Feb. 25, 1930. A. M. MARTIN 1,748,236

BOOK COVER

Filed Oct. 1, 1927

Fig. 1

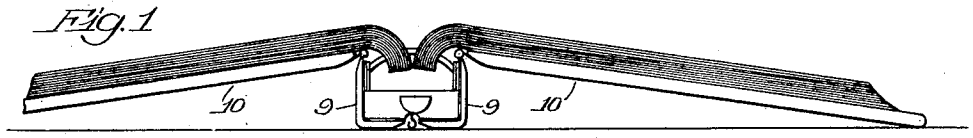


Fig. 2

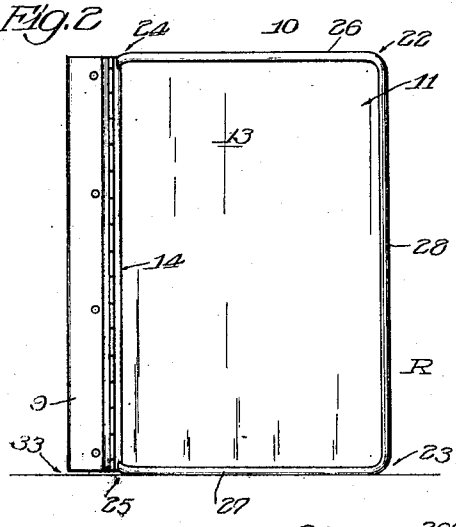


Fig. 4

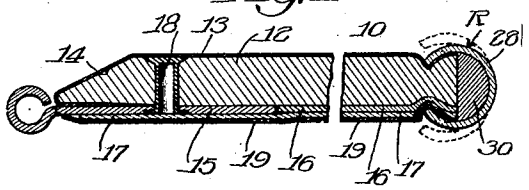


Fig. 5

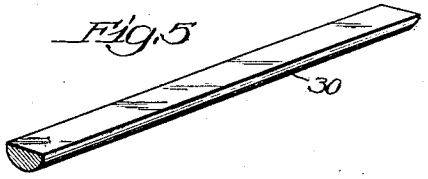
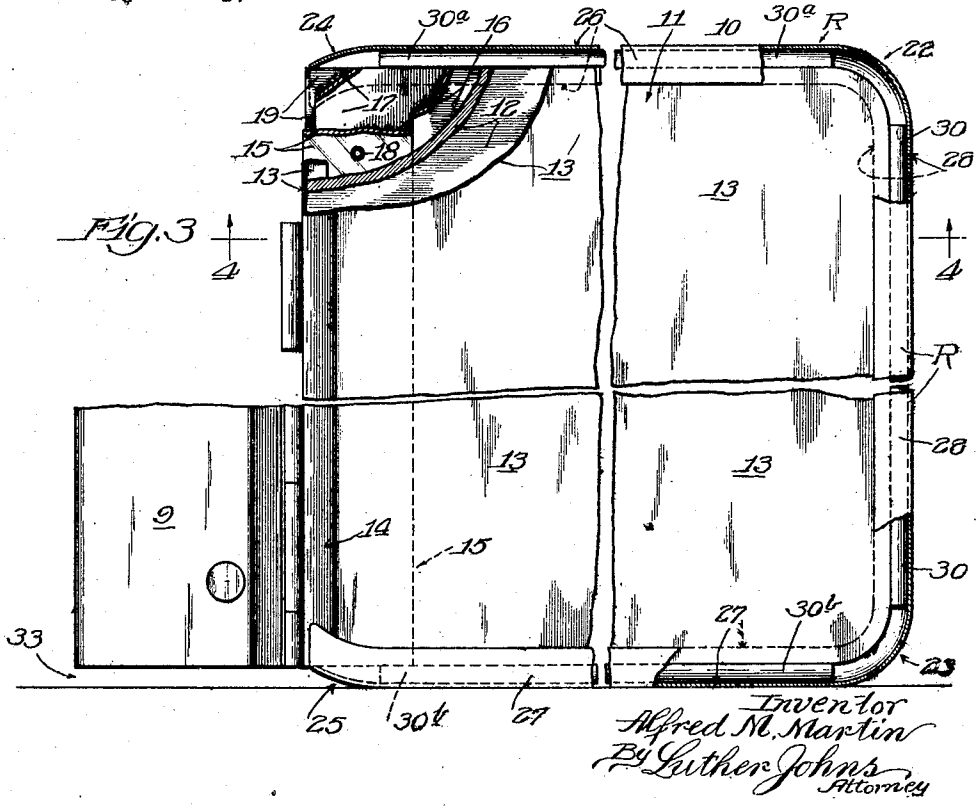


Fig. 3



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UNITED STATES PATENT OFFICE

ALFRED M. MARTIN, OF CHICAGO, ILLINOIS

BOOK COVER

Application filed October 1, 1927. Serial No. 223,276.

These improvements relate to lids or covers for books. An important application of the invention is to large-size loose-leaf binders having prongs or other means for holding the sheets. My Patent No. 1,269,479 of June 11, 1918 shows a binder adapted to accommodate many series of sheets with the sheets of each series in overlapped relation. In such binders the accumulated thickness and corresponding weight of the middle portion of the mass of sheet material impose unusual strains upon the middle portions of the lids or covers in handling and especially upon the marginal portions of the covers not supported by the sheet material within. To provide covers for the large-size and heavy books or binders which will withstand the hard usage imposed on them and retain their normally flat shape against warping and such unusual strains has proved a difficult problem and one which many persons have sought to answer and in various ways. In my copending application filed January 31, 1927 as Serial No. 164,692 on book covers I have shown how the desired results may be attained to a notable extent. The present improvements provide an unusually strong and durable cover and one which though forced awry or out of its normal plane from time to time during long-continued handling with spring back and maintain its normally plane character or shape. One feature of improvement is in a construction involving a metal binding which will not mar furniture, such as the table top on which the book or binder is placed during normal usage. Other objects and advantages will appear hereinafter.

In the drawings Fig. 1 shows in end view and in open position a book-type binder having lids or covers of the present invention applied thereto; Fig. 2 is a side view of such a binder closed; Fig. 3 is an enlarged fragmentary and partially broken-away side view of the binder of Fig. 2 in corresponding position; Fig. 4 is a further enlarged sectional view of the cover as on the line 4—4 of Fig. 3; and Fig. 5 is a perspective of one of the reinforcing members shown sectionally in Fig. 4.

The lid or cover 10 comprises first a rectangular body of flat sheet material denominated 11 as a whole in Figs. 2 and 3. This body may be variously constructed. It is common to make such a body of laminations of cardboard, fibre, etc. or of single sheets of material. An advantageous construction of the plate-like body 11 when employed with other features shown herein is illustrated in Figs. 3 and 4. There is first a strong sheet of cardboard material 12 which may be say three-sixteenths of an inch thick for the larger books. This sheet 12 is covered by an outer finishing sheet 13, which may be of cloth or of any other suitable surfacing material. The main sheet 12 is beveled at its inner edge portion 14 according to common practice and the surfacing sheet 13 is shown as passing around the beveled inner edge of the sheet 12. Next in order is the hinge leaf 15 extending along the inner edge portion of the cover adjacent to the associated back member 9. A cardboard sheet 16 of the thickness of the hinge leaf abuts and terminates at the hinge leaf and covers the rest of the normally inner surface of the main sheet 12. Another lamination 17 of thin cardboard covers the hinge leaf and the sheet 16 and incidentally covers the inner heads of the rivets as 18 holding the hinge leaf upon the main sheet 12. Then follows the inner surfacing sheet 19, usually of paper. These laminations are glued one upon another and tightly compressed in the usual way.

Tightly crimped upon the three outer marginal edge portions of the body 11 is a continuous metal binding rim R, preferably circular in cross view, having rounded corners at 22 and 23 and having its inner ends, normally adjacent to the back members 9, turned inward at 24 and 25. This outer binding frame, merely as a tubular frame, and with-

out the inturned ends at 24 and 25, is shown in my said copending application, of which this application is a division with respect to the rim.

Fig. 4 shows the cross-view shape of this rim member R. It may be formed by preliminarily rolling flat stock such as cold rolled steel of about 20 gauge into a somewhat tubular form but with the edges spaced apart sufficiently to admit edge portions of the body 11 thereinto. The dotted lines of Fig. 4 show this preliminary stage. The next operation is to bend the formed strip into a substantially U-shaped member having corners at 22 and 23 rounded in the plane of the cover and also inwardly-directed rounded ends at 24 and 25. The rim thus formed comprises an upper member 26, a lower member 27, and a side member 28. The body as 11 is then inserted between the upper and lower rim members 26 and 27 and then the rim may be crimped tightly upon the sheet material as shown by Fig. 4.

The present improvements contemplate that for large-size books reinforcing, as the strips 30, 30^a and 30^b will be employed, but the rim formed from a single piece of any appropriate metal, with rounded corners at 22 and 23 is a notable improvement over binding rims heretofore suggested, and the inturning of the ends at 24 and 25 in the plane of the cover makes for a still further improvement.

For the large-size covers I have found that even the continuous frame of 20-gauge cold-rolled steel has not the required characteristics for the heavy and repeated strains imposed. For such covers I add strong and springy reinforcing material, preferably in the half round strip form of Fig. 5. In assembling the parts including the reinforcing as 30 the body as 11 is inserted between the upper and lower rim members 26 and 27 until the side edge of the body is a short distance from the entrance to the side rim member 28, and at this stage the reinforcing element 30 is inserted in the frame member 28 to occupy its relative position shown by Fig. 4, and then the rim and body are further telescoped together until the body abuts the reinforcing element 30 as shown in Fig. 4.

The next operation is to insert similar reinforcing strips marked 30^a and 30^b in the rim members 26 and 27 respectively. These may simply be forced in from the free ends of the rim, the upper and lower rim members being sprung apart slightly to facilitate the operation. In all instances the reinforcing members 30, 30^a and 30^b are continuous strips reaching from one rounded part of the rim member to the other, as well illustrated in Fig. 3.

The next operation is to crimp the rim upon the plate-like body. This is most conveniently done in a press having suitable dies, and all as a single operation. When so crimped the material of the body is indented, as shown in Fig. 4, and the rim is thus very tightly and securely held upon the body. At the same time the reinforcing as 30, Fig. 4, preferably having the half-round shape of the hollow interior in cross view, is very tightly bound within the rim.

The reinforcing material as 30 is in strip form having substantial width in directions at right angles to the plane of the cover as a whole. For the best results it should be of highly springy material, for example, steel of the kind used for making slender fishing rods.

There are particular reasons for the rim construction thus described. It might be suggested that the hollow rim be made of heavier material to give it additional strength. The objection to that is that such a heavier rim would have to be objectionably large in diameter to permit of the rolling and crimping operations. If made of lighter and more springy stock than commercial cold-rolled steel there would be difficulty in obtaining the proper crimping effect, due to the springiness of the metal, and there would be a further objection due to the want of sufficient metal in the rim to withstand the knocks and bumps received in use. After many experiments with many different kinds of metal suitable for the purpose I have ascertained that the cold-rolled half-hard steel of about 20-gauge is most suitable for the rim in view of the manufacturing requirements as well as those of wear. Such a mere rim, however, is likely to develop a permanent distortion out of the normally flat plane of the cover in the larger-sized books or binders, particularly when of the kind having a heavy mass of sheet material in the middle of the book. The book is almost necessarily handled by grasping it around marginal portions of the opposed covers, bending them toward each other, particularly at the top and bottom portions where the sheet material between the covers is not as thick as it is in the middle. By inserting the strong and resilient reinforcing members 30, 30^a and 30^b means are provided for maintaining the covers in their normally flat shape, for although the covers will be sprung out of the plane, even with the reinforcing strips therein, yet the nature of the construction is now such as to restore the cover to its flat shape. Of course it would be possible to give even the cover of this disclosure a permanent set, but the ordinary strains upon them in practice are not enough to do so. Without the reinforcing the objectionable permanent set awry does not occur at any one time but as a result of many repeated strains, each one leaving a minute distortion. According to the present improvements the rim is so strengthened as to reduce the temporary deformation and,

furthermore, the elastic limit of the parts is increased owing to the resiliency of the reinforcing strips.

It would be a marked improvement if a reinforcing strip were applied to any one of the three rim members, especially to the side rim member 28, but the best results are had when it is applied to all three as shown.

The present construction may be employed without sacrificing the advantages of lightness of the cover as a whole. Indeed I am thus able to produce a cover having the advantages herein pointed out which is even lighter than covers heretofore found necessary to withstand ordinary usage and which, notwithstanding, suffer greatly from the deforming strains.

An important feature of improvement is in the inward rounding of the ends of the rim at 24 and 25 in the plans of the cover, whether the reinforcing is used or not. This inward rounding has several important functions. In the first place it strengthens the rim where the rim is crimped tightly upon parts including the hinge leaf 15, and since the weight and strains of the mass of sheet material and the book as a whole is communicated to the covers through the hinge lugs this feature of diverting these strains to a large extent to the rim is a valuable and important one. Another advantage of this construction is that there is thus produced rounded surfaces where the rim comes upon the table top as illustrated in Fig. 3, and the table top is saved from being marred by the contact. The rounded construction at these places also feels better in the hands of the user, and it also gives the cover a better appearance.

The cover as a whole is peculiarly pleasing in appearance and in handling. The circular shape of the rim in cross view provides smooth surfaces which do not mar furniture, which is true also of the rounded corners at 22 and 23. The rounding of the corners at 22 and 23 taken with the continuous formation of the rim provides a peculiarly strong corner where the shocks are often very severe, and the cover is thus saved from the breakage and "mushy" character of the corner portions so common in ordinary practice. Heretofore it has been common practice to apply to the lids separate metal corner pieces in order to overcome the serious objections referred to; but such corner pieces have not met the requirements since the corners would break off or bend bodily and in practice sharp edges and projections were presented at the joints, especially after some bending or breaking effects.

In binders of the kind herein referred to it is customary to have the lids extend slightly beyond the back members as 9 to protect these back members. This construction is indicated by the space at 33 between the back member as 9 and the horizontal support. In such a binder the rim R is peculiarly important in the safety it provides against the "mushy" condition so commonly found in the lower edge portions of the lids due to the impacts of handling. The rounding of the inner ends of the rim at 24 and 25 is therefore at somewhat exposed portions of the lid and avoids the occurrence of sharp elements at these places likely to cause damage.

I contemplate as being included in the present improvements all such changes, variations and departures from what is thus specifically illustrated and described as fall within the scope of the appended claims.

I claim:

1. A substantially rectangular book lid or cover comprising substantially stiff sheet material, with a metal binding rim having its three members tightly crimped upon and around each of the three outer marginal edge portions of the sheet material, and with a strong and springy reinforcing element extending longitudinally of and held tightly within at least one of the members of said binding rim.

2. A substantially rectangular book lid or cover comprising substantially stiff sheet material having tightly crimped upon and around the three outer marginal edge portions thereof a continuous and hollow metal rim continuously open inwardly to receive said sheet material, said rim comprising a side member, an upper member and a lower member, with strong and springy reinforcing material in strip form extending longitudinally of and tightly held within the hollow interior of each of said members.

3. The combination of claim 2 hereof in which the metal rim is substantially circular in cross view and the corners thereof where the upper and lower members respectively join the side member are rounded in the plane of the cover, and the respective end portions of the upper and lower members normally adjacent to the back of the book are turned inward in the plane of the cover.

4. The combination of claim 2 hereof in which the metal rim is substantially circular in cross view and the corners thereof where the upper and lower members respectively join the side member are rounded in the plane of the cover, and the reinforcing material is of springy metal and is substantially half-round in cross view, extends continuously approximately from end to end of each rim member, and tightly occupies approximately one-half of the hollow interior of each rim member in cross view, the sheet material abutting the reinforcing material throughout the respective lengths of the reinforcing material.

5. A book lid or cover comprising a body of sheet material and a metal marginal binding crimped tightly thereon with the ends of the metal binding normally adjacent to

the back of the book turned inward in the plane of the cover to effect a rounded termination of said end portions.

6. A substantially rectangular book lid or cover of substantially stiff sheet material having tightly crimped around the three outer marginal edge portions thereof a rim formed from a single piece of metal, the rim being of rounded contour in cross view and being rounded in the plane of the cover at the corners thereof where the several members of the rim join adjacent ones thereof, the end portions respectively of the rim being rounded inwardly in the plane of the cover.

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