June 19, 1962 J. K. DUNCAN 3,039,472

RING BINDER OR THE LIKE

Filed Oct. 16, 1959

Fig. 1.

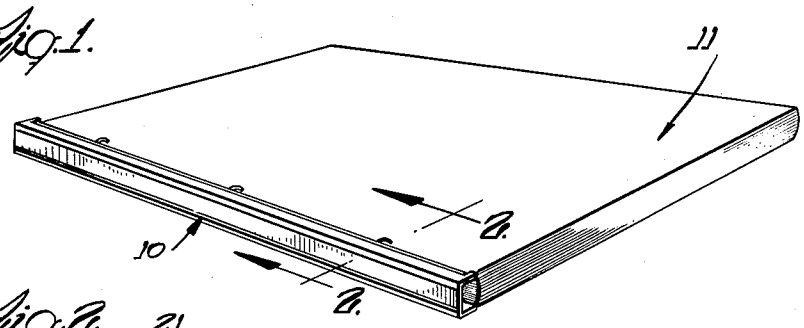


Fig. 2.

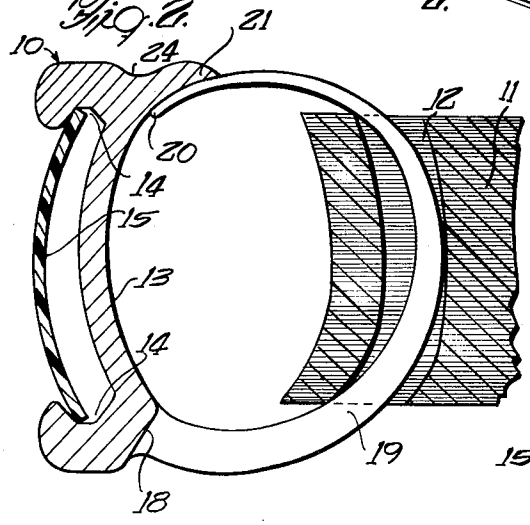


Fig. 3.

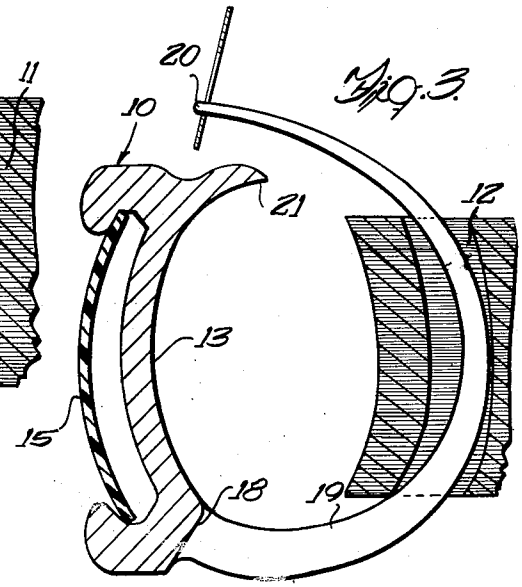


Fig. 4.

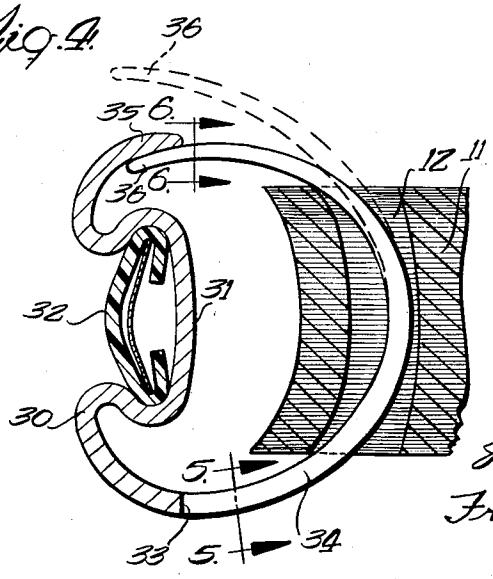


Fig. 5.

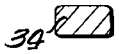


Fig. 6.



Fig. 7.



Fig. 8.



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RING BINDER OR THE LIKE

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4 Claims. (Cl. 129—24)

The present invention relates to a binder of a type often referred to as a ring binder used to hold a plurality of sheets having perforations adjacent one edge thereof through which perforations the rings extend to hold the sheets in the binder.

In the past numerous types of ring binders have been utilized and still other types have been proposed. Those in which the rings could be opened to permit the insertion or removal of sheets from the binder universally have had some sort of a mechanical locking arrangement to hold the rings closed when the binder was in normal use. The principal object of the present invention is to provide a relatively simple binder structure not having the complicated mechanical locking means found in prior art devices while at the same time the binder is of such a nature that the rings will not be opened accidentally during the normal course of use of the binder.

A number of advantages are achieved by the binder I have devised. In the first place, because of its simplicity the binder is relatively inexpensive to manufacture and can be sold for a relatively nominal cost. The binder is particularly adapted to be manufactured of relatively low cost, colorful plastics by an extrusion process which in itself tends to hold down the cost of manufacturing the binder. At the same time, binders embodying my invention are not limited to extruded forms. If desired, the binder may be made of metal by suitable metal forming operations. The binder is easily opened and closed. Yet, because of its unique structure, it is remarkably resistant to being opened accidentally in the course of normal usage. The binder may be made with any desired number of rings and in sizes suitable for the conditions under which one may desire to use it. It may readily be provided with suitable labeling guides having indicia identifying each individual binder as to usage.

The binder I have devised is particularly adapted to be made by extrusion with subsequent cut prongs, or by forming from metal from a sheet metal blank, lends itself to production with say 2, 3, 5, or 7 prongs.

Standard ring bindings are so constructed that they do not lend themselves to this kind of flexibility in manufacture. As a means of making bindings easy to use, say, in schools, we may sell 7 hole paper which may be used with bindings having any combination of holes. These hole spacings will accommodate most bindings on the market, including those which are the subject of this application.

Further objects and advantages will become apparent from the following description taken in conjunction with the drawings in which:

FIGURE 1 is a perspective view of a binder of my invention holding a plurality of sheets;

FIGURE 2 is an enlarged partial section as seen at line 2—2 of FIGURE 1;

FIGURE 3 is a view corresponding to FIGURE 2 but showing the ring in the open position for the insertion or removal of sheets;

FIGURE 4 is a view corresponding to FIGURE 2 of a second embodiment of the invention;

FIGURE 5 is a section taken at line 5—5 of FIGURE 4;

FIGURE 6 is a section taken at line 6—6 of FIGURE 4;

FIGURE 7 is a section as viewed at line 5—5 of FIGURE 4 but illustrating an alternative embodiment; and

FIGURE 8 is a section viewed at line 6—6 of FIGURE 4 but showing the same alternative embodiment as that of FIGURE 7.

Referring to FIGURE 1, the binder generally **10** is used to hold a plurality of sheets generally **11** having perforations **12** adjacent one edge thereof. The binder **10** comprises a spine **13** which normally will extend the length of the sheets to be bound. Along the spine are a pair of ways **14** to hold a plastic labeling strip **15** or the like. Strip **15** may be clear or opaque depending upon the application and whether or not labeling indicia is to appear on the outside or underneath the labeling strip. I plan to provide label strips in white and various colors which may be inserted in the "ways" of the spine. These may be dull surfaced opaque vinyl, if desired, so that they may be written upon with a pencil and erasures made any number of times.

Along one side of binder **10** is a base edge **18** to which the prongs **19** are affixed. Prongs **19** are deflectible and in their undeflected state have a generally U-shaped configuration as seen in FIGURE 3. One end of the U is, of course, the end affixed to base edge **18**. The other end is the unsupported end **20**. The distance between these two ends when the prong is in the undeflected position is greater than the distance between base edge **18** and a projection **21** which runs along the length of binder **10** at the opposite side thereof from base edge **18**. Projection **21** extends outwardly from the spine **13** and in the same general direction as to the prongs **19** and defines an undercut portion into which the prongs are received.

An important feature of my invention is that while the prongs **19** are deflectible the portion thereof adjacent base edge **18** is relatively rigid as compared with the portion of the prong adjacent the free end **20**. Preferably, about the first quarter to one-third of the prong commencing at the end thereof at base edge **18** is of about the same degree of rigidity, the next one-third to one-half being tapered so as to be of decreasing rigidity, while the final one-quarter to one-third is of about the same degree of rigidity. In any event, there should be a substantial decrease in the rigidity of the prong from the end thereof at base edge **18** to the unsupported end **20**. The varying rigidity to which reference is made primarily is rigidity in the plane of the prong rather than varying rigidity in the direction generally parallel to the length of spine **13**. The rigidity in the latter direction, relatively speaking, should be more constant throughout the length of the prong than is the case of the varying rigidity in the plane of the prong. Further description of this will be found subsequently in references to FIGURES 5 to 8.

By reason of the varying rigidity of prong **19** as described above, it is possible to deflect the prong **19** so as to insert free end **20** under projection **21** to the position illustrated in FIGURE 2 without undue difficulty. At the same time, with the prong **19** engaged with the projection **21** as illustrated in FIGURE 2, the prong will not be dislodged during the normal course of use of the binder. When the binder is to be open for the insertion or removal of sheets, the spine **13** may be grasped by the fingers along depression **24** at the top thereof and along edge **18** at the bottom with the fingers of the other hand being employed to deflect prongs **19** in the relatively deflectible portion thereon to disengage free end **20** from under projection **21**. In some embodiments all of the prongs may be disengaged at one time by a strong pull or a succession of strong pulls opposite the prongs on a plurality of the sheets **11** in a direction away from spine **13**.

It will be apparent to those skilled in the art that the basic structure of the binder of FIGURES 2 and 3 may be formed by a plastic extrusion process. The spine **13** and the portion that would be employed to form prongs **19** would be extruded as a continuous length substantially

in the shape illustrated in FIGURE 3. After extrusion lengths would be cut to form each binder with the portions intermediate prongs 19, and the portions from the prongs to each end of the binder being cut away to define the prongs. The plastic employed would be chosen to meet the particular application and could be a vinyl plastic, polystyrene, buterate, polyethylene, etc. For bindings which have to be used frequently for addition and removal of sheets, preferably a plastic would be chosen that does not tend to "creep" or take a permanent set under a deforming stress. Since prong 19 is to have an undeformed shape substantially as illustrated in FIGURE 3 and since during most of its useful life it will be bent into the shape illustrated in FIGURE 2, it would be undesirable to have a plastic deform permanently to the FIGURE 2 shape.

The embodiment of FIGURE 4 illustrates an alternative that could be made by the plastic extrusion process as described or could be made by suitable metal forming operations. In this embodiment a curved spine 30 has a reentrant portion 31 which forms a guide to receive a labeling slide 32 or the like. At one side is a base edge 33 from which prongs 34 project. At the opposite side of spine 30 is a projection 35 under which the free end 36 of prong 34 is engaged to form a ring. When the free end 36 is disengaged from projection 35, the prong moves to the undeflected position illustrated in dotted lines in FIG. 4.

Again, the prong is of varying rigidity with the greatest rigidity existing in the portion thereof adjacent base edge 33. This might be achieved in several ways, one alternative being illustrated in FIGURES 5 and 6 and another alternative being illustrated in FIGURES 7 and 8. In FIGURES 5 and 6 the cross-sectional thickness of the prong as measured in the plane of the prong decreases from the relatively thick prong of FIGURE 5 to the relatively thin prong of FIGURE 6 adjacent the free end 36 of the prong, In FIGURES 7 and 8 the prong is of a channel shape with the legs of the channel decreasing in thickness from the portion adjacent base edge 33 to the free end 36 of the prong. Other shapes for obtaining the varying rigidity of the prong 34 will be apparent to those skilled in the art.

The foregoing description of a specific embodiment is for purposes of complying with 35 U.S.C. 112 and should not be construed as imposing unnecessary limitations unto the appended claims. For example, the projections 21 and 35 could be a series of individual projections, one at each prong, rather than a continuous projection running the length of the binder.

I claim:

1. A binder for a plurality of sheets having perforations therethrough adjacent one edge thereof, said binder comprising: an elongated spine having a pair of edges, one at each side thereof; and spine having an undercut along one of said edges; and a plurality of curvilinear deflectible prongs affixed to the other of said edges and extending to a terminus beyond said one of said edges, each of said prongs having a cross-section configuration such that the prong is more rigid to deflection in the plane of the prong in the portion thereof adjacent said other edge than in the portion adjacent said terminus, said prong in its undeflected position extending to beyond and outside of said one edge whereby in said undeflected position said prongs may be slipped into said perforations of said sheets to put the sheets on said binder and thereafter said prong may be deflected with said terminus being latched within said undercut to hold said sheets on said binder.

2. A binder for a plurality of sheets having perforations

therethrough adjacent one edge thereof, said binder comprising: an elongated spine having a pair of edges, one at each side thereof; a plurality of curvilinear deflectible prongs affixed to one of said edges and extending to a terminus outside and beyond the other of said edges, each of said prongs having a cross-sectional configuration such that in the plane of the prong the prong has a greater strength in the portion thereof adjacent said one edge than in the portion adjacent said terminus, the width of said prongs as measured transverse to said plane being substantially constant between said one edge and said terminus; and means to releasably engage said terminus at the other of said edges.

3. A binder for a plurality of sheets having perforations therethrough adjacent one edge thereof, said binder comprising: a plurality of curvilinear deflectible prongs, said prongs being of generally U shaped configuration, said prongs having a cross-section such that in the plane of the prong the prong has a greater rigidity in the portion adjacent one end thereof than in the portion adjacent the other end thereof; and an elongated spine having a base extending the length thereof to which base said one end of the prongs are affixed with the prongs extending outwardly to a side in the direction generally normal to the length of said spine, said spine along the edge thereof opposite said base having a projection extending outwardly in the same general direction from said spine as said prong extends, the distance between said base and said projection being less than the distance between said ends of said prong whereby in the free position said other ends of said prongs extend beyond said projections to enable said prongs to be inserted through said perforations and thereafter said prongs may be deflected to engage said other ends thereof under said projections to retain said sheets on said prongs.

4. A binder for a plurality of sheets having a plurality of perforations therethrough adjacent one edge thereof, said binder comprising: an elongated spine having a pair of edges, one at each side thereof; said spine having an undercut along one of said edges; and a plurality of curvilinear deflectable prongs affixed to the other of said edges and extending to a terminus beyond said one of said edges, each of said prongs being substantially greater in length as measured along the longitudinal axis thereof than is the thickness as measured parallel to a plane within which said axis lies and than is the width as measured along a line normal to said plane, said thickness of said prongs being the greatest in the portion of the prong adjacent said other edge and being the smallest in the portion of the prong adjacent said terminus, the thickness of said prong being tapered between said portions, said thickness and width being about equal in the portion of the prong adjacent said other edge and of a size to be received in said perforations, said prong in its undeflected position extending to beyond and outside of said one edge whereby in said undeflected position said prong may be slipped into said perforations of said sheets to put the sheets on said binder and thereafter said prong may be deflected with said terminus being latched within said undercut to hold said sheets on said binder.

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