This application is directed to non-metallic binders for loose leaf note-books, folders, etc. The objects of the invention include the provision of an improved loose leaf binder device comprising an elongated base element for attachment to a backing or other support, the base element being curved in cross-section to provide opposite edges for contact with the support, and a flanged split collar depending from the base element; and stopping short of the plane of the edges, together with a headed button for penetration through the backing and for locking contact with the flange on the collar to secure the base element to the support; the provision of a pair of relatively pivotable loose leaf holding fingers disposed in a slot in the base element for manual opening and closing to free or secure the leaves to the support; the provision of fingers as aforementioned, said fingers being non-metallic and having interengaging free ends which slip past each other to become latched by reversely disposed undercut latching shoulders, said shoulders being disposed in the same plane so that although they deflect each other during the latching action, no sidewise tension is placed upon the fingers once the latching takes place.

Further objects of the invention include the provision of non-metallic or plastic looseleaf holding fingers having corresponding ends secured to a base element for relative pivoting movement, said fingers being formed with hooks or angles adjacent their free, locking ends, to prevent the dispersal of loose leaves when the fingers are separated; and the provision of plastic, separable loose leaf holding fingers which are provided with interengaging free ends for holding the fingers closed, said free ends, however, being of a construction to fail to cause any interruption to the free and smooth passage of leaves from one finger to the other.

Still further objects of the invention include the provision of an economical and efficient all-plastic binder for loose leaf books, and the provision of an all plastic fastening device to secure the binder to a book or other support. Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing in which:
Fig. 1 is a top plan view of one end of my new non-metallic binder;
Fig. 2 is a section on line 2—2 of Fig. 1;
Fig. 3 is a section similar to Fig. 2, but showing the fastener removed;
Fig. 4 is a section on line 4—4 of Fig. 3;
Fig. 5 is a section on line 5—5 of Fig. 1;
Fig. 6 is a top plan view of a section of the base element with the fingers removed;
Fig. 7 is a view similar to Fig. 5 but showing a modification of the invention;
Fig. 8 is a partial side view of a modified latching means;
Fig. 9 is a plan view of Fig. 8;
Figs. 10 and 11 are enlarged detail views of the latching means of Fig. 8, and
Fig. 12 shows a modified structure.

In the drawing the reference character 10 indicates the back of a loose leaf note book or the like having front and end cover sheets 12 attached to the back to swing relative thereto to open or close the book. I provide a base element 14 which is made in longitudinally bowed form to present edges 16 to contact the back 10 when the parts are assembled. In cases where the invention is made of plastic, the entire base element about to be described is molded in one piece.

At a point spaced inwardly from an end of the base element, I provide a depending integral collar 18 having a single or double split or splits 20 therein. This collar depends to a point just short of a plane passing through the extreme ends of edges 16, and an inward flange 22 is provided at the free end of the collar.

A button 24 having a flat end flange 26 and a conical head 28 at its other end is provided for cooperation with the collar to secure the base element 14 to the support 10. This is accomplished by providing an aperture 29 in the support, aligning the collar 18 therewith, and forcing the head 28 of the button through the aperture and into the collar past the flange, whereupon head 28 will be caught and held by flange 22. During the attaching action, head 28 will spring apart the legs of the collar as defined by slots 20, and the base element itself may also spring somewhat, as the collar is integral therewith. However, once head 28 is past the flange, the collar and base element return to their original positions, and the parts are so arranged as to avoid any tension thereon, except for a slight tension imparted on the base element by the fastener to ensure close contact of edges 16 and the support 10. This tension is occasioned by the relative lengths of the collar and button, and the curvatures of the base element.

As many collars and buttons as may be needed or desired are used with the base element, it being preferred to form one adjacent each end of the base element.

Inwardly of the collars, I provide and also mold integrally a partition or cross-piece 30 which extends from edge to edge and from the top of the bowed portion of the base element substantially to the bottom in line with the edges 16. This cross-piece has a width substantially as shown in Fig. 6, and a slot 32 is molded therein across the base element and extending down towards, or all the way to the plane of the edges 16 if desired.

In the form shown in Figs. 5 and 6, the slot 32
is interrupted by a bar or transverse member 34, again molded integrally, this bar having substantially flat side surfaces 35. A pair of parallel pins 38 extend across the slot as shown, one at either side of bar 34 and intermediate of the top and bottom of the base member, and these pins are also molded integrally with the base member.

This base construction is very important to the successful use of the invention, and it is desired to point out that one of the most important details resides in the molding of pins 38 integrally with and at the same time as the molding of the base 14 and partitions 30. This provides a rigid, strong, construction which is easily made and requires no hand labor in finishing.

Referring now to Figs. 1 and 5, I provide as shown a pair of similar hook shaped fingers 40. Each finger is formed to provide top and bottom runs 42, 44, which approach a parallel condition, and a side run 46 connecting the top and bottom. Each bottom run terminates in a hook 45 which has a slot 49 capable of slipping over either of the pins 38 to pivot thereon, and each hook 48 is provided with a flat surface 50. The slots 49 are of a nature to allow assembly or disassembly only when the fingers are in their extreme open position, and even then the fingers must be lifted up manually to be removed so that accidental detachment of the fingers is impossible.

Each top run 42 terminates in a free end which is pointed, see Fig. 1, and which has an outer side flush with the finger lateral surface and an angular inner side 51. The inner side is reversely undercut at 52 to form a hook for cooperation with the corresponding hook on the other finger free end, to latch the fingers in their closed condition.

It will be seen that the free ends of the fingers must be laterally sprung a tripe to disengage the hooks at 52 to permit opening of the fingers, and that upon closing of the finger, the angled ends will automatically spring past each other to mutually latch. However, once the hooks are seated in latching relation, there is no lateral tension of any kind on the fingers, so that no undesired lateral set of the fingers is possible.

Also, the pointed ends of the fingers are beveled slightly as at 53 so that these ends, although sharp, underlie the lateral side surfaces of the fingers, and therefore loose leaves will pass smoothly in either direction over the closed and latched fingers.

Surfaces 36 of bar 34 are arranged to abut and stop surfaces 50 of the fingers at the exact point of relative movement of the fingers to latched position, and the fingers thus being held, no pivoting or looseness in these fingers is possible after latching. Also, this abutting action is useful for imparting a slight tension to maintain latching condition.

A modified form of loose leaf holding finger arrangement is illustrated in Fig. 7 wherein the base element is substantially the same as in the other figures. However, in Fig. 7, one finger, as at 34, is fixed in a slot 32, being immaterial to the invention what means is employed to secure finger 54, and it may even be molded with the base element if convenient. An integral pin 59, similar to either of pins 38, extends across slot 56 and pivotally mounts a movable finger 60, this finger being similar to that of Fig. 4.

With the construction of Fig. 7, the bar 34 is unnecessary and may be dispensed with, and instead the fixed and movable fingers are provided with flat abutting surfaces as at 62, so that when the latch 64, substantially the same as in Figs. 1 and 5, is operative, these surfaces abut and prevent any relative movement of the fingers either with relation to each other or to the base element.

Figs. 8 to 11 inclusive show a further modification of latching fingers which may comprise two pivoted fingers or a fixed and a pivoted finger. In either case, the free ends, 66, 67 are beveled or inclined from top to bottom of the finger ends, instead of from side to side as in Figs. 5 and 7. These ends are pointed but are arranged to underlie the top and bottom finger surfaces as at 68. Fig. 8, for smooth passage of the leaves thereover. It will be clear that none of the devices illustrated will provide catches for the leaves as the latter pass over from one finger to the other.

Finger end 68 is provided with a vertical cavity, or aperture 70 having a side slot 72 for guiding a vertical lug or projection 74 on the inclined end surface of finger 67 into the cavity. The lug is central of its finger end, and clearly latches the fingers and holds them against movement in any direction. In this case, the fingers may be accidentally opened by a sidewise force, as sometimes will occur due to the weight of a large number of leaves.

In Fig. 12 I have shown a form of hook connection for the latching fingers which is similar to the Fig. 5 disclosure but wherein the abutment 34a is longer and extends in triangular form substantially to the cover 10. The hooks 78 are flat at their bottom edges to abut the cover as at 80, and each hook has a curve 82 on a radius to roll in contact with a surface of the abutment 34a when the fingers are opened by pivoting on pins 39a. Abutting surfaces 84 may also be provided, and it will be noted that the hooks are easily detachable by opening the fingers to their fullest extent and lifting them from their pins.

From the above description it will be clear that I have provided a completely non-metallic loose leaf binder of relatively simple but efficient nature wherein the loose leaves will be held by the fingers whether the latter are open or closed. Also the latch means is a positive one which imparts no deleterious tension transversely of the fingers, and the same is true of the finger device. By reason of the latch construction, no impedance is presented to the shifting of the loose leaves from one finger to another, but on the contrary a smooth passage for the leaves is provided, especially since the tendency is not to scrape the edges of the holes of the leaves across the sides of the latch, but only along the bottom thereof, and both the bottom and top surfaces of all the latches are smooth.

Due to the fact that in all the herein disclosed constructions, the movable fingers abut a fixed surface in their latched conditions, no slipping, nor any other movement, of the fingers is possible in latched condition thereof, and in fact the abutments impart a slight tension on the fingers in a direction to help maintain them latched. Also, all movable fingers are easily assembled and detached, and in all cases they have a rolling contact on abutments or cooperating fingers.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A leaf binder element, means providing a slot in said element, a leaf-holding finger in the slot, a hook on the finger,
said finger being pivoted to the base element by
the hook, an abutment on the base element to stop
the pivotal motion of the finger in its direction
of movement to closed condition, means cooperating
with the finger to hold leaves therewith, and
a fastener for securing the base element to a sup-
port, said fastener comprising a flanged collar
fixed on the base element and a separate button
having a head for engagement with said collar,
said hook having a continuous sliding engage-
ment with the abutment during movement of the
finger.
2. A looseleaf binder comprising an elongated,
transversely bowed base element, a collar depend-
ing from the element, a partition depending from
said element but contained within its confines, a
slot in the partition, a pin traversing the slot, a
leaf holding finger pivoted on the pin, an abut-
ment for stopping said finger in one direction of
its movement, and means cooperating with the
finger and forming a continuous leaf holder, said
base element, collar, pin, and partition being
formed in one integral piece, and a fastener co-
operating with the collar to secure the base ele-
ment to a pivot.
3. A device of the class described, a pair of
relatively moveable resilient fingers, a support
therefor, and means for latching said fingers,
said latching means comprising complementary
beveled areas on said fingers, a cavity in one
beveled area, an upstanding lug on the other
beveled area, said lug and a wall of the cavity
forming interengaging shoulders which are guided
into engagement by one of the beveled areas, an
abutment for at least one of said fingers, said
abutment stopping the movement of one finger
substantially at the point of latching and bearing
on said one finger to maintain the latching en-

gagement.
4. A loose leaf binder as recited in claim 2
wherein said means comprises a fixed finger.
5. A loose leaf binder as recited in claim 2
wherein said means comprises a fixed finger, said
abutment forming a part thereof.

6. A loose leaf binder as recited in claim 2
wherein said means comprises a pivotal finger and
said abutment acts on both fingers.
7. A looseleaf binder comprising a base ele-
ment, means providing a slot in said base, a leaf-
holding finger in the slot, said finger being move-
able therein, means cooperating with said fin-
ger to form a continuous leaf holder, said finger
being movable to and away from said last named
means, an element for stopping said finger in its
movement to said last named means to position
the finger relative thereto, and a pin on the
base and extending across the slot, said finger
having a hook for detachable engagement on said
pin, and a curved surface on the hook for sub-
stantially continuous bearing on the abutment
during normal opening and closing of the finger.
8. A looseleaf binder comprising a base element,
means providing a slot in said base, a leaf-hold-
ing finger in the slot, said finger being moveable
therein, means cooperating with said finger to
form a continuous leaf holder, said finger being moveable to and away from said last named means,
an abutment for stopping said finger in its move-
ment to said last named means to position the
finger relative thereto, and said means compris-
ing a fixed finger, the abutment being integral
with the fixed finger.
9. A looseleaf binder comprising a base ele-
ment, means providing a slot in said base, a leaf-
holding finger in the slot, said finger being move-
able therein, means cooperating with said finger
to form a continuous leaf holder, said finger
being moveable to and away from said last named
means, an abutment for stopping said finger in
its movement to said last named means to position
the finger relative thereto, and said means compris-
ing a pivoted finger and the abutment being integral with the base element and extend-
ing across the slot.

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