Aug. 24, 1948. J. SCHADE 2,447,775

BINDER MECHANISM

Filed July 15, 1944 2 Sheets-Sheet 1

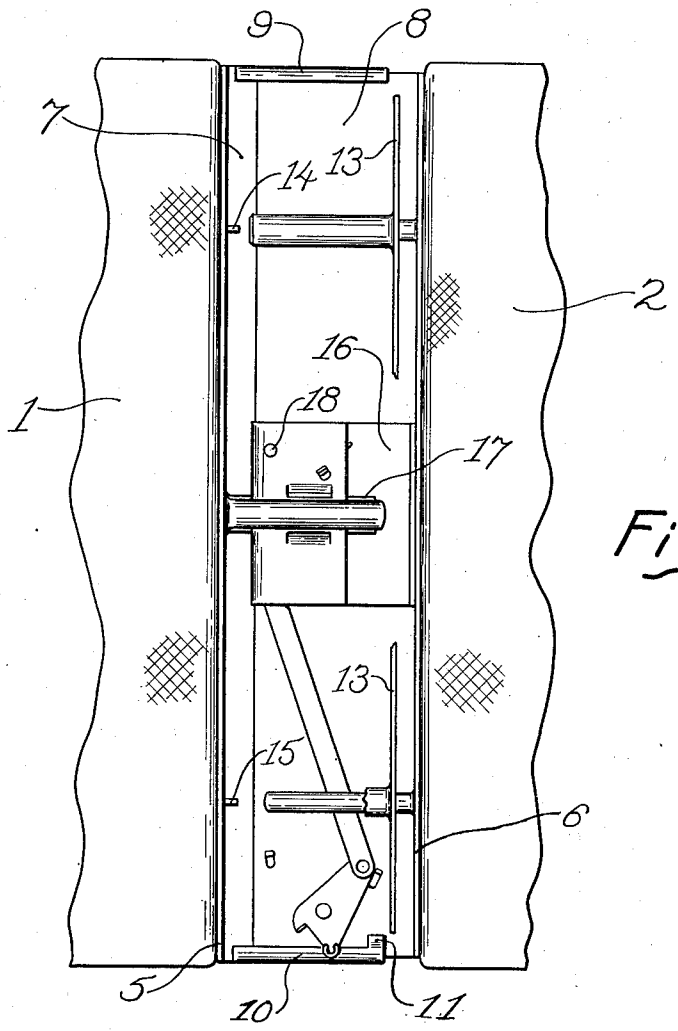


Fig. 1

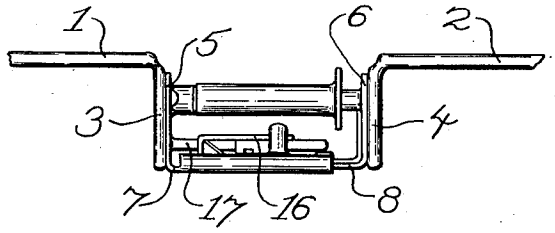


Fig. 2

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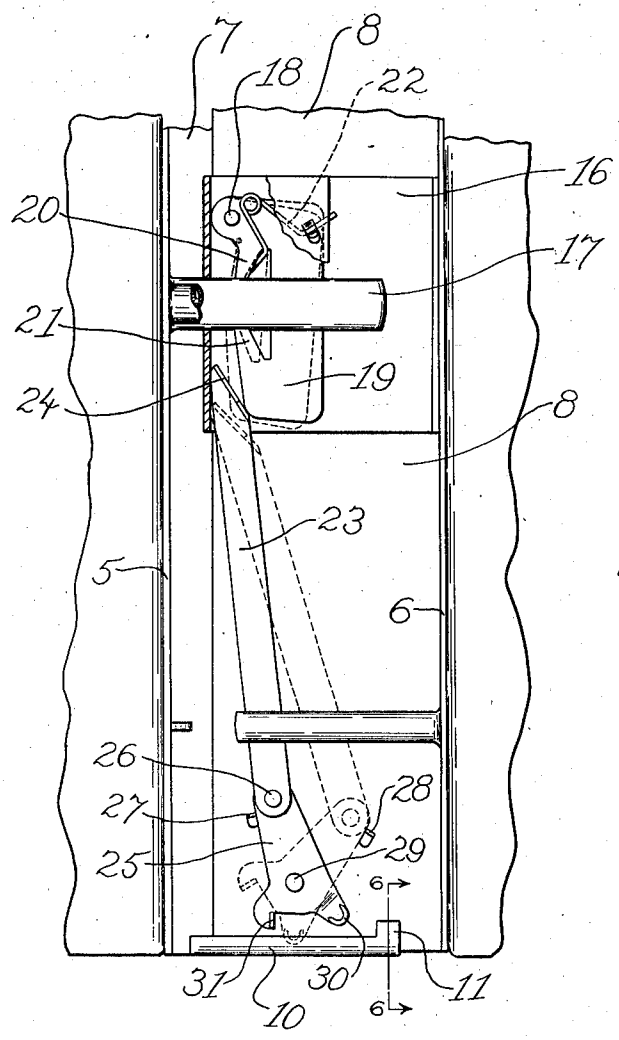


Fig. 3

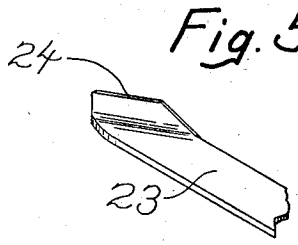


Fig. 5

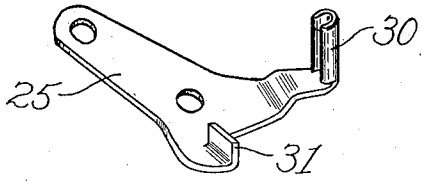


Fig. 4

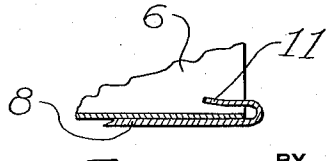


Fig. 6

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UNITED STATES PATENT OFFICE

2,447,775

BINDER MECHANISM

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Application July 15, 1944, Serial No. 545,116

1 Claim. (Cl. 129—13)

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This invention relates to loose leaf binder construction. It is an improvement of the construction shown in my Patent #2,320,102 of 1943. Such patent shows the nearest prior art known to me.

The purpose of the improvement is to provide a better mechanism, one more convenient for the user, to operate the binder. The construction in said patent shows the two-part back panel provided with a clutch. It operates automatically to permit movement for overlapping the back panels to an increasing degree and to prevent separation to any degree until the clutch is manually set out of clutching position. An inconvenience in the prior structure is its requirement that the user must not only set the clutch out of clutching position but also reset it to clutching position by a separate hand operation. If the latter is not understood or forgotten by the user he meets a difficulty or inconvenience. He must figure out what the trouble is or give more attention to the operation than is desirable from the ordinary user's standpoint.

The particulars of the improved construction are disclosed in the drawings and description.

Fig. 1 shows a plan view;

Fig. 2 shows an end view of the asssembled binder in commercial form but with covers cut away to save space;

Fig. 3 is a detail view in plan showing parts of the back panel, the clutch mechanism with the top wall of its casing removed, the center post removed, and the parts which operate in relation to the clutch so as to better consider the way of operating the mechanism;

Figs. 4 and 5 are detail views of parts of a toggle mechanism; and

Fig. 6 is a section on line 6—6 of Fig. 3.

The binder, apart from the clutch mechanism, is shown as consisting in covers 1 and 2 with hinged flanges 3 and 4. The latter overlie and are fastened to upstanding flanges 5 and 6 on the back panel parts of metal. The pack panel is made of sheet metal plates 7 and 8, one overlapping the other. They are adapted to slide transversely of the back to adjust for binder thickness. The lower one 7 has its upper and lower margins 9 and 10 bent over to provide narrow grooves. The end margins of plate 8 are adapted to enter and be guided by these grooves. A tongue 11 on the grooved margin 10 is used in an operation for the clutch, as will be explained. The flanges 5 and 6 are integral with plates 7 and 8 respectively and the portions 9 and 10 are bent portions of plate 7. It is clear that the

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cover parts and the back panel parts are of the easily constructed inexpensive kind.

The flange 5 has fastened on it, a centrally arranged post near its top edge. Flange 6 has two spaced posts fastened on it in positions shown. The plate 13 has two hollow posts fastened to it adapted to telescope on the two posts of flange 6. The idea is to take a pack of sheets or group of catalogs off the posts on flanges 5 and 6 but held assembled on the hollow posts of plate 13, the latter being entirely and easily removable. The arrangement is generally for the same purpose as in my said patent. Little outstanding tongues 14 and 15, bent out of flange 5 are in position to abut the ends of posts on flange 6, entering the hollow posts. It is for keeping alignment and to avoid canting of plate 8 as it pushes on plate 7 up to the limit.

Centrally of plate 8, there is a clutch mechanism having casing 16. It clutches on to the flat prong 17 fastened on flange 5 when the plates tend to slide apart. As in said prior patent the idea is to permit the sliding of the plates together and to prevent them, by the clutch action, sliding apart. The clutch can be manually set to permit plates 7 and 8 to slide apart when desired. The mechanism in the clutch casing 16 may be substantially the same as that shown in said prior patent except for the device to manipulate the clutch and set it in one position or the other, that is to grip prong 17 or to be in releasing position with respect to prong 17.

The clutch mechanism and actuating means for it is best shown in Fig. 3. Its casing 16 is one flat strip, with a flange upstanding for fastening to flange 8, then extending the width of plate 8, then bent slightly upward and back upon itself for the top wall seen in Fig. 1. This top wall is cut away in Fig. 3. A narrow trough-like casing open on three sides is thus provided, considering the trough as lying on its side when positioned as illustrated. The side forming the bottom of the trough has an opening to admit prong 17. The top wall has bent down spaced ears to serve as a guide for the prong, see Fig. 1. Between the top and bottom walls a pivot pin 18 carries a flat lever arm 19. It generally underlies prong 17 but is provided with two prong-like arms 20 and 21 bent upwardly enough for their ends to engage opposite edge sides of prong 17. A spring 22 arranged as in Fig. 3 or in any other suitable manner, constantly tends to swing lever arm 19 clockwise. One position for the lever 19 is indicated in dotted lines and the spring tends to move it to such position. But when prong 17 is

inserted its edges engaging the arms 20 and 21 or the outer one of them, to swing the lever to full line position. This position permits continued inward movement of the prong. But it prevents outward movement because any movement in that direction causes arms 20 and 21 to cramp in binding fashion on prong 17. The harder prong 17 is pulled outwardly the more the cramping effect is. This will be seen by comparing the full and dotted line positions of lever 19 in Fig. 3 or considering the disclosure and description of said patent. The spacing between arms 20 and 21 is for letting prong 17 pass, when in the full line position. When in dotted line position, the diagonal direction across the prong between the ends of said arms is longer than the width of the prong and there is cramping, as lever arm 19 moves toward the dotted from the full line position. In Fig. 3 the dotted line position generally indicates the condition when prong 17 has been removed. The cramping action, to give the clutch function, occurs before the dotted line position is reached. So far as explained the clutch action is substantially the same as in the prior patent.

The means to set the clutch will now be described. It is different from the means in the combination of the prior patent. Slidably resting on the bottom of the trough provided by casing 16 is the cam shaped end of a lever 23, see Figs. 3 and 5. The cam face 24 is movable between the full and dotted positions of Fig. 3. In the former it holds lever arm 19 in position to permit prong 17 to be removed from the clutch without binding. The adjacent corner of arm 19 rests, with its spring pressure, on cam 24 as a stop for such position. In the dotted line position cam 24 permits arm 19 to occupy its dotted line position or tend in that direction. This is the position setting the clutch in condition to receive prong 17 in a one-way movement, an inward movement through the clutch casing, and to prevent an outward movement. Cam 24 is moved between or conditioned for its two functioning positions above stated, by moving lever 23 back and forth. And the lever 23 is part of a toggle mechanism to lock the cam 24 according to the toggle lock principle, in one position or the other.

This toggle mechanism consists in lever 23, pivoted to bell crank lever 25 at 26. Lever 25 is pivoted to plate 8 at 29. It is movable between stops 27 and 28 provided as ears turned up from plate 8. With lever 23 resting at one end on the bottom of the casing trough, spring pressed by arm 19 bearing on cam 24, the toggle mechanism is spring pressed toward either stop 27 or 28. It can be moved between stops by finger piece 30, see Fig. 4.

Considering the full line toggle position of Fig. 3, assume that the binder halves are pulled apart to fully separate plates 7 and 8 in the back portion. It will be seen that the ear 11 on the margin of plate 7 as it travels transversely of plate 8 will strike ear 31 on bell crank lever 25. This ear will be moved enough to move the toggle mechanism, for pivot 26 to cross the line between the outer bearing point of lever 23 and pivot 29. Then being spring pressed the toggle mechanism will move from full to dotted line positions, see Fig. 3.

The operation just described results in an automatic resetting of the clutch in preparation for a reassembly of the binder halves. For example, when the user moves finger piece 30 to unclutch the binder halves, and then pulls them apart he does not need to remember to reset the clutch mechanism when he reassembles the binder halves. This is so because the action of separating plates 7 and 8 results in resetting the clutch mechanism as just above described. This actuator for the clutch and its mode of operation adds a real improvement in the operation of a binder such as shown. Everyone easily understands that the finger piece 31 is used to unlock the binder for separation. But one will frequently forget or not readily see the necessity of and how to reset the mechanism when constructed as in my prior patent. Confusion then follows. But with the automatic operation of resetting as in the combination now disclosed, no confusion occurs in the full cycle of separating and reassembling the binder halves.

Having disclosed an improvement in the binder construction, I claim:

In a loose leaf binder construction of the kind employing overlapping parts in the back panel to adjust for binder thickness and a one way spring clutch mounted on the middle portion of one of said overlapping parts, said clutch being adapted to cooperate with a prong carried by the other overlapping part to releasably hold such binder parts in assembled position, the combination of a toggle mechanism mounted on said part carrying the clutch, said toggle mechanism extending from a position of adjacency to the spring clutch outwardly to one end of the binder back and comprising an inner lever having a wedge surface at its inner end formed to engage and release said spring clutch from its cooperating prong when said lever is moved to one of its toggle positions, and an outer lever pivotally connected to the outer end of the first lever and extending to the adjacent end of the binder back said outer lever being pivotally mounted between its ends on the clutch-carrying overlapping part, said outer lever cooperating to move and hold said first lever in clutch release position by toggle action when said outer lever is swung by hand to bring the pivotally connected ends of the levers across their toggle center line, and a mechanical finger mounted on that one of said overlapping parts not carrying the clutch in the back panel, said finger being positioned to engage the outer toggle lever and operate said toggle mechanism to withdraw the first lever from its clutch release position as the prong is drawn free of the spring clutch.

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