May 24, 1966 F. S. SCHADE 3,252,461

LOOSE LEAF BINDER CONSTRUCTION

Filed April 6, 1964

Fig. 1.

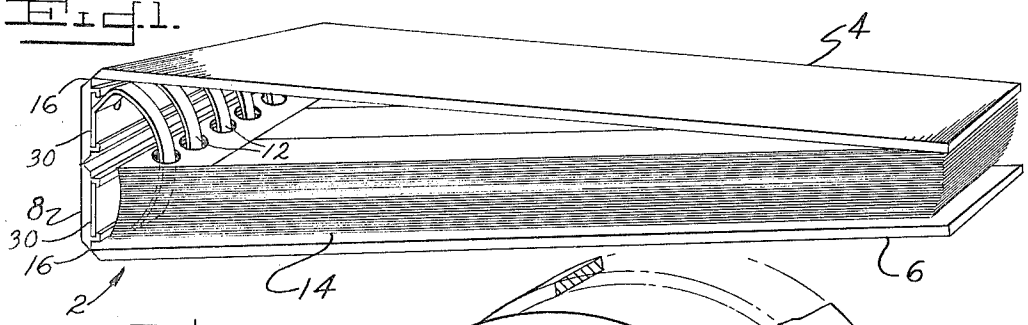


Fig. 2.

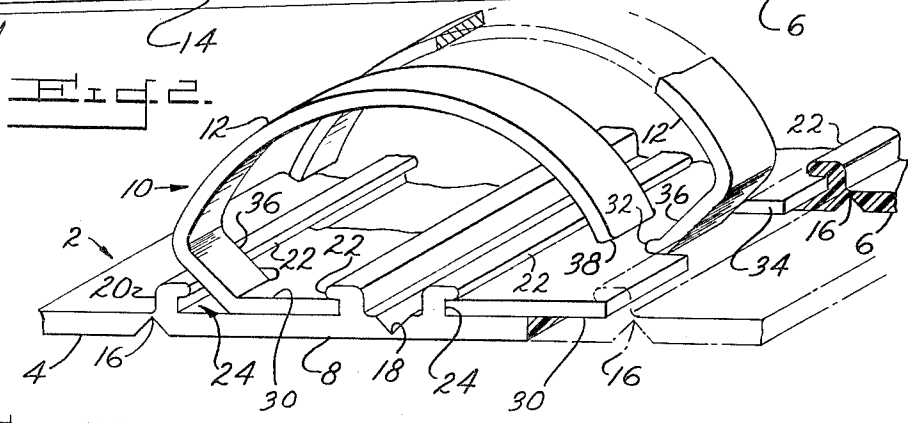


Fig. 3.

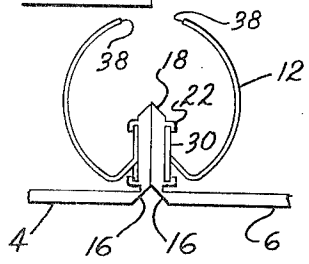


Fig. 4.

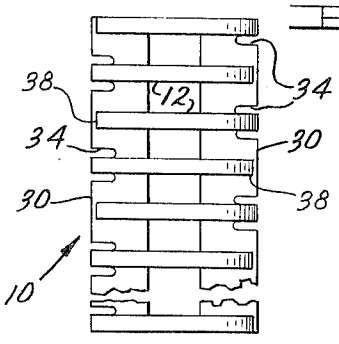


Fig. 5.

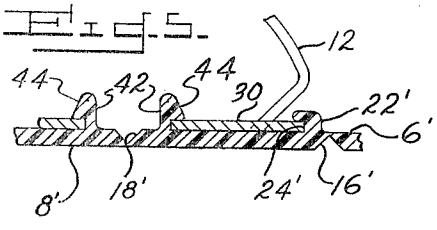
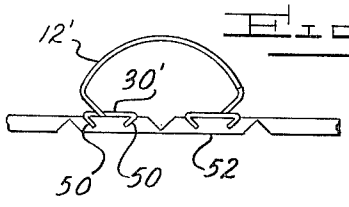


Fig. 6.



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3,252,461

LOOSE LEAF BINDER CONSTRUCTION

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6 Claims. (Cl. 129—17)

This invention relates to loose leaf binders, particularly of the ring or prong wire type and also to cover constructions for loose leaf binders and the like.

An object of the invention is to form a cover construction for a binder assembly from an integral sheet of plastic material such as polyethylene, polypropylene, or the like which can be extruded or otherwise formed with provision for integral hinging portions and integral holding or retaining means on which sheet-holding binder "metal" can be easily mounted to complete a finished assembly.

A related object of the invention is to utilize the above mentioned type of plastic sheet material, which is readily available to the trade, for making a relatively inexpensive yet extremely attractive cover element to be fitted with ring metal of a simplified yet novel character. The metal combines with the cover to furnish a unique and attractive unit.

Another specific object of the invention is to provide hingedly related back and cover panels in a single plastic sheet with the back panel divided into hingedly related half sections with each half supporting a special loose leaf wire binder element. The entire assembly thus comprises but three parts. Loose leaf pages may be inserted or removed from ring or prong wires by folding the half sections of the back panel against each other. The binder has some characteristics of the "ring" type, the "prong" type and the "break-back" type of binder as will be understood by those skilled in the art. In this respect the nearest prior art known to me is Patent No. 2,071,767 of Febraury 23, 1937, to John Schade.

The above and other objects and advantages of the invention will be apparent from the following description of several examples thereof as shown in conjunction with the accompanying drawings, in which,

FIG. 1 is a perspective view of an assembled binder embodying the invention;

FIG. 2 is a fragmentary perspective view on a greatly enlarged scale showing the hinged relation of back and cover panels of the unit of FIG. 1 with the back panel having ring or prong type metal elements assembled therewith;

FIG. 3 is an end edge view on a reduced scale showing back panel sections folded against each other for a ring open position;

FIG. 4 is a plan view of a pair of ring metal elements which are shown assembled in the unit of FIGS. 1–3;

FIG. 5 is a fragmentary sectional view showing a modification of holding means formed in the back panel sections for retaining the ring elements; and

FIG. 6 is a fragmentary end edge view of a further modification of the back panel sections.

Referring to FIG. 1 and FIG. 2 an assembled binder unit is shown with the front and rear panels of a cover member, generally designated by numeral **2**, being indicated at **4** and **6** with back panel **8** therebetween. Associated with back panel **8**, which is provided with holding means as will be described, is a sheet holding assembly indicated generally by numeral **10** and having flat ring wires **12** on which a filler pack of sheets **14** are mounted between covers **2** and **4**. In its outward appearance the assembled binder looks much like a conventional loose leaf ring binder.

As best indicated by FIG. 2 a preferred form of the invention comprises but three parts; cover **2** formed from

a single sheet of plastic material and a pair of identically formed ring-wire bearing plate members mounted in holding means integral with the back panel.

Cover member **2** comprises an integral plastic sheet, preferably polyethylene or polypropylene or the like, which can be supplied with varying degrees of stiffness depending in some respects on the thickness of the particular sheet. Preferably, the thickness is such as to simulate a stiffly flexible cardboard type of book or binder cover and the material may be made with various attractive surface colorations and textures as is well known in the art. As will be apparent later in the description, the degree of sheet thickness particularly in the area of the back panel is also determined somewhat by the degree of stiffness and stability required in order to impart sufficient gripping power for the holding means to retain the sheet-holding metal elements assembled on the back panel.

Back panel **8** is defined by a pair of spaced parallel hinge portions indicated at **16**. Portions **16** are provided in the sheet material of the cover by depressed linear areas, here shown as V-shaped grooves formed in the outer surface of the cover member. These hinging areas are formed either by originally extruding a sheet with grooves, or alternatively, the grooves may be pressed out in a sheet with suitable tools. In any event, the reduced cross section along each hinge line **16** connects the panels at the inner side of the sheet. Between the portions **16** and centrally of the back panels is an intermediate hinge portion at **18**, this portion being formed by a groove in the inner wall surface so that the connecting wall is at the outer side of the sheet.

This arrangement of hinge line portions divides the back panel **8** into separate, hingedly related, half sections. On the inside wall of each half section are parallel upraised portions **20** having inwardly projecting edges or lips **22** at the top to provide laterally faced grooves or recesses **24** extending along each side of the half sections. The oppositely facing channeled recesses **24** constitute a holding or retaining means for the binder "metal" elements and preferably extend from the top to the bottom edges.

Held in the facing channels **24** of each half section are the edges of plate or base portions **30** of a pair of binder wire elements. These separate elements are seen in FIG. 4 in plan view. Each element may be identically formed from a flat bank of sheet metal, the ring members being cut in the flat with the inner end at **32** (FIG. 2) being inwardly of the edge of plate **30** by virtue of indented portions as at **34** on each side of the inner end **32**. At its inner extremity at **32** the wire is first bent upwardly from the flat and outwardly to extend as far as the vertical projection of the outer edge **30** of the plate to provide an inner wire portion **36**. The wire is then turned inwardly in arched fashion to form the wire ring or prong portion **12**. The prongs **12** of each plate, when assembled on the back panel sections, overlie the back panel and terminate at their free tip ends **38** upwardly of the outside edge of the opposite plate **30** and approximately in alignment with the upper ends of the inner portions **36**. As shown by FIG. 2 and FIG. 4 the wire prongs **12** of each plate are preferably located in staggered relation to the wire of the other plate.

As will be apparent the plates **30** may be slidably inserted in the grooves **24** by endwise movement. As will be appreciated, plate **30** may be diminished to fit tightly in the grooves **24** and once inserted to be held by a tight frictional grip.

As will also be appreciated the plastic material is stiffly flexible and accordingly the plate may be set edgewise in one groove **24** and the other edge snapped into the opposite groove by flexing the lip **22**.

In FIG. 5 a modification of the recessed holding means is shown to facilitate this method of assembly. In this

view corresponding portions of the cover member are indicated by prime numerals and the inner upraised portions at 42 on each half of the back panel are shown with enlarged top sections formed with an inclined cam surface or nose 44. In this form the inclined nose 44 enables the outer edge of plate 30 to be tucked into groove 24' and the inner edge to be pressed downwardly against nose 44 and snapped into place by a latching action. This modification contributes to the ease of assembly of a finished binder.

Still another form of holding means is illustrated by FIG. 6. In this modification the back panel 52 is provided with diagonally slotted grooves or recesses 50. The grooves 50 of each half section of panel 52 are in spaced divergently angled relationship. The edge portions of the plate members 30' of the binder elements are turned downwardly and inwardly angled to fit into the slots and thus be retained in the assembly. In this form the overall thickness of the back panel is the same as that of the cover panels so that a sheet of plastic material of uniform thickness throughout may be used for this modification. The degree of thickness required is that which will allow a sufficient depth for the slots and insure adequate gripping power but without affecting the self-sustaining character of the panel sections. The prong arrangement of the plate members and the hinge arrangement of the cover members is the same as described in connection with FIGS. 1–4, the prongs being arched on a center of curvature approximately coinciding with the intermediate hinge portion.

Referring now to FIGS. 2 and 3 the operation of the binder will be seen with respect to inserting and removing loose leaf sheets. Briefly the half sections of the back panel are swung on hinge line 18 to lie one against the other so that the offset inner ends 38 of prongs 12 of opposing plates 30 are spaced apart from one another. The free ends are thus separated for passing the perforated binding margins of the sheets therebetween and the sheets may be taken off or placed on the prongs of either plate.

When the back panel sections are returned to the position of FIG. 2 the sheets on the prongs 12 of one plate will then receive the prongs 12 of the other plate. Since each plate is supplied with a plurality of prongs the perforations at the inner edges of the sheets will be more or less positionally maintained for readily receiving the tip ends 38 of the prongs of the other plate as the half sections are swung back into coplanar relation as in FIG. 2.

It will be noted that with the connecting wall portion of the hinge line 18 at the outside of the panel 8 and the connecting wall of hinge lines 16 at the inside, the half sections of the back panel tend to remain in the position of FIG. 1 or FIG. 2 unless a deliberate attempt is made to "break" the back panel on hinge line 18. This tendency of the back panel to remain in flat coplanar condition is also assisted by the flat arch of the wire prong formation and frictional resistance of the sheets against withdrawal of either set of prongs from the perforations. It will be noted particularly that when the cover is laid flatly against a table surface, as in the position of FIG. 2, the hinging connection 18 is below the plane of a line connecting the hinge connections 16. Thus the hinge line 18 must be brought upwardly "over the center," in a manner of speaking, before having any real freedom to travel to the position of FIG. 3. Coupled with the frictional resistance of the sheets on prongs 12 there is thus no tendency for the back panel to "collapse."

It will also be appreciated from a consideration of FIG. 2 that in manipulating the binder to the "open" position of FIG. 3 that the hinge line 18 may first be slightly raised to an "over the center" position by working the hinge from the top and bottom of the back. Then by grasping the covers at each side and shoving inwardly from each side the back panel will be folded to the position shown by FIG. 3. Alternatively, the back panel may be slightly "cracked" by pushing it against a pencil, or the edge of a table, and then shifting it to a flat surface and shoving inwardly on the cover panels. In closing the prongs, the covers are simultaneously pulled outwardly to swing the back panel sections into coplanar relation.

The loose leaf binder as described is a sturdy inexpensive unit of attractive appearance. The integrally formed cover member of polyethylene or the like provides along the hinge lines 16 and 18 a tough wear-resistant hinge area well able to withstand the opening and closing action just described. The novel unitary sheet holding prong elements made from sheet metal stock have no moving parts nor is any precision fitting necessary for proper operation. The assembly has an outward appearance of conventional binder units of this type and with its simplified construction is a more durable longer lasting article.

What is claimed is:

1. Loose leaf binder structure comprising a single sheet of stiffly flexible plastic material divided into a pair of cover panels and a back panel with bendable integrally formed parallel hinge line portions of reduced sheet thickness interconnecting said panels, a similarly formed parallel hinge portion dividing said back panel into hingedly related half sections, the sheet material of each said back panel section being integrally formed with a pair of spaced oppositely directed grooves at the inside face thereof, and a rigid plate on each half section having side edges engaged in the grooves thereof, and a series of loose leaf sheet-holding prongs bent upwardly from the material of each plate and arching inwardly over a major portion of the width of the back panel, the prongs of one plate being in staggered offset relation to the prongs of the other plate and the free ends thereof being spaced apart when said back sections are folded against each other on the hinge portion of said back panel.

2. The structure of claim 1 in which the hinge portions interconnecting said covers to the back panel are adjacent the inside wall of said sheet and the interconnecting hinge portion dividing said back portion is adjacent the outside wall thereof.

3. The structure of claim 1 in which the said oppositely directed grooves of said back panel sections are provided in enlarged portions upraised from the inner surface of the sheet along opposite sides of the sections and said portions extend from the top to the bottom ends thereof.

4. The structure of claim 3 in which one of said upraised portions of each back panel section is provided with an inclined surface at the upper edge of said groove and serves as a cam surface for pressing the edge of said plate thereagainst and snapping into the groove..

5. In combination a loose leaf binder cover member comprising a single sheet of stiffly flexible plastic material having a pair of spaced bendable parallel hinge portions of reduced wall thickness defining front and rear cover panels and a back panel hingedly related thereto, said back panel having an intermediate parallel hinge line portion of reduced thickness defining hingedly related half sections, and, at the inner surface of said half sections grooved holding means, and a pair of identically formed sheet holding elements on each half section, each element comprising a metal plate member having its edges engaged by said grooved holding means and adjacent the outer edge portion provided with integrally extending prong members bent upwardly and outwardly from the metal of the plate at a location inwardly of its outer edge to overlie the outer plate edge, and then bent reversely and upwardly arched to extend over said back panel, the prongs of one plate being in offset staggered relation to the prongs of the other plate, the center of curvature of said arched prong portions

being approximately at the hinge line portion between said half sections of the back panel.

6. The structure of claim 5 in which said grooved holding means are diagonally slotted recesses in spaced divergently angled relationship extending from the tops of said half sections to the bottoms thereof.

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JEROME SCHNALL, *Primary Examiner.*