

Jan. 19, 1937.

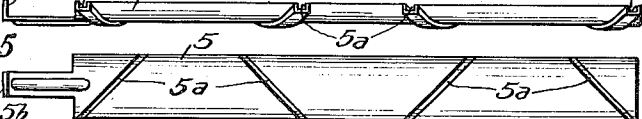
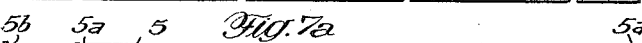
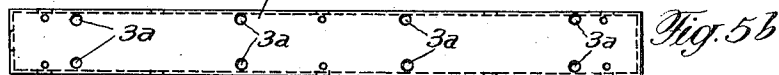
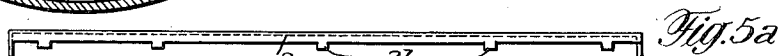
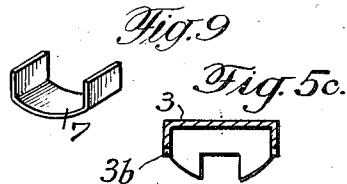
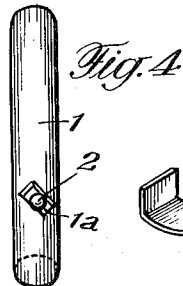
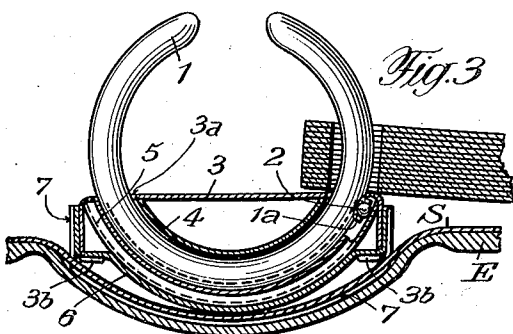
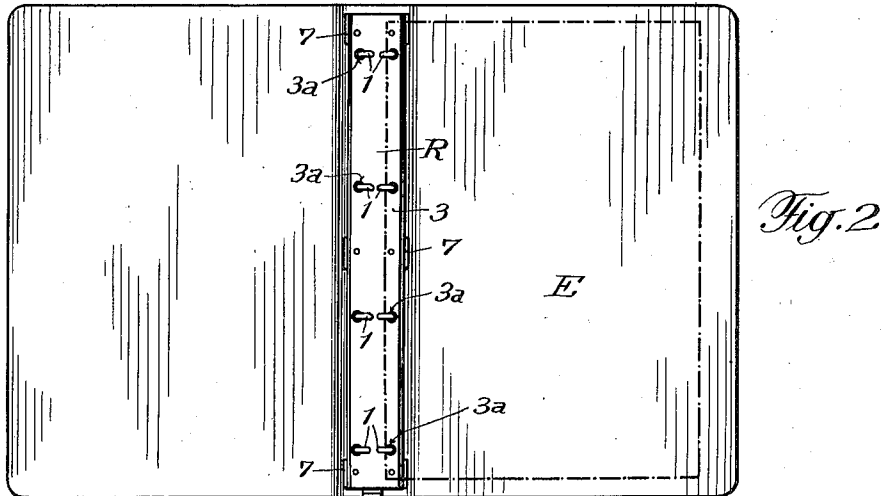
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2,068,229

HOLDING DEVICE FOR THE SHEETS OF LOOSE LEAF BOOKS

Filed Jan. 20, 1936

2 Sheets-Sheet 1



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HOLDING DEVICE FOR THE SHEETS OF LOOSE LEAF BOOKS

Filed Jan. 20, 1936

2 Sheets-Sheet 2

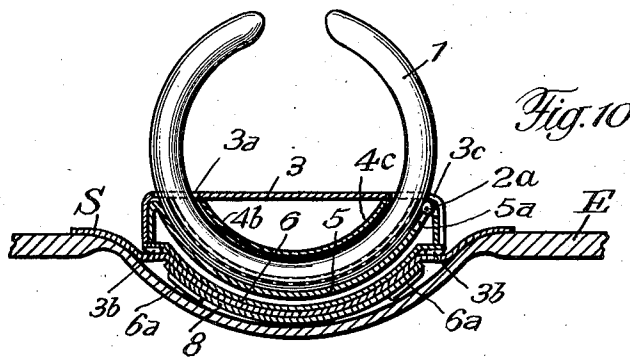


Fig. 10

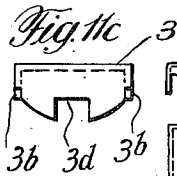


Fig. 11c

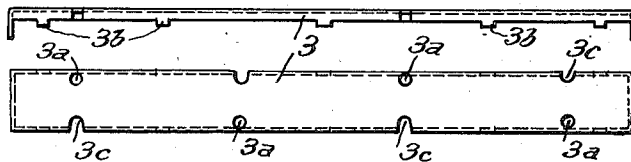


Fig. 11a

Fig. 11b



Fig. 12c

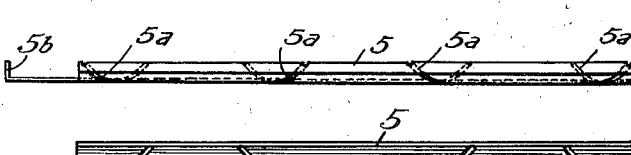


Fig. 12a

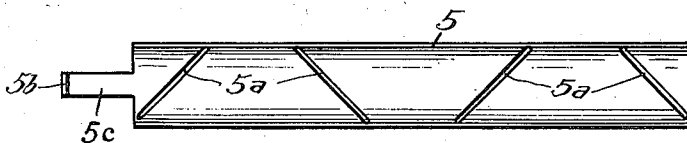


Fig. 12b



Fig. 13c

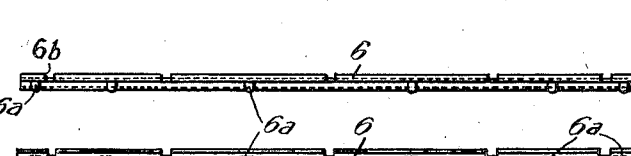


Fig. 13a

Fig. 13b



Fig. 14b

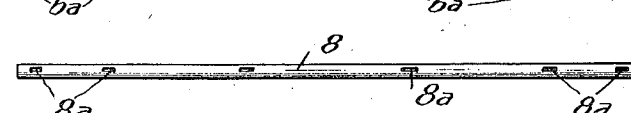


Fig. 14a



Fig. 15c



Fig. 15a



Fig. 16a



Fig. 16b

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UNITED STATES PATENT OFFICE

2,068,229

HOLDING DEVICE FOR THE SHEETS OF
LOOSE LEAF BOOKS

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Application January 20, 1936, Serial No. 59,952
In Germany February 11, 1935

4 Claims. (Cl. 129—23)

The object of the present invention is a holding device for the sheets of loose leaf books comprising slitted rings that are rotatably mounted in a base member and slide means for conjointly turning all the rings at one or both ends of the base member.

Arrangements of this kind have already been proposed which had, however, several drawbacks. In as much as the slits of the rings were always aligned in all positions of the rings and in most cases separate slide members for covering the slits in the locking position were provided, the receiving capacity of the rings could be utilized only up to a small percentage. Furthermore, inserting the sheets into and removing the same from the rings, the slits of which required to be made as narrow as possible in order to avoid the sheets dropping out unintentionally, was difficult and also turning the rings was rendered difficult in consequence of the resistance resulting from the improperly guided sheets.

Other arrangements were attempted to be improved by using rings of T-shaped cross section, but this required a correspondingly abnormal punching of the sheets, due to which tearing of the adjacent edges of the sheet material is particularly prone to arise.

These drawbacks are eliminated according to the present invention by the provision that the slide for turning the rings, which engages the latter at the exterior circumference thereof, is so connected with the rings that the same are turned pairwise in opposite directions, in such a way, that only in the position of the rings for removing the sheets the slits in the rings align, whereas during turning the rings into the position for removal as well as into the locking position, the slits in the individual pairs of rings are positioned on opposite sides.

Owing to this construction of the ring control mechanism, turning the rings as well as inserting and removing sheets is considerably facilitated, while the receiving capacity of the device is as great as obtainable, and at the same time dropping out of individual sheets is positively prevented, since the slits of the rings are not aligned in the locking position but are positioned in pairs on opposite sides. Furthermore, as the control mechanism cooperates with the exterior circumference of the rings, a large portion of the circumference of the rings is available for the reception of sheets. Moreover, with this arrangement, the slits of the rings can be made wide enough to permit of removing individual sheets or a greater number of sheets conjointly and in-

serting the same again respectively, and since, to this end, the individual pairs of rings turn in two opposite directions, the sheets are always guided by the integral portions of the rings, so that the apertures of the sheets are truly aligned and thus the ends of the rings are prevented from unhooking, the turning operation being thus facilitated and damaging of the sheets is avoided.

In the accompanying drawings several embodiments of the invention are illustrated by way of example only, in which

Fig. 1 shows a side elevation of a first form of a loose leaf binder according to the invention, inclusive of the control mechanism, the binder being opened;

Fig. 2 shows a corresponding plan view;

Fig. 3 shows a section through the holding device as such, on a larger scale;

Fig. 4 shows a front elevation of a holding ring;

Fig. 5a shows a side elevation of a cover plate of the device, on a smaller scale;

Fig. 5b is a plan view of Fig. 5a; and

Fig. 5c is a cross section thereof;

Fig. 6a shows a side elevation of a guide plate for the rings;

Fig. 6b is a plan view of Fig. 6a, and

Fig. 6c is a cross section thereof;

Fig. 7a shows a side elevation of a control slide of the device,

Fig. 7b is a plan view of Fig. 7a, and

Fig. 7c is an end elevation thereof;

Fig. 8a shows a side elevation of a base supporting plate, and

Fig. 8b is an end elevation of Fig. 8a.

Fig. 9 is a perspective view of a detail on a somewhat larger scale;

Fig. 10 shows a section of a second form of a loose leaf binder according to the invention;

Fig. 11a shows a side elevation of the cover plate of a modification of the device on a smaller scale,

Fig. 11b is a plan view of Fig. 11a, and

Fig. 11c is an end elevation thereof;

Fig. 12a shows a side elevation of the control slide of the modified device,

Fig. 12b is a plan view of Fig. 12a, and

Fig. 12c is a cross section as seen from the left in this figure;

Fig. 13a shows a side elevation of the base supporting plate,

Fig. 13b is a plan view of Fig. 13a, and

Fig. 13c is a cross section thereof;

Fig. 14a shows a side elevation of a backing plate, and

Fig. 14b is a cross section thereof;

Fig. 15a is a side view of a curved guide plate,

Fig. 15b is a plan view of Fig. 15a, and

Fig. 15c is an end elevation thereof;

Fig. 16a is a side elevation of a leaf holding ring, and

Fig. 16b is an end elevation thereof.

In the embodiment of the holding device shown in the Figs. 1 to 8, E represents the book cover for the binder to the back of which the base member R and the rotatable leaf holding rings 1 are fastened. Each slitted ring is provided on one side with a walled recess 1a constituting a driving projection in which a ball 2 is loosely mounted. The device is composed of a sheet metal cover plate 3, which holds the rings 1, a sheet metal guide plate 4 for the rings, which is carried by the cover plate 3, a slide 5 below the guide plate to enclose the lower ring portions, and a base supporting plate 6 to which the whole assembly is secured. The cover plate 3 is in the form of an inverted tray of a channel shaped cross section and having depending end plates projecting below the sides of the tray. The sides of the cover plate are provided with bendable tongues 3b for connecting with the base supporting plate 6. The slitted rings 1 are rotatably mounted in apertures 3a of the cover plate.

The cover plate 3 is inserted between the up-turned side edges of the base supporting plate 6 (Fig. 8a) and secured to the latter by means of the bent over tongues 3b, so as to form with this plate a closed hollow base member.

Inside of the cover plate 3 the guide plate 4 (Fig. 6a) of an arcuate cross section is disposed which is provided opposite the apertures 3a with transverse grooves 4a as guideways for the slitted rings 1.

Underneath the guide plate 4 a slide 5 (Fig. 7a) of a curved cross section and also consisting of sheet metal is arranged one end of which is formed into a handle 5b which projects upwardly from the base member at the lower end thereof. This slide is provided with guideways as grooves 5a which are, however, not transversely directed as those of the guide plate 4, but rather inclined to each other in pairs so as to form portions of oppositely inclined helices. Into these grooves 5a the balls 2 secured to the rings 1 engage, so that the rings are compelled to revolve pairwise in opposite directions, when the slide 5 is displaced. The length of the slide 5 is shorter for the range of the necessary displacement than the length of the guide plate 4.

The base supporting plate 6 rests upon a fabric strip S pasted onto the book cover E and is secured thereto by means of staples 7 (Fig. 9) which are soldered laterally on the base supporting plate.

In the locking position the rings 1 are so positioned that their slits are situated inside the base member, so that none of the sheets can drop out. When it is desired to insert or remove any sheet, the slide 5 is pulled out of the book cover by means of the handle 5b in the outward direction, the rings 1 thus being turned so that the slits are all aligned in an upper disposition as shown in Fig. 3. Then any sheets can readily be inserted or removed. For locking the holding device the slide 5 is pushed inwardly in which way the rings 1 revolve back until their slits are returned to the interior of the base member.

Due to the rings being turned pairwise in opposite directions, the slits thereof arrive into their positions of alignment only at the end of this turning movement, that is, in the central disposition, so that no sheets can drop out laterally.

In the embodiment of the invention shown in the Figs. 10 to 16b, at the circumference of each slitted ring-holder 1 a radially projecting stud 2a is disposed.

The cover plate 3 is of the same construction as in the first embodiment except that for each ring 1, instead of two apertures, only one aperture 3a and a slot 3c are provided. The cover plate 3 is connected to the curved base supporting plate 6 by means of tongues 3b inter-engaging with notches 6b (Fig. 13a) and the latter is provided with depending tongues 6a which are passed through slots 8a of a curved backing plate 8 and bent down thereon in the inward direction (Fig. 10). Between the base supporting plate 6 and the backing plate 8 the fabric strip S is clamped which is pasted on to the book cover E.

On the inner side of the cover plate 3 curved guide plates 4b of arcuate cross section are inserted in the transverse grooves 4c of which the rings 1 are guided (Figs. 10 and 15, a, b, c). Underneath these plates the curved slide 5 is positioned which is provided with oblique grooves 5a that are relatively inclined in pairs and which has a handled end 5b that projects upwardly from the base member. The shank 5c of this end is guided by a recess 3d in the adjacent end plate of the cover plate 3. Into the grooves 5a the studs 2a on the rings 1 are projecting (Figs. 10 and 16a, b), so that in displacing the slide 5 the rings are turned in the same manner as described above for the preceding embodiment.

The spacings between rings are advantageously of a length which permits of inserting in the holding device sheets of various sizes of standard punching.

Instead of a single slide two slides may be provided, each of which serving for controlling a separate group of rings and being controlled at opposite ends of the base member.

I do not limit myself to the particular size, shape, number or arrangement of parts as shown and described, all of which may be varied without going beyond the scope of my invention as shown, described and claimed.

What I claim is:

1. In a holding device for the sheets of loose leaf books, a series of slitted sheet holding rings, a base member accommodating said rings circumferentially revolubly about the axis of said series, said rings having projections thereon, slide means engaging said projections on said rings at portions of their circumferences interiorly of said base member, guide means on the slide means at the engaging portions of said slide means for turning said rings pairwise in opposite directions during the sliding movement of the slide means, and handle means disposed terminally on said slide means for reciprocating the same longitudinally of said axis, for turning each pair of rings in position of interchanging sheets with the slits of the rings aligning exteriorly of said base member and for reversely turning each pair into position of locking the sheets respectively, the slits of the individual pairs being positioned on opposite sides of said axis during said turning movements.

2. In a holding device for the sheets of loose leaf books, a series of slitted sheet holding rings, a base member accommodating said rings circumferentially revolubly about the axis of said series, with the greater portion of their circumference situated exteriorly of said member, an arcuate guide plate for said rings disposed inside said base member and having guide grooves,

extending transversely of said axis, and engaging the inner circumferences of said rings, said rings having projections thereon, slide means engaging said projections on said rings radially outwardly at their smaller circumferential portions interiorly of said base member, guide means on the slide means at the engaging portions of said slide means for turning said rings pairwise in opposite directions during the sliding movement of the latter means, and handle means disposed terminally on said slide means for reciprocating the same longitudinally of said axis, for turning each pair of rings in position of interchanging sheets with the slits of the rings aligning exteriorly of said base member and for reversely turning each pair into position of locking the sheets respectively, the slits of the individual pairs being positioned on opposite sides of said axis during said turning movements.

3. In a holding device for the sheets of loose leaf books, a series of slitted sheet holding rings, spherical driving means rotationally mounted on the circumference of each ring, a base member accommodating said rings circumferentially revolubly about the axis of said series, with the greater portion of their circumference situated exteriorly of said member, an arcuate guide plate for said rings disposed inside said base member and having guide grooves, extending transversely of said axis, and engaging the inner circumferences of said rings, a slide curved coaxially with said guide plate for engaging said rings radially outwardly at their smaller circumferential portion interiorly of said base member, oblique guideways at the engaging portions of said slide for cooperation with said driving means, for turning said rings pairwise in opposite directions during the sliding movement of said slide, and handle

means disposed terminally on said slide means for reciprocating the same longitudinally of said axis, for turning each pair of rings in position of interchanging sheets with the slits of the rings aligning exteriorly of said base member and for reversely turning each pair into position of locking the sheets respectively, the slits of the individual pairs being positioned on opposite sides of said axis during said turning movements.

4. In a holding device for the sheets of loose leaf books, a series of slitted sheet holding rings, a driving stud fixed circumferentially on each ring, a base member accommodating said rings circumferentially revolubly about the axis of said series, with the greater portion of their circumference situated exteriorly of said member, an arcuate guide plate for said rings disposed inside said base member and engaging the inner circumferences of said rings by means of guide grooves extending transversely of said axis, a slide curved coaxially with said guide plate for engaging said rings radially outwardly at their smaller circumferential portion interiorly of said base member, oblique guideways relatively inclined at the engaging portions of said slide for cooperation with said driving means on adjacent rings for turning said pairs of adjacent rings in opposite directions during the sliding movement of said slide, and handle means disposed terminally on said slide means for reciprocating the same longitudinally of said axis, for turning each pair of rings in position of interchanging sheets with the slits of the rings aligning exteriorly of said base member and for reversely turning each pair into position of locking the sheets respectively, the slits of the individual pairs being positioned on opposite sides of said axis during said turning movements.

JEAN FAHRNBÜHL.