E. A. P. WOLF.

LOOSE LEAF BOOK.

APPLICATION FILED MAY 6, 1919.

1,343,103. **Patented June 8, 1920.**

2 SHEETS—SHEET 1.

Fig. 1.

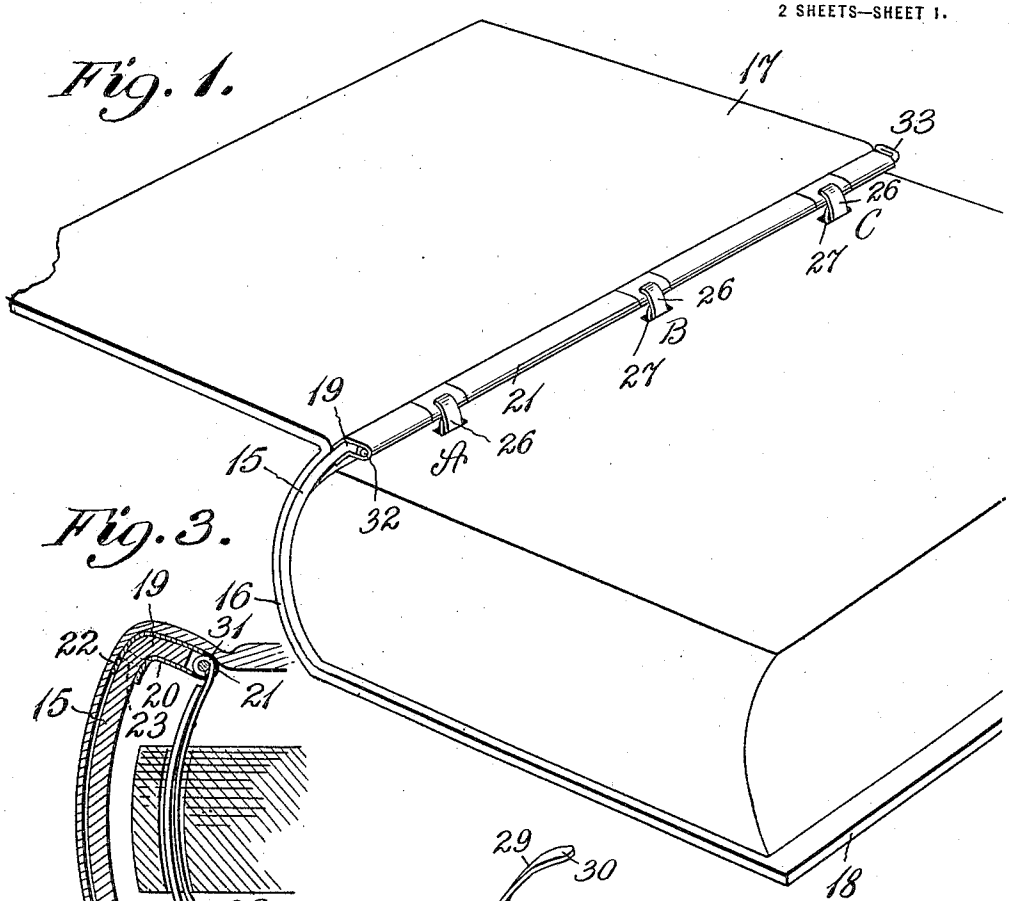


Fig. 3.

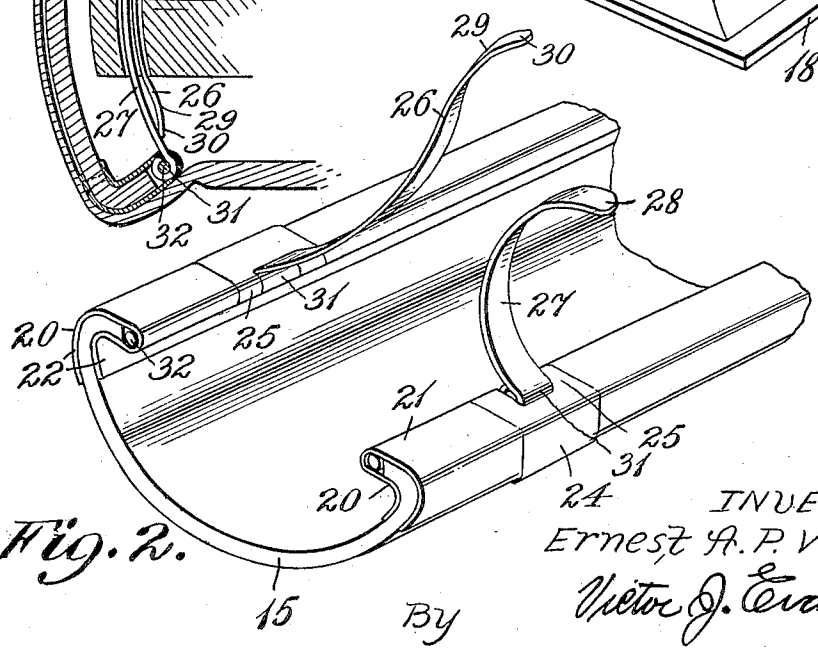


Fig. 2.

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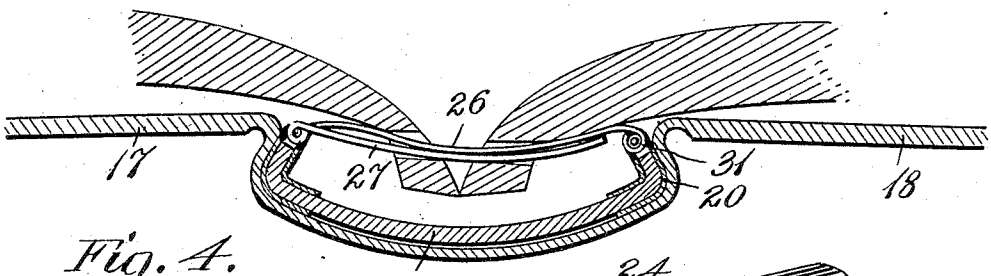


Fig. 4.

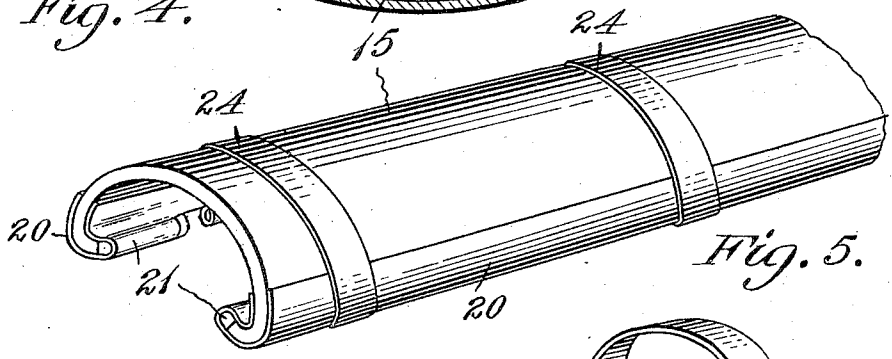


Fig. 5.

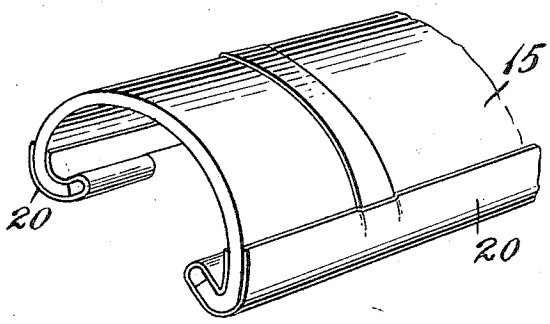


Fig. 6.

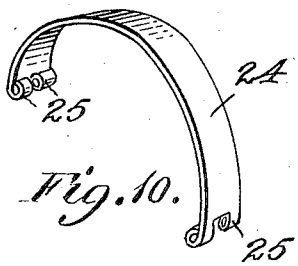


Fig. 10.

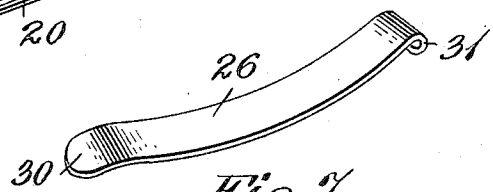


Fig. 7.

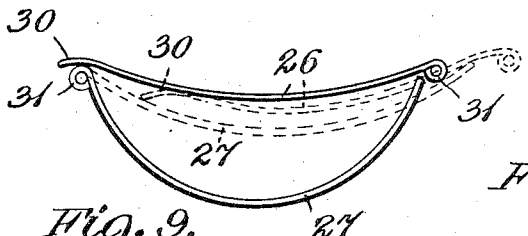


Fig. 9.

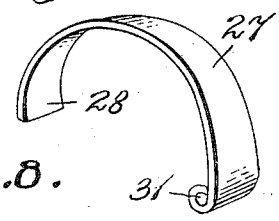


Fig. 8.

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UNITED STATES PATENT OFFICE.

ERNEST A. P. WOLF, OF NEW YORK, N. Y.

LOOSE-LEAF BOOK.

1,343,103. Specification of Letters Patent. Patented June 8, 1920.

Application filed May 6, 1919. Serial No. 295,059.

To all whom it may concern:

Be it known that I, ERNEST A. P. WOLF, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Loose-Leaf Books, of which the following is a specification.

This invention relates to loose leaf books and particularly to an improvement upon the form of invention shown in my Patent No. 1,078,116 of November 11, 1913.

One object of the invention is to improve the construction of the back member of the book by strengthening the same along longitudinal lines and imparting flexibility or elasticity thereto transversely of the curvature of the back so that the cover members can be freely adjusted and the book opened to its maximum extent without possibility of derangement of parts or mutilation thereof, while combining the features above named in a manner which will cause the back to always assume a regular or uniform shape, and adapt itself to the weight or bulk of the supported leaves.

Another object of the invention resides in the provision of a novel form of leaf binder, the same consisting of sets of companion springs, the springs of each of said sets respectively possessing relatively diffierent degrees of resiliency or elasticity and one serving as a means to sufficiently resist the flexing of the other or companion spring so as to cause the latter to fully adapt itself automatically to the mass of leaves supported and retain said leaves in a grouped or non-scattered state.

A still further object of the invention relates to the provision of a binder consisting of mating springs adapted to be threaded respectively in opposite directions through perforations in the edges of the leaves, the form of each of such springs being such that one co-acts with the other to maintain an operative relation of one to the other and thus effectuate a means for establishing their operative confinement with the leaves without resorting to the use of special fastening devices.

Another object of the invention is to provide a loose leaf book having a freely flexible back with which devices are associated so as to expedite the operation of arranging the leaves in the book and render the book highly flexible and elastic and enable the operator to fully compress the leaves against each other so that the entire space between the sides of the back can be fully occupied in the building up of the book.

A still further object of the invention is to provide a loose leaf book which will be strong and durable of construction, effective for the purpose, comparatively inexpensive of manufacture and one which will consist of parts which are structurally designed to facilitate and simplify the operation of arranging the leaves in book form.

In the drawings:—

Figure 1 is a perspective view of a portion of a book showing one of the cover members opened to disclose the invention.

Fig. 2 is a perspective view of a portion of the back.

Fig. 3 is a transverse section therethrough with the leaves applied.

Fig. 4 is a view similar to Fig. 3 showing the book opened.

Fig. 5 is a perspective view of the back.

Fig. 6 is a perspective view of a slightly modified form of back.

Fig. 7 is a perspective view of one of the springs.

Fig. 8 is a perspective view of the mating spring.

Fig. 9 is a diagrammatic illustration of the mating springs associated in operative relation and illustrating relatively different flexible conditions thereof.

Fig. 10 is a perspective view of one of the leaf springs forming a part of the back.

The book comprises a relatively stiff back 15 secured in any suitable well known manner to an outer cloth binding 16, the latter being provided with the usual cover members 17 and 18. Along each longitudinal edge the back 15 is up-set as at 19 and secured thereto is a metallic strip 20, looped at 21 and provided with flanges 22—22 secured by rivets or the like 23 against the opposite faces of the back as illustrated.

Following the curvature of the back are leaf springs 24 each having loops 25 formed thereon at its ends and disposed in alinement with the loops 21 of the metallic strips 20. This construction, in combination with the longitudinally arranged metallic strips 20, gives stiffness and rigidity to the back

15 as a body member while serving to permit the back to be freely flexed or expanded. The arrangement always maintains the back in a uniform condition and it enables the user to open the book to its maximum extent without possibility of derangement of parts or mutilation thereof.

The book is intended to be used in conjunction with the type of perforated leaves shown in my Patent No. 1,078,116, of Nov. 11, 1913, and in view thereof, I provide sets A, B, and C of binding springs which are adapted to be threaded through the perforations of the leaves to constitute an elastic transverse connection between the extreme sides of the back 15. Each of said sets comprises leaves 26 and 27 respectively, the former being of an appreciably lighter quality of material than the former and normally bowed or curved to a lesser degree than the mating heavier leaf 27 and as illustrated, the terminal 28 of the leaf 27 is arranged in free sliding contact with the convexity or outer surface of the leaf 26 while in the case of the leaf 26, the extremity 29 is off-set and curved inwardly as at 30 for free sliding engagement over the concavity or inner face of the leaf 27. By off-setting and curving the extremity 29, as stated, the perforations in the leaves are easily found and the leaves successively picked up in the action of closing the book. This prevents the perforations from being torn away or otherwise mutilated. By providing mating springs of respectively different degrees of resiliency or elasticity, I find that they adapt themselves to the condition of the supported leaves and the tendency of the springs is to maintain the leaves in a grouped mass. I also find the construction additionally desirable and advantageous over the form employed in my former patent in that a greater flexing of the springs is possible and consequently better expansion of the back can be made so as to build up the leaves to a point where they will occupy the whole of the space between the metallic strips 20 heretofore mentioned.

Each of the leaves 26 and 27 is provided with a loop 31, the loop of one leaf being positioned at a point adjacent to the free extremity of the mating leaf and as illustrated these loops are adapted to aline or register with the loops 21 and 25 and receive therewith a continuous locking rod 32. These rods are preferably provided with manipulating ends 33 whereby they can be quickly threaded through or removed from the respective loops as the occasion demands.

In the operation of assembling the leaves they are grouped together with their perforations in registration. The spring leaves 26 and 27 are then threaded respectively in opposite directions through said perforations so that the loops 31 of said leaves are positioned outermost where they will be capable of convenient application to the metallic strips 20 and the loops 25 of said springs 24.

In the modified form shown in Fig. 6, the back spring has its ends secured between the back 15 and the strip 20.

What is claimed as new is:—

1. In a loose leaf book, side boards and a connected back, and flexible strips arranged in pairs and adapted to enter the perforations in the leaves to be bound, said strips having their outer ends detachably secured to the side edges of the back and having their inner ends arranged in free sliding contact with each other, one of said strips having its free end bent at an angle to the curve of the major portion of the strip so as to provide a leaf collecting portion, as and for the purpose set forth.

2. In a loose leaf book, side boards and a connected back, and flexible strips arranged in pairs and adapted to enter the perforations in the leaves to be bound, said strips having their outer ends detachably secured to the side edges of the back and having their inner ends arranged in free sliding contact with each other, said strips respectively being of different degrees of flexibility.

3. The combination with a back and mating side boards, of a leaf binder carried by the back and comprising a pair of leaf springs each possessing a different normal curvature and having free end portions arranged in sliding engagement with each other, and means for detachably securing said springs to said back.

4. The combination with a back and mating side boards, of a leaf binder carried by the back and comprising a pair of leaf springs each possessing a different normal curvature and having free end portions arranged in sliding engagement with each other, means for detachably securing said springs to said back, said springs respectively possessing varying degrees of elasticity.

5. A loose leaf book structure comprising a back having looped portions at its side edges, springs extending between the sides of the back and having outer looped ends associated with said looped portions, the inner ends of the springs being freely slidable over one another, one of said springs having its free terminal offset and curved in the direction of the other spring, and devices for holding the looped portions in hinge relation to said looped ends.

6. A loose leaf book structure comprising a back, mating springs extending respectively in opposite directions from the sides of the back and adapted to be passed through perforations in the leaves, said springs arranged in free sliding engagement with each other, one of said springs having a curved

leaf collecting terminal arranged in contact with the other spring, and means separably supporting said springs from said back.

7. A loose leaf book structure comprising a back, and bowed springs respectively extending from the opposite sides of said back, the springs at one side having curved free terminals arranged in close contact with the springs at the other side for maintaining a sliding relation of the springs at one side with those of the other side of said back.

8. A loose leaf book structure comprising a back, springs embracing said back, springs extending from one side of said back, springs extending from the opposite side of said back and arranged in free sliding engagement with said second named springs, and provided with terminals curved in the direction of said second named springs and contacting therewith.

9. A loose leaf book structure comprising a back, leaf springs extending from one side of the back, leaf springs extending from the opposite side of said back and arranged in free sliding contact with the first named springs so as to permit of relative separation of the sides of said back, said springs adapted for extension through alined perforations in the leaves, and means for detachably supporting said springs from said back, said second named springs having terminals curved in the direction of said first named springs and contacting therewith.

10. A loose leaf book structure comprising a back, metallic members extending along the side edges of the back, said members having loops formed thereon, springs embracing the back and having loops alined with the loop of said members, mating leaf engaging devices extending from the side edges of the back and having looped outer terminals, and rods extending through said looped terminals and through the loops of said members and the loops of said springs.

In testimony whereof I have affixed my signature.

ERNEST A. P. WOLF.