enter the enlarged inner ends of said transverse slots and transversely reduced portions to enter the narrower outwardly extending portions of said transverse slots.

3. A binder of the character disclosed, comprising a non-metallic back piece of solid material such as wood, said back piece having oppositely disposed transversely extending slots undercut toward their outer ends to form opposed marginal confining ledges and enlarged at the inner ends to provide access beneath said ledges and rings consisting of short lengths of firm, flexible, smooth, hard, springy non-metallic material having end portions of a size to enter the larger ends of said slots and to pass beneath said marginal ledges, said end portions having transverse grooves in opposite sides of the same of a width approximating the wall thickness of said ledges, said grooves being of a depth reducing the cross-section of the ring material to substantially the width of the narrow portions of the slots between said ledges, whereby when engaged in said narrow portions of the slots, said grooved end portions will be engaged and held by the ledges both above and below the ledges and will be gripped between said ledges and thereby braced and made to stand up firmly on the back piece, said grooves lying in planes which form an obtuse angle between themselves to hold said upstanding end portions of the rings in outwardly divergent relation to tension said rings in an opening direction when both ends are anchored in place and whereby upon release of either end of a ring, said end will spring up from the back piece while supported by the other end which remains firmly anchored in upstanding relation on the back piece.

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